

**Sexual partnership patterns and behaviour of HIV  
positive men who have sex with men: implications for  
HIV/STI prevention and partner notification**

***Sonali Wayal***

Department of Infection and Population Health  
University College London

This thesis is submitted for a Doctor of Philosophy in  
Social Epidemiology and Public Health  
in accordance with requirement of University College London

**2013**

Declaration:

'I, Sonali Wayal, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.'

Signed:

## Abstract

**Background:** In the UK, men who have sex with men (MSM) continue to be disproportionately affected with HIV and sexually transmitted infections (STI). Due to the increasing emphasis on using biomedical strategies like cART for prevention of sexual transmission of HIV, I examined HIV positive MSM's sexual partnerships and behaviours; their attitudes towards biomedical and behavioural HIV transmission risk reduction strategies, and their association with sexual behaviour. I also examined their attitudes towards partner notification for STI, willingness and preferred methods to notify partners of STI in the future.

**Methods:** 429 HIV positive MSM attending a central London clinic completed a computer assisted self-interview on sexual partnerships and behaviours, attitudes, preferences and willingness to notify partners for STI in the future. 24 purposively selected men participated in in-depth interviews.

**Results:** Of 429 men, 380 men had been sexually active in the last year. The survey data showed that the prevalence of unprotected anal intercourse (UAI) with a serodiscordant (i.e., HIV negative or unknown status) primary partner and the most recent non-primary partner was high, 18.3% and 16.9% respectively. A substantial minority of men had positive attitudes towards biomedical and various behavioural HIV transmission risk reduction strategies. Duration of partnership, recreational drug use, and belief that undetectable viral load reduces the risk of HIV transmission during UAI were all independently associated with HIV transmission risk behaviours with a serodiscordant primary partner. Disclosure of HIV status and recreational drug use during sex were independently associated with UAI with the most recent serodiscordant non-primary partner. Of the 258 men who had new partners, 53% had engaged in UAI with new partners. Prevalence of anonymous partnerships was high. Stigma associated with HIV/STI diagnosis, and the venues for meeting sexual partners also influenced men's sexual partnerships and behaviour, and disclosure of HIV status.

Approximately one in five sexually active men had not tested for STI and 25% of men had been diagnosed with STI in the last year. Young age; self-reported detectable viral load status; greater number of new anal sex partners; UAI with new and concurrent partners; having a seroconcordant primary partner; frequency of engagement in group sex were independently associated with STI diagnosis in the last year.

The qualitative data highlighted that the majority of men felt an emotional responsibility towards and acknowledged the personal health benefits of notifying primary and regular partners of STI. A greater proportion of men would be less willing to notify casual partners of STI in the future (21%) compared to a primary partner (5.3%) and regular partners (7.5%). Attitudes such as 'it is not my responsibility to notify partners of STI', and the lack of previous experience of notification were independently associated with unwillingness to notify casual

partners of STI in the future. The qualitative study indicates that the lack of emotional responsibility; fear of stigma and breach of HIV-related confidentiality due to partner notification; and fear of criminalisation for HIV/STI transmission were barriers to notifying sexual partners of STI, especially casual and group sex partners. Patient-referral was the most preferred method of notifying partners of STI in the future, particularly a primary partner; whereas there was greater willingness for notifying regular, casual, and group sex partners using remote self-led methods, provider referral or an anonymous e-card. The acceptability of sending an anonymous e-card and taking a home sampling kit for partners, and telephone assessment of partners for STI by clinic staff was low to moderate.

**Conclusion:** The findings of this study underscore the need for sustained interventions to ensure sexual health of HIV positive MSM and prevent HIV/STI in MSM. They highlight that cART should be offered to sexually active HIV positive MSM, especially those in serodiscordant partnerships irrespective of CD4 cell count to minimize the risk of onward HIV transmission in this population. Frequent STI testing of sexually active men should be integral part of routine HIV care. Various partner notification choices should be offered to those diagnosed with STI. Interventions to reduce stigma associated with homosexuality and HIV continue to remain vital in this population. Research examining the feasibility, acceptability, effectiveness, and cost effectiveness of integrating brief behavioural interventions to enhance regular STI testing, adherence to cART, address recreational drug use and mental health needs, and promote safer sex with routine HIV care is urgently needed.

## Table of contents

|   |           |
|---|-----------|
| <b>Abstract</b> .....   | <b>3</b>  |
| <b>Table of contents</b> .....  | <b>5</b>  |
| <b>List of tables</b> .....   | <b>12</b> |
| <b>List of figures</b> .....  | <b>16</b> |
| <b>Glossary</b> .....   | <b>20</b> |
| <b>Acknowledgements</b> .....   | <b>22</b> |
| <b>Chapter 1: Introduction, rationale and aims of the thesis</b> .....  | <b>23</b> |
| <b>1. Introduction</b> .....  | <b>23</b> |
| 1.1 Current state of the global HIV epidemic.....   | 25        |
| 1.2 A brief history of HIV/AIDS.....  | 26        |
| 1.2.1 <i>Emergence of AIDS</i> .....  | 26        |
| 1.2.2 <i>Identification of the causative agent HIV</i> .....  | 27        |
| 1.2.3 <i>Human immunodeficiency virus</i> .....   | 27        |
| 1.2.4 <i>Natural course of HIV infection: implications for HIV transmission and<br/>disease progression</i> ..... | 30        |
| 1.2.5 <i>Antiretroviral treatment</i> .....   | 32        |
| 1.3 Epidemiology of HIV in the UK .....   | 35        |
| 1.3.1 <i>HIV prevalence in the UK</i> .....   | 35        |
| 1.3.2 <i>Undiagnosed HIV</i> .....  | 37        |
| 1.3.3 <i>Late and very late HIV diagnosis</i> .....   | 37        |
| 1.4 HIV among MSM in the UK.....  | 38        |
| 1.4.1 <i>HIV prevalence and incidence among MSM</i> .....   | 38        |
| 1.4.2 <i>Prevalence of undiagnosed and late diagnosed HIV in MSM in the UK</i> .....                              | 40        |
| 1.4.3 <i>Epidemiology of STI among MSM in the UK</i> .....  | 41        |
| 1.5 Determinants of HIV transmission .....  | 42        |

|           |  |           |
|-----------|--|-----------|
| 1.5.1     | <i>Determinants of sexual transmission of HIV among MSM</i> .....                  | 45        |
| 1.5.2     | <i>Efficiency of transmission per contact (<math>\beta</math>)</i> .....           | 45        |
| 1.5.3     | <i>Duration of infectivity (D)</i> .....   | 52        |
| 1.6       | Rationale for thesis .....   | 52        |
| 1.7       | Overall goal of the thesis .....   | 54        |
| 1.8       | Interventions for PLWH .....   | 54        |
| 1.8.1     | <i>Routine clinical management of PLWH</i> .....                                   | 54        |
| 1.8.2     | <i>Interventions for HIV prevention among PLWH</i> .....                           | 55        |
| 1.9       | Keys areas examined in the thesis .....  | 61        |
| 1.9.1     | <i>Sexual partnership patterns and sexual behaviour of HIV positive MSM</i> .....  | 61        |
| 1.9.2     | <i>cART, viral load and sexual behaviour</i> .....                                 | 61        |
| 1.9.3     | <i>Partner notification for STI</i> .....  | 62        |
| 1.10      | Research questions .....   | 69        |
| 1.11      | Overview of the thesis .....   | 69        |
|           | <b>Chapter 2: SHARPEN: methodology</b> .....                                       | <b>72</b> |
| <b>2.</b> | <b>Introduction</b> .....  | <b>72</b> |
| 2.1       | SHARPEN study design .....   | 72        |
| 2.2       | Study setting .....  | 75        |
| 2.3       | Study population and eligibility criteria .....                                    | 75        |
| 2.4       | Ethical approval.....  | 75        |
| 2.5       | Quantitative survey.....   | 76        |
| 2.5.1     | <i>Development of the SHARPEN survey</i> .....                                     | 76        |
| 2.5.2     | <i>Survey design and administration</i> .....                                      | 86        |
| 2.5.3     | <i>Identification and recruitment of participants for the SHARPEN survey</i> ..... | 88        |
| 2.5.4     | <i>Piloting the SHARPEN survey</i> .....   | 89        |
| 2.5.5     | <i>Monitoring and recruitment</i> .....  | 96        |
| 2.5.6     | <i>Data protection and confidentiality</i> .....                                   | 96        |

|        |   |     |
|--------|---|-----|
| 2.5.7  | <i>Challenges and facilitators to recruitment to the survey</i> .....               | 97  |
| 2.5.8  | <i>Sample size calculation for the SHARPN survey</i> .....                          | 98  |
| 2.5.9  | <i>Data management and analysis</i> .....   | 100 |
| 2.5.10 | <i>Data reduction</i> .....   | 102 |
| 2.5.11 | <i>Definitions of key outcome variables</i> .....                                   | 102 |
| 2.5.12 | <i>Key exposure variables of interest and risk of misclassification bias</i> .....  | 105 |
| 2.5.13 | <i>Descriptive and univariate analysis</i> .....                                    | 109 |
| 2.5.14 | <i>Multivariate analysis</i> .....  | 110 |
| 2.6    | <b>Qualitative study</b> .....  | 121 |
| 2.6.1  | <i>Key aims of the qualitative component of the SHARPN study</i> .....              | 121 |
| 2.6.2  | <i>Study sample and methods of data collection</i> .....                            | 122 |
| 2.6.3  | <i>Development of a topic guide</i> .....   | 123 |
| 2.6.4  | <i>Identification and recruitment of participants for in-depth interviews</i> ..... | 124 |
| 2.6.5  | <i>Piloting the topic guide</i> .....   | 125 |
| 2.6.6  | <i>Data collection</i> .....  | 128 |
| 2.6.7  | <i>My role as an interviewer</i> .....  | 130 |
| 2.6.8  | <i>Reflections on the interview process</i> .....                                   | 130 |
| 2.6.9  | <i>Data protection and confidentiality of the participants</i> .....                | 132 |
| 2.6.10 | <i>Data management and analysis of the in-depth interviews</i> .....                | 132 |
| 2.7    | <b>Study Timetable</b> .....  | 135 |

### **Chapter 3. Sexual partnership patterns, and sexual behaviour of HIV**

|           |   |            |
|-----------|---|------------|
|           | <b>positive MSM: results of the SHARPN survey</b> ..... | <b>136</b> |
| <b>3.</b> | <b>Aims</b> .....                                       | <b>136</b> |
| 3.1       | Specific objectives.....                                | 136        |
| 3.2       | Methods .....   | 137        |
| 3.3       | Results .....   | 137        |
| 3.3.1     | <i>Response rate to the SHARPN survey</i> .....         | 137        |

|  |   |            |
|--|---|------------|
| 3.3.2  | <i>Socio-demographic profile of the study participants</i> .....  | 139        |
| 3.3.3  | <i>General health and HIV related health</i> .....  | 140        |
| 3.3.4  | <i>Attitudes of men towards HIV transmission risk reduction strategies</i> .....                          | 144        |
| 3.3.5  | <i>Sexual activity and sexual partnership patterns and behaviour of HIV positive MSM</i> .....            | 146        |
| 3.3.6  | <i>Characteristics of men who had a primary partner and their primary partner's characteristics</i> ..... | 148        |
| 3.3.7  | <i>Sexual behaviour with a most recent non-primary sex partner</i> .....                                  | 168        |
| 3.3.8  | <i>Sexual behaviour with new sex partners in the last year</i> .....                                      | 186        |
| 3.4  | Discussion of findings and comparison with other studies .....  | 193        |
| 3.5  | Strengths and limitations .....   | 205        |
| 3.5.1  | <i>Bias</i> .....   | 206        |
| 3.5.2  | <i>Confounding</i> .....  | 208        |
| 3.5.3  | <i>Chance</i> .....   | 208        |
| 3.6  | Implications for clinical practice, policy and further research .....                                     | 209        |
| <b>Chapter 4. Sexual identity, disclosure of HIV serostatus and HIV/HCV transmission risk reduction strategies: results of qualitative study</b> ..... |   |            |
| <b>4.</b>  | <b>Aims</b> .....   | <b>211</b> |
| 4.1  | Objectives .....  | 211        |
| 4.2  | Methods .....   | 211        |
| 4.3  | Results .....   | 212        |
| 4.3.1  | <i>Study participants</i> .....   | 212        |
| 4.3.2  | <i>HIV diagnosis and sexual behaviour: shock and 'new sexual identity'</i> .....                          | 215        |
| 4.3.3  | <i>Seroconcordant partnerships: fear of rejection, 'shared stigma' and 'sense of belonging'</i> .....     | 216        |
| 4.3.4  | <i>Serodiscordant primary partner: anxiety, risk management and sexual behaviour</i> .....                | 219        |



|   |   |            |
|---|---|------------|
| 4.3.5   | <i>Serodiscordant regular and casual partners: sexual pleasure and<br/>'shared responsibility'</i> .....              | 220        |
| 4.3.6   | <i>Group sex, recreational drugs, UAI and STI</i> .....   | 221        |
| 4.3.7   | <i>HCV co-infection and stigma</i> .....  | 224        |
| 4.3.8   | <i>Disclosure strategies</i> .....  | 227        |
| 4.3.9   | <i>Attitudes towards cART, undetectable viral load status and its<br/>implications for HIV transmission</i> .....     | 232        |
| 4.4   | Discussion of findings and comparison with other studies .....  | 238        |
| 4.5   | Strengths and limitations .....   | 243        |
| 4.5.1   | <i>Transferability and specificity of the study findings</i> .....  | 244        |
| 4.6   | Implications for clinical practice, policy and future research.....   | 246        |
| <b>Chapter 5: STI and partner notification for STI among HIV positive</b> |   |            |
| <b>MSM: results of the SHARPN survey</b> .....                            |   | <b>248</b> |
| <b>5.</b>   | <b>Aims</b> .....   | <b>248</b> |
| 5.1   | Specific objectives.....  | 248        |
| 5.2   | Methods .....   | 249        |
| 5.3   | Results .....   | 249        |
| 5.3.1   | <i>Experience of and attitudes towards partner notification for STI</i> .....   | 249        |
| 5.3.2   | <i>Testing and diagnosis of STI in the last year</i> .....  | 251        |
| 5.3.3   | <i>Factors associated with STI diagnosis in the last year</i> .....   | 253        |
| 5.3.4   | <i>Clinic support and partner notification following STI diagnosis in the<br/>last year</i> .....                     | 258        |
| 5.3.5   | <i>Willingness to notify sexual partners of STI in the future and use<br/>different methods of notification</i> ..... | 260        |
| 5.3.6   | <i>Willingness to notify casual partners of STI in the future</i> .....   | 266        |
| 5.3.7   | <i>Views towards notifying members of social network for STI</i> .....  | 276        |
| 5.3.8   | <i>Preferred methods to be notified by sexual partners of STI in the future</i> .....                                 | 277        |

|     |  |     |
|-----|--|-----|
| 5.4 | Discussion of findings .....   | 278 |
| 5.5 | Limitations.....   | 285 |
| 5.6 | Implications for clinical practice, health policy and future research..... | 286 |

**Chapter 6: Attitudes towards partner notification for STI and preferred methods of partner notification: results of qualitative study..... 288**

**6. Aims ..... 288**

|       |  |            |
|-------|--|------------|
| 6.1   | Objectives .....   | 288        |
| 6.2   | Methods .....  | 288        |
| 6.3   | Results .....  | 289        |
| 6.3.1 | <i>Attitudes of the participants towards partner notification for STI .....</i>  | <i>289</i> |
| 6.3.2 | <i>Barriers associated with partner notification for STI.....</i>  | <i>290</i> |
| 6.3.3 | <i>Facilitator of partner notification for STI: ‘negotiated risk’ .....</i>  | <i>292</i> |
| 6.3.4 | <i>Attitudes towards notifying different types of sexual partners and willingness to use different methods of partner notification for STI .....</i> | <i>293</i> |
| 6.3.5 | <i>Acceptability of novel methods of notifying partners for STI.....</i>   | <i>301</i> |
| 6.3.6 | <i>Shame, stigma and interaction with clinic staff for partner notification.....</i>   | <i>310</i> |
| 6.3.7 | <i>Non-notification of partners following-STI diagnosis.....</i>   | <i>313</i> |
| 6.3.8 | <i>Experience of notifying sexual partners following STI diagnosis .....</i>   | <i>313</i> |
| 6.3.9 | <i>Attitudes towards being notified by sexual partners of STI.....</i>   | <i>315</i> |
| 6.4   | Discussion of the findings and comparison with other studies.....  | 318        |
| 6.5   | Strengths and limitations .....  | 324        |
| 6.6   | Implications for clinical practice, health policy and future research.....   | 324        |

**Chapter 7: Implications of the SHARPN study findings..... 326**

**7. Introduction ..... 326**

|       |   |            |
|-------|---|------------|
| 7.1   | Summary of the findings of SHARPN study.....                                    | 327        |
| 7.1.1 | <i>Sexual partnership patterns and sexual behaviour of HIV positive MSM....</i> | <i>327</i> |

|       |  |            |
|-------|--|------------|
| 7.1.2 | <i>Attitudes towards HIV transmission risk reduction strategies and sexual behaviour.....</i>  | 328        |
| 7.1.3 | <i>Risk context of HIV/STI diagnosis.....</i>  | 329        |
| 7.1.4 | <i>STI diagnosis and risk factors for STI.....</i>   | 330        |
| 7.1.5 | <i>Attitudes towards partner notification for STI and willingness to notify sexual partners and be notified of STI in the future .....</i> | 331        |
| 7.1.6 | <i>Attitudes towards using novel methods of partner notification for STI in the future .....</i>   | 332        |
| 7.2   | Overall strengths and limitations of the SHARPN study .....  | 333        |
| 7.3   | Policies and legal framework of relevance to HIV/STI prevention in MSM.....  | 335        |
| 7.3.1 | <i>Current policies and programmes for sexual health, HIV/STI prevention and HIV treatment.....</i>  | 336        |
| 7.3.2 | <i>Revised guidelines for offering cART to PLWH.....</i>   | 338        |
| 7.3.3 | <i>Criminalisation of HIV/STI transmission.....</i>  | 339        |
| 7.4   | SHARPN findings: implications for policy, clinical practice and research.....  | 340        |
| 7.4.1 | <i>Recommendations for clinical practice and policy .....</i>  | 341        |
| 7.4.2 | <i>Recommendations for research .....</i>  | 351        |
| 7.5   | Conclusions .....  | 358        |
|       | <b>References .....</b>  | <b>359</b> |
|       | <b>Appendices.....</b>   | <b>399</b> |

## List of tables

| <b>Table</b> | <b>Title</b>  | <b>Page</b> |
|--------------|---|-------------|
| 1            | Sampling quota for in-depth interviews  | 122         |
| 2            | Socio-demographic characteristics of the study participants   | 141         |
| 3            | General and HIV related health of the study participants  | 143         |
| 4            | Attitudes towards various risk-reduction strategies for prevention of sexual transmission and re-infection with HIV                                 | 144         |
| 5            | Overall sexual activity, sexual partnerships and sexual behaviour of HIV positive MSM in the last year  | 146         |
| 6            | Nature of relationship with a primary partner   | 148         |
| 7            | Socio-demographic, partnership, HIV-related characteristics of men with a primary partner and by primary partner's HIV status                       | 150         |
| 8            | Overall sexual behaviour with a primary partner in the last six months  | 155         |
| 9            | Sexual behaviour with a primary partner in the last six months by primary partner's HIV status  | 156         |
| 10           | Association between attitudes towards reduced risk of HIV transmission due to undetectable viral load and UAI with a serodiscordant primary partner | 161         |
| 11           | Association between beliefs about risk reduction strategies and risky sexual behaviours among men with a serodiscordant status primary partner      | 165         |
| 12           | Type of partnership and HIV status of the most recent non-primary partner   | 170         |
| 13           | HIV status and type of partnership by nature of sexual activity with the most recent non-primary partner  | 171         |
| 14           | Disclosure of HIV status to the most recent non-primary partner by type of sexual activity  | 173         |

| <b>Table</b> | <b>Title</b>   | <b>Page</b> |
|--------------|--|-------------|
| 15           | Venue of meeting the most recent non-primary partner   | 174         |
| 16           | Sexual behaviour with the most recent non-primary partner: overall and by type of sexual activity  | 175         |
| 17           | Socio-demographic, HIV related factors and attitudes towards HIV transmission risk reduction strategies by HIV status of the most recent non-primary partner                     | 177         |
| 18           | Sexual behaviour with the most recent non-primary partner by partner's HIV status  | 179         |
| 19           | Association between UAI with the most recent non-primary serodiscordant partner and attitudes towards reduced risk of HIV transmission during UAI due to undetectable viral load | 182         |
| 20           | Association between attitudes towards HIV transmission risk reduction strategies and risky sexual behaviours with the most recent non-primary serodiscordant partner             | 184         |
| 21           | Sexual behaviour with new partners in the last year  | 188         |
| 22           | Venues of meeting new sexual partners in the last year   | 192         |
| 23           | Comparison between socio-demographic characteristics of study participants in the SHARP and SHARPN surveys   | 194         |
| 24           | Comparison of general health and HIV related health indicators of the SHARP and SHARPN survey study participants   | 196         |
| 25           | Proposed and actual recruitment of the purposive sample based on age and cART status   | 212         |
| 26           | Characteristics of in-depth interview participants   | 214         |
| 27           | Previous experience of partner notification for STI  | 249         |
| 28           | Attitudes towards partner notification for STI   | 251         |
| 29           | STI testing and diagnosis among sexually active HIV positive MSM in the last year  | 252         |

| <b>Table</b> | <b>Title</b>  | <b>Page</b> |
|--------------|---|-------------|
| 30           | Socio-demographic and HIV related health factors associated with STI diagnosis in the last year among HIV positive MSM  | 254         |
| 31           | Sexual behaviour and partnership factors associated with STI diagnosis in the last year among sexually active HIV positive MSM  | 257         |
| 32           | Clinic support and partner notification following STI diagnosis in the last year  | 259         |
| 33           | Willingness to notify different types of sexual partners and use different methods of notification by partnership type  | 261         |
| 34           | HIV positive MSM's willingness to notify different types of sexual partners of STI in the future via conventional and novel methods   | 263         |
| 35           | Socio-demographic and HIV related factors associated with variation in preferred methods for notifying casual partners for STI in the future                                  | 268         |
| 36           | Attitudes, perceived self-efficacy, and sexual behaviour and partnership related factors associated with preferred methods for notifying casual partners of STI in the future | 270         |
| 37           | Association between socio-demographic and HIV related factors with unwillingness to notify casual partners of STI   | 273         |
| 38           | Attitudes, perceived self-efficacy, sexual behaviour, and partnership factors associated with unwillingness to notify casual partners of STI                                  | 274         |
| 39           | Factors associated with unwillingness to notify casual partners of STI  | 276         |
| 40           | Preferred methods to be notified by sexual partners for exposure to STI in the future   | 278         |
| 41           | Inclusion criteria for selection of studies for the systematic review   | 404         |

| <b>Table</b> | <b>Title</b>  | <b>Page</b> |
|--------------|---|-------------|
| 42           | Search strategy for systematic review                           | 406         |
| 43           | Summary of all the studies included in the systematic review    | 410         |
| 44           | Quality assessment of studies included in the systematic review | 415         |

## List of figures

| <b>Figure</b> | <b>Title</b>   | <b>Page</b> |
|---------------|--|-------------|
| 1             | Life cycle of HIV  | 29          |
| 2             | Representation of the natural history of HIV infection   | 31          |
| 3             | Annual new HIV and AIDS diagnosis and deaths in the UK: 1982-2010  | 36          |
| 4             | New diagnosis of HIV by exposure groups in the UK: 2001-2010   | 39          |
| 5             | Diagnoses of selected STI in MSM in England: 2001-2010   | 41          |
| 6             | Proximate-determinants conceptual framework for HIV transmission   | 44          |
| 7             | SHARPN study design  | 73          |
| 8             | Recruitment strategy for the SHARPN survey   | 95          |
| 9             | Recruitment of the study participants for the SHARPN survey  | 138         |
| 10            | Willingness to notify different types of sex partners of STI in the future   | 260         |
| 11            | HIV positive MSM's willingness to use different methods of notification to notify different types of sex partners: detailed overview | 265         |
| 12            | Flow diagram of the studies from 1990-August 2009 screened and included in the review  | 409         |



## List of appendices

| <b>Appendix</b> | <b>Title</b>  | <b>Page</b> |
|-----------------|---|-------------|
| 1               | Systematic review on partner notification for STI         | 399         |
| 2               | Local Research Ethics Committee approval letter           | 433         |
| 3               | Research and Development approval letter                  | 436         |
| 4               | SHARPN survey   | 438         |
| 5               | SHARPN display board write-up                             | 514         |
| 6               | Participant information sheet for cognitive interviews    | 515         |
| 7               | Consent form for cognitive interviews                     | 518         |
| 8               | Patient information sheet for SHARPN survey               | 519         |
| 9               | Consent form for the SHARPN survey                        | 522         |
| 10              | Modified patient information sheet                        | 524         |
| 11              | Study sheet for SHARPN survey                             | 527         |
| 12              | Topic guide for qualitative interviews                    | 528         |
| 13              | Patient information sheet for focus group discussion      | 532         |
| 14              | Consent form for focus group discussions                  | 535         |
| 15              | Patient information sheet for in-depth interviews         | 537         |
| 16              | Consent form for in-depth interviews                      | 540         |
| 17              | Broad themes identified during coding of qualitative data | 542         |
| 18              | Charting of qualitative data using excel data             | 545         |

## Abbreviations

|               |  |
|---------------|--|
| <b>AI</b>     | Anal intercourse                             |
| <b>AOR</b>    | Adjusted odds ratio                          |
| <b>AZT</b>    | Azidothymidine                               |
| <b>BASHH</b>  | British Association of Sexual Health and HIV |
| <b>BHIVA</b>  | British HIV Association                      |
| <b>cART</b>   | Combined antiretroviral treatment            |
| <b>CASI</b>   | Computer assisted self-interview             |
| <b>CCGs</b>   | Clinical Commissioning Groups                |
| <b>CHAPS</b>  | Community HIV and AIDS Prevention Strategy   |
| <b>CI</b>     | Confidence interval                          |
| <b>CPS</b>    | Crown Prosecution Service                    |
| <b>DDA</b>    | Disability Discrimination Act                |
| <b>DH</b>     | Department of Health                         |
| <b>DNA</b>    | Deoxyribonucleic acid                        |
| <b>ELISA</b>  | Enzyme linked immunosorbant assay            |
| <b>EU</b>     | European Union                               |
| <b>EuroPN</b> | European Partner Notification project        |
| <b>GMSHS</b>  | Gay Men's Sexual Health Survey               |
| <b>GUD</b>    | Genital ulcer disease                        |
| <b>HAART</b>  | Highly active antiretroviral treatment       |
| <b>HCV</b>    | Hepatitis C Virus                            |
| <b>HIV</b>    | Human Immunodeficiency Virus                 |
| <b>HPA</b>    | Health Protection Agency                     |
| <b>HPV</b>    | Human Papilloma Virus                        |
| <b>HTVL</b>   | Human T-lymphotropic virus                   |
| <b>IAI</b>    | Insertive anal intercourse                   |
| <b>IDUs</b>   | Injecting drug users                         |
| <b>IQR</b>    | Interquartile range                          |
| <b>IUAI</b>   | Insertive unprotected anal intercourse       |
| <b>KS</b>     | Kaposi's sarcoma                             |
| <b>LAV</b>    | Lymphadenopathy-associated virus             |
| <b>LGV</b>    | Lymphogranuloma venereum                     |
| <b>LREC</b>   | Local Research Ethics Committee              |

**Abbreviations continued**

|               |  |
|---------------|--|
| <b>MSM</b>    | Men who have sex with men                                      |
| <b>NATSAL</b> | National Survey of Sexual Attitudes and Lifestyles             |
| <b>NHS</b>    | National Health Service  |
| <b>NICE</b>   | National Institute of Clinical Excellence                      |
| <b>NNRTIs</b> | Non-Nucleoside Reverse Transcriptase Inhibitors                |
| <b>NRTIs</b>  | Nucleotide Reverse Transcriptase Inhibitors                    |
| <b>OECD</b>   | Organisation for Economic Co-operation and Development         |
| <b>OR</b>     | Odds ratio   |
| <b>PCP</b>    | <i>Pneumocystiscarinii</i> pneumonia                           |
| <b>PCTs</b>   | Primary Care Trusts  |
| <b>PDPT</b>   | Patient delivered partner therapy                              |
| <b>PI</b>     | Principal investigator   |
| <b>PIs</b>    | Protease Inhibitors  |
| <b>PLWH</b>   | People living with HIV   |
| <b>PrEP</b>   | Pre-exposure prophylaxis                                       |
| <b>RAI</b>    | Receptive anal intercourse                                     |
| <b>RCT</b>    | Randomised control trial                                       |
| <b>RNA</b>    | Ribonucleic acid   |
| <b>RUAI</b>   | Receptive unprotected anal intercourse                         |
| <b>SHARP</b>  | Sex, Health, Antiretroviral Treatment Project                  |
| <b>SHARPN</b> | Sex, Health, Antiretroviral Treatment and Partner Notification |
| <b>SHAs</b>   | Strategic Health Authorities                                   |
| <b>SMS</b>    | Short messaging service  |
| <b>SOPHID</b> | Survey of Prevalent HIV Infections Diagnosed                   |
| <b>STI</b>    | Sexually transmitted infections                                |
| <b>UAI</b>    | Unprotected anal intercourse                                   |
| <b>UCL</b>    | University College London                                      |
| <b>UK</b>     | United Kingdom   |
| <b>USA</b>    | United States of America                                       |

## Glossary

### Definitions of concepts used from other studies

|                            |   |
|----------------------------|---|
| <i>Enacted stigma</i>      | Episodes of discrimination against people (for e.g. people living with HIV) solely on the grounds of their social and cultural unacceptability (Scambler, 2004)             |
| <i>Felt stigma</i>         | Shame associated with (for e.g. HIV diagnosis) and fear of being discriminated against due to it (Scambler, 2004)   |
| <i>Passing</i>             | Concealing one's diagnosis (with a stigmatised condition) (Nack, 2000)  |
| <i>Seroguessing</i>        | Assuming the HIV status of sexual partners to be the same as one's own serostatus (Zablotska et al., 2009)  |
| <i>Serosorting</i>         | Have sexual partnerships only with men of the same HIV serostatus or engage in unsafe sex, namely UAI, only if the partner is of similar serostatus (Snowden et al., 2009). |
| <i>Stigma transference</i> | Blame one's sexual partner for being diagnosed with sexually transmitted infections to avoid stigma (Nack, 2000)  |

### Definitions as used in this study

|                                  |   |
|----------------------------------|---|
| <i>New partner</i>               | Sex partner with whom the participant had sex for the first time (in the last month and in the last year) |
| <i>Non-primary partner</i>       | Regular, casual, anonymous or paid sex partner of the participant   |
| <i>Primary partner</i>           | Sex partner considered by the participant to be his boyfriend/lover                                       |
| <i>Risk reduction strategies</i> | HIV prevention strategies used by MSM to reduce the risk of HIV transmission/acquisition                  |

**Definitions as used in this study (continued)**

*Seroconcordant partner* Sexual partner who was known to be HIV positive

*Serodiscordant partner* Sexual partner known or assumed to be HIV negative or of unknown HIV status, or assumed to be HIV positive

## **Acknowledgements**

The SHARPN study was a collaborative project between the Centre for Sexual Health and HIV Research, University College London (UCL) and Department of Primary Care and Public Health, Brighton and Sussex Medical School (BSMS). I have had the honour of receiving the Overseas Research Student Award given to me by UCL in 2008 and a scholarship from BSMS.

I have had the great opportunity to be mentored and supervised by Professor Graham Hart from UCL and Professor Jackie Cassell from BSMS. I am thankful to them for their support, encouragement, and guidance throughout this process. I would like to thank Professor Graham Scambler for the insightful discussions and encouragement, and Professor Jonathan Elford for being my upgrade examiner and giving me critical feedback on my work in progress.

I would also like to thank all the members of the Research Advisory Committee: Dr Simon Edwards, Dr Catherine Mercer, Dr John Richens, Ms Rose Tobin, and Mr Mathias Chopin. I would like to thank Dr Maryam Shahmanesh and Dr Andrew Copas, who have been great friends and mentors, for their support, encouragement and inspiration and Andre also for statistical advice. I would also like to thank Professor Helen Smith (BSMS) and Dr Richard Gilson (UCL) for their support.

I thank all my friends and colleagues at the Centre for Sexual Health and HIV Research who have made this journey a positive experience. I am indebted to all the clinic staff, particularly Brian George and Chris Sandford, without whose help and support my research project would not have been possible. I am grateful to all the study participants who devoted their time to participate in the research study.

I devote this thesis to the near and dear ones I have lost to HIV and are an inspiration for my work. I want to thank my parents Subhash and Ujwala; my grandmother Phulabai; Jaideep; my brothers Rakesh, Kedar; my sisters-in-law Shweta, Dhanashree for their love, support, and faith in me, and my adorable nieces Anushka and Sai whose endless banter fills me with joy.

# **Chapter 1: Introduction, rationale and aims of the thesis**

## **1. Introduction**

Since the diagnosis of the first case of human immunodeficiency virus (HIV) 30 years ago, developments in the field of diagnostics, prevention, and treatment for HIV have changed the landscape of the HIV epidemic globally. Despite these changes, in late 2008 when I started developing the research proposal for my thesis, surveillance and epidemiological data from developed countries indicated that men who have sex with men (MSM) continue to bear a disproportionate burden of HIV and sexually transmitted infections (STI)<sup>1</sup>. Increase in HIV diagnoses among MSM was reported in developed countries like the United Kingdom (UK), the United States of America (USA), Australia and Netherlands (Centers for Disease Control and Prevention, 2003; National Centre in HIV Epidemiology and Clinical Research, 2004; Dougan, et al., 2007; Bezemer et al., 2008). In the UK, at the end of 2007, of the total estimated 77,400 people living with HIV (PLWH) an estimated 32,000 were MSM (Health Protection Agency 2008a; Health Protection Agency 2008b). Increase in new HIV diagnoses among MSM was also reported (Health Protection Agency, 2008a).

Nevertheless, the availability of effective combination antiretroviral treatment (cART) since the mid-1990 has heralded a new era for HIV prevention and treatment. Studies published in the mid-1990 have showed that cART reduces plasma viral load, and the risk of opportunistic infections and mortality due to

---

<sup>1</sup> In this thesis, I have used the term STI to mean all STI other than HIV.

acquired immunodeficiency syndrome (AIDS) in PLWH (Hammer et al., 1996, 1997; Mocroft et al., 1998, 2007). Moreover, in 2008, the Swiss National AIDS Commission issued a statement that an HIV positive person who is on cART with a suppressed viraemia and has no other STI is sexually non-infectious (Vernazza et al., 2008). This statement, henceforth referred to as the ‘Swiss statement’, emphasised the significance of adherence to cART to achieve and maintain suppressed viraemia. It received widespread attention in the UK and worldwide, and led to concerns about the implications of this statement on risky sexual behaviours (Bernard, 2008a, 2008b). Since the Swiss statement was published, no studies had been conducted in the UK to examine the association between risky sexual behaviours and cART status/viral load status among PLWH. Therefore, for my thesis I decided to examine the sexual behaviours and partnership patterns of HIV positive MSM in the UK to understand its implications for HIV/STI transmission and STI acquisition. I also decided to explore their awareness about the Swiss statement, and examine the association between risky sexual behaviours and cART/viral load status.

Since 1996, there has also been a resurgence of STI in MSM in Western Europe (Ciesielski et al., 2005; Chauhan et al., 2006; Emerson et al., 2007; Singh et al., 2007). Outbreaks of syphilis and lymphogranuloma venereum (LGV) have been documented in 11 and 9 Western European countries respectively (Dougan, Evans, et al., 2007). The incidence of Hepatitis C virus (HCV) has increased significantly in HIV positive gay and bisexual men in Brighton and London between 2001 and 2006 (Giraudon et al., 2008). Given the significance of lack of co-infection with STI, as indicated in the Swiss statement, to ensure effectiveness of cART for prevention of sexual transmission of HIV and the high prevalence of STI among



HIV positive MSM, I thereby decided to explore the risk factors for STI, the attitudes of HIV positive MSM towards partner notification for STI and willingness to use various methods of partner notification for STI.

In the subsequent part of this chapter, firstly I briefly provide an overview of the global HIV epidemic and history of AIDS, the pathogenesis of HIV, and development of cART. Next, I describe the epidemiology of HIV and STI in the UK, particularly in MSM. Subsequently, I describe the determinants of HIV transmission in MSM. I conclude with further details of the rationale for undertaking this work for my thesis, aims and overview of the thesis.

### **1.1 *Current state of the global HIV epidemic***

Globally, approximately 34 million people were living with HIV at the end of 2010 (World Health Organisation, 2011). This highlights the significance of interventions for PLWH to ensure their physical, mental, sexual, reproductive and HIV-related health and wellbeing. Although by the end of 2010 there was a decline in new cases of HIV, 2.7 million new HIV infections were reported in 2010 alone (World Health Organisation, 2011). Unlike the generalized HIV epidemic in sub-Saharan Africa, the HIV epidemic in North America, and Central and Western Europe continues to be predominantly concentrated among MSM (UNAIDS, 2010). There is growing evidence of resurgence of the HIV epidemic among MSM in North America and Western Europe (Likatavicius et al., 2008; World Health Organisation, 2011). Although HIV continues to be a significant public health challenge, tremendous progress has been made in understanding the pathogenesis of HIV since the first reports of AIDS.

## 1.2 *A brief history of HIV/AIDS*

In the following sub-sections I provide a brief overview of emergence of AIDS and identification of HIV.

### 1.2.1 **Emergence of AIDS**

MSM have been at the centre stage of the HIV epidemic since the emergence of AIDS. The first report of five cases in Los Angeles, USA of a rare lung infection *Pneumocystis carinii* pneumonia (PCP), a condition associated with severe immunosuppression, (Centers for Disease Control and Prevention, 1981a), and a first case in London, UK (du Bois et al., 1981) were reported in 1981 in MSM with no clinical immunodeficiency or an identifiable cause. This was followed by cases of Kaposi's sarcoma (KS), a type of cancer, in New York and California in the USA (Centers for Disease Control and Prevention, 1981b). The earlier cases of PCP in the USA were among patients who did not know each other and had no known common contacts or knowledge of sexual partners who had similar illnesses. Due to the lack of evidence about the cause of the condition various theories about its possible cause emerged, like infection with cytomegalovirus (Centers for Disease Control and Prevention, 1981a; Dubois, et al., 1981; Hymes et al., 1981), an infective agent transmitted during homosexual practice, and exposure to substances, particularly amyl nitrite, rather than an infectious agent (Centers for Disease Control and Prevention, 1982a; Marmor et al., 1982). Because the condition was not given a uniform name, it was referred to in different ways e.g. "lymphadenopathy" (Centers for Disease Control and Prevention, 1982b), "gay compromise syndrome" (Brennan and Durack, 1981). In 1982, reports of similar cases among Haitians (Centers for Disease Control and Prevention, 1982c) and haemophiliacs (Centers for Disease Control and

Prevention, 1982b) confirmed that this condition was not restricted only to MSM. Nevertheless, HIV came to be associated with behaviours considered immoral by sections of society, i.e., homosexuality, drug use and promiscuity. Towards the end of 1982, the condition came to be referred to as AIDS.

### 1.2.2 Identification of the causative agent HIV

In 1983, the *Institut Pasteur*, France, isolated a retrovirus from a Caucasian patient who had symptoms that preceded AIDS. It was suggested that this virus belongs to a general family of T-lymphotropic retroviruses that are horizontally transmitted in humans and may be associated with AIDS and was named as lymphadenopathy associated virus (Barré-Sinoussi et al., 1983). A year later, another study that compared AIDS patients to non-AIDS affected subjects reported that the serum samples from a greater proportion of AIDS patients contained antibodies to human T-lymphotropic virus (HTVL) III, a member of retrovirus family, i.e., a ribonucleic acid (RNA) virus, which differed biologically and immunologically from the previous isolates known as HTVL-I and HTVL-II (Gallo et al., 1984). This research suggested that HTVL-III might be the primary cause of AIDS. The identification that a retrovirus is responsible for the AIDS condition led to the development in 1985 of the first USA Food and Drug Administration approved enzyme linked immunosorbant assay (ELISA) test kit to screen for antibodies of HTVL-III. In 1986, the International Committee on the Taxonomy of Viruses proposed to name the AIDS virus as Human immunodeficiency virus (Coffin et al., 1986).

### 1.2.3 Human immunodeficiency virus

In order to develop prevention interventions for a disease, it is important to know the causative agent and its interaction with the human body. HIV is a retrovirus,

and a lentivirus, i.e., it has a long incubation period with persistent infection. There are two different types of HIV viruses: HIV-1, which is predominantly found in Europe, USA, South America, Australia, New Zealand, Asia and Africa. HIV-2, which was first discovered in 1985, is predominantly found in West Africa. These viruses are structurally different: HIV-1 mutates rapidly and is more virulent than HIV-2. HIV-1 is further divided into three groups: M, N, and O. The majority of the HIV-1 strains responsible for the global HIV infections belong to group M, which is classified into 10 subtypes (World Health Organisation, 2011).

Understanding the constitution and genetic material of HIV and the process through which it binds with the host cells has been a key factor in developing different classes of cART drugs for HIV. HIV is a retrovirus with RNA as its genetic material. The genome of the HIV virus encodes a reverse transcriptase enzyme, which allows deoxyribonucleic acid (DNA) to be transcribed from the RNA. Due to this feature, HIV can make copies of its own RNA genome as DNA (i.e. viral DNA). HIV infection attacks the white blood cells responsible for maintaining the immune system known as CD4+ “T-helper” lymphocytes (henceforth referred to as CD4 cells), leading to severe immunodeficiency due to their depletion (McCune, 2001). CD4 is a glycoprotein expressed on the surface of the CD4 cells and is a primary receptor for entry of HIV into host cells. The chemokine receptors (CCR5 and CXCR4) also act as coreceptors for HIV entry. HIV gains entry into the host CD4 cells by binding its protein, gp120, to CD4 as shown in Figure 1. Once it gains entry into a human CD4 cell, this viral DNA is able to integrate into the CD4 cell’s DNA, a process facilitated by the viral integrase enzyme. This enables the process of replication of the HIV virus from the viral DNA. The new complete HIV virus particles are assembled and released

from the infected CD4 cell. This process is facilitated by the HIV protease enzyme, which enables maturation of the virus particle (Mortimer and Loveday, 2001). cART have been developed to disrupt the replication of HIV during each of these phases, the details of which are described later in section 1.2.5.

**Figure 1. Life cycle of HIV**

Source: National Institute of Allergy and Infectious Diseases, 2012 (<http://www.niaid.nih.gov/topics/HIVAIDS/Understanding/Biology/pages/hivrelicationcycle.aspx>)

**1.2.3.1 CD4 cells**

A CD4 cell count is the measurement of the number of CD4 cells detected per cubic millimetre ( $\text{mm}^3$ ) of blood. It is usually between 500-1120 cells/ $\text{mm}^3$  in HIV-uninfected individuals (Bofill et al., 1992). CD4 cell count is used as a surrogate marker of immunodeficiency because these cells are the primary targets

of HIV (Mellors et al., 1997). The depletion of CD4 cells increases the susceptibility of the HIV infected persons to opportunistic infections, cancers, and death. The risk of AIDS-related illnesses, e.g., KS, PCP increases if the CD4 cell count drops below 200 cells/mm<sup>3</sup>.

#### **1.2.3.2 HIV viral load**

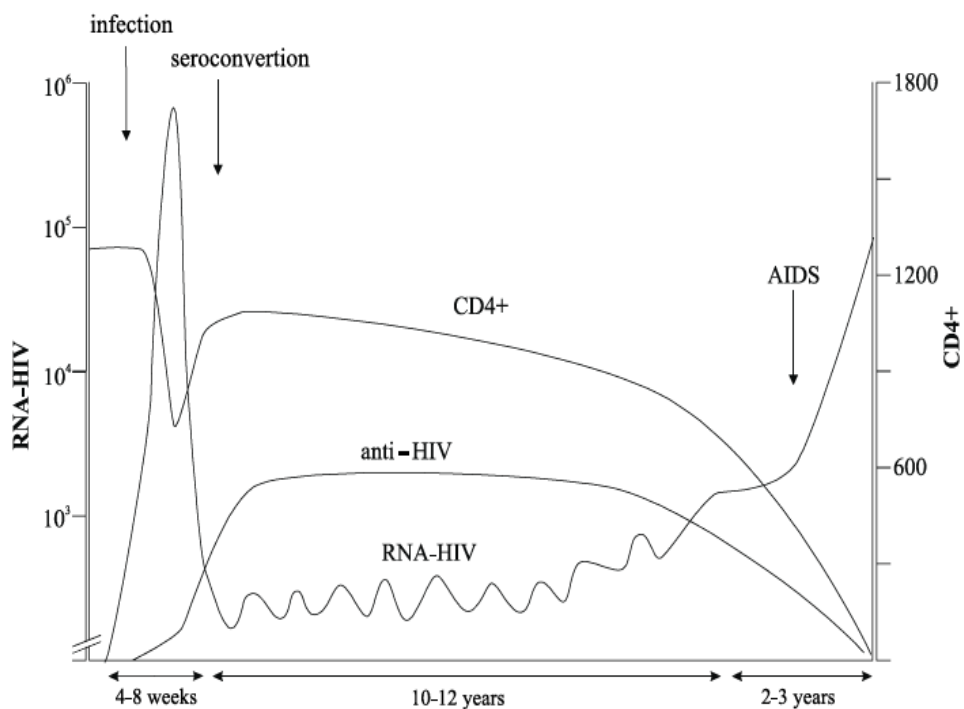
HIV viral load is the level of HIV genetic material RNA that is present in the body fluids. In 1996 a viral load test that measures the amount of HIV RNA in an HIV positive person's blood became available (Mascolini, 1996). Viral load in the blood plasma is measured as the number of copies of RNA per millilitre (mL) (Mellors et al., 1997). Repeat viral load test results as 'undetectable viral load' are regarded as an indication of successful suppression of the HIV in an individual. The viral load count characterised as undetectable varies depending on the technology that is available and used for testing, and ranges from a viral load of <400, <50, or <40 copies/mL. Plasma viral load is the strongest predictor of onward sexual transmission of HIV (Quinn et al., 2000; Attia et al., 2009; Cohen et al., 2011).

#### **1.2.4 Natural course of HIV infection: implications for HIV transmission and disease progression**

Understanding the natural course of HIV is important to recognize its implications for the clinical manifestations of HIV in infected individuals, and the course of the HIV epidemic. The natural progression from being infected with HIV to developing AIDS is a gradual process. The primary HIV infection phase is associated with flu-like symptoms within two to four weeks after being infected with HIV (Stekler and Collier, 2004). As shown in Figure 2, the levels of HIV RNA are high in this initial phase of the infection (Coutinho et al., 2001; Pilcher et

al., 2007). After the initial high level of viraemia during the primary phase of HIV infection, during the subsequent asymptomatic phase of HIV infection, virus production and clearance are believed to reach a balance leading to relatively stable level of HIV viral load concentration in the plasma. This balance is also known as 'set point' (Mellors et al., 1996).

**Figure 2. Representation of the natural history of HIV infection**



Source: Coutinho et al, 2001: pp. 1047

However, it may increase gradually (Sabin et al., 2000). Subsequent to the latent phase, the levels of viraemia can increase depending on various factors like the initial viral load, a concurrent decline in the CD4 cell count, and lack of access to cART, making the HIV infected persons vulnerable to AIDS-related illnesses (Coutinho et al., 2001). The viral set point and CD4 cells set point can influence an HIV positive person's disease progression. A higher viral load set point, and lower CD4 cells set point are correlated with a rapid disease progression and poorer

responses to treatment (Mellors et al., 1997) and high infectiousness (Wawer et al., 2005). Without treatment, the average life expectancy of a person with HIV is 10-12 years (Mellors et al., 1997). These stages of HIV infection are correlated with infectiousness, which is a “U-shaped” distribution indicating that infectiousness is high during the early days of HIV infection and in the last stage of the disease when the viral load is high (Jacquez et al., 1994; Wawer et al., 2005).

In the next sub-section, I examine the development of cART and guidelines for starting treatment in PLWH.

### 1.2.5 **Antiretroviral treatment**

cART primarily controls the replication of the HIV virus and thus reduces the viral load, and prevents damage to the immune system (Hammer et al., 1997). Therefore the purpose of starting treatment with cART for an HIV infected person is to reduce and maintain low plasma viral load concentrations within the first few weeks of starting cART to reduce HIV related morbidity and restore immunologic function (Gazzard et al., 2008). Nevertheless, even after suppression of the viral load to undetectable levels, some patients can experience transient increases in the viral load levels to detectable levels known as ‘blips’ or experience viral load rebound. Studies have reported that a significant proportion of patients on cART experience blips in the viral load over time (Havlir et al., 2001; Greub et al., 2002).

#### 1.2.5.1 ***When to start cART***

The guidelines on when to start cART have been influenced by on-going research that aims to understand the benefits of starting cART at varying levels of CD4 cell count on morbidity related to HIV. The drugs for HIV are linked to the various stages they inhibit in the life cycle of HIV described in section 1.2.3. The first class of drugs to be approved for HIV in 1987 was nucleotide reverse transcriptase



inhibitors (NRTIs) and the first drug to be approved was called azidothymidine (AZT). The NRTIs prevent replication of HIV by interfering with the process of viral replication from RNA to DNA. A double-blind placebo-control trial of the efficacy of AZT showed that oral AZT administration can decrease mortality and the frequency of opportunistic infections among people with advanced disease due to HIV (Fischl et al., 1987). Subsequent trials showed that AZT slowed the progression to AIDS in patients with mild symptomatic disease (Fischl et al., 1990). The AIDS Control Trial Group 019 study showed that in the short term AZT delayed the onset of AIDS and associated conditions in asymptomatic patients with CD4 cell counts of  $<500$  cells/mm<sup>3</sup> (Volberding et al., 1990). However, the subsequent Concorde trial showed that AZT did not have sustained benefits over time as there was no difference in survival or disease progression among asymptomatic patients randomised to immediately starting AZT compared to those assigned to the deferred treatment arm (Aboulker and Swart, 1993). The non-nucleoside reverse transcriptase inhibitors, approved in 1997, also prevent the replication of the HIV RNA to DNA. Other drugs like didanosine and the Protease Inhibitors (PIs) were also approved in the late 1990. The PIs bind to the active site of the HIV enzyme protease and interfere with the formation of the new HIV virus. Studies conducted in the mid-1990's showed that cART was effective in treating HIV compared to monotherapy (Hammer et al., 1996, 1997). cART, also known as highly active antiretroviral treatment (HAART), is defined as a combination of at least three drugs from two different ART drug classes. This led to a growing interest in using combination therapy for controlling the progression of HIV infection. Subsequently, fusion inhibitors were approved in 2003. They block the

entry of the HIV virus into the host cells. The integrase inhibitors, first approved in 2007, prevent the integration of the viral DNA with the host DNA.

In 2008, the UK guidelines recommended that cART should be started for patients who have a chronic HIV infection, are symptomatic or severely immunocompromised, i.e., with a CD4 count less than 350 cells/mm<sup>3</sup> (Gazzard et al., 2008). However, the results from a definitive multinational RCT reported in 2011 has provided evidence that early initiation of cART (i.e., when CD4 cell counts is between 350-550 cells/mm<sup>3</sup>) compared to delayed initiation of cART (i.e., when CD4 cell count is <250 cells/mm<sup>3</sup>) reduces rates of sexual transmission of HIV as well as clinical events (Cohen et al., 2011). The results of this trial have led to increase in the focus on using cART for prevention of sexual transmission of HIV and have contributed to the revision of the UK as well as the USA guidelines for starting cART (U.S. Department of Health and Human Services, Panel on Antiretroviral Guidelines for Adults and Adolescents, 2012; Williams et al., 2012). This is discussed in greater detail in section 7.3.2.

Since the first case of AIDS, global, regional and national surveillance systems have been set-up to understand the variation in the epidemiology of HIV, the nature of the HIV epidemics and factors associated with HIV transmission. The availability of cART has changed the landscape of HIV epidemiology by decreasing HIV related morbidity and mortality, and reducing the average infectivity of a person on cART with an effective viral suppression. In the following sub-section I examine the epidemiology of HIV in the UK, particularly in MSM and the epidemiology of STI in HIV positive MSM.

### 1.3 *Epidemiology of HIV in the UK*

HIV can be transmitted sexually, through blood or blood products, and from mother-to-child. An understanding of the national epidemiology of HIV infection, regional variations, key drivers, and the stage of the infection at the population level is important to inform the development of appropriate HIV prevention and treatment programmes. It is equally important to understand the source of the surveillance data, its reliability, and limitations.

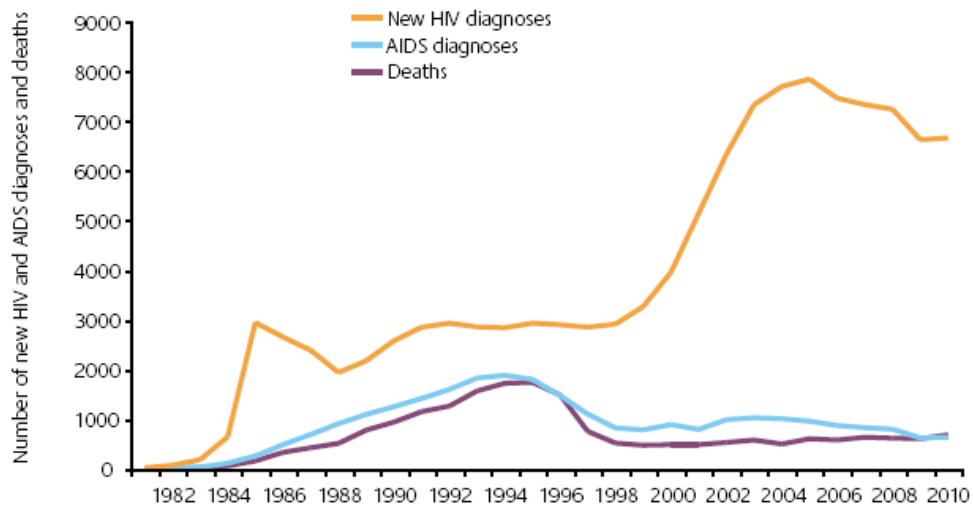
In the UK, the surveillance system for HIV and STI has evolved over time in response to the changes in the HIV epidemic, development of diagnostic tests for HIV and the effect of cART on HIV prevalence (Dougan et al., 2008). The national surveillance system for AIDS was set-up in 1982. At the time of writing this thesis, the surveillance data for HIV was collected via various mechanisms, including unlinked anonymous seroprevalence surveys, the Survey of Prevalent HIV Infections Diagnosed (SOPHID), and HIV and AIDS New Diagnoses and Deaths surveillance. The national estimates of the number of PLWH in the UK are obtained by fitting a statistical model to the prevalence data collected through these surveys (Health Protection Agency, 2011a). The model assumes a subdivision of the target UK population aged 15-59 years into key mutually exclusive exposure subgroups, and produces estimates by geographical region, infection diagnosis status, and gender (Health Protection Agency, 2011a). In the following sub-section I describe the HIV prevalence in the UK.

#### 1.3.1 **HIV prevalence in the UK**

By the end of 2010 the number of estimated PLWH in the UK was 91,500 and the estimated HIV prevalence was 1.5 per 1,000 people of all ages (Health Protection Agency, 2011a). As shown in Figure 3, there has been a tremendous increase in

the number of new HIV diagnoses since 1981 when the first case of HIV was diagnosed. However, these data should also be interpreted in the context of developments in the field of diagnostics for HIV. In the mid-1980's, the annual number of new HIV diagnoses rose to approximately 3000 new cases due to the availability of HIV antibody test in 1985. This was followed by a decline in the new cases from 1985-1987 to approximately 2000 new cases per year. There was a subsequent increase from 1987 until 1991 after which the number of new diagnoses of HIV per year stabilized at 3000 new cases per year until 1996. After 1996, there was a steep rise in the number of new HIV diagnoses, with the highest number of new diagnoses being in the year 2005 (7837 cases).

**Figure 3. Annual new HIV and AIDS diagnosis and deaths in the UK: 1982-2010**



Source: UK Collaborative Group for HIV and STI Surveillance, 2010

Since 2005, the number of new HIV diagnoses has declined but continues to be high compared to pre-1996. In 2010, the number of new HIV diagnoses was 6660 (Health Protection Agency, 2011a) and the rate of new HIV diagnosis was 0.11 per 1,000 population. AIDS related diagnosis and deaths increased from 1982 until 1995 to approximately 2000 cases of each (Figure 3). Deaths due to HIV and

AIDS related diagnosis have declined rapidly since 1996 due to the availability of cART. Since 1996, the number of AIDS diagnosis and deaths has stabilized at approximately 500 cases per year. The UK Collaboration of HIV Cohort data indicates that the life expectancy of people treated for HIV infection has increased between 1996-2006 by over 15 years (May et al., 2011).

### 1.3.2 **Undiagnosed HIV**

The benefits of cART are associated with its timely initiation (May et al., 2011). However, one of the biggest challenges in the UK is the high proportion of undiagnosed HIV cases. The source of data on undiagnosed HIV infections in the UK is the unlinked anonymous serological surveys conducted among pregnant women, injecting drug users (IDUs), and sexual health clinic attendees tested for syphilis. These unlinked anonymous surveys, started in the UK in 1990, monitor the prevalence of HIV within defined populations. Of the 91,500 HIV cases by the end of 2010, approximately 22,000 people were unaware of their infection (Health Protection Agency, 2011a). Moreover, timely diagnosis has implications for prevention of onward sexual and vertical HIV transmission. People who are unaware of their HIV status may engage in unprotected sex with implications for onward HIV transmission.

### 1.3.3 **Late and very late HIV diagnosis**

Late HIV and very late HIV diagnosis is defined as patients with a CD4 cell count of  $<350$  cells/mm<sup>3</sup> and  $<200$  cells/mm<sup>3</sup> respectively within three months of HIV diagnosis (Gazzard et al., 2008). Late HIV diagnosis continues to be a problem in the UK (Sullivan et al., 2005; Rodger et al., 2010), with an estimated 22% of adults diagnosed with HIV in 2010 having a CD4 cell count of  $<350$  cells/mm<sup>3</sup> (Health Protection Agency, 2011a). Late diagnosis is associated with the risk of

already having developed AIDS-defining conditions at the time of HIV diagnosis or developing one shortly afterwards (Girardi et al., 2007; Rodger et al., 2010). The data on CD4 cell count monitoring indicates that the key groups affected by late HIV diagnosis in the UK are heterosexual men, particularly black African men and older people (Health Protection Agency, 2011a).

#### 1.4 *HIV among MSM in the UK*

MSM continue to be one of the two groups disproportionately affected with HIV in the UK. The following sub-section describes the prevalence and incidence of HIV and the level of undiagnosed and late HIV diagnosis in this population.

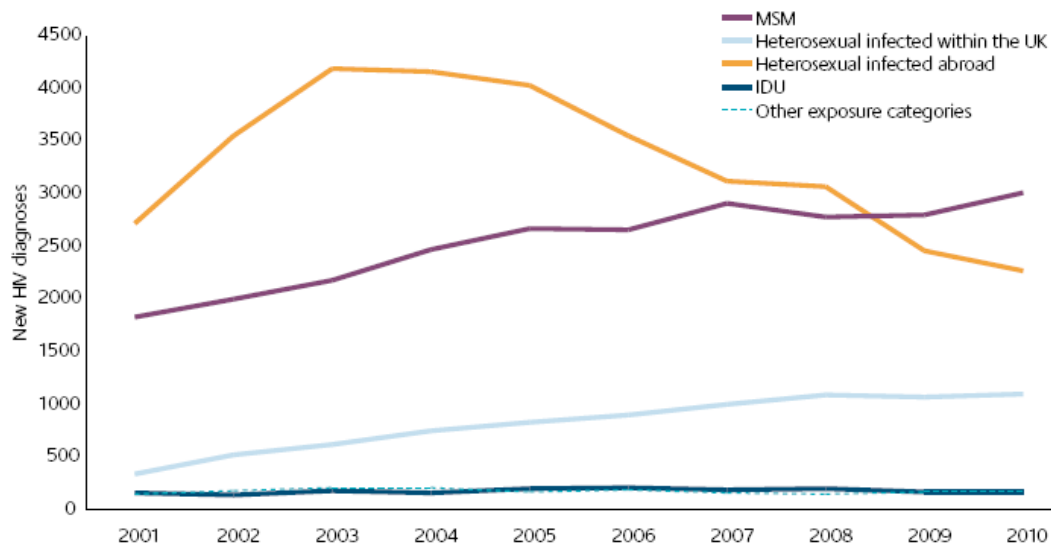
##### 1.4.1 **HIV prevalence and incidence among MSM**

The British National Survey of Sexual Attitudes and Lifestyles (NATSAL) conducted in 2000 reported a significant increase in the proportion of MSM in the population compared to the 1990 NATSAL survey (Mercer et al., 2004). The prevalence of homosexual practices in the preceding five years among men aged 16–44 years in the 2000 NATSAL survey was 5.5% in Greater London and 2.1% for the rest of Britain (Johnson et al., 2001). In 2010 the estimated number of MSM living with HIV in the UK, derived using the Office for National Statistics data, was 40,100 (Health Protection Agency, 2011a). Assuming that 3.4% of the adult male population in the UK in 2010 are MSM, one in 20 gay men are living with HIV nationally (47 per 1,000 population), and one in 11 in London (83 per 1,000). The prevalence of HIV in MSM in England is high compared to other regions of the UK.

As indicated in Figure 4, in 2010 the number of new HIV diagnoses was highest in MSM (3000 cases) compared to other groups. The number of new HIV cases in MSM has increased steadily from 1820 cases in 2001 to 2660 cases in 2005 and

stabilized at this level until 2006. However, there was an increase in the number of new cases to 2900 in 2007 following which again there was a decline in new cases to 2770 in 2008 and 2790 in 2009. Since 2001, the number of new diagnoses in MSM has reached the highest mark in 2010, i.e., 3000 cases. Of these 3000 cases, 81% were probably acquired in the UK. The annual incidence of HIV among MSM, aged 15-44, living in England and Wales has increased from 0.5% per year in 2002 to 0.9% in 2007 (Presanis et al., 2011). A study conducted in Brighton has reported that the proportion of recently acquired infections in MSM was not only high but has increased between 1996-2007 (Fisher et al., 2007).

**Figure 4. New diagnosis of HIV by exposure groups in the UK: 2001-2010**



Source: UK Collaborative Group for HIV and STI Surveillance, 2010

In 2010, approximately 90 HIV clinics and 50 laboratories participated in the national monitoring of recent HIV infections in England and Northern Ireland which incorporates results from an HIV antibody assay modified for the determination of HIV avidity as evidence of recent or long-standing HIV infection (Health Protection Agency, 2011a). The proportion of recently acquired infections was higher among MSM (24%), compared to heterosexual women (7%) and

heterosexual men (9%) indicating on-going HIV transmission in MSM. However, this is likely to be influenced by the differential uptake of HIV testing among these groups.

#### **1.4.2 Prevalence of undiagnosed and late diagnosed HIV in MSM in the UK**

The estimated prevalence of undiagnosed HIV in MSM in 2003 in England and Wales, derived using data from the community-based surveys, STI clinic surveillance data and a general population sexual behaviour survey, was 2.4% (Walker et al., 2011). Recent community based studies in MSM have reported that the undiagnosed HIV prevalence in MSM is high, i.e. 28% in London (Wayal et al., 2008) and 41.7% in Glasgow and Edinburgh (Williamson and Hart, 2007). The number of undiagnosed HIV cases among MSM in 2010 was estimated to be 10,300 (26%) and a further 39% of MSM were diagnosed late with HIV (Health Protection Agency, 2011a). This is lower than the proportion of late HIV diagnosis among heterosexual women (58%) and men (63%).

##### **1.4.2.1 *HIV testing among MSM in the UK***

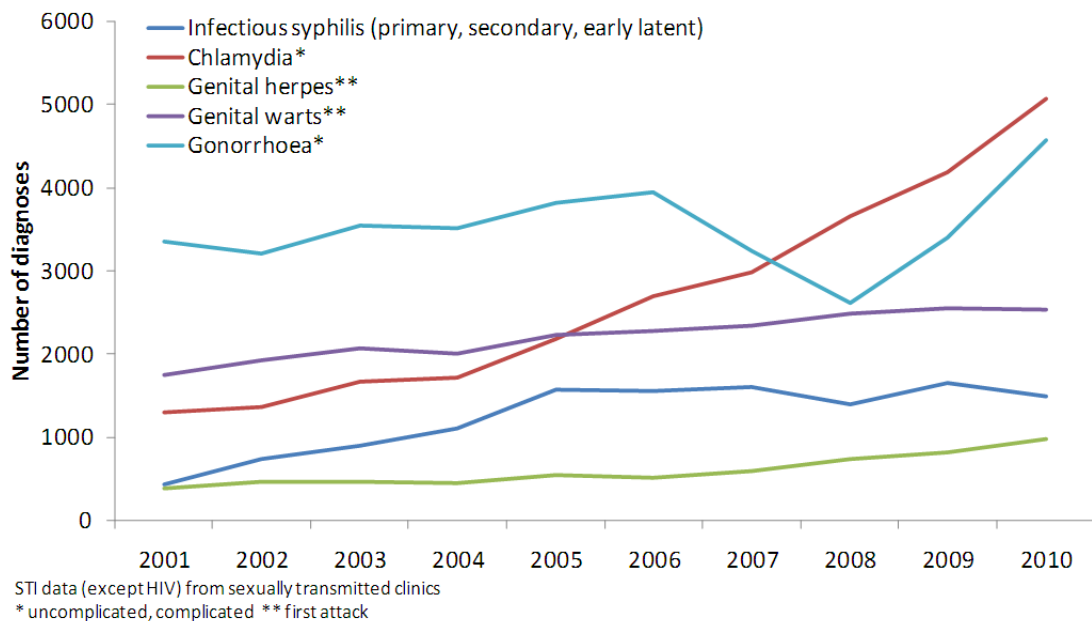
Improving uptake and frequency of HIV testing is important to reduce the risk of onward HIV transmission due to being unaware of one's serostatus and to enhance timely access to treatment and care among those who are HIV positive. A community-based survey conducted in MSM in London indicates that the proportion of men who had ever tested for HIV has increased from 72.1% in 1998 to 90.1% in 2008 (Lattimore et al., 2011). However, given the high prevalence of undiagnosed HIV among MSM, regular testing for HIV and partner notification among MSM is important to prevent onward HIV transmission.



### 1.4.3 Epidemiology of STI among MSM in the UK

There has been a tremendous increase in the diagnoses of primary, secondary and early latent infectious syphilis among MSM in England with the number of diagnoses increasing from 440 in 2001 to 1490 in 2010 (Health Protection Agency, 2011a). 35% of these diagnoses were among HIV positive MSM (Jebbari et al., 2011). As depicted in Figure 5, since 2001 there has been an increase in the diagnosis of all STI in MSM in England. The number of gonorrhoea diagnoses in MSM in 2010 was 4,500, and chlamydia diagnosis was 5,000 (Health Protection Agency, 2011b). Approximately 800 MSM had a first episode of genital herpes and 2000 MSM had a first episode of genital warts.

**Figure 5. Diagnoses of selected STI in MSM in England: 2001-2010**



Source: UK Collaborative Group for HIV and STI Surveillance, 2010

Of the total 520 LGV diagnoses in 2010, 99% were in MSM, with 80% among HIV positive MSM, and a significant proportion of these were re-infections (Health Protection Agency, 2011b). An enhanced surveillance system for newly

acquired HCV in MSM from 2008 to 2010 has shown that 228 cases were identified in STI clinics across London, Manchester and South East (Health Protection Agency, 2011b). Although some of the STI like syphilis, gonorrhoea and chlamydia can also be transmitted via oral sex, LGV is transmitted predominantly during unprotected anal intercourse (UAI). The increase in STI among HIV positive MSM is an indicator of sexual behaviours that facilitate STI transmission and acquisition. This suggests that there is a need to ensure on-going sexual health of MSM living with HIV.

As mentioned previously in section 1.4.1, in 2010 there was an increase in the number of recent HIV infections in MSM in the UK. These data indicate that among MSM there has been an increase in the sexual behaviours that enhance HIV transmission and acquisition. Thus, there is a need to examine the sexual behaviour of MSM to understand its implications for the HIV epidemic. The following sub-section describes factors associated with HIV transmission.

### ***1.5 Determinants of HIV transmission***

Sexual transmission is the foremost risk factor for HIV transmission in adults worldwide (World Health Organisation, 2011). Using a simple mathematical model to explain HIV transmission dynamics May and Anderson postulated that the prevalence and spread of HIV/STI in a population is determined by the key parameter  $R_0$ , the basic reproductive rate of an infection (May and Anderson, 1987).  $R_0$  is influenced by  $\beta cd$  as explained in Box 1 (Hethcote and Yorke, 1984; May and Anderson, 1987).

**Box 1. Factors affecting HIV transmission**

$R_0$ , the basic reproductive rate of the infection =  $\beta cd$

$B$  = the average probability that infection is transmitted from an infected individual to a susceptible partner, i.e., efficiency of transmission

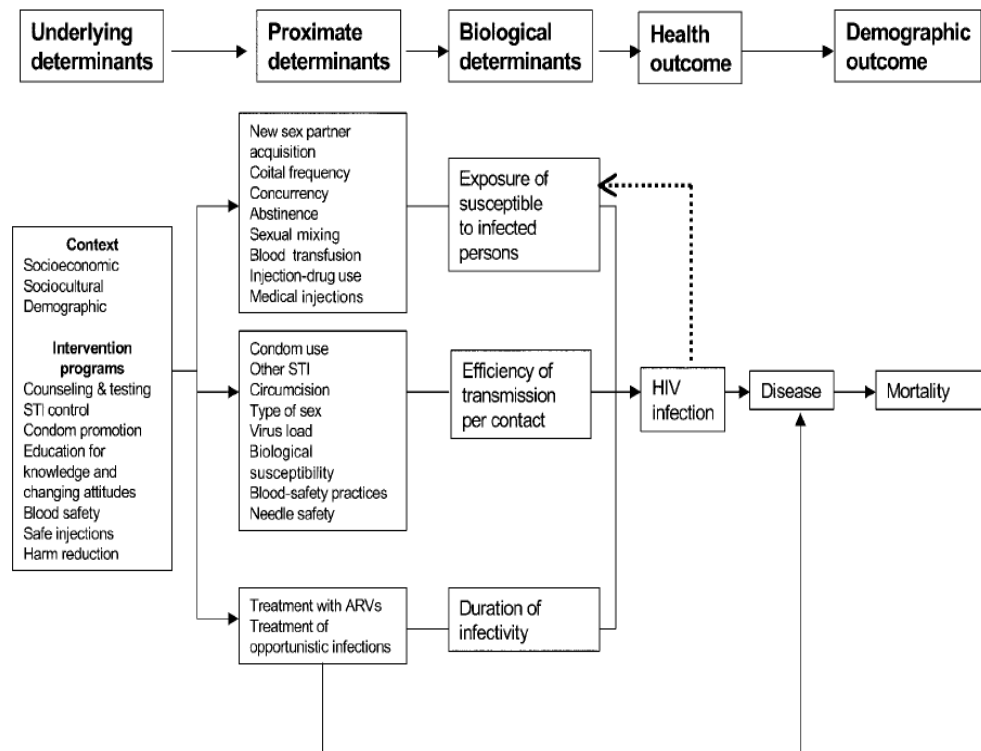
$c$  = average rate of contact between an infected and susceptible individual, i.e., rate of partner change

$d$  = the average duration of infectiousness

If the average number of infections that result from one infection is greater than one [ $R_0 > 1$ ] then the rate of HIV in the community will increase, and if the average number of infections is less than one [ $R_0 < 1$ ] then the rate of HIV in the community will decrease (Garnett, 2002).

Boerma and Weir proposed a hierarchical conceptual framework (Boerma and Weir, 2005) to study the distribution and determinants of HIV in the population. As shown in Figure 6, they postulated that the social and structural factors and intervention programs, termed as the underlying factors, affect the biological determinants of HIV ( $\beta cd$ ) through the proximate determinants to affect the spread of HIV. This framework focuses on the identification of factors that can be influenced by changes in the contextual variables, i.e., underlying determinants, which influence the biological factors that influence health outcomes. As shown in figure 6, ' $\beta$ ', i.e., the efficiency of HIV transmission per contact is influenced by behavioural as well as biological factors like condom use, type of sex, viral load, STI, circumcision; ' $c$ ' is also influenced by behavioural factors like the rate of sex partner change, number of sex acts, nature of sex partnerships, and IDUs or blood transfusion, and ' $d$ ' is influenced by the treatment with cART and treatment of opportunistic infections.

**Figure 6. Proximate-determinants conceptual framework for HIV transmission**



Source: Boerma and Weir, 2005

At the population level, factors like the interaction between the population prevalence of the infection, phase of the epidemic and socio-sexual networks and sexual mixing patterns (Wasserheit and Aral, 1996; Potterat et al., 1999; Aral et al., 2005), access to sexual health care and treatment, namely cART and community viral load (Porco et al., 2004; Das et al., 2010) can also affect HIV transmission. This implies that in order to reduce HIV transmission, HIV prevention programs should influence  $\beta$ cd by developing interventions to influence the proximate determinants of HIV transmission, which in turn can influence the biological determinants and prevent HIV transmission.

### **1.5.1 Determinants of sexual transmission of HIV among MSM**

In the following section, I examine the proximate determinants of HIV among MSM.

#### **1.5.1.1 *Exposure of susceptible to infected person (c)***

The exposure of susceptible persons to infected persons is influenced by various behavioural factors like the rate of sex partner change, age at sexual debut, socio-sexual networks, etc among individuals. In the UK, multiple sexual partnerships are commonly reported by a substantial proportion of MSM (Weatherburn et al., 2008). In addition, MSM, in particular HIV positive MSM, frequently meet sexual partners online via dating websites (Bolding et al., 2005, 2007). Gay and MSM dating websites like Gaydar, Manhunt, and Bareback.com etc. can facilitate geographical mixing, mixing of men with similar sexual preferences and meeting multiple sexual partners. These sites can also facilitate the organization of sex parties, which has implications for onward transmission of HIV. Similarly, sexually charged environments like saunas and sex on premises venues are also likely to facilitate access to sexual partners among men accessing these venues.

### **1.5.2 Efficiency of transmission per contact ( $\beta$ )**

The efficiency of sexual transmission of HIV is influenced by various behavioural and biological factors described in the following sections.

#### **1.5.2.1 *Type of sex***

One of the factors affecting the probability of HIV transmission is the nature of sexual contact between an infected person and a susceptible person (Mastro and de Vincenzi, 1996; Vernazza et al., 1999). The probability of HIV transmission associated with insertive or receptive unprotected anal intercourse (UAI) is higher

than other types of sex. Moreover, insertive unprotected anal intercourse (IUI) is associated with greater risk of HIV transmission compared to receptive unprotected anal intercourse (RUI) between an HIV positive person and an HIV negative person, i.e., between serodiscordant partners (Caceres and van Griensven, 1994; Mastro and de Vincenzi, 1996; Vittinghoff et al., 1999). Similarly, the risk of HIV transmission associated with RUI and IUI with ejaculation is greater than RUI and IUI with withdrawal prior to ejaculation.

The pre-cART estimates of the probability of HIV acquisition per 1000 episodes of RUI with ejaculation, after assuming the risk of transmission per sexual contact between an infected and an uninfected partner to be constant, was estimated to be 0.005-0.03 (DeGruttola et al., 1989). Another study estimated the per-contact risk of HIV acquisition associated with RUI when the partner was of known HIV positive status to be 0.82% (95% CI: 0.24-2.76%), and 0.27% (95% CI: 0.06-0.49%) with an unknown serostatus partner (Vittinghoff et al., 1999). The per-contact risk associated with IUI with an HIV positive or unknown serostatus partner was estimated to be comparatively lower, i.e., 0.06% (95% CI: 0.02-0.19); and the estimated risk associated with receptive penile-oral sex was 0.04% (95% CI: 0.01-0.17) (Vittinghoff et al., 1999).

Estimates of HIV transmission in the cART era indicate that the per-contact risk of HIV acquisition for RUI if ejaculation occurred inside the rectum was 1.43% (95% CI: 0.48%-2.85%) and it was 0.65% (95% CI: 0.15%-1.53%) if withdrawal prior to ejaculation occurred during RUI (Jin, Jansson, et al., 2010). This study also showed that the per-contact risk of HIV acquisition for IUI in circumcised men was 0.11% (95% CI 0.02–0.24) and it was 0.62% (95% CI 0.07–1.68) in uncircumcised men. Despite the availability and effectiveness of cART, the

overlap in the 95% confidence interval (CI) of the per-contact risk of HIV acquisition due to engagement in RUAI suggests that the post-cART estimate is similar to that reported in the pre-cART era (Vittinghoff et al., 1999; Jin, Jansson, et al., 2010). This may be because the risk of HIV transmission is correlated not only with biological factors like access to cART and ensuing viral load but also with other population and individual level factors like disease stage, co-infection with STI, and sexual behaviour thus emphasising the relevance to examine the prevalence of these factors to understand their impact on the probability of HIV transmission.

A recent mathematical model based on the USA national surveillance data from five cities estimated that the risk of HIV transmission was high among HIV positive men who engaged in RUAI and reported a higher number of episodes of RUAI with a main partner compared to casual partners (Sullivan et al., 2009). However, some MSM use various strategies to reduce the risk of HIV transmission. These strategies are also termed as seroadaptive behaviours (Snowden et al., 2009). Some men, especially if they are HIV positive, may decide not to engage in sex at all or may engage only in oral sex, which is associated with a very low risk of HIV transmission compared to anal sex. They may also engage in serosorting, i.e., have sexual partnerships only with men of the same HIV serostatus or engage in unsafe sex, namely UAI only if the partner is of identical serostatus (Snowden et al., 2009). However, undiagnosed HIV prevalence and seroguessing, i.e., assuming the HIV status of the sexual partners to be the same as one's own status, which can be faulty and lead to HIV transmission (Zablotska et al., 2009) are challenges to serosorting, especially among HIV negative MSM. Additionally, serosorting does not offer protection against STI in the event of UAI nor does it protect against the

risk of super-infection with other strains of HIV in the case of HIV positive MSM (Poudel et al., 2007).

Some MSM may also engage in strategic positioning, i.e., an HIV positive person may choose to be the receiver and the HIV negative partner may choose to be the insertive partner in the event of UAI between serodiscordant partners (Van de Ven et al., 2002) or unknown status partners. MSM may engage in practices like strategic positioning if they perceive varying risk of HIV transmission associated with IUA and RUA. MSM may also decide to engage in UAI with withdrawal before ejaculation to reduce the risk of HIV. In this thesis, I have referred to the use of sexual positioning or non-engagement in certain types of sex to reduce the risk of sexual transmission of HIV as ‘behavioural risk reduction strategies’. An HIV negative and an HIV positive man may decide to engage in UAI if they believe that the HIV positive partner has an undetectable viral load and thus the risk of HIV transmission is low, also known as negotiation around viral load (Van de Ven et al., 2002; Jin et al., 2007). In this thesis, I have referred to relying on undetectable viral load status to decide engagement in UAI as ‘biomedical risk reduction strategy’ for prevention of sexual transmission of HIV. However, except condom use, both, the behavioural as well as biomedical risk reduction strategies may not necessarily offer protection against HIV acquisition/transmission (Jin et al., 2007).

#### **1.5.2.2 *cART, viral load, and transmission risk***

A prospective study conducted in Rakai, Uganda showed that in heterosexual serodiscordant couples plasma viral load is the main predictor of the risk of HIV transmission (Quinn et al., 2000). This study also showed that HIV transmission was rare in among persons with viral load less than 1500 copies mL. By the late



1990's, several trials had shown that cART is effective in preventing mother-to-child transmission of HIV by reducing plasma viral load (Mofenson and McIntyre, 2000). Among men, cART has also been shown to reduce the semen viral load (Gupta et al., 1997; Vernazza et al., 1997). Therefore, since early 2000 there has been a growing interest in the potential to use cART to reduce the risk of sexual transmission of HIV (Hosseinipour et al., 2002; Montaner et al., 2006). An ecological study from Taiwan reported a 53% reduction in new HIV positive tests after introduction of free access to cART (Fang et al., 2004). In addition, a reduction in HIV infectivity due to cART was also reported among MSM in San Francisco (Porco et al., 2004). The use of cART was independently associated with 86% reduction in HIV transmission in Spanish serodiscordant couples if the HIV positive partner was on cART (Castilla et al., 2005). A recent RCT has shown that early initiation of cART reduces the rate of sexual HIV transmission in serodiscordant couples (Cohen et al., 2011); however the study population was predominantly heterosexual serodiscordant couples.

Several mathematical modelling studies have suggested that increasing the usage of cART among MSM can reduce AIDS-related death rate and HIV incidence rate (Blower et al., 2000; Velasco-Hernandez et al., 2002; Bezemer et al., 2008). However, all these studies also suggest that benefits of cART can be offset by increase in risky sexual behaviours. The lack of difference between the per-contact risk of HIV transmission associated with RUAI among MSM in the pre and post cART era reported in section 1.5.2.1 is a concern. It indicates that the relationship between viral load status and HIV infectiousness for sexual transmission for anal sex remains unproven (Baggaley et al., 2010). Thus, although cART is associated with reduced infectivity among heterosexual couples, these mixed results indicate

that there is a need for further research among MSM to examine the relationship between effectiveness of cART in preventing HIV transmission.

### **1.5.2.3 *Treatment with pre-exposure prophylaxis***

There is also an increasing focus on the potential for using cART as pre-exposure prophylaxis (PrEP) to prevent sexual transmission of HIV. A multinational RCT showed that daily intake of oral cART (emtricitabine and tenofovir disoproxil fumarate) by HIV negative MSM and transgender women who have sex with men reduced the risk of HIV acquisition by 44% (95% CI: 15-63;  $p= 0.005$ ) (Grant et al., 2010). Recently in the USA, the FDA has approved the drug combination of 300 mg tenofovir and 200 mg emtricitabine for daily use by uninfected adult to prevent sexual acquisition of HIV (Centers for Disease Control and Prevention, 2012). However, PrEP offers only partial protection against the risk of HIV.

### **1.5.2.4 *STI and HIV Transmission***

Bacterial STI are a surrogate marker of high-risk sexual behaviour. Being infected with STI increases the risk of both, HIV transmission and acquisition (Hayes et al., 1995; Cohen et al., 1997; Fleming and Wasserheit, 1999). STI facilitate HIV acquisition by breaching protective mucosal barriers and recruiting susceptible immune cells like the CD4 cells and macrophages to the site of infection (Ward and Rönn, 2010). STI are associated with onward HIV transmission during primary HIV infection (Pao et al., 2005). Among HIV infected persons, STI, particularly ulcerative and inflammatory STI and those causing urethral/vaginal discharge, such as herpes simplex virus type 2 (HSV-2), chancroid, gonorrhoea, chlamydia, syphilis, chlamydia, trichomoniasis, bacterial vaginosis, urethritis, and cervicitis facilitate HIV shedding in the genital tract (Kalichman et al., 2011), thus facilitating onward HIV transmission. Syphilis increases the concentration of HIV

plasma viral load and reduces CD4 cell count (Buchacz et al., 2004). Genital ulcer disease (GUD) is an independent factor for shedding of HIV in the genital fluids (Ghys et al., 1997). However, another study did not find this relationship but found that GUD appeared to increase viral load in semen by increasing the blood plasma HIV concentrations (Dyer et al., 1998). Anal gonorrhoea among MSM in an Australian cohort was the strongest predictor of HIV acquisition (Jin, Prestage, et al., 2010).

A RCT conducted in 1985 demonstrated that syndromic management of STI can reduce the incidence of HIV in the general population (Grosskurth et al., 1995). However, subsequent studies on the effect of STI management on HIV incidence have shown no positive effect (Padian et al., 2010). The lack of effectiveness of treating curable STI on HIV incidence at the population level is likely to be due to various factors like the stage of the HIV infection (i.e., mature epidemic), changes in sexual behaviours in the population over time and distribution of viral load in the community (Freeman et al., 2007; White et al., 2008).

Although cART offers protection against the risk of HIV transmission, it does not offer protection against the risk of STI transmission or acquisition. The studies that have modelled the probability of HIV transmission in the cART era have not factored in the impact of STI (Bezemer et al., 2008; Wilson et al., 2008). Thus there is no robust evidence about the impact of co-infection with STI on HIV transmission in the cART era. Nevertheless, STI are associated with increased infectivity due to increase in viral load.

#### **1.5.2.5 *Male circumcision***

Male circumcision is associated with reduced risk of heterosexual as well as homosexual HIV acquisition (Gray et al., 2008; Jin, Jansson, et al., 2010). As

mentioned earlier, the estimated per-contact probability of HIV acquisition during IUI was lower in MSM who were circumcised, i.e., 0.11% (95% CI: 0.02-0.24) compared to 0.62% (95% CI: 0.07-1.68) in uncircumcised MSM (Jin, Jansson, et al., 2010).

### 1.5.3 **Duration of infectivity (D)**

HIV is not curable and can be transmitted throughout the course of infection. As described in section 1.2.4, the high level of viraemia during the primary phase of HIV infection can increase the risk of onward HIV transmission (Brenner et al., 2007). Treatment with cART and treatment of other opportunistic infections can reduce the infectivity of an HIV positive person. Currently, however cART is not started immediately at HIV diagnosis. Undiagnosed HIV can also contribute to lack of access to timely cART and onward HIV transmissions. Therefore, the duration of infectivity due to HIV is associated with both, timely HIV diagnosis and treatment with cART.

These data indicate that certain types of sexual behaviours significantly increase the risk of HIV transmission and acquisition among MSM, and these risks are moderated by various biological and pharmacological factors. In the following section, I explain the rationale for the work undertaken for my thesis.

### 1.6 ***Rationale for thesis***

Since the availability of cART, globally there has been a decline in HIV related morbidity and mortality. HIV infection is now a manageable chronic condition. PLWH can lead healthier lives including sexual lives compared to the pre-cART era. This has led to a growing acknowledgement of the health care needs and the role of HIV prevention in PLWH, also termed as 'positive prevention' (International Alliance for HIV/AIDS, 2003).

The concept of early intervention among PLWH and their partners to prevent HIV transmission was promoted for the first time in 1989 (Francis et al., 1989). It was proposed that prevention interventions in PLWH are likely to have a greater impact on the epidemic for equivalent input of cost, resources and time than prevention focused on HIV negative persons (King-Spooner, 1999; Vernazza et al., 1999). However, due to the lack of effective medication for HIV in the 1980s, there was reluctance to target HIV prevention interventions at PLWH due to the fear of blame and social stigma associated with HIV (Auerbach, 2004). Until early 2000 HIV/STI prevention strategies did not address the unique prevention needs of PLWH and failed to acknowledge their efforts in preventing onward HIV transmission (Collins et al., 2000).

Early discussions on positive prevention in the USA in early 2000 focused on expanding HIV prevention efforts to PLWH through the Serostatus Approach to Fighting the Epidemic (Janssen et al., 2001). In the UK, the National Strategy for Sexual Health and HIV emphasised the health care needs of PLWH (Department of Health, 2001). Since then, there have been significant changes in HIV testing policies and as described previously in section 1.5.2.2, an increase in the debate about the benefits of starting cART earlier for HIV prognosis and prevention of sexual transmission of HIV.

In the UK, there has been an increase in the prevalence of an older cohort on PLWH. MSM continue to be one of the groups disproportionately affected with HIV. In the recent years as described previously in section 1.4.3, there have been outbreaks of STI among MSM, especially HIV positive MSM. These factors also have implications for provision of health care services as well as HIV prevention

among PLWH. In the backdrop of these changes, there is a need to re-evaluate the HIV prevention and health care strategies for PLWH.

### ***1.7 Overall goal of the thesis***

The overall goal of my thesis is to inform strategies for HIV/STI prevention among MSM in the UK in the context of the changing landscape of HIV epidemic in the UK and the increasing emphasis on HIV testing and cART for HIV prevention.

In this following section, I briefly examine the existing range of interventions for PLWH.

### ***1.8 Interventions for PLWH***

The interventions for PLWH can be broadly categorised as interventions that address the health care needs, and HIV prevention needs of PLWH. I will briefly describe these interventions, focusing on interventions for HIV positive MSM.

#### **1.8.1 Routine clinical management of PLWH**

In the UK, the majority of PLWH access free HIV care and treatment via the NHS. At the time of starting this PhD, routine clinical care and treatment for PLWH was provided as per the 2008 UK guidelines for management of PLWH (Gazzard et al, 2008). During the course of my PhD, some of the guidelines for routine monitoring and treatment of PLWH in the UK have changed and this is addressed further in section 7.3.2. As per the 2008 guidelines, all newly diagnosed HIV positive persons should be assessed for CD4 cell count, viral load, psychiatric history and substance abuse, bone profile, glucose, lipids and cardiovascular risk in the first six months following diagnosis. They should also be screened for STI, especially HIV positive MSM should be offered testing and vaccination for Hepatitis; offered support for partner disclosure and risk reduction counselling for

safer sex. cART should be offered to patients who have a chronic HIV infection, are symptomatic or severely immunocompromised, i.e., CD4 cell count less than 350 cells/mm<sup>3</sup>. Subsequently depending on their cART status, they should be assessed periodically for CD4 cell count and viral load to monitor their HIV related health (i.e., every 4-6 months) and screened annually for risks of cardiovascular diseases, mental health including substance abuse and sexual health including hepatitis. Those on cART with poor adherence should also be assessed for mental health. PLWH with poor mental health should be offered referral for psychological support. These guidelines indicate that routine monitoring for HIV related treatment and care should also focus on other health risks among PLWH like cardiovascular diseases and mental health. Apart from offering risk reduction counselling for promoting safer sex among PLWH, these guidelines do not outline any other HIV prevention interventions among PLWH.

### **1.8.2 Interventions for HIV prevention among PLWH**

Since 2000, several studies predominantly conducted in the USA have examined the efficacy of behavioural interventions for HIV prevention among PLWH. These studies have examined the feasibility and effectiveness of behavioural interventions to promote physical and mental health; enhance safer sex behaviours and consistent condom use; promote disclosure of HIV status; prevent abuse of recreational drugs. Studies have also examined the impact of voluntary counselling and testing on sexual behaviour in serodiscordant couples. A meta-analysis of RCTs conducted between 1988-2004 conducted by Crepaz and colleagues suggests that behavioural interventions are effective in reducing unprotected sexual behaviour as well as STI (gonorrhoea or chlamydia) acquisition among PLWH (Crepaz et al., 2006). This review highlights that interventions that were

effective in reducing risky sexual behaviours among PLWH were based on behavioural theories like social cognitive theory/social learning theory, theory for planned behaviour, or information-motivation-behaviour skills model; specifically designed to change HIV transmission risk behaviours or addressed other issues like adherence to medication, mental health along with HIV risk reduction behaviour; focused on skill building; delivered by health-care providers or counsellors; delivered to individuals on a one-to-one basis. However, due to the small number of studies conducted among HIV positive MSM there was no evidence of substantial effect of behavioural interventions in this group. Also, none of these RCTs were conducted outside the USA. The Seropositive Urban Men's Intervention Trial (SUMIT) conducted to assess the effectiveness of a behavioural intervention to promote safer sex was the only trial included in this review by Crepaz and colleagues that was conducted exclusively among HIV positive MSM (Wolitski et al., 2005). It compared the efficacy of six 3-hour peer-led group counselling sessions informed by behavioural theories for gay and bisexual HIV positive MSM focusing on sexual and romantic relationships, HIV/STI transmission, substance abuse, disclosure of serostatus and mental health with a single-session counselling focusing on safer sex, and transmission risks by local experts with 3 and 6 month follow-up. This trial highlighted that enhanced intervention was associated with only a limited reduction in HIV transmission risk at 3 months compared to the standard intervention and there were no other significant differences in other HIV transmission risk behaviours or serostatus disclosure during the 3 or 6 months follow-up period.

Following the systematic review by Crepaz and colleagues and during the course of my PhD, there has been an increase in the number of positive prevention



trials/studies conducted exclusively among HIV positive MSM. Studies have shown that individually-tailored behavioural interventions using cognitive behaviour therapy (Morin et al., 2008), information-motivation-behavioural skill based counselling (Safren et al., 2011) or motivational interviewing (Golin et al., 2012) are effective in reducing overall HIV transmission risk behaviours among HIV positive MSM. However, another RCT conducted in the USA to examine the effectiveness of an intervention to enhance disclosure among HIV positive MSM showed that although disclosure behaviours and attitudes improved in the intervention arm, prevalence of UAI in 3 months post intervention increased in the intervention arm compared to the control arm (Serovich et al., 2009). But this study does not provide data on the HIV status of UAI partners and it is likely that the observed increase in UAI was due to serosorting, which has implications for STI risk. Another recent prospective observational cohort study conducted in the USA has reported similar results (Patel et al., 2012). Despite 50% reduction in STI incidence observed in this study at twelve months among HIV positive MSM who had received a brief risk-reduction counselling provided by a health care professional with biannual STI testing, rates of UAI with seroconcordant partners increased and there was no change in UAI with serodiscordant or unknown HIV status partners.

A systematic review of studies conducted between January 1990-December 2006 among PLWH in developing countries has shown that HIV counselling and testing interventions can increase condom use among PLWH, especially among HIV serodiscordant couples (Kennedy et al., 2010). However, the majority of these studies were conducted among heterosexual populations. A RCT conducted in the USA among HIV negative MSM comparing a standard counselling session with a

standard counselling session plus counselling for high risk sexual behaviours showed that there was a significant reduction in UAI in the latter group with discordant casual partners but UAI did not decrease with serodiscordant primary partners (Dilley et al., 2002). Recreational drug use, especially use of crystal methamphetamine continues to be a significant challenge for safer sex and adherence to cART among PLWH. A systematic review of studies conducted among HIV positive MSM in the USA on the effect of abuse of drugs like crystal methamphetamine has shown that existing behavioural-theory based interventions have variable impact on treating this drug addiction highlighting the need for developing better interventions to address this challenge (Rajasingham et al., 2012).

The findings of these studies reiterate that behavioural interventions that focus on a broad range of issues like safer sex, mental health and coping, adherence to cART and disclosure of HIV status to sex partners; are intensive as opposed to a single session; are delivered on an one-to-one basis are effective in HIV prevention among HIV positive MSM. These studies also highlight that such interventions can also be delivered by trained counsellors or HIV positive peers. However, these data highlight the partial effectiveness of behavioural interventions for HIV prevention and health promotion among HIV positive MSM.

With regards to biomedical interventions for HIV prevention among PLWH, as explained in section 1.5.2.2, there has been a growing emphasis on using cART for HIV prevention. Briefly, this emphasis was fuelled by the observed effectiveness of cART in early 2000 in preventing mother-to-child transmission of HIV. Data from ecological and longitudinal studies also suggested that there was a reduced risk of HIV transmission in serodiscordant couples if the positive partner was on

cART and had an undetectable plasma viral load. Thereby, it was hypothesised that if cART reduces plasma viral load, which is one of the strongest risk factor for sexual HIV transmission (Quinn et al, 2010), it can potentially reduce the risk of sexual transmission of HIV among PLWH receiving cART and have an undetectable viral load. At the time of starting this PhD, there was no evidence from RCT to support this hypothesis but several studies were underway to examine this hypothesis. For example, a HPTN 052 trial examining the effectiveness of earlier initiation of cART (CD4 cell count 350-500 compared to <250) on the risk of sexual HIV transmission and clinical events was underway in nine countries. As mentioned in section 1.5.2.2, it was also hypothesised that enhanced identification of HIV-infected individuals followed by 'immediate' initiation of cART irrespective of CD4 cell count or disease stage can reduce infectiousness at a population level. A HPTN 062 trial called TLC-Plus (Test, Link to Care, Plus Treatment) is currently underway to assess the effectiveness of this HIV prevention strategy. This trial will examine the impact of expanded HIV testing, linkage to care, viral suppression through adherence to cART, prevention for positives through risk-reduction counselling. Another cluster RCT HPTN 071 called PopART, is also currently underway to evaluate the effectiveness of a combination of interventions including voluntary testing, offering male circumcision to men testing HIV negative, counselling and immediate initiation of cART ([www.zambart.org](http://www.zambart.org)). The findings of these studies can potentially influence the clinical practice of timing of initiation of cART among PLWH, and enhance our understanding of the effectiveness and effective components of combination prevention strategies for HIV prevention.

In the backdrop of the limited evidence on the effectiveness of behavioural interventions and lack of robust data on the effectiveness of biomedical interventions like cART for HIV prevention, there has been an increase in emphasis on using combination prevention strategies for HIV prevention, i.e. using behavioural, biomedical as well as structural interventions to prevent HIV (Vandenbruaene, 2007). It is also important to recognise the symbiotic relationship between the effectiveness of biomedical interventions and behavioural interventions. As mentioned previously in section 1.5.2.4, the effectiveness of cART for HIV prevention is likely to be compromised due to co-infection with STI, which can potentially influence infectivity. Given the growing emphasis on using cART for preventing sexual HIV transmission, it is vital to reduce the prevalence of STI co-infection among PLWH, especially among HIV positive MSM. Regular screening and partner notification for STI can potentially reduce the risk of increased infectivity due to STI and risk of HIV acquisition. Concerns have also been raised about the implications of cART related optimism on risk compensation, i.e., risky sexual behaviours. In the backdrop of this growing emphasis in the scientific community on using cART for HIV prevention, in this thesis I will examine the sexual behaviour and partnership patterns of HIV positive MSM, their attitudes towards risk reduction strategies for HIV prevention including the effectiveness of cART for prevention of sexual transmission of HIV and its impact on sexual behaviour, and attitudes towards notifying sexual partners for STI and preferred methods of partner notification.

In the following section, I explain briefly the key components that I have examined in this thesis in order to inform the HIV/STI prevention interventions among HIV positive MSM, i.e., the sexual partnership patterns and behaviour of

HIV positive MSM, the association between risk reduction strategies and sexual behaviour and partner notification for STI.

### **1.9 *Keys areas examined in the thesis***

In the following section, I explain briefly the key components that I have examined in this thesis in order to inform the HIV/STI prevention interventions among HIV positive MSM, i.e., the sexual partnership patterns and behaviour of HIV positive MSM, the association between risk reduction strategies and sexual behaviour and partner notification for STI.

#### **1.9.1 Sexual partnership patterns and sexual behaviour of HIV positive MSM**

Understanding the sexual partnership patterns and behaviours of PLWH is vital to understand the course of the HIV epidemic. The increase in new HIV infections among MSM in the UK indicates continuing HIV transmission in this population. Sexual HIV transmission can occur only if an HIV infected person and an HIV uninfected person engage together in unprotected risky sexual behaviour. Therefore, in this thesis I have examined the sexual partnership patterns of HIV positive MSM, namely the HIV status of their sexual partners, and their sexual behaviour and practices. As mentioned earlier in section 1.5.2.1, some MSM may use various risk-reduction strategies to prevent the risk of HIV transmission and acquisition. Therefore, I also examined their attitudes towards behavioural and biomedical risk reduction strategies for HIV prevention.

#### **1.9.2 cART, viral load and sexual behaviour**

Subsequent to the availability of cART in 1996, there was an increase in HIV/STI and high-risk sexual behaviours in MSM in the UK (Elford et al., 2002, 2004a; Dodds et al., 2007) and abroad (Ciesielski, 2003). This led to concerns regarding

the negative effects of cART on sexual behaviours of MSM (Elford and Hart, 2005). However, studies conducted in the UK in early 2000 and in 2007 showed that being on cART or having an undetectable viral load is not associated with risky sexual behaviours among PLWH (Stephenson et al., 2003; Elford et al., 2007). A meta-analysis of studies conducted in the USA between 1996-2007 has also reported similar results (Crepaz et al., 2004, 2009). However, some studies have reported an association between optimism related to cART and an increase in risky sexual behaviour (Elford et al., 2002; Crepaz et al., 2009).

As mentioned in section 1, the Swiss statement was issued in the year I started my PhD and there were debates about the potential increase in risky sexual behaviours due to the effectiveness of cART for prevention of sexual transmission of HIV. Given the growing emphasis on cART for HIV prevention, I have explored the awareness about the Swiss statement among HIV positive MSM and examined their attitudes towards cART for prevention of sexual transmission of HIV. I also examined the association between cART/viral load status as well as attitudes towards cART for prevention of sexual transmission of HIV with risky sexual behaviours.

### **1.9.3 Partner notification for STI**

Partner notification, also known as contact tracing, is a process of informing the sex partners of a person diagnosed with HIV/STI of their probable exposure to infection(s) to enable timely testing and treatment, and to provide advice about preventing future infection (World Health Organisation/UNAIDS, 1999). The key objectives of partner notification are to control the spread of STI in the population by identifying previously undiagnosed infections, testing and treating sexual partners of persons diagnosed with STI, and preventing the development of

negative sequelae of undiagnosed STI. Partner notification can be effective in case finding compared to population level screening for STI because it focuses on individuals who have a high probability of being exposed to the infected persons.

In the UK, the guidelines for health care providers working in STI clinics suggest that patients diagnosed with STI should be offered the choice of informing partners themselves known as patient referral, or providing details of the partners to a health adviser who can contact them without revealing the identity of the index case, i.e., the person diagnosed with STI known as provider referral (Society of Sexual Health Advisers, 2004). These guidelines also suggest offering contract referral to the index cases who intend to notify their sexual partners of STI. It entails that the index case agrees that a health adviser notifies their partners without naming the index case if the partner has not presented to the clinic within an agreed time.

In the cART era, PLWH have a life expectancy similar to that of the general population, and are likely to be sexually active. The consistent high and disproportionate rate of STI co-infection in HIV positive MSM in the UK is a public health concern. It is an indication of highly prevalent sexual behaviours that facilitate STI transmission. It also signifies the need to revitalise existing measures of STI control among this population. Co-infection with STI can affect the immune system of PLWH (Sadiq, McSorley, et al., 2005; Sadiq, Taylor, et al., 2005). As described in section 1.5.2.4, STI can also reduce the effectiveness of cART for HIV prevention by increasing the plasma/peripheral viral load among those on cART. Thus, timely diagnosis and treatment of STI in PLWH is vital to ensure their sexual wellbeing, reduce infectivity associated with co-infection and slow disease progression.

In theory, effective partner notification programs can influence HIV and STI incidence and reduce STI prevalence by enhancing timely diagnosis and treatment of HIV/STI. The focus of research related to partner notification has been on notifying the sexual partners of newly diagnosed HIV positive persons to test for HIV. Given the high prevalence of STI among HIV positive MSM, there is a need to enhance partner notification for STI control among MSM living with HIV.

#### **1.9.3.1 *Systematic review of qualitative literature on partner notification***

The effectiveness of partner notification is likely to be influenced by its acceptability, and perceived and experienced barriers for notification of STI. Therefore, I conducted a systematic review of qualitative literature from 1990 to the 31<sup>st</sup> August 2009 on the attitudes, barriers, experiences, and preferences regarding partner notification for STI among adolescents, and adult men and women using meta-ethnography. I undertook this work as a member of a research consortium of the European Partner Notification (EuroPN) project for the European Centre for Disease Prevention and Control. A review of quantitative studies on the effectiveness of different types of partner notification methods was undertaken by a separate group of researchers from the University of Bern led by Dr Nicola Low. The details of the systematic review are presented in Appendix 1 because only two qualitative studies conducted among MSM were identified. However, as the review provides an overview of the barriers and facilitators to partner notification for STI, I will briefly present the key findings of this review.

Overall, the systematic review highlighted that the experience of STI diagnosis and the operationalization of partner notification is influenced not only by the type of infection; but also by gender, the socio-cultural, religious, legal and policy framework governing STI control in the society. MSM, women, and African



American heterosexual men were worried about being perceived as ‘vectors of diseases’. MSM and bisexual men feared double discrimination due to STI diagnosis due to their perceived ‘deviant’ sexuality. The shame and immorality associated with STI influenced the strategies adopted for (non)disclosure of STI diagnosis to sexual partners. The characteristics of STI (for example, treatable, symptomatic, or recurrent) also influenced partner notification strategies.

The review highlights that people diagnosed with STI face real fear of societal stigma and discrimination which motivates them to adopt strategies to protect themselves from it (Nack, 2000; Lichtenstein, 2003). Therefore, the decision to notify partners involves risk-assessment by the index case of the impact of notification on their personal wellbeing, relationships with their partners, and social status. Thus the index cases are likely to choose strategies like non-disclosure, selective disclosure (i.e., informing some but not all partners), partial disclosure (i.e., lying about the cause of their infection in an attempt to manage the stigma associated with their condition), ‘stigma transference’ (i.e., blaming the partner for their diagnosis to avoid stigma) (Nack, 2000; Lichtenstein, 2003). The need to manage stigma is also reflected in the preference for notifying partners themselves. Due to the interdependent nature of sexual health, i.e., the risk of re-infection; the challenges to hide symptomatic STI; the chronic nature of some infections; and the intimate nature of sexual partnerships, especially with main partners, the utility of coping strategies like ‘passing’, i.e., concealing one’s diagnosis with a stigmatised condition like STI (Nack, 2000) is limited. This explains the greater likelihood of main current partners being notified observed in the studies. However, in MSM a mutual acceptance of non-monogamy facilitates partner notification for STI and symbolises trust. Both trust and blame enable

partner notification, especially in the context of current main partners. Notifying casual and ex-partners was reported to be challenging due to its perceived threat to social standing.

This review highlights that, to date, there is little published evidence on attitudes, barriers and preferences relating to STI partner notification in MSM, especially HIV positive MSM. However, the consistency of certain themes emerging across various populations, i.e., stigma and partner notification, suggest that this literature can nevertheless inform the research on partner notification among HIV positive MSM.

### **1.9.3.2 *Sexual partnership patterns and partner notification among MSM***

The sexual behaviour and partnership patterns of MSM are likely to influence partner notification for STI, and thus partner notification and STI control strategies in MSM should be informed by these factors. The outbreaks of syphilis in MSM have been linked to meeting sex partners via the internet, saunas, or bars (Ashton et al., 2003; Jebbari et al., 2011). A high proportion of MSM in the UK use the internet to meet sex partners via dating websites (Elford et al., 2004b; Bolding et al., 2005). HIV positive MSM are more likely to use chat rooms to meet sex partners than HIV negative and men who have not tested for HIV (Halkitis and Parsons, 2003; Bolding et al., 2005). HIV positive MSM use the internet to seek partners of same serostatus (Halkitis and Parsons, 2003; Bolding et al., 2005) and are more likely to report UAI with these partners (Elford et al., 2004b; Bolding et al., 2005). Gay men who seek sex partners via the internet are more likely to have had an STI compared to those who did not (Bolding et al., 2005). A syphilis outbreak among MSM in San Francisco was linked to internet use and a high proportion of partners of those diagnosed with syphilis were contactable only via

an internet email address (Levine et al., 2005; Hogben and Kachur, 2008). The internet has facilitated access to multiple sex partners and connected previously isolated sexual networks. These factors have generated interest in the use of internet based partner notification for STI among MSM (Levine et al., 2005; Hogben and Kachur, 2008).

A needs assessment among MSM conducted in San Francisco, USA showed that men are usually willing to notify their primary partner for STI either themselves or via provider referral (Levine et al., 2008). However, they expressed preference for easy, convenient and anonymous way to notify casual partners. Studies conducted in the UK have shown that the existing partner notification methods described in section 1.9.3 were less effective for notification of casual and short term (< 7 days) partnerships (Bell et al., 1998). However, casual partnerships are more likely to contribute to the continued transmissions of STI (Tomnay et al., 2005; Lim et al., 2008). Thus there is a need to develop partner notification methods that are effective for notification in casual partnerships.

Given the multiplicity of sex partners among MSM, there is also a need to assess the uptake and effectiveness of partner notification methods like expedited partner therapy (EPT) where the patient diagnosed with an STI takes medication to deliver to the sex partner, and home sampling for specimens for STI testing that can reduce the time to testing and treatment of sex partners. The acceptability of EPT and home sampling for partner notification for STI has not been explored in MSM in the UK. There is also a growing interest in the role of new technologies like short messaging service (SMS) and email to enhance partner notification (Bell et al., 1998; Ashton et al., 2003; Singh et al., 2007; Jebbari et al., 2011).

The outcomes of partner notification for STI, for example, the number of partners tested or treated, are poor among MSM compared to heterosexual populations in the UK (van Duynhoven et al., 1998; Rogstad et al., 1999) as well as in other European countries (van Duynhoven et al., 1998; Rogstad et al., 1999). A study conducted in the USA indicates that although a significant proportion of MSM notified at least one partner for gonorrhoea and chlamydia, approximately 70% of exposed partners were not notified (Menza et al., 2008) limiting the effectiveness of partner notification to interrupt onward STI transmission. Similar observations were made in the UK during a syphilis outbreak where 64% of contacts were untraceable (Singh et al., 2007). The challenges related to untraceable partners among MSM (Engelgau et al., 1995; Rothenberg et al., 2000; Ogilvie et al., 2005) limits the effectiveness of partner notification as a STI control strategy. Thus there is also a need to develop new STI control strategies as well as prevention initiatives for MSM. In such situations, extended notification approaches like cluster investigations have been used in the USA (Engelgau et al., 1995; Rothenberg et al., 2000; Ogilvie et al., 2005), which has led to increase in the number of contacts identified during the syphilis outbreak (Ogilvie et al., 2005). Cluster investigation involves interviewing cases and their partners to trace the sexual and/or social contacts of cases as well as uninfected persons to elicit information about persons who may benefit from screening.

Thereby in this thesis, I have examined whether the nature of sexual partnership patterns and sexual behaviour of HIV positive MSM influences their attitudes and willingness to notify partners for STI. I also investigated the willingness of HIV positive MSM to use various existing and new methods of partner notification, the

details of which are described in chapter 2 and the preferred methods of being notified for STI by sex partners.

### **1.10 *Research questions***

I have examined the following questions in this thesis:

1. What are the implications of sexual behaviour and sexual partnership patterns of HIV positive MSM for HIV transmission, STI transmission and acquisition, and partner notification for STI?
2. What are the views of HIV positive MSM towards cART for HIV prevention? How does the socio-cultural context of HIV/STI diagnosis, beliefs about the effectiveness of various biomedical and behavioural strategies for reducing the risk of HIV transmission influence and interact with sexual partnerships, sexual behaviour, and risk management choices among HIV positive MSM?
3. What are the factors associated with STI diagnosis and willingness to notify sexual partners of STI amongst HIV positive MSM?
4. What are the attitudes of HIV positive MSM towards partner notification for STI, and towards perceived and experienced barriers and facilitators for partner notification of STI?
5. What are the attitudes of HIV positive MSM towards notifying different types of sexual partners of STI and being notified of STI via various existing and new methods of partner notification in the future?

### **1.11 *Overview of the thesis***

I conducted the Sex, Health, Antiretroviral treatment and Partner Notification (SHARPN) project. I used mixed methodology, drawing from disciplines like behavioural sciences, social epidemiology and public health. This thesis comprises

of 7 other chapters summarised below. Details of the SHARPN project methodology are presented in the methods chapters, separately for quantitative and qualitative component of the study. The results of quantitative and qualitative analysis are presented in separate chapters. Each results chapter ends with a discussion of the findings in the context of existing literature and its implications for clinical practice, health policy and further research. The overall implications of the SHARPN study findings for clinical practice; health policy and research are presented in the final chapter 7 along with key recommendations. The contents of each of the remaining chapter are as follows:

In chapter 2, I describe the details of the SHARPN project, i.e., the study design, development, and piloting of the study instruments, identification, and recruitment of the study participants and data collection, challenges and facilitators of the implementation of the study protocol. I also provide an overview of the measures taken in the study to ensure confidentiality and anonymity of the study participants, data management, and data analysis.

In chapters 3 to 6, I present the results of the study. In chapter 3, I describe the response rate of the SHARPN survey and using the survey data, I describe the socio-demographic characteristics and HIV related health of the study population, their attitudes towards various risk-reduction strategies, and the sexual partnership patterns and networks, and sexual behaviour of HIV positive MSM with their primary partner, the most recent non-primary and new partners. I also describe the factors associated with risky sexual behaviours with a serodiscordant primary and the most recent serodiscordant non-primary partner.

In chapter 4, I present the findings of the qualitative study on factors that influence the sexual partnerships, disclosure of HIV status within partnerships, and sexual

behaviour of HIV positive MSM; attitudes towards risk reduction strategies, namely cART and undetectable viral load for HIV prevention among these men and its relationship with their sexual behaviour and partnership patterns.

In chapter 5, using the survey data, I describe the attitudes of HIV positive MSM towards partner notification for STI and previous experience of notification for STI. I describe STI testing and diagnosis among these men in the last year, examine the factors associated with STI diagnosis and lack of willingness to notify casual partners of STI, and willingness to notify sexual partners of STI in the future and use various traditional and novel methods of notification for STI. I also examine the willingness to be notified of STI by sexual partners and preferred methods for the same.

In chapter 6, I present findings of the qualitative study on the attitudes of HIV positive MSM towards partner notification for STI, barriers and facilitators for willingness to notify different types of sexual partners of STI, willingness to use various methods of partner notification for STI, and experiences of notifying sexual partners of STI or being notified by sexual partners of STI.

In the last chapter 7, I discuss the implications of the study findings for HIV/STI prevention interventions in HIV positive MSM, clinical practice, health policy and future research.

## **Chapter 2: SHARPN: methodology**

### **2. Introduction**

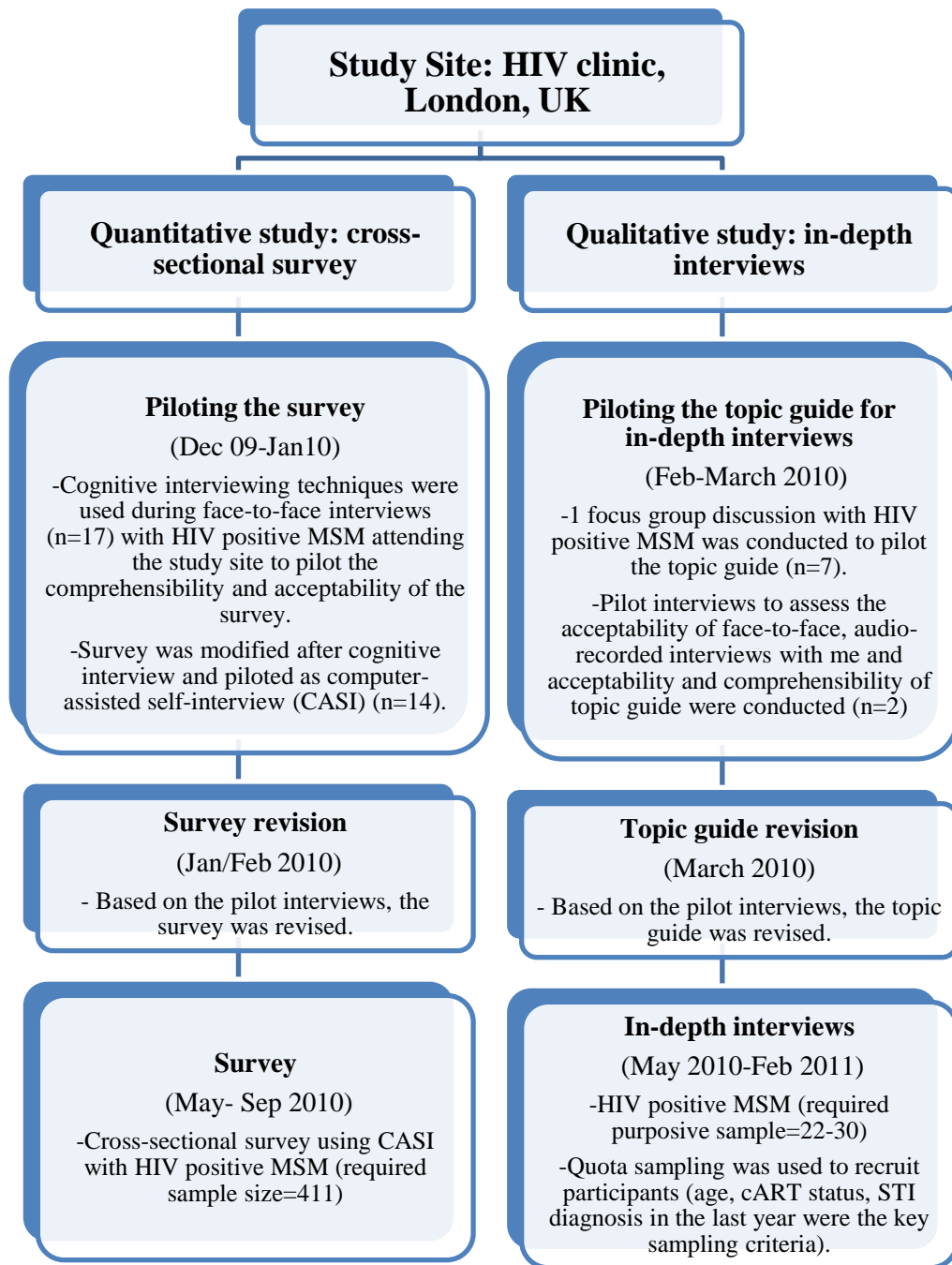
In this chapter, I first describe the methodology employed in the SHARPN project, the process of development, and validation of study instruments, data collection and ethics approval for the study. I then describe the details of data management and analysis, and discuss the facilitators and challenges to the implementation of the project.

#### **2.1 *SHARPN study design***

A mixed methodology comprising a qualitative component (i.e. in-depth interviews) and a quantitative component (i.e., a cross-sectional survey) as shown in Figure 7 was used. The quantitative component of the SHARPN study was a repeat of the Sex, Health, Antiretroviral treatment Project (SHARP) survey conducted in 1999-2000. The SHARP survey was conducted to examine the association between cART and sexual behaviour among HIV positive MSM attending a specialist HIV clinic in central London, UK (Stephenson et al., 2003). Originally the focus of my thesis was to examine the changes between 1999-2000 (i.e., the SHARP survey) and 2010 (i.e., the SHARPN survey) in the sexual behaviour of HIV positive MSM, and the association between cART status and sexual behaviour. However, in the context of the publication of the Swiss statement and the ensuing debates on cART for sexual HIV prevention, and observed increase in STI among HIV positive MSM in the UK, the focus of my thesis was modified. I have examined in greater detail the sexual behaviour and partnership patterns of HIV positive MSM, and the association between cART/viral load status, attitudes towards effectiveness of cART for HIV prevention and risky sexual behaviour using only the SHARPN survey data.



**Figure 7. SHARPN study design**



A novel component on partner notification for STI was added to the SHARPN survey. The overall goal of the partner notification component of the SHARPN survey was to inform the development of strategies for partner notification for STI in HIV positive MSM. The methodology for the formative work on partner

notification for STI among HIV positive MSM was informed by the Medical Research Council framework for developing and evaluating complex interventions (Campbell et al., 2000; Craig et al., 2008). This framework emphasises the iterative process involved in identifying the available evidence about the intervention and delineating appropriate theory of change, modelling the process and outcomes of the intervention, leading to testing the intervention through pilot studies to assess feasibility and acceptability prior to conducting an exploratory or definitive trial (Craig et al., 2008). Therefore, I conducted a systematic review of existing qualitative literature on the attitudes, barriers, experiences and preferences regarding partner notification for STI, which was described in section 1.9.3.1 (Appendix 1). I contacted researchers to identify existing partner notification methods being used or developed in the UK and other countries like USA, Australia, particularly among MSM. The partner notification component of the survey was designed to examine the acceptability of partner notification for STI among HIV positive MSM and their willingness to use various existing and new methods of partner notification for STI in the future. Further details are described in section 2.5.1.3.

HIV research has shown that it is not only important to understand the prevalence of risky behaviours but also understand the contextual factors within which risk occurs, and the meanings of the phenomenon observed (Martin, 2006). A qualitative study was conducted as part of the SHARPN project to gain insights into the context, the personal as well as structural factors and the meanings of the phenomenon being investigated.

In the following section, I present the details of the SHARPN study design and how these above-mentioned factors guided the process of study design and implementation.

## **2.2 *Study setting***

The SHARPN study was conducted in the same specialist HIV clinic in central London, UK where the SHARP study was previously conducted. When the SHARPN study was being designed, 13,226 of the 27,699 MSM accessing care for HIV in the UK were residing in London (Health Protection Agency, 2010). Approximately 3600 HIV positive patients were accessing HIV care in the study clinic and the majority of them were MSM (personal communication from the clinic's Lead HIV Clinician, September 2009).

## **2.3 *Study population and eligibility criteria***

Eligible participants for both, the quantitative and qualitative component of the study, were HIV positive MSM, aged 18 and above who were registered with and attending the study clinic. Men for whom the probable route of HIV acquisition was marked as homosexual in the clinic records were categorised as MSM for the study purposes. Patients attending the clinic due to health-related emergency or ill health (as determined by the clinic staff) were ineligible to participate in the study. Patients who were either unable to read and write in English, or who could not use computers and the internet were also ineligible to participate in the quantitative component of the study.

## **2.4 *Ethical approval***

The SHARPN study was approved by the East London and the City Research Ethics Committee 1 and the reference number of the SHARPN study is 09/H0703/120 (Appendix 2). The study was also approved by the Research and

Development department of the Camden National Health Services (NHS) Primary Care Trust (Appendix 3).

## 2.5 *Quantitative survey*

A single-site, cross-sectional survey among HIV positive MSM attending a specialist HIV clinic in central London was conducted. The following section describes the details of the development of the survey and administration.

### 2.5.1 **Development of the SHARPN survey**

One of the key aims of conducting the SHARPN project was to enable comparison of the changes in the sexual partnership patterns and behaviour of HIV positive MSM and examine the change in the relationship between cART status, viral load status, and sexual behaviour between the SHARP and the SHARPN surveys. Thus, SHARPN survey was largely a repeat of the SHARP survey. However, some new questions were added to the SHARPN survey to integrate developments since 1999 in the understanding of the sexual behaviour and HIV/STI transmission dynamics in MSM, and the role of sexual networks and mixing on HIV/STI transmission as described in chapter 1. To enable the addition of new questions described in section 2.5.1.2, a section on mental health included in the SHARP survey was removed.

I consulted local stakeholders such as the study clinic's HIV clinicians and patient representatives of the HIV positive patients' network during the process of survey development. I set up a research advisory committee comprising two HIV clinicians (Dr Simon Edwards and Dr John Richens), a health advisor (Mathias Chopin), a statistician (Dr Catherine Mercer), and my PhD supervisors Professor Graham Hart, Professor Jackie Cassell and myself. The research advisory committee members gave feedback during the process of survey development. The

patient representatives gave feedback on the acceptability of the terminology used in the survey.

#### **2.5.1.1 *Areas of interest for which data was collected in both SHARP and SHARPN survey***

The survey (Appendix 4) comprised the following sections:

1. Socio-demographic details: age, first language, ethnicity, place of birth, residency in London, employment status, annual income, social welfare benefits, educational status, accommodation ownership, living arrangements.
2. General health and HIV diagnosis: overall self-assessed general health, year of HIV diagnosis.
3. Sexuality and sexual practices with a primary partner: sexual orientation, details of age at first sex, currently has a primary partner (i.e. men were asked if they had a sex partner who they consider to be their boyfriend/lover). Data was collected on age and HIV status of primary partner, disclosure of HIV status to primary partner, when started relationship with primary partner, overall condom use with primary partner during anal intercourse (AI) in the last six months (questions on condom use with primary partner were modified and some new questions were added, the details are explained in the section 2.5.1.2), and types of sexual partners in the last six months.
4. Sexual behaviour with new partners: men were also asked about their sexual behaviour with new partners (i.e., sex partners with whom men had had sex for the first time in last month or last year). The data on sexual behaviour with new partners was collected on an aggregate basis (i.e., ‘in the last month, did you have insertive or receptive anal intercourse (fucking) with your new partners?’). Men

were asked about the total number of new AI partners, type of anal sex, HIV status of new partners (questions on HIV status of new partners were modified).

5. HIV and health service use and treatments: ever diagnosis with AIDS, self-reported recent CD4 cell count and viral load test results and self-reported changes in these in the last 12 months, cART status (ever and current), year of starting cART and details of current regimen, experience of sexual difficulties in last 12 months, attitudes towards HIV medication.

6. Sexual behaviour with three recent sexual partners: men were asked on a partner-by-partner basis about their sexual behaviour with the three last persons with whom they had sex prior to their participation in the SHARPN survey. They were asked when they last had sex with each of these 3 recent sex partners, whether this was on a one-to-one basis or in a group-sex situation, type of sexual partner (i.e., primary partner, regular partner, casual partner, commercial sex partner, other), disclosure of HIV status to the partner, timing of disclosure, perception or knowledge of HIV status of partner and reasons for the same, place met and had sex with the partner, type of sex, recreational drug use and type of drug use, rating of quality of sex. Men who had engaged in group sex were asked about their sexual behaviour with a 'main' partner during group sex.

7. Peer and community: support to discuss about sex and relationship issues, HIV positive gay friends network, use of services for HIV positive gay men, perceptions of HIV positive gay friends' sexual behaviour, membership of gay organisations, perceptions of their gay friends' attitudes towards their sexual behaviour.

8. Attitudes towards risk reduction strategies and personal responsibility: HIV treatment optimism, i.e., attitudes towards HIV and its effects on health and sexual

life in the context of availability and effectiveness of cART; attitudes towards cART, viral load and sexual behaviour; and attitudes towards personal responsibility, HIV, safer sex.

#### **2.5.1.2 *New questions added to the SHARPN survey***

In the SHARPN survey, new questions on areas of interest were added. The overall rationale for addition of new questions on sexual behaviour was:

- To examine in greater detail the use of various risk reductions strategies (strategic positioning, serosorting, anal intercourse (AI) with or without withdrawal prior to ejaculation) by HIV positive MSM with different types of sexual partners and to understand participants' knowledge of the HIV status of their sexual partners.
- To examine the age and ethnic sexual mixing patterns among these men with different types of sexual partners.
- To enable modelling the implications of the sexual behaviour, partnership patterns and sexual networks of HIV positive MSM for onward HIV transmission in the context of their cART and viral load status.

New questions on the following areas of interest were added:

- **Sexuality and sexual practices with primary and new partners:** ethnicity of the primary partner, civil partnership with primary partner, most recent sex with primary partner, year of HIV diagnosis of primary partner if positive, details of condom use or non-use in the last six months during both, insertive and receptive AI with primary partner and type of insertive and receptive AI, i.e., with or without withdrawal prior to ejaculation, total number of episodes of each type of AI, other types of sexual practices with primary partner including engagement

together in group sex, beliefs about primary partner's concurrent sexual partners. With regards to sexual behaviour with new partners, questions on venues for meeting new partners in last six months, engagement and frequency of group sex, number of anonymous sexual partners in the last 12 months, type of AI, i.e., with or without withdrawal prior to ejaculation, number of known, assumed and unknown status new insertive and receptive AI partners.

- **HIV and health service use and treatments:** meaning of undetectable viral load, testing and details of viral resistance test, drug holiday (reasons and period).
- **Attitudes towards risk reduction strategies:** HIV transmission risks associated with various risk reduction strategies (i.e., engagement in withdrawal prior to ejaculation during anal sex, strategic positioning, and ejaculation during oral sex).
- **Partner notification:** as mentioned earlier, partner notification for STI was not explored in the SHARP survey; therefore, a new section on partner notification was also added. The details are described in the following section.

### ***2.5.1.3 Development of the questions for the component on partner notification for STI***

The systematic review of qualitative literature on partner notification described in chapter 1 suggests that despite willingness to notify sexual partners for STI and acknowledgment of its health benefits, the stigma associated with STI, fear of blame and concerns of confidentiality ensuing due to this stigma, gender, race and the nature of sexual partnership are key barriers to partner notification. Therefore, in the SHARPN survey I included new questions on attitudes towards partner notification for STI/HIV, previous experience of ever notifying partners for



STI/HIV or being advised to notify partners, negative experiences of notification and perceived barriers and self-efficacy to notify partners of STI.

One of the aims of the SHARPN survey was to assess the acceptability of existing as well as new strategies of partner notification for STI among HIV positive MSM. The acceptability of following new methods of partner notification for STI was examined:

1. Accelerated partner therapy (APT): I was informed by Dr Escourt from the Barts and the London School of Medicine and Dentistry that she was conducting a pilot study among predominantly heterosexual population examining the acceptability of APT for STI like chlamydia and gonorrhoea (Sutcliffe et al., 2009; Estcourt et al., 2012). The key focus of APT is to reduce the time to treatment of sex partners and provide remote or face-to-face partner assessment by an appropriately qualified healthcare professional. One of the methods of APT that was being piloted was a 'telephone assessment model'. As per this model, the contacts are assessed by a health care professional via telephone using a standard consultation guide following which the partner can collect a treatment pack from the clinic reception or have it delivered to them by the index patient. This is a modified version of patient delivered partner therapy (PDPT). PDPT is used in the USA where the index case is given medication to hand it to their sexual partners without prior medical assessment of their partners by a healthcare professional (Golden et al., 2005; Kissinger et al., 2005). Given the multiple sexual partnerships among MSM, it is vital to treat the index patients diagnosed with STI and reduce the time to treatment of their sexual partners to prevent the risk of re-infection to the index case and prevent onward transmission. Thus, in the SHARPN survey I examined the acceptability of the telephone assessment model.

2. Anonymous e-card: as mentioned in chapter 1, there is a growing interest in using the internet for partner notification in MSM as it is one of the key modes of meeting sexual partners among MSM. Participants were asked about their willingness to notify sexual partners of STI via an anonymous e-card, i.e., sending notification to sexual partners anonymously via a clinic website using tailored e-cards, if such a service was provided by the clinic.

3. Home sampling kits for specimen-collection: a study conducted among MSM in the UK has shown that 76% MSM were willing to use a home self-sampling kit to collect rectal and pharyngeal specimens using swabs (Wayal et al., 2009). In the SHARPN survey, I examined men's willingness to take a home sampling kit for their sex partners to enable home sampling for specimens and returning these kits to the clinic for testing.

Accordingly, I developed questions to examine the willingness of HIV positive MSM to notify different types of sexual partners and use different types of existing and new notification methods in the future. For example, men were asked: "Assume that you are diagnosed with STI and you have a primary partner. Please read each of the following options to inform him that he should get tested for STI. Let us know how likely are you to use EACH of the following options". Participants were asked to rate the likelihood of using these methods using a Likert rating scale of 1-5, with 1 indicating very likely and 5 indicating very unlikely:

- i. Not contact my primary partner
- ii. I would inform him face-to-face
- iii. I would email him from my personal account
- iv. I would call him
- v. I would text him

- vi. I would ask a clinic staff/health advisor to contact him without giving my name
- vii. I would ask a clinic staff/health advisor to contact him and give my name
- viii. I would send him an anonymous e-card (if such a service of e-cards without giving my name is provided by the clinic)
- ix. I would take a home sampling kit (if the clinic provides home sampling kit so my partner can take his samples at home and return samples to the clinic for testing)
- x. I would ask clinic staff to do a telephone assessment of my partner while I am at the clinic and take his medication with me

I also asked men about willingness to refer members of their social network (not necessarily sexual partners but friends) to screen for STI, and willingness to be contacted by the clinic to inform them to test for STI in the event of an STI outbreak.

#### **2.5.1.4**     *Validated question from other surveys*

When adding new questions to the SHARPN survey, where possible, attempts were made to use validated questions from other surveys specified below. Apart from the questionnaire of the Futures Five Study, which is available online, I had contacted the researchers to obtain copies of the following questionnaires:

- Futures Five Study, a national survey of people living with HIV/AIDS, 2005 Australia (Grierson et al., 2006): questions on risk reduction strategies;
- Positive Health Study, 2005 Australia (Rawstorne et al., 2005; Zablotska et al., 2009): questions on knowledge of HIV status of new sex partners;
- Partner Notification Study, 2008 UK (Woodward et al., 2010): questions on referring members of social network for STI screening;

I piloted all the new and modified questions using cognitive interviewing methods in a sample of eligible participants to determine the acceptability and comprehension. Participants' whose first language was not English were purposively selected for these interviews. The details of pilot phase are described in section 2.5.4.

#### **2.5.1.5 *Improving validity and reliability of the survey data***

Participants' sexual behaviour and practices were measured through self-report and no specimens were collected for STI testing, a biological marker of risky sex behaviour. Various socio-cultural factors like stigma, taboos surrounding sexuality and fear of criminalisation for intentional transmission of HIV can affect the reporting of sexual behaviour and practices. Therefore, self-administration of the survey was considered optimal to ensure privacy for the study participants, reduce the reporting bias likely to be introduced by an interviewer-administered survey and improve reliability of the data.

A key challenge in determining the validity of self-reported sexual behaviour data is the lack of availability of gold standard to compare this data to. A review of studies comparing computer assisted self-interview (CASI) with face-to-face interviews in STI clinics reported that CASI identified risky sexual behaviour more commonly than clinician interviews and was acceptable to participants as they felt it allowed honest reporting (Fairley et al., 2010; Richens et al., 2010). Thus, the SHARPN survey was administered using CASI and further details are described below in section 2.5.2. Internal consistency checks were developed in the questionnaire to determine the reliability of behavioural data reported by the participants. For example, data was collected on participants' sexual behaviour

with new partners for varying timelines (one month and 12 months). These data were examined to assess internal consistency in reporting of sexual behaviours.

#### **2.5.1.6 *Self-reported clinical data***

In the SHARP survey, data on clinical measures such as STI, recent plasma viral load and CD4 cell count test results, and current cART regimen, were collected from participants' clinic records. However, in the SHARPN survey these data were collected anonymously through self-report to ensure anonymity of study participants and improve accuracy in reporting of the sexual behaviour data. Laboratory tests for these clinical measures are expensive and it was not feasible to conduct these tests for this project because SHARPN was a low budget project.

Previous research has shown that self-reported CD4 cell count test results are reliable (Cunningham et al., 1997; Kalichman et al., 2000). While the reliability of self-reported plasma viral load is reported to be less accurate, it is most reliable when dichotomised into clinically relevant diagnostic categories as 'undetectable' and 'detectable' (Kalichman et al., 2000). These studies also indicate that self-reported data on clinical measures like plasma viral load and CD4 cell count test results are likely to introduce optimistic bias, i.e., reporting of values depicting better health. Therefore, the following measures were taken to improve the reliability and validity of these self-reported clinical data. In order to improve the reliability of the data collected, the response options were presented in clinically relevant diagnostic categories of recent CD4 cell counts and recent plasma viral load. Participants were not expected to remember the 'exact' values of their recent test results, as was the case in both the above reported studies. In addition, to avoid misclassification bias, the response option of 'don't know/don't remember' was included so the participants did not feel obliged to randomly select a response

option if they did not remember their results. Since HIV positive patients registered at and attending the study setting are monitored for their CD4 cell counts and plasma viral load at least every 4 months (personal communication with clinic's lead consultant), the probability of recall bias is likely to be minimal. To improve the reliability of response to the question on cART regimen, response options provided the class of the HIV drug as well as the brand names of the drugs. Given the high prevalence of STI among MSM, it was anticipated that they would be able to recall being diagnosed with STI in the last year. The survey was piloted to determine the feasibility of collecting these data through self-report and pilot results are presented in section 2.5.4.

### **2.5.2 Survey design and administration**

The SHARPN survey questionnaire was developed in English, as the majority of the clinic's population are able to communicate in English. However, a significant proportion of the clinic population's first language is not English (personal communication with clinic staff). Therefore, in order to ensure clarity and accuracy in data collection, definitions of concepts/medical terms used in the questions were provided. This sometimes made the questions lengthy but was considered important to ensure that participants understood and interpreted the questions as intended. The majority of the questions were closed-ended with multiple choice response options. However, for questions on topics with limited existing literature, particularly questions related to partner notification, an additional open-ended response option was provided. Participants' attitudes towards factors being investigated were explored using five-point Likert rating scales and if needed, additional options of 'don't know', 'declined to answer' and 'not applicable' were provided.

The 1999 SHARP survey was administered via computer tablets using Questionnaire Development System software (personal communication with Dr John Imrie who led the study). The SHARPN survey was administered via a web interface using Opinio software. Opinio is a web-based survey tool that allows creating and distributing surveys. Since the Internet is commonly used by HIV positive MSM in the UK to meet sexual partners (Bolding et al., 2005, 2007), it was anticipated that the majority of the eligible population would be familiar with using computers and the Internet. Using survey development software and CASI enabled skipping questions, i.e., depending on the participant's response, 'not applicable' questions were skipped automatically and they were directed to appropriate questions depending on their response to the branching questions. This saved a considerable amount of time for the participant, which would otherwise be wasted trying to skip to next appropriate question if a pen and paper were used to administer the survey.

The web interface of Opinio also meant the SHARPN survey could be administered from any computer with access to the Internet. The data were stored on a secure University College London (UCL) server. Once the web link for the survey was clicked, the survey opened in a separate window and the participant was automatically allocated a random study number. A percentage bar at the bottom of the survey page enabled the respondents to see what proportion of the survey was completed. The first page of the survey explained the survey rationale and the process of completing the online survey. The anonymity and confidentiality of the survey process was emphasised at this stage. The feasibility of administering the survey online was piloted, and the details of the pilot study are presented in section 2.5.4.2.

### **2.5.3 Identification and recruitment of participants for the SHARPN survey**

At the time of the survey, the study clinic was split between three floors. Regular blood test units and pharmacy for cART were located in the basement, the consultation rooms for pre-booked clinic appointments were located on the ground and the first floor and on-call/drop-in appointment rooms and STI screening was done on the ground floor. Prior to developing the study protocol, I had several meetings with the clinic staff to understand the clinic's operating system. This enabled the development of a cost-effective recruitment and monitoring strategy for the study focusing on minimising the burden for the clinic staff. I was informed that registered HIV positive patients access the clinic for booked appointments or they access walk-in service for various reasons like STI screening, picking up HIV medication, regular blood tests for plasma viral load and CD4 cell count. Most HIV positive patients attend the clinic at regular intervals: every 3-4 months or as advised by their clinician or to provide blood samples or to collect their HIV medication. On these occasions, they interact with the nurses or phlebotomists who identified the eligible patients for the study and introduced them to me. The method of identification and recruitment of the participants was modified based on the pilot results and these changes are described in section 2.5.4.3. There were electronic display boards in the waiting areas on all the clinic floors. These display boards were used to disseminate the study information (Appendix 5). The study information sheets were put up in every consultation room in the clinic and in waiting rooms on every floor of the clinic.



## 2.5.4 **Piloting the SHARPN survey**

The SHARPN survey was piloted in the following stages:

### 2.5.4.1 *Cognitive interviews*

All the new and modified questions were piloted prior to the survey. The first stage involved using cognitive interviewing methods (Willis, 2005) with an aim to understand participants' interpretation of terminology used in the questions, comprehension of the questions and their ability to respond to the questions, i.e., memory retrieval and decision-making processes to derive their responses. I conducted face-to-face interviews with 17 purposively selected participants, identified as described in section 2.5.3, from January 2010-February 2010. A participant information sheet (Appendix 6) and a consent form (Appendix 7) for the cognitive interviews were used to obtain written informed consent of the participants. Purposive sampling was used to ensure that the pilot sample reflected the population eligible for the study and variation in age and language (not have English as a first language but are able to read and write in English). The latter was considered important because, as mentioned previously in section 2.5.3, I was informed that a significant proportion of the clinic's population's first language is not English.

Of the 17 participants selected for cognitive interviews, 7 participants' first language was not English, 4 were aged <30 years, 5 between 30-40 years, 8 were >40 years. I took the participants to a quiet room in the clinic allocated for the study. Respondents were given a paper copy of the new questions that were included in the survey. They were asked to read approximately 10 questions at a time and highlight the questions they did not understand or had difficulty responding to. A combination of think-aloud technique (asking participants to say

their thoughts out loud while responding to the questions) and verbal probing techniques (such as asking participants to paraphrase the question in their own words and asking them to explain their interpretation of the question) were used during the interview. I used pen and paper to document bodily gestures, thinking aloud process and discussion during the interviews. This process helped me evaluate whether the participants understood and interpreted the questions as intended and their ability to respond to the questions.

Some questions involved a long recall period, for example, questions on sexual behaviour in the year prior to the survey were asked. Thus, the feasibility of responding to such questions accurately was also examined during the cognitive interviews. Participants were also able to recall information related to their first sexual experience, and information on sexual partners they had had in the last month and last year. Most participants were able to recall information on their three most recent sexual partnerships; however, participants with sexual encounters five or more years ago struggled to recollect specific information about their sexual encounters. Participants were able to understand statements used to measure attitudes towards various factors, for example, implications of cART and viral load for prevention of HIV transmission. Participants were able to provide data on clinical measures like recent plasma viral load test result, recent CD4 cell count test results, their current HIV medication regimen, and recent STI diagnosis. Some participants had the 'exact' values of their recent CD4 cell count and plasma viral load test results written on a clinic appointment card, which they had kept in their wallet and referred to while responding to these questions. The majority of participants were also able to recall the name of their cART medications or had

them written on a clinic appointment card. A few men also had a list of their sexual partners written in a small pocket diary.

The survey was modified based on the results of the cognitive interviews. Where needed further explanations of the terms/concepts used were added. For questions on the 3 most recent sexual partners, a skip was introduced for the questions on sexual behaviour and practices if the participants' last sexual encounter was more than 5 years ago. Some men who were newly diagnosed with HIV had participated in the pilot due to which it was evident that there was a need to add a question on participant's HIV status at the time of previous sexual encounters.

#### **2.5.4.2 *Piloting the survey using CASI***

The next pilot phase involved administering the entire survey using a CASI. Following the cognitive interviews, the modified survey was set up online using the Opinio software as described previously in section 2.5.2. Another 14 participants were identified as described in section 2.5.3 and recruited to the pilot. I took the participants to a quiet separate room in the clinic allocated for the study, which had a computer with Internet access. I provided them with a patient information sheet for the survey (appendix 8) and a consent form (appendix 9) and sought their written informed consent. Participants then completed the online survey. On average, as anticipated, participants took 30 minutes (range 25-55 minutes) to complete the survey online. Pilot data were exported from Opinio and difficulties with data transfer were identified and resolved at this stage. During the online pilot following other issues also emerged:

- Some participants suggested that they would be more comfortable if their regular clinician informed them about the study.

- I had to continually remind the nurses to recruit patients to the CASI pilot. The nurses expressed the need for some visual aid to prompt them to recruit patients to the study.
- Occasionally, the clinic was busy and the room allocated for the study had to be used for regular clinic purposes.
- Since a single room was allocated for the study, if more than one person agreed to participate in the pilot at the same time they had to wait. This led to some men declining to participate and was identified as a potential challenge to future participation rate and response bias.
- The fluctuation in the clinic's Internet speed and problems with the Internet connection (i.e., connection being slow or down) affected completion time of the online survey. Participants felt frustrated if the percentage bar on the survey page indicated that they had completed most of the survey but they could not save it because the connection was slow.
- Some patients were willing to complete the online survey but did not have the time to do so during their current clinic visit.
- Several participants were reluctant to provide written signed consent. The main reason for reluctance was concern about confidentiality of their HIV status. Patients felt that if the survey was anonymous, they should not be expected to write their name on the consent forms. Despite assurance that the consent forms were unlinked to the survey and stored in a secure manner, their fears remained unresolved.

In the following section, I describe the changes made to the participant identification and recruitment strategy for the survey after the pilot interviews.

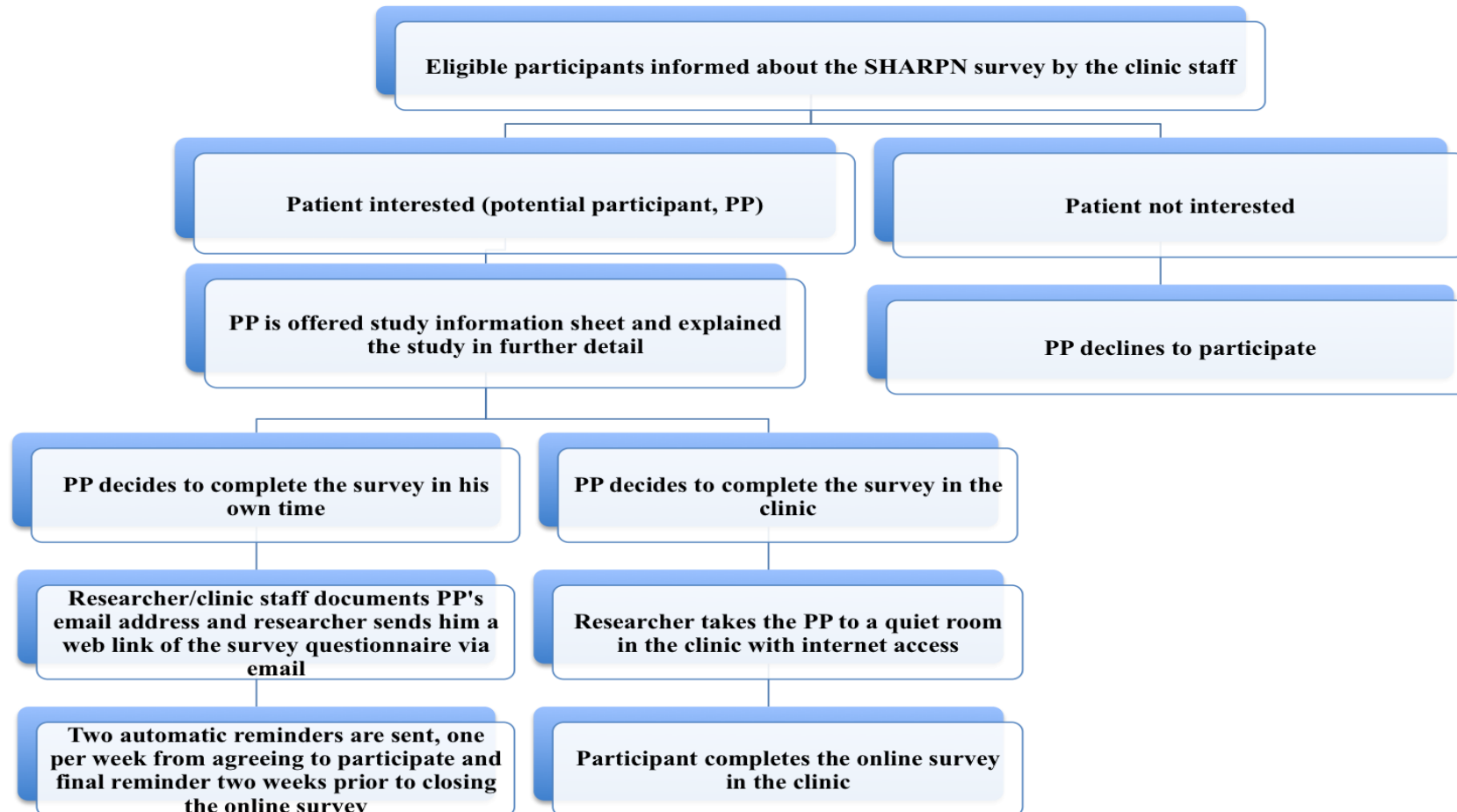
#### **2.5.4.3     *Modification of the survey protocol based on pilot results***

Based on the pilot interviews, the strategy used to identify and recruit participants to the survey was modified and is presented in Figure 8. The following changes were made as a result of the participants' feedback:

- The study protocol was amended to indicate that participation in the survey and its completion would be considered as an indication of implicit consent. Thus the participants were no longer required to provide written informed consent. The survey patient information sheet was modified to reflect this change (Appendix 10).
- During the pilot, some participants had expressed a preference to be recruited to the study by their clinicians. On average, approximately 60-80 patients have pre-booked appointments with the clinic doctors. Therefore, the protocol was amended to enable participants to be recruited with the help of clinicians, in addition to recruitment with the help of nurses and phlebotomy staff.
- The clinic's administration staff routinely attaches follow-up sheets to the patient's clinic notes prior to appointment. In order to remind the clinic staff to recruit patients for the survey, a patient information sheet and a study sheet (Appendix 11) were attached to the patients' notes with the help of the administration staff. The study sheet provided details of the eligibility criteria for the survey and researcher's contact details, and enabled documentation of recruitment rate (i.e., whether the clinicians invited the patients to participate in the SHARPN project) and the participants' response rate.

- The clinicians were asked to record whether they invited their patients to participate in the study or they considered the patient ineligible to participate in the study and the reasons for their decision.
- If patients agreed to participate in the study, the clinic staff introduced them to me. I took the participants to the study room and logged them on to a computer in the study room where they completed the survey.
- If patients felt unable to complete the survey in the clinic, they were offered the option to do so from home if they had access to a computer and Internet. In this case, patients were asked by the clinic staff to write their email address on the study sheet. These participants were emailed a survey link via Opinio. This approach offered participants flexibility to complete the survey in their own time and preferred setting. The survey was set-up to ensure anonymity. Although Opinio was used to send survey links using the email address of the participants, their responses were unlinked to their email address. The participants had the choice to save the survey at any point and complete it at a later stage. Information about what the participants could do if they wanted to stop halfway through the survey and return to it at a later stage and guidance on what to do when they completed the survey was provided at the beginning of the survey.
- Participants who opted to complete the survey at home were sent two automatic reminders via Opinio to complete the survey. The first reminder was sent at the end of a week from the date of their recruitment to the study, and a second reminder was sent a week after that. A third and final reminder was emailed to all the participants prior to stopping the survey, irrespective of whether or not they had responded to the survey due to the anonymity of the participants.

**Figure 8. Recruitment strategy for the SHARPN survey**



- A survey patient information sheet and study sheet was also attached to the blank sexual health proforma used for sexual history taking by the clinic staff who conducted sexual health screens to act as a reminder to recruit the patients to the study.

### **2.5.5 Monitoring and recruitment**

The administration staff put patient stickers containing patients' clinic number on the study sheets to enable documentation of the decliner rate and avoid approaching the same patient twice (this was likely because the same patient could attend the clinic more than once during the study period). A study folder was kept in every consultation room and nurses' station and the clinic staff deposited the study sheets in these folders. I collected these study sheets at the end of each day and sent the survey weblink via an email invitation to all the patients who had expressed a preference to complete the survey at home.

I maintained a record of the clinic number of patients who had declined to participate in the survey. Their notes were flagged as 'decliners of SHARPN' by the clinic's administration staff to avoid approaching them again for recruitment in the study. I also maintained a record of the clinic numbers of the participants who had agreed to participate in the survey and their notes were flagged as 'recruited to SHARPN'. The data from the study sheets were used to estimate recruitment rate and participation rate. Opinio enabled estimation of the response rate among participants who had agreed to complete the survey from home.

### **2.5.6 Data protection and confidentiality**

All consent forms of the pilot interviews were stored in a locked cabinet in my office. The pilot interview participants' names and identifiable data were recorded only on their consent form. There was no documentation of the link between the



participants' names and their pilot interview data to ensure participants' confidentiality. The email addresses of the participants who wanted to complete the survey online in their own time were maintained in a password protected file on my password protected UCL computer. These data were not stored on memory sticks. Similarly, data collected via the online survey was stored on a secure UCL server. Once the data collection for the survey was over, the electronic data from Opinio was transferred to STATA and the file was stored in a password-protected computer in my office.

### **2.5.7 Challenges and facilitators to recruitment to the survey**

The recruitment to the survey was not without its challenges. The key challenge was identifying and recruiting participants to the study. I had to rely on the clinic staff to identify and recruit participants to the study to ensure patient confidentiality. As there was no budget beyond my salary, no research nurse or member of clinic staff was specifically allocated to recruit patients for the SHARPN study. Therefore I had to remind the clinic staff on a daily basis to recruit patients to the study. I had to be physically present in the clinic every day during clinic hours to encourage the clinic staff to recruit patients. The recruitment rate dropped on days I was not present in the clinic. This made the recruitment process laborious for me and slowed down the qualitative study, as I did not have time to conduct face-to-face interviews during the survey. The other challenge was the Internet system in the clinic being extremely slow and affecting the speed of survey completion.

However, the pilot phase was extremely important in flagging challenges to recruitment to the survey and consent procedures. The substantial modifications to the study protocol, described in section 2.5.4.3, facilitated recruitment and

improved participant response rate due to the flexibility to complete the survey at home. This also minimised the impact of the problems created due to the clinic's slow internet system. As the study progressed, I developed a good rapport with the clinic staff and the clinic staff was familiarised with the study, which enhanced recruitment. I kept the clinic staff informed about the study recruitment by attending regular clinic meetings, sending monthly email updates on the study recruitment and sent email reminders to the clinicians' to recruit patients for the study. I made presentations at various clinic staff meetings to keep them informed about the recruitment and any challenges, and also to seek their feedback. The lead consultant of the clinic, Dr Simon Edwards provided tremendous support and advice to improve recruitment rates.

#### **2.5.8 Sample size calculation for the SHARPN survey**

As mentioned previously in section 2.1, change over time in sexual behaviour in HIV positive MSM is not the focus of this thesis. However, the sample size calculation for the SHARPN survey was guided by the aim to enable comparison with the SHARP survey to examine changes in the sexual behaviour of HIV positive MSM, and the association between cART, viral load, and sexual behaviour.

For the 1999 SHARP survey, 422 HIV positive MSM were recruited over a period of one year. It was anticipated that for the SHARPN survey 370 participants would provide 80% power to detect a statistically significant ( $p < 0.05$ ) increase of approximately 10.5% in the reporting of UAI during the last year compared to the SHARP survey in which the prevalence of UAI with one or more new partners in the last year was 39% (Stephenson et al., 2003). Therefore it was anticipated that the UAI with new partners in the last year would have increased from 39% in 1999

to approximately 49.5% in 2010. An increase of this magnitude in the practice of UAI in the last year was estimated based on the observed increase in UAI in the last year among HIV positive MSM in the gay men's sexual health survey (GMSHS) conducted annually in London from 1996-2008 (Wayal et al., 2008). The GMSHS report indicates that the proportion of HIV positive MSM reporting UAI in the last year has fluctuated between 1996-2008; however there has been an overall increase of 10% since 2000 (49.6%-58%;  $p=0.006$ ).

The proposed sample size of 370 was expected to provide 80% power to detect a significant association in the SHARN data alone between a binary risk factor (of approximately 50% prevalence) and UAI, where the strength of association is an odds ratio of 1.83 (prevalence 57.5% with risk factor, 42.5% without, i.e., a difference of 15% with an overall prevalence of UAI being 50%). cART and viral load status are the key exposure variables in the comparative analysis of the surveys, and the proportion of patients on cART was estimated to be around 80% (personal communication with the HIV clinicians). This sample size would provide more than 80% power to detect a difference of 20% in the prevalence of UAI between those receiving cART and have an undetectable viral load (54%) and those not receiving cART or have a detectable viral load (34%). It was estimated that at least 50% of the participants would opt to complete the survey from home in their own time. A dropout rate of 20% was anticipated, i.e., non-completion of the survey by those opting to do it at home. After taking into consideration the drop out rate, the recruitment of a total of 411 participants was considered necessary to achieve the required sample of 370 participants.

## 2.5.9 **Data management and analysis**

In the following section, I describe the details of management and analysis of the survey data.

### 2.5.9.1 *Data Preparation*

The SHARPN survey data was imported from Opinio into Excel and then transferred to STATA 11.0 (Stata Corporation, College Station, Texas, USA). The data imported from Opinio was in a non-numerical format (string format). To enable data analysis in STATA, I converted the entire dataset to numerical format and compiled a codebook of all the variables with variable names and variable labels.

### 2.5.9.2 *Data Checking*

The dataset was checked for range and consistency in the participants' responses. The distribution of each variable used in the analysis was examined for errors and consistency. Categorical variables were checked for values beyond those pre-specified in the survey by examining tabulations and cross-tabulations of variables and missing data were identified. For numerical variables, range checks using histograms were conducted to identify outliers, if any, to examine the distribution of the variable (i.e. normal or skewed), and identify missing data.

### 2.5.9.3 *Derived responses and item non-response*

Where possible, data was deduced depending on the nature of the question. For example, for men who reported not having anal sex in the last year, the number of anal sex partners in the last year was coded as '0'. Men were asked to rate their willingness for using various partner notification methods in the future on a Likert scale of 1-5, with 1 indicating 'highly likely' to 5 indicating 'highly unlikely'. If men had expressed unwillingness to notify any of their sexual partners in the

future, then their response were coded as 5, indicating ‘highly unlikely’ to use any of the partner notification methods in the future. Data were recorded as missing if answers to the missing responses could not be derived from the responses to other questions as explained previously. Missing data were recorded using standard coding format, i.e., 9, 99 or 999. The highest level of item non-response was 15 (3.5%) for the question on social welfare benefits. Except for this item, the item non-response for the variables used in the analysis was in the range of 0.5%-1.6%. These data indicate that, overall, the participants were able and willing to respond to the questions.

#### **2.5.9.4**     *Validity and reliability of responses*

The consistency of the participants’ responses to questions measuring similar information in the questionnaire survey was examined. For example, men were asked similar questions about their sexual behaviour with new partners in the last month and in the last year. Men first responded to the questions about their sexual behaviour with new partner in the last month and then in the last year. The participants’ responses to these questions were compared to examine internal consistency in their responses. For example, it was examined whether men had reported not engaging in AI in the last year and had reported having AI in the last month with a new partner. Similarly, consistency of participants’ responses to questions within the specified timeline (i.e., in last month) was also examined by comparing their responses to other questions on sexual behaviour in that time period. For example, it was checked whether the total number of ‘new anal sex partners’ reported in the last month was greater than the ‘total number of new sex partners’ reported in the last month. Where possible, inconsistencies in the responses to such questions were corrected. For example, the total number of new

sex partners in the last month was equated with the total number of new anal sex partners reported in the last month if the latter was greater than the former. Overall, there was good internal consistency in participants' responses.

#### **2.5.10 Data reduction**

Continuous variables such as age, number of UAI partners were converted into categorical variables with meaningful categories based on published studies, to enable comparison with results from other studies. Categorical variables with several categories were converted into new variables with fewer categories by merging the existing categories into a meaningful smaller number of categories. The responses of variables collected using a Likert scale with a rating of 1-5, where 1 indicated 'very likely' and 5 indicated 'very unlikely', were also reduced by combining rating scores of 1 and 2 to indicate 'willingness' and rating scores of 3-5 to indicate 'unwillingness'. Data on attitudes towards partner notification for STI, willingness to notify sexual partners for STI in the future, and willingness to use various partner notification methods for notifying different types of sexual partners in the future were collected using Likert scales. All variables for which the responses were collected using Likert scales were treated in a similar fashion. Men were asked to rate their attitudes towards, for example, reduced infectivity due to cART and undetectable viral load status on a 5-point Likert scale (strongly agree/agree/not sure/disagree/strongly disagree) with an additional 3 options ('don't know', 'refused to answer', and 'not applicable'). For the purpose of analysis, the category of 'don't know' was combined with 'not sure'.

#### **2.5.11 Definitions of key outcome variables**

Prior to analysing the data, key outcome variables of interest were defined.

#### **2.5.11.1 *Unprotected anal intercourse***

Men who engaged in both or either RUAI or IUI were treated as engaging in UAI.

#### **2.5.11.2 *Receptive unprotected anal intercourse***

Both, men who reported ‘always’ or ‘occasionally’ engaging in RUAI without withdrawal prior to ejaculation, and men who reported ‘always’ or ‘occasionally’ engaging in receptive UAI with withdrawal prior to ejaculation were both treated as engaging in ‘RUAI’.

#### **2.5.11.3 *Insertive unprotected anal intercourse***

Both, men who reported ‘always’ or ‘occasionally’ engaging in IUI without withdrawal prior to ejaculation and men who reported ‘always’ or ‘occasionally’ engaging in IUI with withdrawal prior to ejaculation were both treated as engaging in ‘IUI’.

#### **2.5.11.4 *Seroconcordant and serodiscordant primary partner***

Men whose primary partner was HIV positive were classified as having a ‘seroconcordant’ primary partner. Men whose primary partner was either HIV negative or of untested/unknown HIV status were classified as having a ‘serodiscordant’ primary partner. Thus seroconcordant and serodiscordant were mutually exclusive categories.

#### **2.5.11.5 *Seroconcordant and serodiscordant most recent non-primary partner***

As described previously in section 2.5.1.1, men were asked about their sexual behaviour with three recent sex partners (i.e., the last 3 sex partners participants had sex with prior to participating in the SHARPN survey). Data on sexual behaviour with each of these three recent sex partners was collected on a partner-by-partner basis. In this thesis I present the analysis of sexual behaviour with the ‘most recent’ sex partner if this partner was not participant’s primary partner but

was a regular, casual, commercial sex partner, or other type of sex partner. This partnership was classified as the ‘most recent non-primary partnership’. Participants whose most recent non-primary partner was HIV positive were treated as having a ‘seroconcordant’ most recent non-primary partner and those who reported that their most recent non-primary partner was either HIV negative or they did not know their HIV status were treated as having a ‘serodiscordant’ most recent non-primary partner.

#### **2.5.11.6 *Seroconcordant and serodiscordant new sex partnerships***

As mentioned previously in section 2.5.1.1, new sex partner was defined as a sexual partner with whom the participant had sex with for the first time in the last month or the last year. The data on sexual behaviour with new partners was collected on an aggregate basis (i.e., in the last month, did you have insertive or receptive anal intercourse (fucking) with your new partners?).

Men were specifically asked about the number of new receptive and insertive AI partners they ‘knew’ were HIV positive or negative, they ‘assumed’ to be HIV positive or HIV negative, or who were of ‘unknown’ HIV status. Men who reported having sex ‘only’ with men they ‘knew’ to be HIV positive were treated as having ‘seroconcordant’ new partners if all their new partners were known to be HIV positive. If men reported that they had ‘assumed’ any of their new partners to be HIV positive, or had ‘assumed’ or ‘knew’ their new partners to be HIV negative or reported having ‘unknown’ status new partners, they were treated as having ‘serodiscordant’ new partners.



## **2.5.12 Key exposure variables of interest and risk of misclassification bias**

It was important to consider the implications of the nature of study design (i.e., cross-sectional study) on the analysis of variables like time since men were diagnosed with HIV, cART status, and viral load status in order to examine the association of these variables with sexual behaviour, especially in the last year, to minimise misclassification bias. This was dealt with in the following ways:

### **2.5.12.1 *Time since HIV diagnosis***

The SHARPN survey was conducted between May-September 2010. Men were asked about the ‘year’ of their HIV diagnosis. Data on the ‘month’ of HIV diagnosis was not available. For men who reported being diagnosed with HIV in the same year as the year the survey was conducted (i.e., 2010) or in 2009, it was not possible to accurately determine the number of months prior to the survey the participant was diagnosed with HIV. Thus men who reported being diagnosed with HIV in 2010 and in 2009 were excluded from the analysis of sexual behaviour of HIV positive MSM in the ‘last year’ and ‘in the last six months’ as these men could have been HIV negative or undiagnosed HIV positive. Accordingly, fifteen men who reported that they were diagnosed with HIV in 2010 and 34 men who reported that they were diagnosed in 2009 were excluded from the analysis.

### **2.5.12.2 *cART status in the last year***

The data on cART status at the time of the survey was self-reported. Data was collected on the year men started taking cART and if they were taking cART at the time of the survey. If men reported taking cART at the time of the survey, it was important to determine if these men were receiving cART at least for a year in order and to examine the association of cART status with sexual behaviour in the last year without the risk of misclassification bias. There was a likelihood of

misclassifying men who were 'not on cART' during the 'whole of the last year' as being on cART if men had started taking cART only a few months or weeks prior to the survey. For men who reported that they started taking cART in 2009 and 2010, it was not possible to determine how many months prior to the survey they were receiving cART. Therefore, of the 346 men who reported currently taking cART, 21 men who had started taking it in 2010 and 37 men who had started it in 2009 were excluded from the analysis of sexual behaviour in the last year and six months.

Similarly, some men had reported 'not being on cART' at the time of the survey but had responded positively to the question on 'ever' receiving cART. It was not possible to determine when these men had 'stopped taking cART' because these data were not collected. Thus, it was difficult to determine if these men had stopped taking cART just a few months prior to the survey. However, only a small number of men in the SHARPN survey (n=7) who reported 'ever' being on cART reported not being on ART at the time of the survey and thus were retained in the analysis.

### **2.5.12.3 Plasma viral load status**

Men were asked to report the numerical value of their recent plasma viral load test result as well as their recent plasma viral load status (i.e., whether it was undetectable, low, medium, high, or don't know). In the thesis, the latter is referred to as self-reported viral load status. No biological specimens were collected from the men during this study. In order to examine the consistency of their recent plasma viral load status with that during the 'last year', men were asked about changes in their plasma viral load status in the last year. Men who reported that they did not know or did not remember any of these data were excluded from the

analysis examining the association between plasma viral load status and sexual behaviour, i.e., 34 men. The concordance between the data on recent self-reported plasma viral load status and plasma viral load test results, and between the data on self-reported recent plasma viral load status and changes in the plasma viral load status in the last year were examined to determine the likelihood of misclassification bias in determining participants' plasma viral load status during the last year.

With regards to concordance between recent plasma viral load test result and self-reported viral load status, of the 429 men, 14 (14.6%) men did not know their recent plasma viral load status. Of the remaining 414 men, 96 (22.4%) men had self-reported their plasma viral load to be detectable. Of these 96 men, 12 (12.5%) men had reported their recent plasma viral load test result to be <50 copies/mL. The remaining 72.9% of men who had self-reported their plasma viral load to be detectable also reported their viral load test results to be >50 copies/mL. Of 429, 318 (74%) of men had reported their recent plasma viral load status to be undetectable. There was good concordance between self-reported plasma viral load status and recent plasma viral load test result (<50 copies/mL) among 93% of these 318 men. A small minority of these men (0.5%) with a recent plasma viral load test result of >50 copies/mL believed themselves to be undetectable and 5% of men who did not know their recent plasma viral load test result also believed themselves to be undetectable. Overall, there was good concordance between recent plasma viral load test result and self-reported recent plasma viral load status. Men were also asked what does undetectable viral load mean and were provided with multiple choice options. While the majority of men viewed undetectable plasma viral load as a plasma viral load of 1-50 copies/mL, 6.8% of men believed

it to be equal to zero and 2.1% of men believed it to be between 50-50,000 copies/mL. In addition, 11.7% of men did not know what level of plasma viral load is considered to be an undetectable plasma viral load.

With regard to the changes in the viral load status in the last year, of the 429 men, 318 men (74%) reported that their recent plasma viral load status was undetectable. Of these 318 men, 81% men reported that their plasma viral load status remained stable in the last year and 1% of men had reported that it had increased but was undetectable. Among these men, the risk of misclassifying those with a probable detectable plasma viral load during the last year as having an undetectable plasma viral load is highest among 11% of men who had reported a decrease in their recent plasma viral load status. A small minority of men who reported not knowing about the changes in their plasma viral load status in the last year (3%) reported their recent plasma viral load status to be undetectable. Of the 429 men, 96 (22.4%) men reported their recent plasma viral load status to be detectable. Of these 96 men, the risk of misclassifying those who may have been undetectable in the last year as having had a detectable viral load is highest among men who reported their recent plasma viral load has increased in the last year (25%). Fluctuation in their viral load status was reported by 17.7% of these 96 men and a decrease in viral load status in the last year was reported by 15.6% of men. Since it was not possible to make any changes to these data, these data were not changed in the analysis examining the association between sexual behaviour and viral load status and this is acknowledged as a limitation of the study. In order to examine the association between plasma viral load status and sexual behaviour in the last year and last six months, data on plasma viral load status as opposed to recent

plasma viral load test result, was used as an indicator of their plasma viral load status.

### 2.5.13 **Descriptive and univariate analysis**

Data were analysed using STATA. Frequency tables with 95% CI and summary statistics were used to describe the study population. Chi-square tests ( $\chi^2$ ) were used to examine the association between categorical variables or Fisher's exact test in the case of small numbers. Student's T-test and the Mann Whitney U test were used to examine the association between continuous variables and binary variables. For non-normally distributed data, non-parametric test such as the Kruskal-Wallis test was used. For the comparison of two non-independent groups, i.e., to compare if men were more likely to engage in RUAI compared to IUI with their primary partner, McNemar test for categorical variables was used. Logistic regression was used for univariate analysis and to obtain unadjusted (crude) odds ratios (OR) with 95% CI. All continuous and ordered categorical variables associated with the outcome variables of interest in univariate analysis were assessed for linearity using likelihood ratio test.

For the analysis of sexual behaviour with a primary partner in the last six months, all men who reported having a primary partner were diagnosed with HIV more than a year ago, and whose duration of partnership with their primary partner was at least six months were included. For the analysis of sexual behaviour with new sexual partners in the last year, all men who reported having new partners in the last year and were diagnosed with HIV more than a year ago were included. The data on sexual behaviour with new partners was collected on an aggregate basis and thus the data analysis of sexual behaviour with new partners is based on aggregate data. For the analysis of sexual behaviour with the most recent non-

primary partner, men who were diagnosed with HIV more than a year ago, were sexually active in the last year and reported a most recent non-primary partner were included.

#### 2.5.14 **Multivariate analysis**

In the following sub-section, I will explain the analytical framework used during the various multivariate analyses conducted to examine the research questions. During multivariate analysis, if two explanatory variables were highly correlated, then only one of these explanatory variables was included in the multivariate analysis to avoid problems associated with collinearity. cART status and recent self-reported viral load status were highly correlated and thus, only recent self-reported viral load status was included in the final model during analysis.

##### 2.5.14.1 *Association between a primary partner's HIV status and sexual behaviour*

With regards to sexual behaviour and practices with a primary partner, I hypothesised that:

Hypothesis 1: HIV positive MSM who are in a serodiscordant partnership (i.e., have an HIV negative or unknown/untested status primary partner) are less likely to engage in sexual behaviours that increase the risk of HIV transmission to their primary partner compared to men who are in a seroconcordant partnership (i.e. have an HIV positive primary partner).

Hypothesis 2: Men who have a serodiscordant primary partner are more likely to engage in strategic positioning (i.e., RUAI compared to IUAI).

Hypothesis 3: Men who have a serodiscordant primary partner are more likely to engage in receptive unsafe oral sex than insertive unsafe oral sex.

In order to test the first hypothesis that men who have a serodiscordant primary partner are less likely to engage in sexual behaviours that increase the risk of HIV transmission compared to men who have a seroconcordant primary partner, the key explanatory variable of interest was being in a partnership with a serodiscordant primary partner (versus seroconcordant primary partner). The dependent variables of interest were:

- Sexual activity in the last six months: sexually active but no AI, only IAI, only RAI, both RAI and IAI (versus no sexual contact),
- UAI (versus no UAI),
- RAI (versus no RAI),
- RUAI (versus no RUAI),
- RUAI with withdrawal prior to ejaculation (versus no RUAI with withdrawal prior to ejaculation),
- IAI (versus no IAI),
- IUAI (versus no IUAI),
- IUAI with withdrawal prior to ejaculation (versus no IUAI with withdrawal prior to ejaculation),
- Insertive unsafe oral sex (versus no insertive safe oral sex),
- Receptive unsafe oral sex (versus receptive safe oral sex),
- Insertive fisting (versus no insertive fisting),
- Receptive fisting (versus no receptive fisting),

- Engagement in group sex along with primary partner (versus no engagement in group sex),
- Perception that primary partner has other concurrent sex partners (versus not).
- Had new sex partners (versus no new sex partners)
- Had UAI with new sex partners (versus no UAI with new sex partners)

All men who were in a relationship with a primary partner for at least six months, and were diagnosed with HIV more than a year ago were included in this analysis. Firstly, univariate analysis was conducted to examine the association between each dependent variable of interest specified above and the key explanatory variable of interest (serodiscordant status versus seroconcordant status primary partner) using logistic regression and crude OR and 95% CI were calculated. It was specified *a priori* that separate multivariate logistic regression analysis would be conducted to examine the association between the key explanatory variable of interest and each dependent variable of interest that was significant during the univariate analysis ( $p < 0.2$ ) adjusting for potential confounders, and adjusted odds ratios (AOR) and 95% CI will be calculated.

To identify potential confounding factors, univariate association between the key explanatory variable of interest and variables known to be associated with sexual behaviours of interest were examined. Age, employment status, recent plasma viral load status, attitudes towards reduced infectivity due to undetectable viral load status and risky sexual behaviour, recreational drug use during sex, time since HIV diagnosis, duration of partnership were identified as potential confounders from the existing literature (Van de Ven et al., 2005; Bouhnik et al., 2007; Elford et al.,



2007; Suzan-Monti et al., 2011). These factors were treated as confounders and retained in the model if they were significantly associated with the key explanatory variable of interest during univariate analysis ( $p < 0.2$ ) or the crude OR and 95% CI of the association between the dependent variable and independent variable of interest changed by at least 10% when they were included in the model. Interactions between the independent variable of interest and confounding variables were examined.

With regards to the above-mentioned 2<sup>nd</sup>-3<sup>rd</sup> hypotheses that men who have a serodiscordant primary partner are more likely to engage in sexual practices that they perceive have lower risk of HIV transmission, the comparisons were based on non-independent data (i.e., the same participant could have had IUAI and RUAI with their primary partner). As mentioned previously in section 2.5.13, to test these hypotheses between non-independent observations, McNemar test for categorical variables was used. Only men who reported having a serodiscordant primary partner were included in the analysis. The dependent variables of interest were:

- RUAI (versus IUAI)
- Receptive unsafe oral sex (versus insertive unsafe oral sex)

#### **2.5.14.2 Association between the most recent non-primary partner's HIV status and sexual behaviour**

With regards to the sexual behaviour with a most recent non-primary partner, I hypothesised that:

Hypothesis 4: HIV positive MSM whose most recent non-primary partner was of serodiscordant HIV status were less likely to engage in sexual behaviours that

increase the risk of HIV transmission compared to men who had a seroconcordant status most recent non-primary partner.

Hypothesis 5: Men who have a serodiscordant non-primary partner are more likely to engage in strategic positioning (i.e., RUAI compared to IUAI).

Hypothesis 6: Men who have a serodiscordant non-primary partner are more likely to engage in receptive unsafe oral sex than insertive unsafe oral sex.

In order to test hypothesis 4 that men who had a serodiscordant status most recent non-primary partner were less likely to engage in sexual behaviours that increase the risk of HIV transmission compared to men who had a seroconcordant non-primary partner, the key explanatory variable of interest was had a most recent serodiscordant status non-primary partner (versus a seroconcordant non-primary partner). The dependent variables of interest were:

- UAI (versus no UAI),
- RUAI (versus no RUAI),
- RUAI with withdrawal prior to ejaculation (versus no RUAI with withdrawal prior to ejaculation),
- IUAI (versus no IUAI),
- IUAI with withdrawal prior to ejaculation (versus no IUAI with withdrawal prior to ejaculation),
- Insertive unsafe oral sex (versus no insertive safe oral sex),
- Receptive unsafe oral sex (versus receptive safe oral sex),
- Fisting (versus no fisting)

All men who reported that their most recent sex partner was a non-primary partner and who were diagnosed with HIV more than a year ago were included in this analysis. This analysis includes men who reported that they have a primary partner but their most recent sexual encounter was with a non-primary partner. Firstly, univariate analysis was conducted to examine the association between each dependent variable of interest specified above and the key explanatory variable of interest (serodiscordant versus seroconcordant HIV status most recent non-primary partner) using logistic regression and crude OR and 95% CI were calculated. It was specified *a priori* that separate multivariate logistic regression analysis would be conducted to examine the association between the key explanatory variable of interest and each dependent variable of interest that was significant during the univariate analysis ( $p < 0.2$ ) adjusting for potential confounders, and AOR and 95% CI will be calculated. It was specified *a priori* to include age in the model.

To identify potential confounding factors, univariate association between the key explanatory variable of interest and variables known to be associated with sexual behaviours of interest were examined. Attitudes towards reduced infectivity due to undetectable viral load status during risky sexual behaviour, recreational drug use during sex, whether met partner via internet were identified as potential confounders from the existing literature (Van de Ven et al., 2005; Bouhnik et al., 2007; Elford et al., 2007; Suzan-Monti et al., 2011). The univariate association between cART status and viral load status with the explanatory variable of interest was also examined. These factors were treated as confounders and retained in the model if they were significantly associated with the key explanatory variable of interest during univariate analysis ( $p < 0.2$ ) or the crude OR and 95% CI of the association between the dependent variable and independent variable of interest

changed by at least 10% when they were included in the model. Interactions between the independent variable of interest and confounding variables were examined.

With regards to the above-mentioned 5<sup>th</sup>-6<sup>th</sup> hypotheses that men who had a most recent serodiscordant non-primary partner were more likely to engage in sexual practices that they perceive have lower relative risk of HIV transmission, the comparisons were based on non-independent data (i.e., the same participant could have had IUI and RUI with their non-primary partner). As mentioned previously in section 2.5.13, to test these hypotheses between non-independent observations, McNemar tests for categorical variables were used. Only men who reported having a serodiscordant most recent non-primary partner were included in the analysis. The outcome variables of interest were:

- RUI (versus IUI)
- Receptive unsafe oral sex (versus insertive unsafe oral sex)

#### ***2.5.14.3 Association between beliefs about HIV transmission risk reduction strategies and risky sexual behaviour***

With regards to factors associated with risky sexual behaviours among HIV positive MSM who had a serodiscordant primary or a most recent serodiscordant non-primary partner, I hypothesised that men who believed in reduced risk of HIV transmission due to behavioural and biomedical risk reduction strategies are more likely to engage in risky sexual behaviours compared to men who do not believe in these risk-reduction strategies. The following hypotheses were examined:

Hypothesis 7: Men who believe that undetectable viral load reduces the risk of HIV transmission are more likely to engage in UI compared to men who do not believe that.

Hypothesis 8: Men who believe that strategic positioning reduces the risk of HIV transmission are more likely to engage in RUAI than men who do not.

Hypothesis 9: Men who believe that withdrawal prior to ejaculation during UAI reduces the risk of HIV transmission are more likely to engage in IUAI/RUAI with withdrawal prior to ejaculation compared to men who do not.

Hypothesis 10: Men who believe that HIV is unlikely to be transmitted during unsafe insertive oral sex are more likely to engage in this behaviour compared to men who do not.

To examine these hypotheses, the outcome variables of interest were:

Hypothesis 7: UAI (versus no UAI),

Hypothesis 8: RUAI (versus no RUAI),

Hypothesis 9a: RUAI with withdrawal prior to ejaculation (versus no RUAI with withdrawal prior to ejaculation),

Hypothesis 9b: IUAI with withdrawal prior to ejaculation (versus no IUAI with withdrawal prior to ejaculation),

Hypothesis 10: Insertive unsafe oral sex (versus no insertive unsafe oral sex).

The key independent variables of interest were:

Hypothesis 7: strongly agree/agree that undetectable viral load reduces infectivity during UAI (versus disagree/strongly disagree/not sure),

Hypothesis 8: strongly agree/agree that being a receptive partner during UAI reduces the risk of HIV transmission (versus disagree/strongly disagree/not sure),

Hypothesis 9a/b: strongly agree/agree that withdrawal prior to ejaculation during UAI reduces the risk of HIV transmission (versus disagree/strongly disagree/not sure),

Hypothesis 10: strongly agree/agree that HIV is unlikely to be transmitted during insertive unsafe oral sex (versus disagree/strongly disagree/not sure).

Firstly, the univariate association between each outcome variable of interest and the respective key independent variable of interest was examined using logistic regression and unadjusted OR and 95% CI were calculated. It was decided *a priori* that if a significant association ( $p < 0.2$ ) between the outcome variable and the key independent variables emerged during univariate analysis, then multivariate logistic regression analysis will be conducted to examine the association after adjusting for potential confounding variables known to be associated with the outcome variable, and AOR with 95% CI will be calculated. The univariate association between the factors known to be associated with the outcome variables identified from the existing literature, i.e., age, duration of the partnership (for primary partner only), disclosure of HIV status, time since HIV diagnosis, met via internet (non-primary partner only), viral load status, cART status, and recreational drug use during sex (Van de Ven et al., 2005; Bouhnik et al., 2007; Elford et al., 2007) was examined using logistic regression and unadjusted OR with 95% CI were calculated.

During multivariate logistic regression analysis, it was decided that variables identified in the literature as potential confounders would be treated as confounders if their introduction in the model changed the crude OR and 95% CI of the association between the dependent variable and independent variables of interest by at least 10% or if the p-value for the univariate association between the

dependent variable and the potential confounder was  $p < 0.2$ . Interactions between the independent variables of interest and confounding factors were examined.

#### **2.5.14.4 Factors associated with STI diagnosis in the last year**

The aim of this analysis was to examine the association between STI diagnosis in the last year and independent variables related to sexual behaviour and sexual partnership patterns of HIV positive MSM. Therefore, the association of independent factors such as number of new AI partners in the last year, engagement in UAI (with any type of partner), type of UAI partners (only primary partner, only new partners or both), HIV status of primary partner, UAI with a serodiscordant status primary partner, engagement in group sex and UAI with a most recent serodiscordant status non-primary partner with STI diagnosis in the last year was examined after adjusting for socio-demographic (i.e., age, ethnicity, education, employment status, country of birth) and HIV-related factors (i.e., time since HIV diagnosis, recent CD4 cell count, cART status, self-reported recent viral load status).

The analysis was restricted to men who reported being sexually active in the last year and were diagnosed with HIV more than a year ago. The outcome variable was a binary variable 'diagnosed with STI in the last year' (versus 'not diagnosed with STI in the last year'). Age was specified as *a priori* factor to be retained in the model. Multiple logistic regression models were built. First, age and the socio-demographic and HIV-related factors significantly associated with the outcome variable in the univariate analysis ( $p < 0.2$ ) were included together in a multivariate model and then dropped from the model using a stepwise backward model selection procedure ( $p < 0.2$ ) to form the base model. After retaining the variables in the base model, separate multivariate models were built to examine the association

of STI diagnosis in the last year with each of the independent variable of interest specified above. Interactions between the independent variable and variables in the base model were examined.

#### **2.5.14.5 *Factors associated with unwillingness to notify casual partners of STI in the future***

I had planned to examine factors associated with unwillingness to notify any sex partners of STI in the future. However, due to the small number of men unwilling to notify any sex partners of STI, it was not possible to conduct this analysis. However, I conducted the analysis to examine factors associated with unwillingness to notify casual partners of STI. Men were asked about their willingness to notify casual partners of STI in the future. Casual partner was defined as men with whom men had sex only once or twice. For this analysis, all men willing to notify casual partners of STI via any method were classified as ‘willing to notify’ and those not willing to notify casual partners of STI via any method were classified as ‘unwilling to notify’. Thus the outcome variable was: unwilling to notify casual partners for STI in the future (versus willing to notify them).

Firstly, the univariate association between the factors of interest, i.e., socio-demographic factors (i.e., age, education, ethnicity, employment status, country of birth) and HIV related factors (i.e., time since HIV diagnosis, viral load status, cART status, and CD4 status), previous experience of partner notification for STI, factors related to attitudes towards partner notification (i.e., ‘ever worried about breach of HIV-related confidentiality’, attitudes that ‘a sexual partner of a person diagnosed with curable STI has a right to be informed for STI exposure’, and ‘my sexual partner should inform me if they are diagnosed with any curable STI’), and self-efficacy i.e., comfort level to discuss about sexual partners with clinic staff,



and sexual behaviour and partnership factors (i.e., number of new sex partners, had UAI, used the internet to meet new sex partners) with each outcome variable of interest was examined. Factors significantly associated with the outcome variable in the univariate analysis ( $p < 0.2$ ) were included in a multivariate model and then dropped from the model using backward stepwise selection procedure ( $p < 0.2$ ). Age was specified *a priori* to be retained in the model. The changes to the unadjusted and adjusted OR and 95% CI of the variables were examined for effect of confounding. Possible interactions were examined.

## 2.6 *Qualitative study*

In the following section, I describe the details of the qualitative component of the SHARPN project.

### 2.6.1 **Key aims of the qualitative component of the SHARPN study**

The aims of the SHARPN qualitative study were:

- To understand how the socio-cultural contexts and biomedical technological innovations (namely the recent debates about using cART for HIV prevention, HIV transmission probabilities perceived to be associated with different types of sexual behaviour) and nonmedical technological innovations (namely use of internet for sexual networking) influence and interact with the sexual partnerships, sexual behaviours and practices, and risk management choices made by HIV positive MSM.
- To explore HIV positive MSM's attitudes towards and barriers for partner notification for STI, and their previous experience of notifying sexual partners for STI

- To examine their willingness to notify different types of sexual partners and to use various methods of notifying sexual partners for STI in the future, and their preferences regarding being notified by their sexual partners for STI in the future.

### 2.6.2 Study sample and methods of data collection

I conducted face-to-face in-depth interviews with eligible participants. The study population was the same as described in section 2.3, i.e., men aged 18 and above, able to read and write in English and in good physical health (as determined by clinic staff); however the ability to use computers was not an eligibility criterion for participating in the in-depth interviews. Participation in the SHARPN survey was not a prerequisite for participating in the qualitative study. The sample for the interviews was purposively selected. A quota matrix consisting of primary sampling criteria (age) and secondary sampling criteria (cART status) was developed (Table 1).

**Table 1. Sampling quota for in-depth interviews**

| Age groups | cART status                   |                                       |
|------------|-------------------------------|---------------------------------------|
|            | HIV positive patients on cART | HIV positive patients not taking cART |
| 18-29      | 1-2                           | 2-3                                   |
| 30-44      | 4-5                           | 2-3                                   |
| 45-55      | 5-6                           | 1-2                                   |
| 55+        | 5-6                           | 1-2                                   |

These criteria were selected to understand the experiences of men from different age groups and explore if their experiences varied according to their cART status. HIV prevalence in the UK varies by age group and the majority of HIV positive MSM are in the age group of 35 and above (Health Protection Agency, 2011a). Thus the quota for each age group was derived to reflect these variations. cART

status is also likely to vary depending on the age and time since HIV diagnosis, with older men being more likely to be on cART. Thereby, the quota for cART status in different age groups was derived to reflect these differences. The quota sampling criteria was modified following the pilot and the details are presented in section 2.6.5.3. Based on the quota sampling matrix, approximately 21-29 in-depth interviews were planned. I reviewed the interviews on an on-going basis to examine the need for change in the sample size or criteria.

### **2.6.3 Development of a topic guide**

A topic guide for in-depth interviews was designed based on the review of literature on sexual behaviour and the systematic review on partner notification described in chapter 1 (appendix 1). Various vignettes were developed to depict variation in the type of sexual partnership; nature of STI diagnosed, and partner notification method in order to explore participants' views about barriers to and acceptability of various partner notification methods in these different scenarios. The vignettes on partner notification explored the following hypothetical scenarios (appendix 12):

- Preferred methods for notifying partners for STI: men were given a list of various ways of notifying their sexual partners for STI in the future. This included patient referral methods, i.e., face-to-face notification or using remote notification methods like text, email, telephone call, and online chat/message. This list also included the option of anonymously notifying sex partners via an e-card or via the clinic staff (appendix 12, scenario 1). Participants were asked which of the methods they were most likely to use and why, and if they would use that method to notify all the different types of sexual partners.

- Views towards notifying an HIV positive primary partner for HCV if they are in a monogamous relationship and diagnosed with HCV after having a casual sex encounter at a party (appendix 12, scenario 2)
- Views towards using either a home sampling kit and the telephone assessment model, i.e., the primary partner of the patient diagnosed with chlamydia and/or gonorrhoea is assessed via telephone by a clinic staff and the patient takes medication for his partner, (appendix 12, scenario 3)
- Views towards notifying regular fuck buddies, i.e., regular sex partners, and casual partners of HCV and syphilis diagnosis (appendix 12, scenario 4)
- Views towards notifying sex partners they met at a sex party, which was organised via a dating website like Gaydar, for syphilis (appendix 12, scenario 5)
- Views towards notifying sex partners and members of their social network (i.e., gay friends who they think engage in UAI) to test for LGV in the event of an LGV outbreak (appendix 12, scenario 6).

#### 2.6.4 **Identification and recruitment of participants for in-depth interviews**

The participants for the in-depth interviews were recruited from the same HIV clinic in central London, UK where the SHARPN survey was conducted. Participants for these interviews were identified with the help of the clinic staff. I shared the purposive sampling quota for the in-depth interviews with the clinic staff and asked them to introduce me to patients who met the quota criteria. If the patient was willing to participate in the study, the clinic staff introduced them to me. I re-checked the eligibility of these patients. If they were eligible and willing

to participate in a face-to-face interview, a feasible time and date for an interview in the clinic was arranged.

When a participant arrived on the day of the interview, he was taken to a quiet room in the clinic allocated for study purposes, where all the interviews were conducted. All the participants of the interviews were requested to give a written informed consent (Appendix 15 and 16) and offered a copy of the consent form. As the interviews progressed, I requested the clinic staff to introduce me to the patients who meet the required quota sampling criteria that were not yet achieved.

The topic guide was piloted and the results are presented in the following section.

## **2.6.5 Piloting the topic guide**

A focus group discussion and two pilot interviews were conducted to pilot the topic guide for the in-depth interviews.

### **2.6.5.1 Focus group discussion**

A focus group discussion was conducted in February 2010 to pilot the vignettes that were developed to examine willingness to notify partners of STI and use various partner notification methods in the future. A purposive sample of 7 HIV positive MSM was recruited from amongst the members of the clinic's HIV positive patients' network with the help of the clinic's patient representative. Using members of an existing group was considered likely to facilitate discussion due to familiarity. An attempt was made to select participants who varied in age, ethnic background, years since HIV diagnosis, cART status, and sexuality (gay or bisexual). All the participants were given a focus group discussion study information sheet (Appendix 13) and were asked to provide written consent (Appendix 14).

The discussion was audio-recorded with the participants' consent. Participants were provided with snacks and beverages as a token of gratitude for participating in the focus group discussion. Six of the seven participants were White, and one participant was Black Caribbean. While some participants were living with HIV for more than fifteen years, some men were diagnosed 2-4 years ago. All but two of the participants were receiving cART. I facilitated the focus group discussion and read out the vignettes to the group.

The focus group discussion indicated the feasibility of using the vignettes for initiating discussion on attitudes to partner notification for STI and towards using various methods of partner notification. It also highlighted that some vignettes needed further clarification. Some topics not included in the topic guide came up frequently during the discussion: for example, the role of internet in meeting sexual partners among HIV positive MSM. The topic guide was modified based on the feedback received during the focus group discussion.

#### **2.6.5.2 *Pilot in-depth interviews***

Two pilot in-depth interviews were conducted using the revised topic guide to reassess the comprehension of the concepts discussed, the feasibility of using vignettes and the acceptability and degree of comfort for the participants in discussing these topics during a face-to-face interview with me. These pilots were also conducted to assess the approximate time needed for the interviews and acceptability of audio recording the interviews. Written informed consent was used from both the participants (appendix 15 and 16). The pilot interview participants were a White British man in his early fifties and a Black Caribbean man in his mid-twenties and were recruited with the help of the clinic staff. They provided written consent and their interviews were audio-recorded with their consent.

The interview with the White British participant indicated that he was able to share his experiences of HIV partner notification. However, he had never been diagnosed with STI except at the time of his HIV diagnosis. He therefore found it difficult to respond to the vignettes on partner notification for STI. In addition, he was very sure that he would never need to notify his sexual partners for STI. He was nevertheless asked to comment on the clarity of the vignettes. He was able to understand the scenarios presented in the vignettes and his interview lasted for approximately 50 minutes.

The interview with a young Black Caribbean participant was challenging. He responded to the 'softer' questions like "how long have you been using the services of this clinic?" However, despite being informed of the nature of the interview and agreeing to participate in the interview, he responded 'decline to answer' to every subsequent question related to HIV diagnosis or sex behaviour. I thus stopped the interview and discussed with the participant if he was comfortable with the interview process. At this stage, he revealed that he had never spoken to anyone, including the clinic health advisors, counsellors or his family members about his HIV diagnosis, which was 3 years ago. He was angry with himself, and experienced tremendous guilt due to his sexual behaviour and blamed himself for his diagnosis. I offered the participant the option to terminate the interview and referral either to the clinic's psychology team or the patient representatives and offered him some time to reflect on these options. However, he decided to continue with the interview but declined referral to the psychologists or patient representatives. After this point the interview went well but took approximately 85 minutes. The participant was able to understand the vignettes and terms used in the topic guide.

Both the participants were specifically asked about their experience of being interviewed by me, a young Asian female. The older participant said that my gender or ethnicity did not affect the accuracy or the extent of the information he shared. He, however, mentioned being cautious about using gay slang. The younger participant mentioned that my gender or ethnicity was not a concern for him. He felt reassured when I stopped the interview to re-check if he was willing to participate in the interview and found it easier to talk about his emotions because I am a female.

### **2.6.5.3**     *Modification of the sampling criteria based on the pilot results*

I discussed the pilot results with both my PhD supervisors and we decided to modify the quota sampling criteria to reflect the pilot results. The purposive quota sampling criteria was modified to integrate an additional inclusion criterion, i.e., recent STI diagnosis, which was defined as being diagnosed with any STI (not HIV) in the three months prior to the date of being approached for the interview. The clinic staff in-charge of informing the patients of their recent STI test results and inviting them to the clinic for treatment if they tested positive flagged up the clinic notes of these men with a participant information sheet (appendix 15). This served as a reminder for the clinic nurses to invite those men recently diagnosed with STI to participate in the study.

### **2.6.6**     **Data collection**

The data collection for the qualitative interviews started simultaneously with the survey in May 2010 and was completed in February 2011. I conducted all the interviews and used the modified topic guide for conducting the interviews. The interviews were recorded using a digital audio-recorder. Participants were given an option to opt-out of audio recording their interviews. I started the interview with



less sensitive issues, such as time since accessing the clinic services. This worked as an icebreaker prior to discussion about sensitive issues. The participants were handed the vignettes, one at a time, and were asked to read them. They were then asked about their views towards the scenarios. Although the scenarios usually specified the type of sexual partner or STI, participants' views towards using the partner notification method specified in the scenario to notify other types of sexual partners were also explored. For example: in scenario 3 participants' views towards using a home sampling kit and a telephone assessment model to notify a primary partner were examined. However, participants' views towards using these methods for notifying other sex partners were also explored.

I personally conducted all the interviews and therefore I was able to identify any new issues relevant to the study objectives that emerged during the interviews. A record of new themes added to the topic guide as the interviews progressed was maintained. Three men declined permission for their interviews to be recorded. The main reason for declining audio recording of the interviews was concerns related to confidentiality. One person who declined had not disclosed his HIV status to anyone, including his primary partner. Two others were concerned about the sensitive nature of the interview topic, interpreted by them as talking about their sexual behaviour, and preferred not to have their voice recorded. I took notes using a pen and paper during these interviews. At the end of each interview, I maintained a log of the key themes emanating from the interview and my perceptions of the interview process. Because the interviews were reviewed on an on-going basis, it was evident after the 20<sup>th</sup> interview that no new themes were emerging from the subsequent interviews. Therefore, data collection was stopped after the 24<sup>th</sup> interview.

### **2.6.7 My role as an interviewer**

Reflexivity refers to the interviewer's influence on the process of data collection, analysis and interpretation and is an important component of qualitative research. I was mindful of the fact that my sex and ethnic origin, and my sexuality as perceived by the participant may affect the interview process. I was concerned about how an HIV positive man who has sex with men would perceive being interviewed by a young Asian female of unknown HIV status and sexuality. The fact that I knew they are HIV positive and have sex with men, while they did not know my HIV status and sexuality can create a power imbalance between us where information is not equally shared. At the end of every interview, I asked the participants about their experience of the interview process and being interviewed by me. They were also asked about their perceptions about being interviewed by a gay or a straight man, or a White female. During the interviews it was important to establish that I was not a part of the clinic staff to enable free exchange of participants' views and attitudes towards the clinic services and staff. Therefore when the clinic staff introduced potential participants to me, I explained to them that I am a public health researcher associated with UCL and I am not employed by the clinic.

### **2.6.8 Reflections on the interview process**

The experience of interviewing the participants was humbling and provided me with insights into the challenges some of these men had faced in their lives, not only due to their HIV positive status but also due to their sexuality, and their stories of despair and resilience. The participants perceived me as non-threatening and some treated me as though I were a therapist with whom they shared their darkest and deepest concerns and realities. One participant mentioned that he told

me all the dark facts about his life at the beginning of the interview because that is his mechanism of dealing with rejection. He feels that if someone gets through that and still talks to him, he does not feel the fear of being rejected due to his HIV status. These experiences made me acutely aware of my role and boundaries as a researcher. It also made me aware that participating in an interview is likely to be an emotional experience for some men and for me.

When asked about their experience of being interviewed by an Asian female, most men said that they were pleased that a gay man did not interview them. Although not averse to the idea, some men felt that being interviewed by a gay man would be an unwanted "*distraction*". Two men felt that they were wary of using gay slang and describing their sexual activity in detail. All the men felt that they would prefer not to be interviewed by a straight man and some felt that it would make them feel uncomfortable and judged. Men perceived me to be "*professional*" and "*knowledgeable*" about issues related to gay men and their sexual behaviour, which made them feel comfortable to talk about it. However, it is important to bear in mind, it was me who asked the participants about their experience of being interviewed and it is likely that men did not share their true experiences and may have led to desirability bias.

Some men experienced distress during or at the end of the interview. They were offered the opportunity to terminate the interview or re-schedule it, but they chose to continue with the interview. These men were offered a referral to the clinic's patient representative or a health advisor. However, all these men declined referral. One participant, who had not disclosed his HIV status to anyone and was diagnosed with HIV five years ago, felt that talking about his HIV diagnosis and experiences of living with HIV was not as bad as he had anticipated and hoped that

this experience would eventually help him to disclose his status to his primary partner. Another participant, who was distressed because his HIV negative partner was threatening him with legal action, was given information about Terrence Higgins Trust who provides support to HIV positive men on such issues.

### **2.6.9 Data protection and confidentiality of the participants**

All the consent forms were stored in a locked cabinet in my office and the details were described earlier in section 2.5.6. The audio-recorded files were transferred to a secure computer and were password protected. The audio-recorded files were given numerical codes (e.g. IDI\_1). The interviews were transcribed by an external agency that was bound by a confidentiality agreement signed between us and had substantial experience of transcribing sensitive qualitative data. The audio recordings were destroyed after transcription. The names and identifiable data of the participants were not audio-recorded, transcribed, or used in writing the thesis or related publications. Only anonymous quotes of the participants were used to reflect their opinions.

### **2.6.10 Data management and analysis of the in-depth interviews**

Interviews that were not recorded were typed into a word document. The transcripts and interview logs were imported in to qualitative data management software NVivo, 6.0 (QSR International Ltd, Melbourne, Australia). A matrix based approach for ordering and synthesizing qualitative data known as ‘Framework approach’ (Ritchie and Lewis, 2006) was used for analysis. The analysis of the data followed the key features of this approach specified below:

- Familiarization with the data (reading and re-reading of the transcripts)
- Developing a thematic framework/coding index

- Applying this framework to the entire dataset, i.e., coding the transcripts using the thematic framework and revising the thematic framework as the coding progresses
- Charting themes using a matrix and conduct within and between case analysis
- Developing descriptive and explanatory accounts of the data, identifying emerging concepts and typologies and finding associations and explanations for the patterns observed in the data.

To begin with I read and re-read the hard copies of five interview transcripts. While reading each of these transcripts, I coded the emerging broad themes of interest manually on the hard copies. I maintained a separate log of these broad themes and documented the definition I assigned to these themes for purposes of clarity and to enable accurate coding of subsequent interviews. At the end of identifying the broad themes in all these five transcripts, I reviewed the log of all these themes and their definitions. At this stage I refined some of the themes and their definition. In case of some themes, I felt the need to divide themes into separate sub-themes, for example: I had a broad theme titled sexual partnerships. I sub-divided this broad theme into sub-themes: timing of sexual partnerships (i.e., current/ex), type of sexual partnership (i.e., casual/regular/primary), HIV status of partners. However, I did not want to over-code the data and de-contextualise it. Thereby, at this stage I opted not to make the themes too narrow. This formed the broad thematic framework for further coding. Then, I coded all the interview transcripts in NVivo using this thematic framework. Any new themes identified during this process were added to the thematic framework. This process led to the identification 66 broad/semi-broad themes (appendix 17). Once the emerging

themes in all the interviews were identified, these themes were further categorised using the following 9 key areas:

1. HIV diagnosis
2. HIV and sexual behaviour
3. cART
4. Attitudes towards partner notification
5. Experience of partner notification
6. Preferred methods of partner notification
7. Change over time in attitudes to HIV and cART
8. Interview related challenges
9. Other: for example, social support etc.

Excel spreadsheets were used to chart the summarised data from each case (interview) for each of the sub-themes included under each of the above-mentioned key areas of interest. An example of charting the data using an excel spreadsheet is presented in appendix 18. During this process, consistency was maintained in charting the data by using the rows in the spreadsheet to represent a separate case and the columns represented different sub-themes. A separate comments column was created in each spreadsheet to document any emerging interpretations that were immediately evident during the process of charting the data.

When charting of all the themes was complete, a cross-case analysis for each theme in each of the key areas of interest was conducted to identify the diversity and similarity of the range of issues within each theme was conducted. This process enabled me to develop descriptive accounts for each theme and identify the key concepts and emerging patterns. Typologies for the descriptive accounts

were developed during the within-theme analysis. This process was conducted using the printed excel charts and large plain sheets of paper to document the emerging patterns. If any typologies were identified, attempt was made to understand if it applied to the entire data set and if each individual case mapped on to one and only one typology. This process led to the organization and re-organisation of the cases in different typologies and identification of outliers, i.e., unique cases. After conducting the descriptive analysis for each theme, within-case analysis across all themes to identify emergent patterns was conducted.

At every stage of the analysis, an effort was made to remain as close as possible to the original data. As the interviews were coded using NVivo and thematically charted in excel, it was convenient to access the charted data, and the original coded data in NVivo and the interview transcript. This allowed me to remain grounded in the data during the data analysis process.

## ***2.7 Study Timetable***

It was anticipated that recruitment for the SHARPN survey would span between January-September 2010. However, due to the need for substantial amendment to the study protocol and the survey following the pilot interviews, recruitment to the survey took place from May until September 2010. The qualitative interviews were conducted from May 2010 until February 2011.

## **Chapter 3. Sexual partnership patterns, and sexual behaviour of HIV positive MSM: results of the SHARPN survey**

### **3. Aims**

The aim of this chapter is to examine the sexual partnership patterns and sexual behaviour of HIV positive MSM and its implications for onward HIV transmission, risk of re-infection with HIV, STI transmission and acquisition, and partner notification.

#### **3.1 *Specific objectives***

The specific objectives of this chapter are:

1. To describe the response rate to the SHARPN survey, and describe the socio-demographic characteristics and HIV related health of HIV positive MSM, and their attitudes towards various HIV transmission risk reduction strategies.
2. To describe the characteristics of men who have a primary partner, and examine their sexual behaviour with their primary partner and if it varies by primary partner's HIV status.
3. To describe the sexual behaviour of HIV positive men with their most recent non-primary partner and examine if it varies by the HIV status of their non-primary partner.
4. To examine the association between attitudes towards various HIV risk reduction strategies (i.e., reduced risk of HIV transmission during UAI due to undetectable viral load, strategic positioning, withdrawal prior to ejaculation, and no risk of HIV transmission during unsafe insertive oral sex) and risky sexual



behaviours with a serodiscordant primary partner and a most recent serodiscordant non-primary partner.

5. To describe the sexual behaviour of men with new sexual partners.

### 3.2 *Methods*

The details of the methods of the SHARPN survey were presented previously in section 2.5.

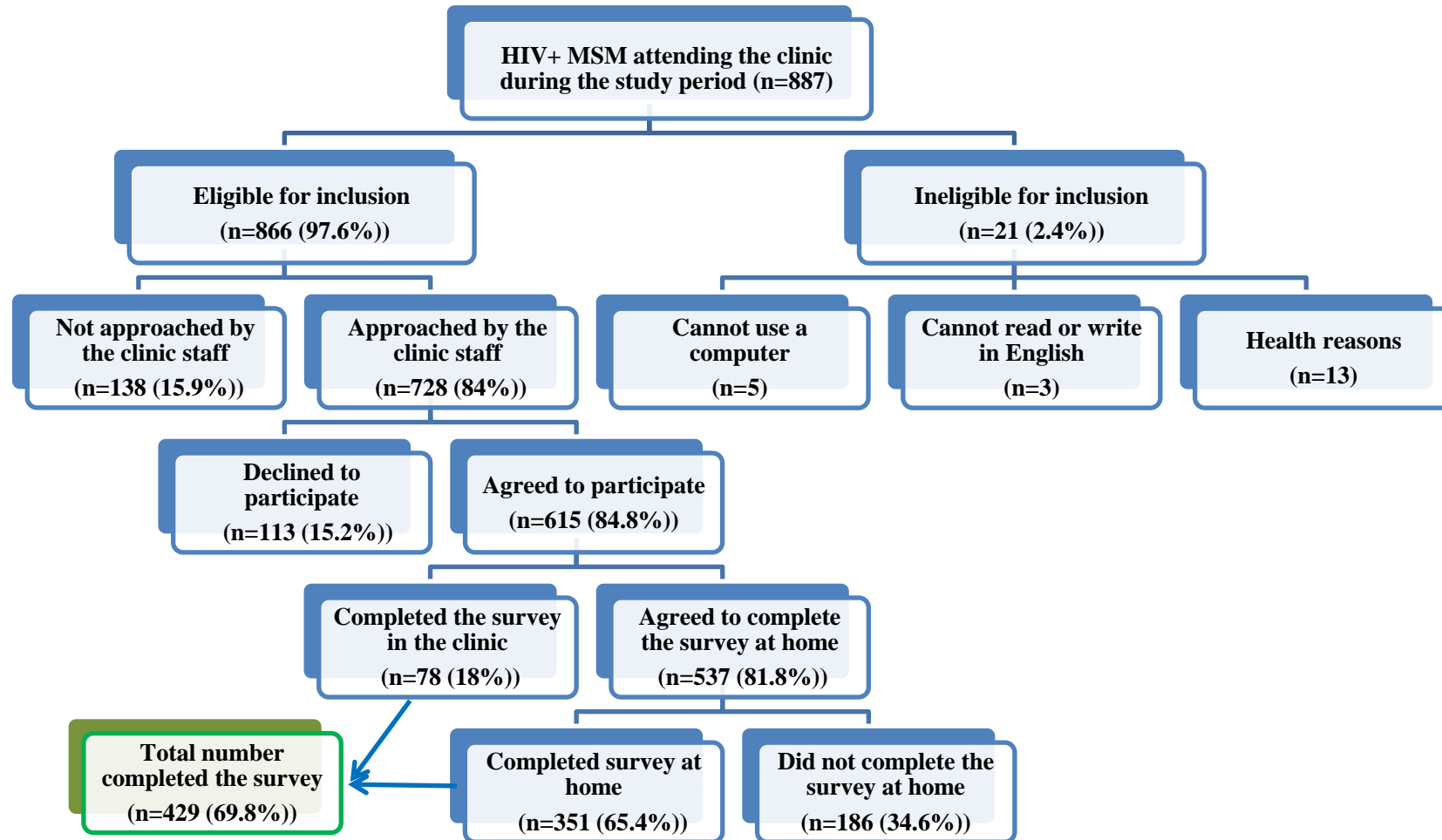
### 3.3 *Results*

In this chapter I present the results of the SHARPN survey for the above-mentioned objectives.

#### 3.3.1 **Response rate to the SHARPN survey**

As shown in figure 9, of the 887 HIV positive MSM attending the study clinic during the SHARPN study period, 21 men (2.4%) were not eligible to be included in the study due to their lack of ability to use computers, read or write in English, or health reasons. Of the 866 eligible patients, 138 (15.9%) men were not approached by the clinic staff for study participation. Of the 728 men approached by the clinic staff, 113 (15.2%) men declined to participate in the study and the remaining 615 (84.8%) men agreed to participate in the survey. Of the 615 men who agreed to participate, the survey completion rate was 69.8% (429/615). Of the 429 men who completed the survey, 18.2% of men (78/429) completed the survey in the clinic and the remaining 81.8% of men (351/429) completed the survey at home. The overall response rate among eligible clinic attendees was 59% (429/728). Among those who agreed to participate and complete the survey at home, the survey completion rate was 65.4% (351/537).

**Figure 9. Recruitment of study participants for the SHARPN survey**



In the following sub-sections, I describe the socio-demographic characteristics and HIV related health of the survey participants.

### **3.3.2 Socio-demographic profile of the study participants**

The socio-demographic characteristics of the 429 study participants are presented in Table 2. Overall, the study participants were middle-aged, with a median age of 43 years (range: 22-74). 86.4% of participants were White and 61% of participants were born in the UK. The majority of participants had been educated beyond secondary school, self-identified as gay and were employed. 15 (3.5%) men self-identified as being bisexual, of whom 11 men were White and 4 men were from a non-White ethnic background. A minority of men (8%) reported being medically retired or were unemployed (13.3%), and 21% of men were receiving social welfare benefits. Approximately 45% of men owned their accommodation whereas 49% of men lived in rented accommodation.

**Table 2. Socio-demographic characteristics of the study participants (N=429)**

| <b>Characteristics</b>        | <b><sup>1</sup>n/N</b> | <b>% (95 % CI)</b> |
|-------------------------------|------------------------|--------------------|
| <b>Age</b>                    |                        |                    |
| Median (range) years          | 422/429                | 43 (22-74)         |
| <b>Age groups</b>             |                        |                    |
| <=34                          | 71/422                 | 17.0 (13.4-20.6)   |
| 35-44                         | 169/422                | 40.0 (35.3-44.6)   |
| >=45                          | 182/422                | 43.0 (38.3-47.8)   |
| <b>Born in the UK</b>         |                        |                    |
| Yes                           | 262/429                | 61.0 (56.4-65.7)   |
| <b>Ethnicity</b>              |                        |                    |
| White                         | 368/426                | 86.4 (83.1-89.6)   |
| Mixed                         | 17/426                 | 4.0 (2.1-5.8)      |
| Asian                         | 13/426                 | 3.0 (1.4-4.7)      |
| Black                         | 15/426                 | 3.5 (1.7-5.2)      |
| Other                         | 13/426                 | 3.0 (1.4-4.7)      |
| <b>Education</b>              |                        |                    |
| Beyond secondary school       | 309/429                | 72.0 (67.8-76.3)   |
| <b>Sexual orientation</b>     |                        |                    |
| Gay                           | 410/425                | 96.5 (94.7-98.2)   |
| Bisexual                      | 15/425                 | 3.5 (1.7-5.3)      |
| <b>Employment</b>             |                        |                    |
| Employed                      | 284/429                | 66.0 (61.7-70.7)   |
| Unemployed                    | 57/429                 | 13.3 (10.1-16.5)   |
| Medically retired             | 34/429                 | 8.0 (5.3-10.4)     |
| Other                         | 57/429                 | 12.7 (9.4-15.7)    |
| <b>Accommodation</b>          |                        |                    |
| Own                           | 191/427                | 44.7 (40-49.5)     |
| Rent                          | 210/427                | 49.0 (44.4-53.9)   |
| Other                         | 26/427                 | 6.3 (3.8-8.4)      |
| <b>Social welfare benefit</b> |                        |                    |
| Yes                           | 87/414                 | 21.0 (17.1-25.0)   |

<sup>1</sup> Base varies due to item non-response

### 3.3.3 General health and HIV related health

The details of general health and HIV related health of the study participants are described in Table 3. Approximately three-quarters of men considered their general health in the last six months to be good or very good. The median number of years participants had lived with HIV was 9 years and the range was less than 1 year to 28 years. While a minority of the study participants were diagnosed with

HIV less than a year ago (11.4%), 18.2% of participants were diagnosed 2-5 years ago and approximately 70% of participants were diagnosed more than five years ago.

With regards to HIV related health, 16.8% of men reported 'ever' being diagnosed with AIDS. Of these, 41 (57.8%) men reported that they were diagnosed with AIDS the same year they were diagnosed with HIV. A small minority of the men reported that their CD4 cell count was  $<200$  cells/mm<sup>3</sup> (4.2%). Almost half of them had a CD4 cell count  $\geq 500$  cells/mm<sup>3</sup>, and 40.6% of men reported it to be between 200-499 cells/mm<sup>3</sup>. A small minority of men did not know their CD4 cell count test result (4.4%). The majority of men reported changes in their CD4 cell count in the last year while 28% of men reported their recent CD4 cell count to be stable in the last year. 9.1% of men were unaware whether their CD4 cell count had varied over the last year. An increase in CD4 cell count in the last year was reported by 38% of men, 7.5% of men reported a decrease, and 17.5% of men reported fluctuations in their CD4 cell count in the last year.

74% of men reported their most recent plasma viral load status to be undetectable; while 71.8% of men reported that their recent plasma viral load test result was  $<50$  copies/mL. Some men (3.5%) reported a high recent plasma viral load test result ( $>100,000$  copies/mL) and a further 7.2% reported their test result to be between 10,000-100,000 copies/mL. A small minority of the men did not report their plasma viral load status (3.5%) and 10.8% of men did not know their recent plasma viral load test results. Approximately 67% of men reported that their plasma viral load status was stable in the last year; 7.9% of men did not know if it had varied during the last year.

**Table 3. General and HIV related health of the study participants (N=429)**

| <b>Characteristics</b>   | <b><sup>1</sup>n/N</b> | <b>% (95% CI)</b> |
|--|------------------------|-------------------|
| <b>Self-assessed overall health in last 6 months</b>                 |                        |                   |
| Good or very good  | 314/429                | 73.2 (69.0-77.4)  |
| <b>Time since HIV diagnosis (years)</b>                              |                        |                   |
| Median (range) (N=429)   | 9 (<1-28)              |                   |
| <1   | 49/429                 | 11.4 (8.3-14.4)   |
| 1-5  | 78/429                 | 18.2 (14.5-21.8)  |
| 6-9  | 93/429                 | 21.7 (17.8-25.6)  |
| 10-14  | 105/429                | 24.5 (20.4-28.6)  |
| >14  | 104/429                | 24.2 (20.2-28.3)  |
| <b>Ever diagnosed with AIDS</b>                                      |                        |                   |
| Yes  | 72/415                 | 16.8 (13.7-21.0)  |
| <b>Self-reported recent CD4 cell count (cells/mm<sup>3</sup>)</b>    |                        |                   |
| < 200  | 18/429                 | 4.2 (2.3-6.1)     |
| 200-499  | 174/429                | 40.6 (35.9-45.2)  |
| >499   | 218/429                | 50.8 (46.1-55.6)  |
| Don't know   | 19/429                 | 4.4 (2.5-6.4)     |
| <b>Self-reported changes to CD4 cell count in last year</b>          |                        |                   |
| Stayed same  | 120/428                | 28.0 (23.8-32.3)  |
| Increased  | 162/428                | 38.0 (33.2-42.4)  |
| Went up and down   | 75/428                 | 17.5 (13.9-21.1)  |
| Decreased  | 32/428                 | 7.5 (5.0-10.0)    |
| Don't know   | 39/428                 | 9.1 (6.3-11.8)    |
| <b>Recent self-reported plasma viral load status</b>                 |                        |                   |
| Undetectable   | 318/429                | 74.0 (70.0-78.3)  |
| Low  | 42/429                 | 10.0 (7.0-12.6)   |
| Medium   | 39/429                 | 9.0 (6.3-11.8)    |
| High   | 15/429                 | 3.5 (1.8-5.2)     |
| Don't know   | 15/429                 | 3.5 (1.8-5.2)     |
| <b>Self-reported recent viral load blood test result (copies/mL)</b> |                        |                   |
| <50  | 308/429                | 71.8 (67.5-76.1)  |
| 50-10,000  | 31/429                 | 7.2 (4.8-9.7)     |
| 10,000-100,000   | 31/429                 | 7.2 (4.8-9.7)     |
| >100,000   | 13/429                 | 3.0 (1.4-4.7)     |
| Don't remember   | 46/429                 | 10.8 (7.8-13.7)   |

**Table 3. Continued**

| <b>Characteristics</b>  | <b><sup>1</sup>n/N</b> | <b>% (95% CI)</b> |
|---|------------------------|-------------------|
| <b>Self-reported changes in the viral load status in the last year</b>    |                        |                   |
| Stayed same   | 286/429                | 66.7 (62.2-71.1)  |
| Increased   | 27/429                 | 6.3 (3.9-8.6)     |
| Gone up and down  | 30/429                 | 7.0 (4.6-9.4)     |
| Decreased   | 52/429                 | 12.1 (9.0-15.2)   |
| Don't know  | 34/429                 | 7.9 (5.3-10.4)    |
| <b>Ever taken cART</b>  |                        |                   |
| Yes   | 353/429                | 82.3 (78.7-86.0)  |
| <b>Currently taking cART</b>  |                        |                   |
| Yes   | 346/429                | 80.6 (76.9-84.4)  |
| <b><sup>2</sup>Time since receiving cART</b>                              |                        |                   |
| Median (range) years (N=345)  | 6 (<1-24)              |                   |
| <1  | 58/345                 | 13.5 (10.3-16.8)  |
| 1-6   | 134/345                | 31.2 (26.8-35.6)  |
| 7-11  | 81/345                 | 18.9 (15.2-22.6)  |
| >11   | 156/345                | 36.4 (31.8-41.0)  |
| <b><sup>2</sup>Adherence to cART (doses missed in the last two weeks)</b> |                        |                   |
| None  | 287/344                | 82.8 (78.8-86.8)  |
| One   | 47/344                 | 13.7 (10.0-17.3)  |
| >1  | 12/344                 | 3.5 (1.5-5.4)     |
| <sup>1</sup> Base varies due to item non-response                         |                        |                   |
| <sup>2</sup> Only among men who were receiving cART                       |                        |                   |

6.3% of men reported an increase whereas 12% of men reported a decrease in their plasma viral load in the last year. 82.3% of men reported 'ever' having taken cART, and 80.6% of men were receiving cART at the time of the survey. The median number of years since participants were receiving cART was 6 years and the range was less than one year to 24 years. The majority of men (83%) reported that they had not missed any doses of their HIV medication in the last two weeks. However, a minority (13.7%) had missed at least one dose and 3.5% of men had missed more than one dose of HIV medication.

In the following section, I describe the attitudes of the study participants towards various HIV transmission risk reduction strategies.

### **3.3.4 Attitudes of men towards HIV transmission risk reduction strategies**

Men were asked about the implications of having an undetectable viral load on the risk of onward HIV transmission. 30% of men agreed that *'Undetectable viral load means that HIV is unlikely to be passed on to a sexual partner'* (Table 4). 19% of men believed that *'Undetectable viral load in my blood means that HIV is unlikely to be passed on to sexual partners even if we fuck without a condom'*. With regards to the implications of having an undetectable viral load and risk of other HIV-related infections, 19% of men believed that *'Undetectable viral load in my blood means that I am unlikely to get other HIV-related infections'*.

82% of men believed that *'I can get infected with another strain of HIV if I have unprotected sex with an HIV positive person'*. A large proportion of men (85.5%) believed that *'Getting another strain of HIV could reduce my treatment options in the future'*. 62.3% of men believed that *'having an STI like gonorrhoea means that HIV is more likely to be passed on to a sexual partner'*.

With regards to attitudes towards behavioural risk reduction strategies to prevent sexual transmission of HIV, 14.8% of men believed that *'HIV is unlikely to be transmitted if a HIV negative person has insertive anal intercourse (he is doing the fucking) without a condom with an HIV positive partner'*.



**Table 4. Attitudes towards various risk-reduction strategies for prevention of sexual transmission and re-infection with HIV (N=429)**

|   | <sup>1</sup> n/N | % (95% CI)       |
|---|------------------|------------------|
| <b>Undetectable viral load means that HIV is unlikely to be passed on to a sexual partner</b>   |                  |                  |
| Strongly agree/agree  | 126/419          | 30.1 (25.7-34.5) |
| <b>Undetectable viral load in my blood means that HIV is unlikely to be passed on to a sexual partners even if we have unprotected anal intercourse</b>                   |                  |                  |
| Strongly agree/agree  | 79/416           | 19.1 (15.3-22.9) |
| <b>Undetectable viral load in my blood means that I am unlikely to get other HIV-related infections</b>   |                  |                  |
| Strongly agree/agree  | 79/414           | 19.1 (15.3-22.9) |
| <b>I can get infected with another strain of HIV if I have unprotected sex with another HIV positive person</b>   |                  |                  |
| Strongly agree/agree  | 243/418          | 82.1 (78.4-85.8) |
| <b>Getting another strain of HIV could reduce my treatment options in the future</b>  |                  |                  |
| Strongly agree/agree  | 359/420          | 85.5 (82.1-88.9) |
| <b>Having an STI like gonorrhoea means that HIV is more likely to be passed on to a sexual partner</b>  |                  |                  |
| Strongly agree/agree  | 258/414          | 62.3 (57.6-67.0) |
| <b>During anal sex withdrawing (pulling out) before ejaculation (cumming) can reduce the risk of passing on HIV to sexual partner(s)</b>                                  |                  |                  |
| Strongly agree/agree  | 176/417          | 42.2 (37.4-46.9) |
| <b>HIV is unlikely to be transmitted if an HIV negative person has insertive anal intercourse (he is doing the fucking) without a condom with an HIV positive partner</b> |                  |                  |
| Strongly agree/agree  | 62/420           | 14.8 (11.4-18.2) |
| <b>HIV is unlikely to be transmitted if HIV positive partner ejaculates inside the mouth of an HIV negative partner during oral sex</b>                                   |                  |                  |
| Strongly agree/agree  | 117/416          | 28.1 (23.8-32.5) |

<sup>1</sup>Base varies due to item non-response

42.2% of men believed that *'During anal sex, withdrawing (pulling out) before ejaculation (cumming) can reduce the risk of passing on HIV to sexual partner(s)'*. Approximately one-third of men also believed that *'HIV is unlikely to be transmitted if HIV positive partner ejaculates inside the mouth of an HIV negative partner during oral sex'*.

In the following section, I describe the details of overall sexual activity and sexual partnership patterns reported by the study participants and their sexual behaviour with different types of sexual partners.

### **3.3.5 Sexual activity and sexual partnership patterns and behaviour of HIV positive MSM**

Of the 427 men who responded to the question on 'age at the time of first sexual activity (any) with a male partner', the median age was 16 years (IQR: 12-19) and range was 4 to 42 years. Of the 429 men, 99% of men reported that they had 'ever' engaged in AI with a male partner. The median age for engaging in AI for the first time with a male partner was 19 years (IQR: 16-22) and range was 7 to 42 years.

Of the 429 participants, as mentioned in table 3, 49 men who reported that they were diagnosed with HIV less than a year ago were excluded from the analysis of sexual behaviour in the past year. Therefore 380 men who were diagnosed with HIV more than a year ago were included in this analysis. Of these 380, 84.7% (322) of men were sexually active in the last year (Table 5). While 16.4% of men reported having sex with only one partner in the last year, 12.1% of men had 2-4 sex partners, 20.8% of men had 5-10 partners and the remaining 35.4% of men had more than ten partners. The median number of sex partners in the last year reported by these men was six. 52.4% (199/380) of men had a primary partner.

**Table 5. Overall sexual activity, sexual partnerships and sexual behaviour of HIV positive MSM in the last year**

| Characteristics  | All participants |                  |
|--|------------------|------------------|
|  | <sup>1</sup> n/N | % (95% CI)       |
| <b>Sexually active</b>   |                  |                  |
| Yes  | 322/380          | 84.7 (81.1-88.4) |
| <b>Number of sexual partners</b>   |                  |                  |
| 0  | 58/379           | 15.3 (11.7-18.9) |
| 1  | 62/379           | 16.4 (12.6-20.1) |
| 2-4  | 46/379           | 12.1 (8.8-15.4)  |
| 5-10   | 79/379           | 20.8 (16.7-24.9) |
| 11-20  | 44/379           | 11.6 (8.3-14.8)  |
| >=21   | 90/379           | 23.8 (19.4-28.1) |
| Median (range)   | 6 (0-400)        |                  |
| Lower and upper quartiles  | 1-20             |                  |
| Mean (standard deviation)  | 20.9 (43.4)      |                  |
| <b>Had a primary partner</b>   |                  |                  |
| Yes  | 199/380          | 52.4 (47.3-57.4) |
| <sup>2</sup> <b>Had sex with new partners</b>  |                  |                  |
| Yes  | 258/322          | 80.1 (75.7-84.5) |
| <sup>2</sup> <b>Engaged in anal sex</b>  |                  |                  |
| Yes  | 285/322          | 88.5 (85.0-92.0) |
| <sup>3</sup> <b>Engaged in UAI</b>   |                  |                  |
| Yes  | 170/285          | 59.7 (53.9-65.4) |
| <sup>3</sup> <b>Serodiscordant UAI with a primary partner or a most recent non-primary partner</b> |                  |                  |
| Yes  | 44/285           | 15.4 (11.2-19.7) |
| <sup>4</sup> <b>Type of UAI partner</b>  |                  |                  |
| Primary partner only   | 33/170           | 19.4 (13.4-25.4) |
| Primary partner and regular/new partners   | 37/170           | 21.8 (15.5-28.0) |
| New/regular partners only  | 100/170          | 58.8 (51.3-66.3) |
| <sup>1,2</sup> <b>Had group sex in the last 6 months</b>   |                  |                  |
| Yes  | 129/304          | 42.4 (36.8-48.0) |

<sup>1</sup>Base varies due to item non-response  
<sup>2</sup>Includes only men who reported being sexually active in the last year  
<sup>3</sup>Includes only men who reported having AI in the last year  
<sup>4</sup>Includes only men who had engaged in UAI in the last year

As shown in Table 5, of the 322 men who were sexually active in the last year, approximately 80% of men had sex with new partners. 285 (88.5%) men had engaged in anal sex. Among men who had engaged in anal sex, 59.7% of men had engaged in UAI and 15.4% of men had engaged in UAI with either a

serodiscordant primary partner or a most recent serodiscordant non-primary partner. Of these 170 men who had UAI, 19.4% of men had engaged in UAI with a primary partner, 21.8% of men engaged in UAI with a primary partner as well as new partners, and 58.8% of men engaged in UAI with new/regular partners. 42.4% of men also reported that they engaged in group sex in the last six months.

In the following section, I describe the nature of relationship, socio-demographic and HIV-related characteristics of men who had a primary partner. I compare the socio-demographic and HIV-related characteristics of men who had a serodiscordant primary partner with men who had an HIV positive primary partner.

### **3.3.6 Characteristics of men who had a primary partner and their primary partner's characteristics**

Of the 429 men, 221 men (51.5%) had a primary partner. As shown in Table 6, three-quarters of the participants had a live-in relationship with their primary partner and a quarter of them were in a civil partnership. A significant proportion of men (51.6%) reported having an HIV negative primary partner and a further 8.1% of men did not know the HIV status of their primary partner. As explained in section 2.5.11.4, men who had an unknown or HIV negative primary partner were termed as being in a serodiscordant partnership. The majority of men were in a long-term partnership with their primary partner as reflected in the median number of years of the duration of partnership (7 years). While 6.4% of men had been in a partnership with a primary partner for less than a year and 17% of men for a year, the remaining three quarters had been in a partnership for more than a year. The median number of years since HIV diagnosis among these men was 9 years and the range was less than one year to 28 years.

**Table 6. Nature of relationship with a primary partner (N=221)**

| <b>Characteristics</b>                    | <b><sup>1</sup>n/N</b> | <b>% (95% CI)</b> |
|---|------------------------|-------------------|
| <b>Live with primary partner</b>          |                        |                   |
| Yes                                       | 160/216                | 74.1 (92.1-97.9)  |
| <b>Civil partnership</b>                  |                        |                   |
| Yes                                       | 57/221                 | 25.8 (19.9-31.6)  |
| <b>HIV status of primary partner</b>      |                        |                   |
| HIV positive                              | 89/221                 | 40.3 (33.8-46.8)  |
| HIV negative                              | 114/221                | 51.6 (44.9-58.2)  |
| Untested/don't know                       | 18/221                 | 8.1 (4.5-11.8)    |
| <b>Duration of partnership (in years)</b> |                        |                   |
| <1  | 14/218                 | 6.4 (3.1-9.7)     |
| 1   | 37/218                 | 16.9 (11.9-21.9)  |
| 2-7                                       | 65/218                 | 29.8 (23.7-35.9)  |
| 8-13                                      | 51/218                 | 23.4 (17.7-29.1)  |
| >13                                       | 51/218                 | 23.4 (17.7-29.1)  |
| Median (range) years (N=218)              | 7 (0.1-34)             |                   |
| <b>Time since HIV diagnosis (years)</b>   |                        |                   |
| <1  | 22/221                 | 9.9 (5.9-13.9)    |
| 1-5                                       | 36/221                 | 16.3 (11.4-21.2)  |
| > 5                                       | 163/221                | 73.8 (67.9-79.6)  |
| Median (range) years (N=221)              | 9 (<1-34)              |                   |

<sup>1</sup>Base varies due to item non-response

Of the 221 men who reported having a primary partner, 20 (9.9%) men had been diagnosed with HIV less than a year ago. 14 (6.4%) men were in a partnership with their primary partner for less than six months. These 34 men were excluded from the analysis examining sexual behaviour with a primary partner in the last six months because as described in section 2.5.12, they may not have been diagnosed with HIV during that time frame or may not have been in a relationship with their primary partner during that time. Thus, 187 men were eligible for the analysis of sexual behaviour with a primary partner. Of these 187 men, 81 men (43.3%) had a seroconcordant primary partner and 106 (56.7%) were in a serodiscordant partnership.

### **3.3.6.1 *Socio-demographic and HIV related characteristics and attitudes towards risk reduction strategies among men who had a primary partner***

The socio-demographic and HIV related characteristics of the 187 eligible men who had a primary partner and the comparison of these characteristics between men in a serodiscordant and a seroconcordant partnership is presented in Table 7. The majority of men who had a primary partner were aged 35 and above, White (88%), born in the UK (61.5%), educated beyond secondary school (76.5%), employed (81.2%) and 93% of men were receiving cART. 86.5% of men self-reported their perceived plasma viral load status to be undetectable. 96% of men had a CD4 cell count of  $>200$  cells/mm<sup>3</sup>. The median number of years since HIV diagnosis was 10 and range was 3 to 28 years.

The median duration of partnership was 8 years (range 1 to 34 years). 16.9% of men had been in a partnership for a year, 32% of men for 2-7 years, and the remaining 51% of men were in partnership for more than 7 years. The majority of men had disclosed their HIV status to their primary partner, but 4.3% of men had not disclosed their serostatus. 21.9% of men reported using recreational drugs during sex with their primary partner. 18.6% of men agreed or strongly agreed that having an undetectable viral load reduces the risk of onward HIV transmission during UAI. 15.2% of men believed that *'HIV is unlikely to be transmitted if a HIV negative person has insertive anal intercourse without a condom with a HIV positive partner'*, whereas 41% of men believed that withdrawal prior to ejaculation during UAI reduces the risk of HIV transmission.

**Table 7. Socio-demographic, partnership, HIV-related characteristics of men with a primary partner and by primary partner's HIV status**

| Characteristics   | <sup>1,2</sup> Overall<br>(N=187)<br>n/N (%) | <sup>1,2</sup> Seroconcordant<br>partnership<br>(N=81)<br>n/N (%) | <sup>1,2</sup> Serodiscordant<br>partnership<br>(N=106)<br>n/N (%) | Unadjusted OR<br>(95% CI)<br>Serodiscordant<br>vs.<br>seroconcordant<br>partnership |
|---|--|---|--|---|
| <b>Age</b>  |  |   |  | <b>p=0.49</b>   |
| <=34  | 24/183 (13.1)                                | 13/80 (16.3)  | 11/103 (10.7)  | 1   |
| 35-44   | 75/183 (40.9)                                | 33/80 (41.3)  | 42/103 (40.8)  | 1.54 (0.60-3.93)  |
| >44   | 84/183 (45.9)                                | 34/80 (42.5)  | 50/103 (48.5)  | 1.73 (0.69-4.33)  |
| <b>Ethnicity</b>  |  |   |  | <b>p=0.54</b>   |
| White   | 162/184 (88.0)                               | 70/81 (86.4)  | 92/103 (89.3)  | 1   |
| Non-White   | 22/184 (11.9)                                | 11/81 (13.6)  | 11/103 (10.7)  | 0.76 (0.31-1.86)  |
| <b>Country of birth</b>   |  |   |  | <b>p=0.95</b>   |
| Outside UK  | 72/187 (38.5)                                | 31/81 (38.3)  | 41/106 (38.7)  | 1   |
| UK  | 115/187 (61.5)                               | 50/81 (61.7)  | 65/106 (61.3)  | 0.98 (0.54-1.78)  |
| <b>Education</b>  |  |   |  | <b>p=0.47</b>   |
| Beyond secondary school   | 143/187 (76.5)                               | 64/81 (79.0)  | 79/106 (74.5)  | 1   |
| Up to secondary school  | 44/187 (23.5)                                | 17/81 (20.9)  | 27/106 (25.5)  | 1.29 (0.64-2.57)  |
| <b>Employment status</b>  |  |   |  | <b>p=0.11</b>   |
| Not employed  | 35/186 (18.8)                                | 11/81 (13.6)  | 24/105 (22.9)  | 1   |
| Employed  | 151/186 (81.8)                               | 70/81 (86.4)  | 81/105 (77.1)  | 0.53 (0.24-1.16)  |
| <b>cART status</b>  |  |   |  | <b>p=0.43</b>   |
| Not receiving cART  | 13/187 (6.9)                                 | 7/81 (8.6)  | 6/106 (5.7)  | 1   |
| Receiving cART  | 174/187 (93.1)                               | 74/81 (91.4)  | 100/106 (94.3)   | 1.57 (0.50-4.89)  |
| <b>Self-reported recent viral load status</b>                     |  |   |  | <b>p=0.34</b>   |
| Detectable  | 25/185 (13.5)                                | 13/80 (16.3)  | 12/105 (11.4)  | 1   |
| Undetectable  | 160/185 (86.5)                               | 67/80 (83.8)  | 93/105 (88.6)  | 1.50 (0.64-3.50)  |
| <b>Self-reported recent CD4 cell count (cells/mm<sup>3</sup>)</b> |  |   |  | <b>p=0.41</b>   |
| >=200   | 175/182 (96.1)                               | 78/80 (97.5)  | 97/102 (95.1)  | 1   |
| <200  | 7/182 (3.9)                                  | 2/80 (2.5)  | 5/102 (4.9)  | 2.01 (0.37-10.64)   |
| <b>Time since HIV diagnosis</b>                                   |  |   |  | <b>p=0.09</b>   |
| Median (range) years  | 10 (3-28)                                    | 9 (3-28)  | 11 (3-26)  | 1.04 (0.99-1.09)  |
| <b>Duration of partnership (in years)</b>                         |  |   |  | <b>p=0.12</b>   |
| 1   | 31/184 (16.9)                                | 16/80 (20.0)  | 15/104 (14.4)  | -   |
| 2-7   | 59/184 (32.1)                                | 31/80 (38.8)  | 28/104 (26.9)  | -   |
| 8-13  | 48/184 (26.1)                                | 16/80 (20.0)  | 32/104 (30.8)  | -   |
| >13   | 46/184 (25.0)                                | 17/80 (21.3)  | 29/104 (27.9)  | -   |
| Median (range) years  | 8 (1-34)                                     | 5.5 (1-30)  | 9 (1-34)   | 1.02 (0.99-1.07)  |
| <b><sup>3</sup>Disclosure of HIV status to primary partner</b>    |  |   |  | -   |
| Yes   | 178/186 (95.7)                               | 81/81 (100)   | 97/105 (92.4)  | -   |
| <b>Recreational drug use during sex</b>                           |  |   |  | <b>p=0.65</b>   |
| Yes   | 41/187 (21.9)                                | 19/81 (23.5)  | 22/106 (20.8)  | 0.85 (0.42-1.71)  |

Table 7. Continued

| Characteristics  | <sup>1,2</sup> Overall<br>(N=187)<br>n/N (%) | <sup>1,2</sup> Seroconcordant<br>partnership<br>(N=81)<br>n/N (%) | <sup>1,2</sup> Serodiscordant<br>partnership<br>(N=106)<br>n/N (%) | Unadjusted OR<br>(95% CI)<br>Serodiscordant<br>vs.<br>seroconcordant<br>partnership<br><br>p=0.66 |
|--|--|---|--|---|
| <b>Undetectable viral load in my blood means that HIV is unlikely to be passed on to a sexual partner even if we have unprotected anal sex</b>       |  |   |  |   |
| Agree/strongly agree   | 34/183 (18.6)                                | 16/80 (20.0)  | 18/103 (17.5)  | 1.18 (0.55-2.49)<br><b>p=0.27</b>   |
| <b>HIV is unlikely to be transmitted if a HIV negative person has insertive anal intercourse without a condom with a HIV positive partner</b>        |  |   |  |   |
| Agree/strongly agree   | 28/187 (15.2)                                | 15/81 (18.5)  | 13/103 (12.6)  | 0.64 (0.28-1.42)<br><b>p=0.44</b>   |
| <b>During anal sex withdrawing (pulling out) before ejaculation can reduce the risk of passing on HIV to sexual partner(s)</b>                       |  |   |  |   |
| Agree/strongly agree   | 76/184 (41.3)                                | 36/81 (44.4)  | 40/103 (38.8)  | 0.79 (0.43-1.43)<br><b>p=0.74</b>   |
| <b>HIV is unlikely to be transmitted if HIV positive sexual partner ejaculates inside the mouth of a HIV negative sexual partner during oral sex</b> |  |   |  |   |
| Agree/strongly agree   | 50/184 (27.1)                                | 21/81 (25.9)  | 29/103 (28.2)  | 1.11 (0.58-2.16)<br><b>p=0.57</b>   |
| <b>I can get infected with another strain of HIV if I have unprotected sex with a HIV positive sexual partner(s)</b>                                 |  |   |  |   |
| Agree/strongly agree   | 149/184 (81.0)                               | 64/81 (79.0)  | 85/103 (82.5)  | 1.25 (0.59-2.62)<br><b>p=0.37</b>   |
| <b>Missed cART dose in last two weeks</b>  |  |   |  |   |
| Yes  | 21/172 (12.2)                                | 7/73 (9.6)  | 14/99 (14.1)   | 1.56 (0.59-4.07)  |

<sup>1</sup>Includes only men who were diagnosed with HIV >1 year ago and the duration of partnership with primary partner was at least six months

<sup>2</sup>Base varies due to item non-response

<sup>3</sup>Univariate analysis was not be conducted because 100% of cases in one category, i.e., all men in a seroconcordant partnership had disclosed their HIV status to their primary partner



27% of men believed that insertive unsafe oral sex is not associated with the risk of HIV transmission. 81% of men believed that they could get infected with other strain of HIV if they engage in unprotected sex with an HIV positive partner. Approximately one in five men had missed at least one dose of cART in the last two weeks. Table 7 also indicates that during univariate analysis, there were no significant differences in the socio-demographic factors, HIV-related health, partnership related factors and attitudes towards HIV transmission risk reduction strategies and risk of re-infection with HIV among men who had a seroconcordant primary partner and who had a serodiscordant primary partner. Neither was there any difference in recreational drug use during sex and adherence to cART by primary partner's HIV status.

#### **3.3.6.2 Overall sexual behaviour with primary partner in the last six months**

Of the 187 eligible men included in the analysis, 26.5% of men had not engaged in any sexual activity with their primary partner in the last six months, 15.7% of men were sexually active but had not engaged in AI, 15.7% of men had engaged only in receptive AI, 9.7% of men had engaged only in insertive AI and 32.4% of men had engaged in both insertive and receptive AI (Table 8). Overall, 69 men (37.5%) had engaged in UAI. 48% of men had engaged in receptive AI. 57 men (30.9%) had engaged in RUAI and 34 (18.4%) men had engaged only in RUAI with withdrawal prior to ejaculation. Overall, 42.2% of men had engaged in insertive AI, 27.2% of men engaged in IUAI, and 19.7% of men had engaged only in IUAI with withdrawal prior to ejaculation.

**Table 8. Overall sexual behaviour with a primary partner in the last six months (N=185)**

| <b>Type of sexual behaviour</b>                                   | <sup>1,2</sup> <b>n/N</b> | <b>% (95% CI)</b> |
|---|---------------------------|-------------------|
| <b>Sexual behaviour with a primary partner</b>                    |                           |                   |
| No sexual contact   | 49/185                    | 26.5 (20.1-32.9)  |
| Sexual contact but no AI  | 31/185                    | 15.7 (10.4-20.9)  |
| Has only insertive AI   | 19/185                    | 9.7 (5.4-14.0)    |
| Has only receptive AI   | 32/185                    | 15.7 (10.4-20.9)  |
| Has both receptive and insertive AI                               | 66/185                    | 32.4 (25.6-39.2)  |
| <b>Any UAI</b>  |                           |                   |
| <b>Had UAI</b>  |                           |                   |
| Yes   | 69/185                    | 37.5 (30.4-44.6)  |
| <b>Receptive AI</b>   |                           |                   |
| <b>Had receptive AI</b>   |                           |                   |
| Yes   | 89/185                    | 48.1 (40.8-55.4)  |
| <b>Had RUAI (with or without withdrawal prior to ejaculation)</b> |                           |                   |
| Yes   | 57/185                    | 30.9 (24.2-37.7)  |
| <b>Had only RUAI with withdrawal prior to ejaculation</b>         |                           |                   |
| Yes   | 34/185                    | 18.4 (12.7-24.0)  |
| <b>Insertive AI</b>   |                           |                   |
| <b>Had insertive AI</b>   |                           |                   |
| Yes   | 78/185                    | 42.2 (34.9-49.3)  |
| <b>Had IUAI (with or without withdrawal prior to ejaculation)</b> |                           |                   |
| Yes   | 50/184                    | 27.2 (20.6-33.7)  |
| <b>Had only IUAI with withdrawal prior to ejaculation</b>         |                           |                   |
| Yes   | 36/183                    | 19.7 (13.8-25.9)  |

<sup>1</sup>Base varies due to item non-response  
<sup>2</sup>Includes only men who were diagnosed with HIV more than a year ago and were in a partnership with their primary partner for at least six months

In the following sections, I present the results of analysis examining each of the hypotheses outlined in section 2.5.14.1.

### **3.3.6.3 Association between a primary partner's HIV status and sexual behaviour**

Hypothesis 1: HIV positive MSM who have a serodiscordant primary partner are less likely to engage in sexual behaviours perceived to increase the risk of HIV transmission compared to men who have a seroconcordant primary partner.

As indicated previously in table 7, there were no significant differences in the socio-demographic, HIV-related health and partnership related factors, or attitudes towards HIV transmission risk reduction strategies and risk of re-infection with HIV between men who had a serodiscordant or a seroconcordant primary partner. Neither were there any differences in recreational drug use or adherence to cART.

As shown in Table 9, unadjusted analysis showed that men with a seroconcordant primary partner were as likely not to have any sexual contact with their primary partner (23.8%) as men in a serodiscordant partnership (28.6%). There was no significant difference by primary partner's HIV status in the proportion of men engaging in *only* insertive (OR: 0.99 95% CI: 0.32-3.01) or *only* receptive AI (OR: 0.89, 95% CI: 0.35-2.29), but men in a serodiscordant partnership were less likely to engage in both receptive and insertive AI (21.9%) compared to men in a seroconcordant partnership (46.3%) (OR: 0.39, 95% CI: 0.18-0.85; p=0.19).

Overall, men who had a serodiscordant primary partner were less likely to engage in UAI (18.3%) compared to those who had a seroconcordant primary partner (62.5%) (OR: 0.13, 95% CI: 0.06-0.26; p<0.001) and this difference remained after adjusted multivariate analysis (AOR: 0.11, 95% CI: 0.05-0.25; p<0.001).

**Table 9. Sexual behaviour with a primary partner in the last six months by primary partner's HIV status**

|   | <sup>1,2</sup> Seroconcordant status (N=84) n/N (%) | <sup>1,2</sup> Serodiscordant status (N=106) n/N (%) | Unadjusted OR (95% CI) (Serodiscordant vs. Seroconcordant) | <sup>3</sup> Adjusted OR (95% CI) (Serodiscordant vs. Seroconcordant) |
|---|---|--|--|---|
| <b>Sexual activity with a primary partner</b>                         |   |  | <b>p=0.19</b>  | -   |
| No sexual contact   | 19/80 (23.8)  | 30/105 (28.6)  | 1  | -   |
| Had sexual contact but no AI  | 5/80 (6.3)  | 24/105 (22.9)  | 3.04 (0.99-9.33)   | -   |
| Had only insertive AI   | 7/80 (8.8)  | 11/105 (10.5)  | 0.99 (0.32-3.01)   | -   |
| Had only receptive AI   | 12/80 (15.0)  | 17/105 (16.2)  | 0.89 (0.35-2.29)   | -   |
| Had both receptive and insertive AI                                   | 37/80 (46.3)  | 23/105 (21.9)  | 0.39 (0.18-0.85)   | -   |
| <b>Overall UAI</b>  |   |  |  |   |
| <b>Had UAI</b>  |   |  | <b>p&lt;0.001</b>  | <b>p&lt;0.001</b>   |
| Yes   | 50/80 (62.5)  | 19/104 (18.3)  | 0.13 (0.06-0.26)   | 0.11 (0.05-0.25)  |
| <b>Receptive AI</b>   |   |  |  |   |
| <b>Had receptive AI</b>   |   |  | <b>p=0.002</b>   | <b>p=0.01</b>   |
| Yes   | 49/80 (61.3)  | 40/105 (38.1)  | 0.39 (0.21-0.71)   | 0.43 (0.22-0.83)  |
| <b><sup>4</sup>Had RUAI</b>   |   |  | <b>p=0.62</b>  | -   |
| Yes   | 42/50 (84.9)  | 15/19 (81.8)   | 0.71 (0.18-2.72)   | -   |
| <b><sup>4</sup>Had RUAI only with withdrawal prior to ejaculation</b> |   |  | <b>p=0.46</b>  | -   |
| Yes   | 26/50 (52.0)  | 8/19 (42.1)  | 0.67 (0.23-1.95)   | -   |
| <b>Insertive AI</b>   |   |  |  |   |
| <b>Had insertive AI</b>   |   |  | <b>p=0.002</b>   | <b>p=0.01</b>   |
| Yes   | 44/80 (55.0)  | 34/105 (32.4)  | 0.39 (0.21-0.71)   | 0.41 (0.20-0.81)  |
| <b><sup>4</sup>Had IUAI</b>   |   |  | <b>p=0.02</b>  | <b>p=0.05</b>   |
| Yes   | 40/50 (80.0)  | 10/19 (52.6)   | 0.28 (0.09-0.87)   | 0.28 (0.08-1.02)  |
| <b><sup>4</sup>Had IUAI only with withdrawal prior to ejaculation</b> |   |  | <b>p=0.10</b>  | <b>p=0.11</b>   |
| Yes   | 29/49 (59.2)  | 7/19 (36.8)  | 0.40 (0.13-1.19)   | 0.37 (0.11-1.22)  |
| <b>Type of UAI</b>  |   |  |  |   |
| <b><sup>4</sup>Type of UAI (only among those who had UAI)</b>         |   |  | <b>p=0.04</b>  | <b>p=0.09</b>   |
| Both insertive and receptive UAI                                      | 32/50 (64.0)  | 6/19 (31.9)  | 1  | 1   |
| Only IUAI   | 8/50 (16.0)   | 4/19 (21.1)  | 2.66 (0.60-11.76)  | 2.40 (0.51-11.47)   |
| Only RUAI   | 10/50 (20.0)  | 9/19 (47.4)  | 4.8 (1.37-16.81)   | 4.53 (1.13-18.25)   |

Table 9. Continued

|   | <sup>1,2</sup> Seroconcordant status (N=84)<br>n/N (%) | <sup>1,2</sup> Serodiscordant status (N=106)<br>n/N (%) | Unadjusted OR (95% CI)<br>(Serodiscordant vs. Seroconcordant) | <sup>3</sup> Adjusted OR (95% CI)<br>(Serodiscordant vs. Seroconcordant) |
|---|--|---|---|--|
| <b>Other types of sexual activity</b>                 |  |   |   |  |
| <b>Insertive unsafe oral sex</b>                      |  |   | <b>p=0.01</b>   | <b>p=0.05</b>  |
| Yes   | 21/81 (25.9)   | 12/106 (11.3)   | 0.36 (0.16-0.79)  | 0.45 (0.20-1.02)   |
| <b>Receptive unsafe oral sex</b>                      |  |   | <b>p=0.92</b>   | -  |
| Yes   | 25/81 (30.9)   | 32/106 (30.2)   | 0.97 (0.51-1.81)  | -  |
| <b>Insertive fisting</b>                              |  |   | <b>p=0.57</b>   | -  |
| Yes   | 8/81 (9.9)   | 8/106 (7.6)   | 0.74 (0.27-2.08)  | -  |
| <b>Receptive fisting</b>                              |  |   | <b>p=0.18</b>   | -  |
| Yes   | 9/81 (11.1)  | 6/106 (5.7)   | 0.48 (0.16-1.41)  | -  |
| <b>Participated in group sex with primary partner</b> |  |   | <b>p=0.02</b>   | <b>p=0.03</b>  |
| Yes   | 24/81 (29.6)   | 17/106 (16.0)   | 0.45 (0.21-0.92)  | 0.46 (0.22-0.95)   |
| <b>Primary partner has other sex partners</b>         |  |   | <b>p=0.03</b>   | <b>p=0.01</b>  |
| Yes   | 43/80 (53.8)   | 40/106 (37.7)   | 0.52 (0.28-0.94)  | 0.45 (0.24-0.84)   |
| <b>Had new sex partners</b>                           |  |   | <b>p=0.06</b>   | <b>p=0.86</b>  |
| Yes   | 47/81 (58.0)   | 62/106 (58.5)   | 0.33 (0.10-1.08)  | 0.94 (0.52-1.74)   |
| <b><sup>5</sup>Had UAI with new partners</b>          |  |   | <b>p=0.12</b>   | <b>p=0.22</b>  |
| Yes   | 29/47 (61.7)   | 29/62 (46.8)  | 0.54 (0.25-1.18)  | 0.60 (0.27-1.35)   |

<sup>1</sup>Base varies due to item non-response  
<sup>2</sup>Includes only men who reported were diagnosed with HIV more than a year ago and were in partnership for at least six months  
<sup>3</sup>Adjusted for time since HIV diagnosis, duration of partnership and employment status  
<sup>4</sup>Includes only men who engaged in UAI  
-No adjusted analysis was conducted because the univariate association between the dependent variable and independent variable was not significant (p<0.2)  
<sup>5</sup>Includes only men who had new sex partners

With regards to receptive AI, men who had a serodiscordant primary partner were less likely to engage in receptive AI (38.1%) compared to men who had a seroconcordant primary partner (61.3%) (OR: 0.39, 95% CI: 0.21-0.71, p=0.002) and (AOR: 0.43, 95% CI: 0.22-0.83; p=0.01). However, among men who engaged in UAI with their primary partner, there was no significant difference by primary

partner's HIV status and the practice of RUAI (OR: 0.71, 95% CI: 0.18-2.72;  $p=0.62$ ). Neither was there any difference by primary partner's HIV status and engagement in RUAI with withdrawal prior to ejaculation (OR: 0.67, 95% CI: 0.23-1.95;  $p=0.46$ ). Eight men who practised RUAI with withdrawal prior to ejaculation with their serodiscordant primary partner reported 48 episodes (median=5, IQR: 1-15). Thirteen men in a serodiscordant partnership who engaged in RUAI with ejaculation reported 230 episodes (median=10; IQR: 1-80).

Overall, men with a serodiscordant primary partner were also less likely to engage in insertive AI (32.4%) compared to men with a seroconcordant primary partner (55%) (OR: 0.39, 95% CI: 0.21-0.71,  $p=0.002$ ) and (AOR: 0.41, 95% CI: 0.20-0.81;  $p=0.01$ ). Among men who engaged in insertive AI, those in a serodiscordant partnership were less likely to engage in IUAI (52.6%) compared to men in a seroconcordant partnership (80%) (OR: 0.28, 95% CI: 0.09-0.87,  $p=0.02$ ) and (AOR: 0.28, 95% CI: 0.08-1.02;  $p=0.05$ ). Seven men in a serodiscordant partnership who practised IUAI with withdrawal prior to ejaculation reported 136 episodes (median=10; IQR: 4-30). Four men in a serodiscordant partnership who engaged in IUAI with ejaculation reported 53 episodes.

Men in a seroconcordant partnership were more likely to engage in both RUAI and IUAI (64%) compared to those in a serodiscordant partnership (31.9%). The latter were more likely to engage *only* in RUAI (47.4%) compared to the former (20%) (OR: 4.8, 95% CI: 1.37-16.81;  $p=0.04$ ) and this difference remained after adjusted multivariate analysis, although the  $p$ -value was not significant (AOR: 4.53, 95% CI: 1.13-18.25;  $p=0.09$ ). A smaller proportion of men in a serodiscordant partnership engaged in insertive unsafe oral sex (11.3%) compared to those in a

seroconcordant partnership (25.9%) (OR: 0.36, 95% CI: 0.16-0.79,  $p=0.01$ ) and (AOR: 0.45, 95% CI: 0.20-1.02;  $p=0.05$ ). However, there was no difference by primary partner's HIV status and engagement in receptive unsafe oral sex (OR: 0.97, 95% CI: 0.51-1.81,  $p=0.92$ ). Similarly, there was no difference in the practice of insertive fisting (OR: 0.74, 95% CI: 0.27-2.08,  $p=0.57$ ) or receptive fisting (OR: 0.48, 95% CI: 0.16-1.41,  $p=0.18$ ). Men in a serodiscordant partnership were less likely to engage in group sex along with their primary partner (16%) compared to men in a seroconcordant partnership (29.6%) (OR: 0.45, 95% CI: 0.21-0.92,  $p=0.02$ ) and (AOR: 0.46, 95% CI: 0.22-0.95;  $p=0.03$ ). Men who had a serodiscordant primary partner were also less likely to report that their primary partner has other sexual partners (37.7%) compared to men who had a seroconcordant partner (53.8%) (OR: 0.52, 95% CI: 0.28-0.94,  $p=0.03$ ) and this difference remained after adjusted analysis (OR: 0.45; 95% CI: 0.24-0.84;  $p=0.01$ ). There was no difference by primary partner's HIV status and reporting of new sex partners or engagement in UAI with new partners.

#### **3.3.6.4 *Serodiscordant primary partner and type of UAI***

Hypothesis 2: Men who have a serodiscordant primary partner are more likely to engage in strategic positioning (i.e., RUAI compared to IUAI).

The hypothesis that men who have a serodiscordant primary partner are more likely to practise RUAI ( $n=15/104$ ; 14.4%) compared to IUAI ( $n=10/104$ ; 9.6%) was not supported in this data (McNemar  $\chi^2$ : 1.92;  $p=0.17$ ).

#### **3.3.6.5 *Serodiscordant primary partner and type of unsafe oral sex***

Hypothesis 3: Men who have a serodiscordant primary partner are more likely to engage in receptive unsafe oral sex compared to insertive unsafe oral sex.

This hypothesis was supported as men with a serodiscordant primary partner were more likely to engage in receptive unsafe oral sex (n=32/106; 30.2%) compared to insertive unsafe oral sex (n=12/106; 11.3%) (McNemar  $\chi^2$ : 13.3; p=0.003).

In the following sections, I examine the association between risky sexual behaviour among men who had a serodiscordant primary partner and attitudes towards HIV transmission risk reduction strategies.

### ***3.3.6.6 Association between attitudes towards reduced risk of HIV transmission due to undetectable viral load status and risky sexual behaviour with a serodiscordant primary partner***

Hypothesis 7: Men who believe that undetectable viral load reduces the risk of HIV transmission during UAI are more likely to engage in UAI compared to men who do not.

As described in section 2.5.14.3, the outcome variable for this analysis was ‘UAI with a serodiscordant primary partner (versus no UAI with a serodiscordant primary partner)’. 105 men, who had a serodiscordant primary partner, were diagnosed with HIV more than a year ago, and the duration of their relationship with the primary partner was at least six months were included in this analysis. As reported previously in Table 9, of these 105 men who had a serodiscordant primary partner, 19 (18.3%) men engaged in UAI.

As shown in Table 10, there was no univariate association between UAI with a serodiscordant primary partner and attitudes towards reduced risk of HIV transmission during UAI due to undetectable viral load status (OR: 2.97; 95% CI: 0.93-9.48, p=0.06). Self-reported viral load status, age, time since HIV diagnosis, and disclosure of HIV status to a primary partner were also not associated with the outcome variable of interest.



**Table 10. Association between attitudes towards reduced risk of HIV transmission due to undetectable viral load and UAI with a serodiscordant primary partner (N=104)**

| Factors  | Factor distribution in sample | Had UAI (versus no UAI) | UAI no | Had UAI (versus no UAI) Unadjusted OR | Had UAI (versus no UAI) Adjusted OR |
|--|-------------------------------|-------------------------|--------|---------------------------------------|-------------------------------------|
|  | <sup>1,2</sup> n/N (%)        | n (%)                   |        | p-value (95% CI)                      | p-value (95% CI)                    |
| <b>Undetectable viral load in my blood means that HIV is unlikely to be passed on to a sexual partner even if we have unprotected anal sex</b> |                               |                         |        | <b>p=0.06</b>                         | <b>p=0.01</b>                       |
| Disagree/strongly disagree/unsure  | 84/103 (83.2)                 | 13 (15.5)               |        | 1                                     | 1                                   |
| Agree/strongly agree   | 17/103 (16.8)                 | 6 (35.3)                |        | 2.97 (0.93-9.48)                      | 6.90 (1.51-31.36)                   |
| <b>Age</b>   |                               |                         |        | <b>p=0.49</b>                         | <b>p=0.20</b>                       |
| <=34   | 10/101 (9.9)                  | 3 (30.0)                |        | 1                                     | 1                                   |
| 35-44  | 42/101 (41.6)                 | 6 (14.3)                |        | 0.38 (0.07-1.93)                      | 0.39 (0.06-2.41)                    |
| >=45   | 49/101 (48.5)                 | 10 (20.4)               |        | 0.59 (0.13-2.73)                      | 1.52 (0.25-9.21)                    |
| <b>Duration of partnership (years)</b>   |                               |                         |        | <b>p=0.003</b>                        | <b>p=0.002</b>                      |
| Median (IQR)   | 9/104 (2-14)                  | 2 (1-5)                 |        | 0.84 (0.76-0.95)                      | 0.81 (0.71-0.92)                    |
| <b>Time since HIV diagnosis</b>  |                               |                         |        | <b>p=0.98</b>                         | -                                   |
| Median (IQR) years   | 11/105 (8-16)                 | 12 (8-19)               |        | 1.04 (0.95-1.13)                      | -                                   |
| <b>Disclosed HIV status</b>  |                               |                         |        | <b>p=0.16</b>                         | <b>p=0.49</b>                       |
| No   | 8/103 (7.8)                   | 3 (37.5)                |        | 1                                     | 1                                   |
| Yes  | 95/103 (92.2)                 | 16 (16.8)               |        | 0.34 (0.07-1.55)                      | 0.47 (0.05-3.91)                    |
| <b>Recreational drug use during sex</b>  |                               |                         |        | <b>p=0.05</b>                         | <b>p=0.02</b>                       |
| No   | 83 (79.8)                     | 12 (14.5)               |        | 1                                     | 1                                   |
| Yes  | 21 (20.2)                     | 7 (33.3)                |        | 2.95 (0.99-8.84)                      | 4.84 (1.18-19.84)                   |
| <b>Self-reported viral load status</b>   |                               |                         |        | <b>p=0.35</b>                         | -                                   |
| Detectable   | 12/104 (11.7)                 | 1 (8.3)                 |        | 1                                     | -                                   |
| Undetectable   | 91/104 (88.4)                 | 18 (17.5)               |        | 2.71 (0.32-22.39)                     | -                                   |
| <b><sup>3</sup>On cART</b>   |                               |                         |        | -                                     | -                                   |
| No   | 6/104 (5.8)                   | 0 (0.0)                 |        | -                                     | -                                   |
| Yes  | 98/104 (94.2)                 | 19 (18.3)               |        | -                                     | -                                   |

<sup>1</sup>Includes only men who had a serodiscordant primary partner

<sup>2</sup>Base varies due to item non-response

<sup>3</sup>No OR was calculated due to zero cases in a category.

However, duration of partnership and recreational drug use during sex were associated with UAI with a serodiscordant primary partner. Every year increase in the duration of partnership with a serodiscordant primary partner was associated with a reduced risk of UAI (OR: 0.84; 95% CI: 0.76-0.95; p=0.003). Men who

used recreational drugs during sex with a serodiscordant primary partner were more likely to engage in UAI compared to men who did not use recreational drugs during sex (OR: 2.95; 95% CI: 0.99-8.84;  $p=0.05$ ), although the 95% CI includes the null value.

In the multivariate analysis, after adjusting for factors associated with the outcome variable of interest ( $p<0.2$ ), men who agreed that undetectable viral load reduces the risk of HIV transmission during UAI were more likely to engage in UAI with a serodiscordant primary partner compared to men who did not (AOR: 6.90; 95% CI: 1.52-31.37;  $p=0.01$ ), however the 95% CI is wide. Men who had a shorter duration of partnership were also more likely to engage in UAI with a serodiscordant primary partner compared to men who had a longer duration of partnership (AOR: 0.81; 95% CI: 0.71-0.92;  $p=0.002$ ). Men who used recreational drugs during sex were more likely to engage in UAI with a serodiscordant primary partner compared to men who did not (AOR: 4.84; 95% CI: 1.18-19.84;  $p=0.02$ ).

It was not possible to check for interaction between beliefs about reduced infectivity during UAI due to undetectable viral load status and self-reported perceived viral load status due to the small number of men with a detectable viral load who had engaged in UAI with a serodiscordant primary partner, i.e., one. Thus the lack of association between self-reported viral load status and UAI should be interpreted with caution.

In the following section I present the results of the analysis for hypothesis 8 to 10 specified earlier in section 2.5.14.3.

**3.3.6.7 Association between attitudes towards reduced risk of HIV transmission due to strategic positioning and RUAI with a serodiscordant primary partner**

Hypothesis 8: Men who believe that strategic positioning reduces the risk of HIV transmission are more likely to engage in RUAI than men who do not.

As reported in Table 9, 15 (14.4%) men had engaged in RUAI with a serodiscordant primary partner. As shown in Table 11, there was no univariate association between beliefs related to reduced risk of HIV transmission due to strategic positioning during UAI and engagement in RUAI with a serodiscordant primary partner (OR: 3.54; 95% CI: 0.91-13.76; p=0.06). However, in univariate analysis shorter duration of partnership with a primary partner, and agreeing that there is a reduced risk of HIV transmission during UAI due to undetectable viral load status were independently associated with RUAI with a serodiscordant primary partner.

In the multivariate analysis, as shown in Table 11, there continued to be no association between attitudes towards reduced risk of HIV transmission due to strategic positioning and engagement in RUAI with a serodiscordant primary partner (AOR: 2.18; 95% CI: 0.43-11.11; p=0.34). However, duration of partnership, and attitudes towards reduced risk of HIV transmission due to undetectable viral load status continued to be independently associated with RUAI with a serodiscordant primary partner. Men who had a longer duration of partnership were less likely to engage in RUAI with a serodiscordant primary partner compared to men who had a shorter duration of partnership (AOR: 0.86; 95% CI: 0.76-0.98; p=0.02). Men who believed that the risk of HIV transmission is reduced during UAI due to undetectable viral load status were also more likely

to engage in RUAI with a serodiscordant primary partner compared to men who did not (AOR: 5.35; 95% CI: 1.29-22.10;  $p=0.02$ ).

**Table 11. Association between beliefs about risk reduction strategies and risky sexual behaviours among men with a serodiscordant status primary partner (N=104)**

| Risk reduction strategy of interest  | Factor                    | Outcome variables of interest  | Unadjusted OR       | Adjusted OR         |
|--|---------------------------|--|---------------------|---------------------|
|  | distribution<br>in sample |  |                     |                     |
|  | <sup>1</sup> n/N (%)      | n (%)  | p-value<br>(95% CI) | p-value<br>(95% CI) |
| <b><sup>2</sup> HIV is unlikely to be transmitted if a HIV negative person has insertive anal intercourse (he is doing the fucking) without a condom with a HIV positive partner</b> |                           | <b>RUAI (versus no RUAI)</b>   | <b>p=0.06</b>       | <b>p=0.34</b>       |
| Disagree/strongly disagree/unsure  | 89/101 (88.1)             | 11 (12.4)  | 1                   | 1                   |
| Agree/strongly agree   | 12/101 (11.9)             | 4 (33.3)   | 3.54 (0.91-13.76)   | 2.18 (0.43-11.11)   |
| <b><sup>3</sup> During anal sex withdrawing before ejaculation (cumming) can reduce the risk of passing on HIV to sexual partner(s)</b>  |                           | <b>IUAI with withdrawal prior to ejaculation (versus no IUAI with withdrawal prior to ejaculation)</b> | <b>p=0.01</b>       | -                   |
| Disagree/strongly disagree/unsure  | 62/102 (60.8)             | 1 (1.6)  | 1                   | -                   |
| Agree/strongly agree   | 40/102 (39.2)             | 6 (15.0)   | 10.8 (1.24-93.2)    | -                   |
| <b>During anal sex withdrawing before ejaculation (cumming) can reduce the risk of passing on HIV to sexual partner(s)</b>   |                           | <b>RUAI with withdrawal prior to ejaculation (versus no RUAI with withdrawal prior to ejaculation)</b> | <b>p=0.92</b>       | -                   |
| Disagree/strongly disagree/unsure  | 62/102 (60.8)             | 5 (8.1)  | 1                   | -                   |
| Agree/strongly agree   | 40/102 (39.2)             | 3 (7.5)  | 0.92 (0.21-4.10)    | -                   |

**Table 11. Continued**

| Risk reduction strategy of interest  | Factor distribution in sample | Outcome variables of interest  | Unadjusted OR     | Adjusted OR      |
|--|-------------------------------|--|-------------------|------------------|
|  | <sup>1</sup> n/N (%)          | n (%)  | p-value (95% CI)  | p-value (95% CI) |
| <b><sup>4</sup>HIV is unlikely to be transmitted if HIV positive sexual partner ejaculates inside the mouth of a HIV negative sexual partner during oral sex</b> |                               | <b>Insertive unsafe oral sex (versus no insertive unsafe oral sex)</b> | <b>p=0.02</b>     | <b>-</b>         |
| Disagree/strongly disagree/unsure  | 74/103 (71.8)                 | 5 (6.8)  | 1                 | -                |
| Agree/strongly agree   | 29/103 (28.2)                 | 7 (24.1)   | 4.39 (1.26-15.23) | -                |

<sup>1</sup>N varies due to item non-response

<sup>2</sup>Adjusted for duration of partnership, attitudes towards reduced risk of HIV transmission during UAI due to undetectable viral load, and recreational drug use during sex

<sup>3</sup>Multivariate analysis was not conducted due to the small number of cases

<sup>4</sup>Multivariate analysis was not conducted because the outcome variable of interest was not associated with any socio-demographic, HIV-related or partnership related factors.

**3.3.6.8 Association between attitudes towards withdrawal prior to ejaculation during UAI and UAI with a serodiscordant primary partner**

Hypothesis 9: Men who believe that withdrawal prior to ejaculation during UAI reduces the risk of HIV transmission are more likely to engage in IUAI/RUAI with withdrawal prior to ejaculation compared to men who do not.

As reported previously in Table 9, 7 (6.7%) men had engaged in IUAI with withdrawal prior to ejaculation, and 8 (7.6%) men had engaged in RUAI with withdrawal prior to ejaculation with a serodiscordant primary partner. In univariate analysis, both, engagement in IUAI with withdrawal prior to ejaculation during UAI and RUAI with withdrawal prior to ejaculation during UAI were associated with shorter duration of partnership and recreational drug use during sex.

As shown in Table 11, men who believed that withdrawal before ejaculation during UAI reduces the risk of HIV transmission were more likely to engage in IUAI with withdrawal before ejaculation than men who do not (OR: 10.8; 95% CI: 1.24-93.2;  $p=0.01$ ). However, it was not possible to conduct a multivariate analysis adjusting for duration of partnership and recreational drug use due to the small number of cases, i.e., only one man who did not believe that withdrawal before ejaculation during UAI reduces the risk of HIV transmission engaged in IUAI with withdrawal prior to ejaculation.

There was no association between beliefs about reduced risk of HIV transmission due to withdrawal prior to ejaculation and engagement in RUAI with withdrawal before ejaculation (OR: 0.92; 95% CI: 0.21-4.10;  $p=0.92$ ).

**3.3.6.9 Association between attitudes that there is no risk of HIV transmission due to unsafe insertive oral sex and engagement in unsafe insertive oral sex with a serodiscordant primary partner**

Hypothesis 10: Men who believe that HIV is unlikely to be transmitted during unsafe insertive oral sex are more likely to engage in this behaviour compared to men who do not.

As reported previously in Table 9, 12 (11.3%) men engaged in unsafe insertive oral sex with a serodiscordant primary partner. As shown in Table 11, men who believed that HIV is unlikely to be transmitted during insertive unsafe oral sex were more likely to practise it compared to those who did not (OR: 4.39; 95% CI: 1.26-15.23;  $p=0.02$ ). In the univariate analysis, the outcome variable of interest was not associated with any socio-demographic, HIV related health or partnership related factors, thus adjusted analysis was not conducted.

In the following section, I describe the sexual behaviour of the participants with their most recent non-primary partner in the last year.

**3.3.7 Sexual behaviour with a most recent non-primary sex partner**

As mentioned previously in 2.5.11.5, if the ‘most recent’ of the three recent sex partners of the participant was not their primary partner but was either a regular, casual, or other type of sex partner, then this partnership was defined as ‘most recent non-primary partnership’. Of the 380 men who were diagnosed with HIV more than a year ago, 198 (52%) men reported that their most recent sex partner was a non-primary partner.



### **3.3.7.1 *Type of partnership, HIV status and type of sex with the most recent non-primary partner***

Data on HIV status of the most recent non-primary partner was available for 188 of the 198 men whose most recent sex partner was a non-primary partner. Of these 188 men, a significant proportion of them were of unknown HIV status (61.7%), 10.6% were HIV negative partner and 27.7% were HIV positive. Therefore, overall 72.3% of men had a serodiscordant most-recent non-primary partner. The majority of men (42.8%) reported that their most recent non-primary partner was a regular partner. 29.9% of men reported that their recent non-primary partner was a known casual partner and 27.3% of men's most recent non-primary partner was an anonymous casual partner.

As shown in Table 12, among men whose most recent non-primary partner was a regular partner, 36.2% of men reported that he was HIV positive, 16.3% of men reported him to be HIV negative and 47.5% of men did not know his HIV status. A high proportion of men did not know the HIV status of their most recent non-primary partner if he was an anonymous casual partner (90.2%) compared to if he was a regular (47.5%) or a known casual partner (57.1%). Similarly, men whose most recent non-primary partner was an anonymous casual partner were less likely to report that he was HIV negative (2.0%) compared to men whose most recent partner was a regular partner (16.3%) or a known casual partner (10.7%).

**Table 12. Type of partnership and HIV status of the most recent non-primary partner (N=187)**

| <b>Factors</b>         | <b>HIV positive<br/>(n=51)</b> | <b>HIV<br/>negative<br/>(n=20)</b> | <b>Unknown<br/>HIV<br/>status<br/>(n=116)</b> | <b>p-value</b> |
|------------------------|--------------------------------|------------------------------------|---|----------------|
| <b>Type of partner</b> |                                |                                    |   | p<0.001        |
| Regular                | 29 (36.2)                      | 13 (16.3)                          | 38 (45.5)                                     |                |
| Known casual           | 18 (32.1)                      | 6 (10.7)                           | 32 (57.1)                                     |                |
| Anonymous casual       | 4 (7.8)                        | 1 (2.0)                            | 46 (90.2)                                     |                |

Of the 198 men, 67% of men had engaged in one-to-one sex, whereas 33% of men had engaged in sex with their most recent non-primary partner in a group sex context. As shown in Table 13, men who had engaged in group sex were more likely to report that their ‘main’ group sex non-primary partner was HIV positive (40.0%) compared to men who engaged in one-to-one sex (22.6%). Men who had engaged in one-to-one sex were more likely to report that their most recent non-primary partner was HIV negative (12.8%) compared to men who had engaged in group sex (5.5%). 64.7% of men had one-to-one sex with an unknown HIV status non-primary partner, whereas 54.6% of men reported that their main group sex non-primary partner was of unknown HIV status.

As shown in Table 13, there were also differences in the type of partnership among men who had one-to-one sex and those who had engaged in group sex. The majority of men who had had one-to-one sex with their most recent non-primary partner reported that he was a regular partner (46.6%); whereas 33.3% of men who had engaged in group sex reported that he was a regular partner. Men who had engaged in group sex were more likely to report that their main group sex partner was an anonymous casual partner (40.7%) compared to men who engaged in one-to-one sex (21.8%). Similarly men who engaged in one-to-one sex were more

likely to report that their partner was a known casual partner (31.6%) compared to men who had engaged in group sex (25.9%).

**Table 13. HIV status and type of partnership by nature of sexual activity with the most recent non-primary partner (N=187)**

| <b>Factors</b>         | <b>One-to-one sex (N=133)<br/>n (%)</b> | <b>Group sex (N=54)<br/>n (%)</b> | <b>p-value</b> |
|------------------------|---|-----------------------------------|----------------|
| <b>HIV status</b>      |   |                                   | 0.03           |
| HIV positive           | 30 (22.6)                               | 22 (40.0)                         |                |
| HIV negative           | 17 (12.8)                               | 3 (5.5)                           |                |
| HIV unknown/untested   | 86 (64.7)                               | 30 (54.6)                         |                |
| <b>Type of partner</b> |   |                                   | 0.03           |
| Regular                | 62 (46.6)                               | 18 (33.3)                         |                |
| Known casual           | 42 (31.6)                               | 14 (25.9)                         |                |
| Anonymous casual       | 29 (21.8)                               | 22 (40.7)                         |                |

### 3.3.7.2 *Disclosure of HIV status to the most recent non-primary partner by type of sex*

Overall, 44.7% of men had themselves directly disclosed their HIV status to their most recent non-primary partner, 8.4% of men had assumed that their partner knew their HIV status and a further 46.9% of men considered it unimportant to disclose their HIV status to their partner. As shown in Table 14, men were more likely to have themselves directly disclosed their HIV status to a regular partner with whom they had engaged in one-to-one sex (62.7%) compared to a known casual partner (47.6%) or an anonymous partner (7.4%). A high proportion of men considered it unimportant to disclose their HIV status to an anonymous casual partner (85.2%) compared to a regular partner (30.5%) and a known casual partner (47.6%). Irrespective of the partnership type, approximately 5-7% of men assumed that their most recent non-primary partner knew their HIV status.

Table 14 also shows that men were more likely to have directly disclosed their HIV status themselves to a regular group sex partner (64.7%) compared to a known casual (38.5%) or an anonymous (20.0%) group sex partner. Men were more likely to assume that a known casual group sex partner knew their HIV status (46.2%) compared to a regular group sex partner (5.9%). A high proportion of men felt that it is not important to disclose their HIV status to an anonymous group sex non-primary partner (80.0%) compared to a regular group sex partner (29.4%) and a known casual partner (15.4%).

**Table 14. Disclosure of HIV status to the most recent non-primary partner by type of sexual activity (N=178)**

| Disclosure of HIV status | One-to-one sex (N=128) |                                  |   |         | Group sex (N=50) |                                  |   |         |
|--------------------------|------------------------|----------------------------------|---|---------|------------------|----------------------------------|---|---------|
|                          | n (%)                  |                                  |   |         | n (%)            |                                  |   |         |
|                          | Told himself           | Assumed partner knows his status | Felt it is not important to disclose his status | p-value | Told himself     | Assumed partner knows his status | Felt it is not important to disclose his status | p-value |
| <b>Type of partner</b>   |                        |                                  |   | p<0.001 |                  |                                  |   | p<0.001 |
| Regular                  | 37 (62.7)              | 4 (6.8)                          | 18 (30.5)                                       |         | 11 (64.7)        | 1 (5.9)                          | 5 (29.4)  |         |
| Known casual             | 20 (47.6)              | 2 (4.8)                          | 20 (47.6)                                       |         | 5 (38.5)         | 6 (46.2)                         | 2 (15.4)  |         |
| Anonymous casual         | 2 (7.4)                | 2 (7.4)                          | 23 (85.2)                                       |         | 4 (20.0)         | 0                                | 16 (80.0)                                       |         |

### 3.3.7.3 *Venue of meeting the most recent non-primary partner*

As shown in Table 15, men had met their most recent non-primary partner in various venues. Overall, the majority of men had met their partner via the internet (34.8%) followed by a bar (15.7%) and a sauna (11.2%). Some men had met their most recent non-primary partner in a sex venues such as a sex on premises venue (7.3%), cruising ground (7.3%), or a leather club (1.1%). 6.7% of men had met their partner through friends. Some men reported that they met him outside London (5.1%).

**Table 15. Venue of meeting the most recent non-primary partner**

| Venue                 | <sup>1</sup> Overall<br>(N=183)<br>n (%) | One-to-one<br>partner<br>(N=126)<br>n (%) | Group sex<br>partner<br>(N=54)<br>n (%) |
|-----------------------|--|---|---|
| Internet              | 62 (34.8)                                | 48 (39.7)                                 | 13 (24.1)                               |
| Bar                   | 28 (15.7)                                | 23 (19.0)                                 | 4 (7.4)                                 |
| Backroom              | 3 (1.7)                                  | 1 (0.8)                                   | 2 (3.7)                                 |
| Toilet                | 4 (2.3)                                  | 2 (1.7)                                   | 2 (3.7)                                 |
| College               | 2 (1.1)                                  | 2 (1.7)                                   | 0 (0.0)                                 |
| Sauna                 | 20 (11.2)                                | 10 (8.3)                                  | 10 (18.5)                               |
| Private party         | 6 (3.4)                                  | 2 (1.7)                                   | 4 (7.4)                                 |
| Gymnasium             | 1 (0.6)                                  | 0 (0.0)                                   | 1 (1.9)                                 |
| Telechat              | 3 (1.7)                                  | 1 (0.8)                                   | 1 (1.9)                                 |
| Sex on premises venue | 13 (7.3)                                 | 5 (4.1)                                   | 8 (14.8)                                |
| Cruising ground       | 13 (7.3)                                 | 8 (6.6)                                   | 5 (9.3)                                 |
| Leather club          | 2 (1.1)                                  | 1 (0.8)                                   | 1 (1.9)                                 |
| Through friend        | 12 (6.7)                                 | 11 (9.1)                                  | 1 (1.9)                                 |
| Outside London        | 9 (5.1)                                  | 7 (5.8)                                   | 2 (3.7)                                 |
| Known partners        | 5 (2.8)                                  | 5 (3.4)                                   | 0 (0.0)                                 |

<sup>1</sup>Data missing for 15 participants

The majority of men who had engaged in one-to-one or group sex had met their partner via the internet, 39.7% and 24% respectively. However, a high proportion of men had met their group sex partner in a sauna (18.5%) or a sex on premise

venue (14.8%) whereas 8.3% and 4.1% of men respectively who had one-to-one sex had met their partner in these venues.

### 3.3.7.4 *Sexual behaviour with the most recent non-primary partner: overall and by type of sexual activity*

As indicated in Table 16, overall 25.3% of men had engaged in UAI with their most recent non-primary partner. Approximately 14% of men had engaged in RUAI.

**Table 16. Sexual behaviour with the most recent non-primary partner: overall and by type of sexual activity**

| Type of sexual behaviour                                      | Overall    | One-to-one partner | Group sex partner | p-value (one-to-one versus group sex) |
|---|------------|--------------------|-------------------|---------------------------------------|
|   | (N=194)    | (N=130)            | (N=64)            |                                       |
|   | n (%)      | n (%)              | n (%)             |                                       |
| <b>UAI</b>  | 49 (25.3)  | 29 (22.3)          | 20 (31.3)         | p=0.21                                |
| <b>RUAI (with or without withdrawal prior to ejaculation)</b> | 28 (14.4)  | 14 (10.8)          | 14 (21.9)         | p=0.05                                |
| <b>RUAI only with withdrawal prior to ejaculation</b>         | 10 (5.2)   | 7 (5.4)            | 3 (4.7)           | p=1.00                                |
| <b>IUAI (with or without withdrawal prior to ejaculation)</b> | 34 (17.5)  | 21 (16.2)          | 13 (20.3)         | p=0.54                                |
| <b>IUAI only with withdrawal prior to ejaculation</b>         | 14 (7.2)   | 10 (7.7)           | 4 (6.3)           | p=1.00                                |
| <b>Fisting</b>  | 13 (6.7)   | 6 (4.6)            | 7 (10.9)          | p=0.09                                |
| <b>Unsafe insertive oral sex</b>                              | 9 (4.6)    | 6 (4.6)            | 3 (4.7)           | p=1.00                                |
| <b>Unsafe receptive oral sex</b>                              | 26 (13.4)  | 20 (15.4)          | 6 (9.4)           | p=0.27                                |
| <b>Recreational drug use during sex</b>                       | 103 (55.9) | 70 (53.9)          | 33 (61.1)         | p=0.41                                |

5.2% of men had engaged only in RUAI with withdrawal prior to ejaculation. 17.5% of men who engaged in IUAI and 7.2% of men had engaged only in IUAI with withdrawal prior to ejaculation 6.7% of men had engaged in fisting. As shown in Table 16, men were more likely to have engaged in unsafe receptive oral sex (13.4%) compared to unsafe insertive oral sex (4.6%). Recreational drug use during sex was high (55.9%).

Univariate analysis showed that there were no significant differences in the engagement in risky behaviours by type of sexual activity (one-to-one or group sex), except men who had engaged in group sex were more likely to have engaged in RUAI compared to men who had one-to-one sex (21.9% vs. 10.8%;  $p=0.05$ ).

In the following sub-section, I examine the association between sexual behaviour and HIV status of the most recent non-primary partner.

#### ***3.3.7.5 Association between the most recent non-primary partner's HIV status and sexual behaviour***

Hypothesis 4: HIV positive MSM whose most recent non-primary partner was of serodiscordant status were less likely to have engaged in sexual behaviours that increase the risk of HIV transmission compared to men who had a seroconcordant status most recent non-primary partner.

Table 17 describes the association between the potential confounding factors described in section 2.5.14.2 and HIV status of the most recent non-primary partner. There were no significant differences in the age, cART status, viral load status, whether met partner via the internet, recreational drug use during sex, and beliefs about reduced risk of HIV transmission due to engagement in strategic positioning, unsafe insertive oral sex, practising withdrawal prior to ejaculation during UAI and the HIV status of the most recent non-primary partner.



**Table 17. Socio-demographic, HIV related factors and attitudes towards HIV transmission risk reduction strategies by HIV status of the most recent non-primary partner (N=187)**

| Characteristics  | Seroconcordant<br>(n=51) | Serodiscordant<br>(n=136) | Unadjusted OR<br>(95% CI)<br>(Serodiscordant<br>vs.<br>Seroconcordant) |
|--|--------------------------|---------------------------|--|
|  | n (%)                    | n (%)                     |  |
| <b>Age</b>   |                          |                           | <b>p=0.65</b>  |
| <=34   | 7 (13.7)                 | 13 (9.7)                  | 1  |
| 35-44  | 23 (45.1)                | 58 (43.3)                 | 1.35 (0.48-3.83)   |
| >44  | 21 (41.2)                | 63 (47.0)                 | 1.61 (0.56-4.58)   |
| <b>cART status</b>   |                          |                           | <b>p=0.10</b>  |
| Not receiving cART   | 13 (25.0)                | 20 (14.7)                 | 1  |
| Receiving cART   | 39 (75.0)                | 116 (85.3)                | 1.93 (0.88-4.25)   |
| <b>Self-reported recent viral load status</b>  |                          |                           | <b>p=0.32</b>  |
| Detectable   | 12 (24.5)                | 23 (17.8)                 | 1  |
| Undetectable   | 37 (75.5)                | 106 (82.2)                | 1.49 (0.67-3.29)   |
| <b>Recreational drug use during sex</b>  |                          |                           | <b>p=0.07</b>  |
| Yes  | 34 (66.7)                | 71 (52.2)                 | 0.54 (0.27-1.07)   |
| <b>Undetectable viral load in my blood means that HIV is unlikely to be passed on to a sexual partner even if we have unprotected anal sex</b>       |                          |                           | <b>p=0.02</b>  |
| Agree/strongly agree   | 16 (31.4)                | 20 (15.0)                 | 0.39 (0.18-0.84)   |
| <b>HIV is unlikely to be transmitted if a HIV negative person has insertive anal intercourse without a condom with a HIV positive partner</b>        |                          |                           | <b>p=0.96</b>  |
| Agree/strongly agree   | 8 (15.7)                 | 21 (15.7)                 | 1.02 (0.42-2.48)   |
| <b>During anal sex withdrawing (pulling out) before ejaculation can reduce the risk of passing on HIV to sexual partner(s)</b>                       |                          |                           | <b>p=0.89</b>  |
| Agree/strongly agree   | 21 (42.0)                | 56 (42.1)                 | 0.95 (0.49-1.84)   |
| <b>HIV is unlikely to be transmitted if HIV positive sexual partner ejaculates inside the mouth of a HIV negative sexual partner during oral sex</b> |                          |                           | <b>p=0.78</b>  |
| Agree/strongly agree   | 16 (32.0)                | 39 (29.3)                 | 0.90 (0.45-1.82)   |
| <b>Met partner via internet</b>  |                          |                           | <b>p=0.18</b>  |
| Yes  | 21 (40.4)                | 41 (30.2)                 | 0.63 (0.32-1.23)   |

However, men whose the most recent non-primary was of serodiscordant status were less likely to believe that having an undetectable viral load reduces the risk of HIV transmission during UAI compared to men who had a seroconcordant most recent non-primary partner.

As shown in Table 18, men with the most recent serodiscordant non-primary partner were less likely to have engaged in UAI (16.9%) compared to men who had a seroconcordant non-primary partner (54.9%) (OR: 0.16, 95% CI: 0.08-0.32;  $p < 0.001$ ) and this difference remained after adjusted multivariate analysis (AOR: 0.21; 95% CI: 0.10-0.45). Similarly men with a serodiscordant non-primary partner were also less likely to have engaged in IUAI (9.6%) compared to men whose non-primary partner was of a seroconcordant status (43.1%) (OR: 0.14; 95% CI: 0.07-0.31;  $p < 0.001$ ) and (AOR: 0.17; 95% CI: 0.07-0.40;  $p = 0.002$ ). However, there was no significant difference in the practice of IUAI with withdrawal prior to ejaculation and HIV status of the most recent non-primary partner (OR: 0.66; 95% CI: 0.21-2.09;  $p = 0.48$ ).

Men with a serodiscordant status non-primary partner were less likely to have engaged in RUAI (9.6%) compared to men whose non-primary partner was of a seroconcordant status (31.4%) (OR: 0.21; 95% CI: 0.09-0.49;  $p < 0.001$ ) and (AOR: 0.24; 95% CI: 0.10-0.59;  $p = 0.002$ ). However, there was no significant difference in the practice of RUAI with withdrawal prior to ejaculation and HIV status of the most recent non-primary partner (OR: 0.51; 95% CI: 0.15-1.68;  $p = 0.27$ ). Men who had a serodiscordant non-primary partner were less likely to have engaged in insertive unsafe oral sex (1.5%) compared to those who had a seroconcordant non-primary partner (13.7%) (OR: 0.09; 95% CI: 0.02-0.48;  $p = 0.004$ ) and (AOR: 0.11; 95% CI: 0.02-0.59;  $p = 0.01$ ). However, there was no significant difference in the

practice of fisting or receptive unsafe oral sex by HIV status of the non-primary partner.

**Table 18. Sexual behaviour with the most recent non-primary partner by partner's HIV status (N=187)**

|  | Seroconcordant<br>(n=51) | Serodiscordant<br>(n=136) | Unadjusted OR<br>(95% CI)<br>(Serodiscordant<br>vs.<br>Seroconcordant) | <sup>1</sup> Adjusted OR<br>(95% CI)<br>(Serodiscordant<br>vs.<br>Seroconcordant) |
|--|--------------------------|---------------------------|--|---|
|  | n (%)                    | n (%)                     |  |   |
| <b>UAI</b>   |                          |                           | <b>p&lt;0.001</b>  | <b>p&lt;0.001</b>   |
| Yes  | 28 (54.9)                | 23 (16.9)                 | 0.16 (0.08-0.32)   | 0.21 (0.10-0.45)  |
| <b>Insertive UAI</b>                                     |                          |                           | <b>p&lt;0.001</b>  | <b>p=0.002</b>  |
| Yes  | 22 (43.1)                | 13 (9.6)                  | 0.14 (0.05-0.31)   | 0.17 (0.07-0.40)  |
| <b>IUAI with<br/>withdrawal prior to<br/>ejaculation</b> |                          |                           | <b>p=0.48</b>  | -   |
| Yes  | 5 (9.8)                  | 9 (6.6)                   | 0.66 (0.21-2.09)   | -   |
| <b>RUAI</b>  |                          |                           | <b>p&lt;0.001</b>  | <b>p&lt;0.001</b>   |
| Yes  | 16 (31.4)                | 13 (9.6)                  | 0.21 (0.09-0.49)   | 0.24 (0.10-0.59)  |
| <b>RUAI with<br/>withdrawal prior to<br/>ejaculation</b> |                          |                           | <b>p=0.27</b>  | -   |
| Yes  | 4 (7.8)                  | 7 (5.2)                   | 0.51 (0.15-1.68)   | -   |
| <b>Insertive unsafe oral<br/>sex</b>                     |                          |                           | <b>p=0.004</b>   | <b>p=0.01</b>   |
| Yes  | 7 (13.7)                 | 2 (1.5)                   | 0.09 (0.02-0.48)   | 0.11 (0.02-0.59)  |
| <b>Receptive unsafe<br/>oral sex</b>                     |                          |                           | <b>p=0.39</b>  | -   |
| Yes  | 9 (17.7)                 | 17 (12.5)                 | 0.68 (0.28-1.64)   | -   |
| <b>Fisting</b>   |                          |                           | <b>p=0.37</b>  | -   |
| Yes  | 5 (9.8)                  | 8 (5.9)                   | 0.58 (0.18-1.88)   | -   |

<sup>1</sup>Adjusted for age, recreational drug use during sex, attitudes that HIV is unlikely to be transmitted during UAI due to undetectable viral load, and cART status

In the following section, I examine the association between type of sexual behaviour and having a serodiscordant status most recent non-primary partner.

### **3.3.7.6 *Serodiscordant most recent non-primary partner and type of UAI***

Hypothesis 5: Men who have a serodiscordant non-primary partner are more likely to engage in strategic positioning (i.e, RUAI compared to IUAI).

Of the 187 men who had a most recent non-primary partner, 136 (72.3%) men had a serodiscordant status partner. There was no evidence to support the hypothesis that men are more likely to have engaged in RUAI (9.6%) compared to IUAI (9.6%) with their most recent serodiscordant non-primary partner to reduce the risk of HIV transmission (McNemar  $\chi^2$ : 0.01; p=1.00).

### **3.3.7.7 *Serodiscordant most recent non-primary partner and type of unsafe oral sex***

Hypothesis 6: Men who have a serodiscordant non-primary partner are more likely to engage in receptive unsafe oral sex than insertive unsafe oral sex.

There was support for this hypothesis. Men with the most recent serodiscordant non-primary partner were more likely to have engaged in receptive unsafe oral sex (12.5%) compared to insertive unsafe oral sex (1.5%) (McNemar  $\chi^2$ : 11.84, p=0.0006).

In the following section, I examine the association between attitudes towards various HIV transmission risk reduction strategies and risky sexual behaviour with the most recent serodiscordant non-primary partner.

### **3.3.7.8 *Association between attitudes towards reduced risk of HIV transmission during UAI due to undetectable viral load status and risky sexual behaviour with the most recent serodiscordant non-primary partner***

In this sub-section, I examine hypothesis 7: Men who believe that undetectable viral load reduces the risk of HIV transmission are more likely to engage in UAI compared to men who do not.

Of the 136 men who had a serodiscordant most recent non-primary partner, as mentioned in Table 18, 23 men (16.9%) had engaged in UAI with their most recent serodiscordant non-primary partner. Of these 16.9% of men who had engaged in UAI, 7.4% of men did so with a regular partner, 5.9% of men with a known casual partner and 3.6% of men with an anonymous casual partner. There was no difference between type of sex partner and engagement in UAI with serodiscordant partner (Pearson's  $\chi^2=20.4$ ;  $p=0.36$ ).

As shown in Table 19, there was no univariate association between UAI with the most recent serodiscordant non-primary partner and beliefs about the reduced risk of HIV transmission during UAI due to undetectable viral load status (OR: 2.42; 95% CI: 0.82-7.17;  $p=0.11$ ). Neither was there an association between UAI with a most recent serodiscordant non-primary partner and cART status (OR: 2.49; 95% CI: 0.84-7.39;  $p=0.09$ ) or self-reported plasma viral load status (OR: 0.69; 95% CI: 0.22-1.20;  $p=0.51$ ). There was also no association between age, time since HIV diagnosis, whether had met partner via the internet and UAI with the most recent serodiscordant non-primary partner. Recreational drug use during sex, and disclosure of HIV status were independently associated with UAI with the most recent serodiscordant status non-primary partner. Men who had used recreational drugs during sex were more likely to have engaged in UAI compared to men who did not (OR: 3.09, 95% CI: 1.14-8.42;  $p=0.02$ ). Men who had directly disclosed their HIV status to their most recent serodiscordant non-primary partner were more likely to have engaged in UAI compared to men who had assumed that their partner knew their HIV status (OR: 4.51, 95% CI: 1.67-12.21;  $p=0.003$ ).

**Table 19. Association between UAI with the most recent non-primary serodiscordant partner and attitudes towards reduced risk of HIV transmission during UAI due to undetectable viral load (N=134)**

| <b>Factors</b>  | <sup>1,2</sup> <b>Factor distribution</b> | <b>Had UAI (versus no UAI)</b> | <b>Unadjusted OR (95% CI)</b> | <b>Adjusted OR (95% CI)</b> |
|---|---|--------------------------------|-------------------------------|-----------------------------|
|   | <b>% (n/N)</b>                            | <b>n (%)</b>                   | <b>p-value</b>                | <b>p-value</b>              |
| <b>Undetectable viral load in my blood means that HIV is unlikely to be passed on to a sexual partner even if we have UAI</b> |   |                                | <b>p=0.11</b>                 | <b>p=0.27</b>               |
| Disagree/strongly disagree/unsure   | 84.9 (113/133)                            | 17 (15.0)                      | 1                             | 1                           |
| Agree/strongly agree  | 15.0 (20/133)                             | 6 (30.0)                       | 2.42 (0.82-7.17)              | 2.19 (0.53-8.93)            |
| <b>Age</b>  |   |                                | <b>p=0.11</b>                 | <b>p=0.94</b>               |
| <=34  | 9.7 (13/134)                              | 5 (38.5)                       | 1                             | 1                           |
| 35-44   | 43.3 (58/134)                             | 8 (13.8)                       | 0.25 (0.07-0.98)              | 0.46 (0.10-2.12)            |
| >=45  | 47.0 (63/134)                             | 10 (15.9)                      | 0.30 (0.08-1.11)              | 0.48 (0.09-2.68)            |
| <b>Time since HIV diagnosis (years)</b>   |   |                                | <b>p=0.17</b>                 | <b>p=0.48</b>               |
| Median (IQR)  | 11 (7-15)                                 | 9 (6-12)                       | 0.94 (0.87-1.02)              | 0.96 (0.86-1.07)            |
| <b>Recreational drug use during sex</b>   |   |                                | <b>p=0.02</b>                 | <b>p=0.04</b>               |
| No  | 47.8 (65/136)                             | 6 (9.2)                        | 1                             | 1                           |
| Yes   | 52.2 (71/136)                             | 17 (23.9)                      | 3.09 (1.14-8.42)              | 3.29 (1.03-10.47)           |
| <b>Self-reported viral load status</b>  |   |                                | <b>p=0.51</b>                 | -                           |
| Detectable  | 17.8 (23/129)                             | 5 (21.7)                       | 1                             | -                           |
| Undetectable  | 82.2 (206/129)                            | 17 (16.0)                      | 0.69 (0.22-1.20)              | -                           |
| <b>cART status</b>  |   |                                | <b>p=0.09</b>                 | <b>p=0.26</b>               |
| Yes   | 14.7 (20/136)                             | 17 (14.7)                      | 1                             | 1                           |
| No  | 85.3 (116/136)                            | 6 (30.0)                       | 2.49 (0.84-7.39)              | 2.17 (0.56-8.51)            |
| <b>Met partner via internet</b>   |   |                                | <b>p=0.59</b>                 | -                           |
| No  | 69.9 (95/136)                             | 15 (15.8)                      | 1                             | -                           |
| Yes   | 30.1 (41/136)                             | 8 (19.5)                       | 1.29 (0.50-3.34)              | -                           |
| Assumed partner knows his status  | 73.4 (94/128)                             | 9 (9.6)                        | 1                             | 1                           |
| Told himself  | 26.6 (34/128)                             | 11 (32.4)                      | 4.51 (1.67-12.21)             | 5.27 (1.70-16.27)           |

<sup>1</sup>Includes only men who had a serodiscordant non-primary partner  
<sup>2</sup>Base varies due to item non-response

When included in a multivariate model, there was no change in the lack of association observed during univariate analysis between attitudes towards reduced risk of HIV transmission during UAI due to undetectable viral load status and UAI

with the most recent serodiscordant non-primary partner (AOR: 2.19; 95% CI: 0.53-8.93;  $p=0.27$ ). However, recreational drug use during sex and disclosure of HIV status continued to remain independently associated with UAI with the most recent serodiscordant non-primary partner. Men who had used recreational drugs during sex were more likely to have engaged in UAI compared to men who did not (AOR: 3.29, 95% CI: 1.03-10.47;  $p=0.04$ ). Direct disclosure of HIV status was associated with UAI compared to assuming that partner knows their HIV status (AOR: 5.27, 95% CI: 1.70-16.27;  $p=0.004$ ). cART status, age, time since HIV diagnosis continued to remain insignificant in the multivariate model.

In the following sub-section, I examine the association between attitudes towards strategic positioning and RUAI with the most recent serodiscordant non-primary partner.

### **3.3.7.9 Association between attitudes towards reduced risk of HIV transmission due to strategic positioning and RUAI with a most recent non-primary partner**

Hypothesis 8: Men who believe that strategic positioning reduces the risk of HIV transmission are more likely to engage in RUAI than men who do not.

As reported previously in Table 17, 15.7% of men who had a most recent serodiscordant non-primary partner believed that strategic positioning reduces the risk of HIV transmission during UAI. Table 18 shows that 9.6% of men had engaged in RUAI with the most recent serodiscordant non-primary partner. As shown in Table 20, there was no support for the hypothesis that men who believed in the reduced risk of HIV transmission due to strategic positioning were more likely to have engaged in RUAI with the most recent non-primary partner (9.5%) compared to men who do not (9.7%) (OR: 0.67; 95% CI: 0.18-2.44;  $p=0.55$ ).

**Table 20. Association between attitudes towards HIV transmission risk reduction strategies and risky sexual behaviours with the most recent non-primary serodiscordant partner**

| Risk reduction strategy of interest   | <sup>1,2</sup> Factor distribution | Outcome variables of interest  | Unadjusted OR       |
|---|------------------------------------|--|---------------------|
|   | N<br>n/N (%)                       | n (%)  | p-value<br>(95% CI) |
| <b>HIV is unlikely to be transmitted if a HIV negative person has insertive anal intercourse without a condom with a HIV positive partner</b>                           |                                    | <b>RUAI (versus no RUAI)</b>   | <b>p=0.55</b>       |
| Disagree/strongly disagree/unsure   | 113/134 (84.3)                     | 11 (9.7)   | 1                   |
| Agree/strongly agree  | 21/134 (15.7)                      | 2 (9.5)  | 0.67 (0.18-2.44)    |
| <b>HIV is unlikely to be transmitted if a HIV negative person has insertive anal intercourse (He is doing the fucking) without a condom with a HIV positive partner</b> |                                    | <b>RUAI with withdrawal prior to ejaculation (versus no RUAI with withdrawal prior to ejaculation)</b> | <b>p=0.41</b>       |
| Disagree/strongly disagree/unsure   | 77/133 (57.9)                      | 3 (3.9)  | 1                   |
| Agree/strongly agree  | 56/133 (42.1)                      | 4 (7.1)  | 1.89 (0.41-8.84)    |
| <b>HIV is unlikely to be transmitted if a HIV negative person has insertive anal intercourse (He is doing the fucking) without a condom with a HIV positive partner</b> |                                    | <b>IUAI with withdrawal prior to ejaculation (versus no IUAI with withdrawal prior to ejaculation)</b> | <b>p=0.88</b>       |
| Disagree/strongly disagree/unsure   | 77/133 (57.9)                      | 5 (6.5)  | 1                   |
| Agree/strongly agree  | 56/133 (42.1)                      | 4 (7.1)  | 1.10 (0.28-4.32)    |
| <b>HIV is unlikely to be transmitted if HIV positive sexual partner ejaculates inside the mouth of a HIV negative sexual partner during oral sex</b>                    |                                    | <b>Insertive unsafe oral sex (versus no insertive unsafe oral sex)</b>                                 | <b>p=0.53</b>       |
| Disagree/strongly disagree/unsure   | 94/133 (70.7)                      | 1 (2.6)  | 1                   |
| Agree/strongly agree  | 39/133 (29.3)                      | 1 (1.1)  | 2.44 (0.14-40.14)   |

<sup>1</sup>Includes only men who had the most recent serodiscordant non-primary partner  
<sup>2</sup>N varies due to item non-response



In the following section, I examine the association between attitudes towards reduced risk of HIV transmission due to withdrawal prior to ejaculation during UAI and engagement in IUAI/RUAI with withdrawal prior to ejaculation.

**3.3.7.10 *Association between attitudes towards reduced risk of HIV transmission due to withdrawal during UAI and UAI with withdrawal prior to ejaculation with the most recent non-primary serodiscordant partner***

Hypothesis 9: Men who believe that withdrawal prior to ejaculation reduces the risk of HIV transmission during UAI are more likely to engage in IUAI/RUAI with withdrawal prior to ejaculation compared to men who do not.

As reported in Table 17, 42.1% of men believed that withdrawal prior to ejaculation reduces the risk of HIV transmission during UAI. Table 18 shows that 5.2% and 6.6% of men had engaged in RUAI with withdrawal prior to ejaculation and IUAI with withdrawal prior to ejaculation respectively with their most recent non-primary partner. As shown in Table 20, 7.1% of men who agreed that withdrawal prior to ejaculation reduces the risk of HIV transmission during UAI had engaged in RUAI with withdrawal prior to ejaculation, whereas 3.9% of men who did not believe so also had engaged in this behaviour. However, there was no support for this hypothesis (OR: 1.89; 95% CI: 0.41-8.84; p=0.41).

7.1% of men who agreed that withdrawal prior to ejaculation reduces the risk of HIV transmission during UAI men had engaged in IUAI with withdrawal prior to ejaculation, whereas 6.5% of men who did not believe so also had engaged in this behaviour. There was no support for this hypothesis (OR: 1.10; 95% CI: 0.28-4.32; p=0.88).

In the following section I examine the association between attitudes of lack of risk of HIV transmission during insertive unsafe oral sex and engaging in this behaviour with a serodiscordant non-primary most recent partner.

**3.3.7.11 *Association between attitudes that there is no risk of HIV transmission during unsafe insertive oral sex and engaging in insertive unsafe oral sex with the most recent non-primary serodiscordant partner***

Hypothesis 10: Men who believe that HIV is unlikely to be transmitted during unsafe insertive oral sex are more likely to engage in this behaviour compared to men who do not.

As reported in Table 17, 29.3% of men who had a most recent serodiscordant non-primary partner believed that HIV is unlikely to be transmitted during unsafe insertive oral sex. It was reported in Table 18 that 1.5% of men had engaged in this behaviour with their most recent serodiscordant non-primary partner. As shown in Table 20, there was no support for the hypothesis that men who believe that HIV is unlikely to be transmitted during unsafe insertive UAI are more likely to engage in this behaviour compared to those who do not believe so (OR: 2.44; 95% CI: 0.14-40.14;  $p=0.53$ ). However, this result should be interpreted with caution due to the small number of men who engaged in insertive unsafe oral sex with their most recent serodiscordant non-primary partner.

In the following section, I describe the sexual behaviour of participants with new sexual partners.

**3.3.8 Sexual behaviour with new sex partners in the last year**

As mentioned in section 2.5.1.1, the data on sexual behaviour with new partners was collected on an aggregate basis and not partner-by-partner basis. As reported in Table 5, of the 380 men who were diagnosed with HIV more than a year ago,

322 men (84.7%) were sexually active in the last year. Among these 380 men, 258 men (67.9%) reported having sex with new sex partners in the last year (Table 21). The median number of new sex partners reported by these men was 4 and IQR was 0-16. The highest number of new partners reported was 399. 31.8% of men reported that they had more than ten new partners in the last year. The 258 men who had had new partners reported a total of 6533 new sex partnerships.

228 (88.3%) men had engaged in AI with new partners. The median number of new AI partners was six, the IQR was 2-20 and the range was 0 to 390. The 228 men who had new AI partners reported a total of 5021 AI partnerships. Three quarters of men reported that some of their new AI partners were anonymous, i.e., not contactable. The median number of anonymous AI partners was 9 (IQR: 3-24). 6% of men reported that they had AI only with seroconcordant new partners, whereas the remaining 94% of men had seroconcordant as well as serodiscordant new AI partners.

Among men who had engaged in AI, 61.6% of men had engaged in insertive AI. As shown in Table 21, 55.3% of men had engaged in insertive AI with known HIV positive new partners, 37% of men had assumed their partners to be HIV positive and 51.6% of men had unknown status new partners. 19.5% of men had known HIV negative insertive AI partners and 16.9% of men had assumed their partners to be HIV negative. Irrespective of the HIV status, the median number of new insertive AI partners was approximately 5. However, the range of known and assumed HIV positive insertive AI partners was high, i.e., 1-200 partners and 1-300 respectively. Similarly, the range of unknown status insertive AI partners was

also high i.e. 1-300. The range of HIV negative new insertive AI partners was 1-30 partners.

**Table 21. Sexual behaviour with new partners in the last year**

|   | <sup>1</sup> n/N | % (95% CI)       |
|---|------------------|------------------|
| <b><sup>2</sup>Had sex with new partners</b>  |                  |                  |
| Yes   | 258/380          | 67.9 (63.2-72.6) |
| <b><sup>2</sup>Number of new sexual partners</b>                                      |                  |                  |
| 0   | 122/380          | 32.1 (27.4-36.8) |
| 1   | 26/380           | 6.8 (4.3-9.3)    |
| 2-4   | 47/380           | 12.4 (9.1-15.7)  |
| 5-10  | 64/380           | 16.8 (13.1-20.6) |
| >10   | 121/380          | 31.8 (27.1-36.5) |
| Median (range), lower and upper quartiles   | 4 (0-399), 0-16  |                  |
| Mean (standard deviation)   | 17.2 (40.8)      |                  |
| <b><sup>3</sup>Had AI with new partners</b>   |                  |                  |
| Yes   | 228/258          | 88.3 (84.4-92.3) |
| <b><sup>3</sup>Number of new AI partners</b>  |                  |                  |
| 0   | 33/258           | 12.7 (8.6-16.8)  |
| 1   | 23/258           | 8.9 (5.3-12.3)   |
| 2-4   | 44/258           | 16.9 (12.3-21.5) |
| 5-10  | 59/258           | 22.7 (17.6-27.8) |
| >10   | 101/258          | 38.9 (32.9-44.8) |
| Median (range), lower and upper quartiles   | 6 (0- 390), 2-20 |                  |
| Mean (standard deviation)   | 19.5 (39.3)      |                  |
| <b><sup>4</sup>Anonymous AI partners</b>  |                  |                  |
| Yes   | 168/223          | 75.3 (69.6-81.1) |
| Median (IQR; range) (N=168)   | 9 (3-24; 1-390)  |                  |
| <b><sup>4</sup>HIV status of new AI partners</b>                                      |                  |                  |
| Only seroconcordant   | 13/222           | 5.9 (2.7-8.9)    |
| Both seroconcordant and serodiscordant  | 209/222          | 94.1 (91.0-97.3) |
| <b>Insertive anal intercourse (IAI)</b>   |                  |                  |
| <b><sup>3</sup>Had IAI</b>  |                  |                  |
| Yes   | 159 /258         | 61.6 (55.4-67.6) |
| <b><sup>5</sup>HIV status of IAI partners</b>   |                  |                  |
| <sup>6</sup> Known HIV positive partners  | 88/159           | 55.3 (47.3-63.2) |
| Median number of known HIV positive partners (lower and upper quartile, range) (N=88) | 5 (2-20, 1-200)  |                  |

Table 21 Continued

|   | <sup>1</sup> n/N | % (95% CI)        |
|---|------------------|-------------------|
| <b><sup>5</sup>HIV status of IAI partners</b>   |                  |                   |
| <sup>6</sup> Assumed HIV positive partners  | 59 /159          | 37.1 (29.5-45.1)  |
| Median number of assumed HIV positive partners (lower and upper quartile, range) (N=59) | 7 (2-20, 1-300)  |                   |
| <sup>6</sup> Known HIV negative partners  | 31/159           | 19.5 (13.6-26.5)  |
| Median number of known HIV negative partners (lower and upper quartile, range) (N=31)   | 5 (2-9, 1-30)    |                   |
| <sup>6</sup> Assumed HIV negative partners  | 27/159           | 16.9 (11.5-23.7)  |
| Median number of assumed HIV negative partner (lower and upper quartile, range) (N=27)  | 5 (3-20, 1-60)   |                   |
| <sup>9</sup> Unknown status partners  | 82/159           | 51.6 (43.5-59.6)  |
| Median number of unknown status partners (lower and upper quartile, range) (N=82)       | 5 (2-14, 1-300)  |                   |
| <b><sup>3</sup>Had IUI</b>  |                  |                   |
| Yes   | 106/258          | 41.1 (35.0-47.1)  |
| <b><sup>7</sup>Type of IUI</b>  |                  |                   |
| Always had IUI with ejaculation   | 19/106           | 17.9 (10.5-25.3)  |
| Always had IUI with withdrawal prior to ejaculation                                     | 32/106           | 30.2 (21.3-39.1)  |
| Practised IUI with and without withdrawal prior to ejaculation                          | 55/106           | 51.9 (42.2-61.6)  |
| <b>Receptive anal intercourse (RAI)</b>   |                  |                   |
| <b><sup>3</sup>Had RAI</b>  |                  |                   |
| Yes   | 167/258          | 64.7 (58.7-70.5)  |
| <b><sup>8</sup>HIV status of RAI partners</b>   |                  |                   |
| <sup>6</sup> Known HIV positive partners  | 82/167           | 49.1 (41.3-56.9)  |
| Median number of known HIV positive partner (lower and upper quartile, range) (N=82)    | 5 (2-20, 1-200)  |                   |
| <sup>6</sup> Assumed HIV positive partners  | 57/167           | 34.1 (26.9-41.86) |
| Median number of assumed HIV positive partners (lower and upper quartile, range) (N=57) | 5 (3-15, 1-300)  |                   |
| <sup>6</sup> Unknown status partners  | 93/167           | 55.7 (47.8-63.4)  |
| Median number of unknown status partners (lower and upper quartile, range) (N=93)       | 5 (2-15,1-300)   |                   |
| <sup>6</sup> Known HIV negative partners  | 43/167           | 25.7 (19.3-33.1)  |
| Median number of known HIV negative partners (lower and upper quartile, range) (N=43)   | 3 (1-6, 1-20)    |                   |

| <b>Table 21 Continued</b>  |                  |                  |
|--|------------------|------------------|
|  | <sup>1</sup> n/N | % (95% CI)       |
| <b><sup>8</sup>HIV status of RAI partners</b>  |                  |                  |
| <sup>6</sup> Assumed HIV negative partners   | 35               | 20.9 (15.1-27.9) |
| Median number of assumed HIV negative partners (lower and upper quartile, range) (N=35)                        | 5 (2-10, 1-60)   |                  |
| <b><sup>3</sup>Had RUAI</b>  |                  |                  |
| Yes  | 113/258          | 48.7 (42.2-55.2) |
| <b><sup>9</sup>Type of RUAI</b>  |                  |                  |
| Always had RUAI with ejaculation   | 22/109           | 20.2 (12.5-27.8) |
| Always RUAI with withdrawal prior to ejaculation   | 34/109           | 31.2 (22.3-40.0) |
| Practised RUAI with and without withdrawal prior to ejaculation  | 53/109           | 48.6 (39.1-58.2) |
| <b>Overall unprotected anal intercourse (UAI)</b>  |                  |                  |
| <b><sup>3</sup>Had UAI</b>   |                  |                  |
| Yes  | 137/258          | 53.1 (46.9-59.2) |
| <b><sup>10</sup>Type of UAI</b>  |                  |                  |
| Only IUIAI   | 28 /137          | 20.4 (13.6-27.3) |
| Only RUAI  | 31/137           | 22.6 (15.5-29.7) |
| Both RUAI/IUIAI  | 78/137           | 56.9 (48.5-65.3) |
| <sup>1</sup> Base varies due to item non-response  |                  |                  |
| <sup>2</sup> Only includes men who were diagnosed with HIV more than a year ago                                |                  |                  |
| <sup>3</sup> Only includes men who reported having new partners in the last year                               |                  |                  |
| <sup>4</sup> Only includes men who reported having AI with new partners in the last year                       |                  |                  |
| <sup>5</sup> Only includes men who reported having insertive AI with new partners in the last year             |                  |                  |
| <sup>6</sup> Percentages will not add up to 100 because men had choice to report partners of varied serostatus |                  |                  |
| <sup>7</sup> Only includes men who reported having IUIAI   |                  |                  |
| <sup>8</sup> Only includes men who reported having receptive AI with new partners in the last year             |                  |                  |
| <sup>9</sup> Only includes men who reported having URAI  |                  |                  |
| <sup>10</sup> Only includes men who reported having UAI  |                  |                  |

As shown in Table 21, 106 (41%) men reported that they had engaged in IUIAI with new partners. 51.9% of men had practised IUIAI with as well as without withdrawal prior to ejaculation, whereas 17.9% of men had always engaged in IUIAI with ejaculation and 30.2% of men had always engaged in IUIAI with withdrawal prior to ejaculation. 64.7% of men had engaged in receptive AI with

new partners. Among men who had engaged in receptive AI, 49.0% of men had known HIV positive receptive AI new partners; whereas 34.0% of men had assumed their receptive AI new partners to be HIV positive. 55.7% of men reported that they did not know the HIV status of their new receptive AI partners. 25.8% of men had had receptive AI with known HIV negative partners and 20.9% of men had new assumed HIV negative receptive AI partners. The median number of new receptive AI partners was five irrespective of the HIV status of the partners; however the median number of new HIV negative receptive AI partners was three. The range of known or assumed HIV status partners and unknown status new receptive AI partners was wide, i.e., 1-200 partners and 1-300 partners respectively; whereas the range was comparatively narrower for HIV negative receptive AI partners (i.e., 1-20). 113 (48.7%) men reported that they had engaged in RUAI with new partners. The majority of men had engaged in RUAI with as well as without withdrawal prior to ejaculation and 20.2% of men had always practised RUAI with ejaculation and 31.2% of men had always practised RUAI with withdrawal prior to ejaculation.

Overall, the proportion of men who had engaged in UAI with new sexual partners was 53%. Among men who had engaged in UAI, the majority of men had engaged in both RUAI as well as IUAI (57%); whereas 20.4% of men had engaged only in IUAI and 22.6% of men had engaged only in RUAI.

### **3.3.8.1 *Venues of meeting new sex partners in the last six months***

Of the 258 men who had new partners in the last year, 233 men had had sex with new partners in the last six months. In this section, I describe the venues for meeting new partners in the last six months among these 233 men. As shown in Table 22, the majority of men had met at least one or more new partner via the

internet (64.4%) A significant proportion of men had met their new partners in sexually charged environments like the saunas (37.8%), other sex on premises venues (34.2%), leather clubs (14.2%). Some men had met their new partners in bars or clubs (34.2%), backrooms or cruising grounds (21.3%), private parties (20%) and public toilets (9%).

34 (15.5%) men had met their partners only via the internet, 9 (4.1%) only in the saunas and 12 men (5.5%) only in gay bars. A further 2.3% of men had met them only in cruising grounds. The majority of men had met their new partners only via gay social venues and internet (18.6%), and 8.6% of men had met them only in gay social venues. Almost 20% of men had met their new partners via gay social venues and social networks as well as via the internet.

**Table 22. Venues of meeting new sexual partners in the last year (N=258)**

| Venue type                                       | <sup>1,2</sup> n | <sup>3</sup> % (95% CI) |
|--|------------------|-------------------------|
| Internet   | 145              | 64.4 (58.14-70.74)      |
| Saunas   | 85               | 37.8 (31.39-44.16)      |
| Bars   | 77               | 34.2 (27.97-40.47)      |
| Other sex on premises venues (other than saunas) | 77               | 34.2 (27.97-40.47)      |
| Backrooms  | 48               | 21.3 (15.93-26.73)      |
| Cruising grounds                                 | 48               | 21.3 (15.93-26.73)      |
| Private parties                                  | 45               | 20.0 (14.73-25.27)      |
| Leather clubs                                    | 32               | 14.2 (9.62-18.82)       |
| Through friends                                  | 28               | 12.4 (8.1-16.79)        |
| Gymnasium  | 20               | 8.9 (5.14-12.63)        |
| Cottage (public toilet)                          | 15               | 6.7 (3.38-9.95)         |
| College  | 6                | 2.7 (0.54-4.79)         |
| Telechats  | 2                | 0.9 (0.11-3.20)         |

<sup>1</sup>Only includes men who were sexually active in the last year and had sex with new partners in the last six months

<sup>2</sup>Data on where men had met their new sexual partners was missing for 8 men

<sup>3</sup> Percentages will not add up to 100 because multiple responses were allowed.



In the following section, I discuss the findings and compare the findings with those of other studies.

### 3.4 *Discussion of findings and comparison with other studies*

The SHARPN study was a repeat of the SHARP study. In the following section, I compare the socio-demographic and general and HIV-related health characteristics of the SHARPN and the SHARP survey participants. I also compare the SHARPN data with the data from the SOPHID survey. SOPHID is a cross-sectional survey of all individuals with diagnosed HIV infection who attend the NHS in England, Wales and Northern Ireland for HIV-related care. Almost all of the PLWH in the UK are thought to seek clinical care in the NHS specialist HIV outpatient clinics. Socio-demographic data (age, ethnicity, gender) and HIV related health data (cART status, viral load status) is collected as part of the SOPHID survey.

#### *Socio-demographic profile of the SHARP and SHARPN study participants and comparison with SOPHID data*

Questionnaire data for analysis was available for 413 and 429 men who had participated in the SHARP and SHARPN survey respectively. As shown in Table 23, men in the SHARPN survey were older (median age: 43 years) than men in the SHARP survey (median age: 38 years) (OR 1.06; 95% CI: 1.04-1.08), less likely to be born in the UK (OR 0.64; 95% CI: 0.48-0.85), or receive social welfare benefits (OR 0.21; 95% CI: 0.15-0.29). There was no significant difference in the ethnicity of the participants between the surveys ( $p=0.35$ ). Men in the SHARPN survey were more likely to be educated beyond secondary level (OR 1.56; 95% CI: 1.16-2.08) and were also more likely to be employed and own their accommodation compared to the SHARP survey participants.

**Table 23. \* Comparison between socio-demographic characteristics of study participants in the SHARP and SHARPN surveys**

|                               | <b>SHARP</b> | <b>SHARPN</b> | <b>p-value and unadjusted odds ratio (95% CI)</b> |
|-------------------------------|--------------|---------------|---|
| <b>Age</b>                    | <b>N=413</b> | <b>N= 422</b> | <b>p&lt;0.001</b>                                 |
| Median (range) (years)        | 38 (21-64)   | 43 (22-74)    | 1.06 (1.04-1.08)                                  |
|                               | <b>N</b>     | <b>N</b>      |   |
|                               | <b>n (%)</b> | <b>n (%)</b>  |   |
| <b>Age groups</b>             | <b>N=413</b> | <b>N=422</b>  | <b>p&lt;0.001</b>                                 |
| <=34                          | 133 (32.2)   | 71 (17.0)     | 1   |
| 35-44                         | 191 (46.2)   | 169 (40.0)    | 1.65 (1.16-2.36)                                  |
| >=45                          | 89 (21.6)    | 182 (43.0)    | 3.83 (2.60-5.62)                                  |
| <b>Born in the UK</b>         | <b>N=413</b> | <b>N=429</b>  | <b>p=0.003</b>                                    |
| Yes                           | 293 (71.0)   | 262 (61.0)    | 0.64 (0.48-0.85)                                  |
| <b>Ethnicity</b>              | <b>N=412</b> | <b>N=426</b>  | <b>p=0.35</b>                                     |
| White                         | 373 (90.5)   | 368 (86.4)    | 1   |
| Mixed                         | 11 (2.7)     | 17 (4.0)      | 1.57 (0.72-3.38)                                  |
| Asian                         | 8 (2.0)      | 13 (3.0)      | 1.64 (0.67-4.20)                                  |
| Black                         | 8 (2.0)      | 15 (3.5)      | 1.90 (0.79-4.53)                                  |
| Other                         | 12 (2.8)     | 13 (3.1)      | 1.09 (0.49-2.43)                                  |
| <b>Ethnicity group</b>        | <b>N=412</b> | <b>N=426</b>  | <b>p=0.06</b>                                     |
| White                         | 373 (90.5)   | 368 (86.4)    | 1   |
| Non-White                     | 39 (9.5)     | 58 (13.6)     | 1.50 (0.97-2.31)                                  |
| <b>Education</b>              | <b>N=413</b> | <b>N=429</b>  | <b>p=0.003</b>                                    |
| Beyond secondary school       | 257 (62.2)   | 309 (72.0)    | 1.56 (1.16-2.08)                                  |
| <b>Employment</b>             | <b>N=412</b> | <b>N=429</b>  | <b>p&lt;0.001</b>                                 |
| Employed                      | 199 (48.3)   | 284 (66.2)    | 1   |
| Unemployed                    | 77 (18.7)    | 57 (13.3)     | 0.25 (0.16-0.39)                                  |
| Medically retired             | 93 (22.6)    | 34 (8.0)      | 0.87 (0.56-1.36)                                  |
| Other                         | 43 (10.4)    | 57 (12.7)     | 0.51 (0.35-0.76)                                  |
| <b>Accommodation</b>          | <b>N=413</b> | <b>N=427</b>  | <b>p=0.004</b>                                    |
| Own                           | 139 (33.7)   | 191 (44.7)    | 1   |
| Rent                          | 240 (58.1)   | 210 (49.2)    | 0.63 (0.47-0.84)                                  |
| Other                         | 34 (8.2)     | 26 (6.1)      | 0.55 (0.31-0.96)                                  |
| <b>Social welfare benefit</b> | <b>N=412</b> | <b>N=414</b>  | <b>p&lt;0.001</b>                                 |
| Yes                           | 228 (55.3)   | 87 (21.0)     | 0.21 (0.15-0.29)                                  |

\*N varies due to item non-response

***General health and HIV related health of the SHARP and SHARPN study participants***

There was no difference in the self-reported general health in the last six months between the survey participants ( $p=0.27$ ) (Table 24). The time since HIV diagnosis among the SHARPN participants was longer than the SHARP participants (OR 1.06; 95% CI: 1.04-1.09). The SHARPN participants were more likely to report ever being on cART (OR 1.59; 95% CI: 1.14-2.22) and receiving cART at the time of the survey (OR 2.00; 95% CI: 1.45-2.74) than the SHARP participants (Table 24). Compared to the SHARP survey, a greater proportion of the SHARPN survey participants reported recent plasma viral load test results to be  $<50$  copies/mm<sup>3</sup> (71.8% vs. 36.4%) and recent CD4 cell count test results to be  $>200$  (91.4% vs. 75.5% %,  $p<0.001$ ). The SHARPN survey participants were also less likely to report AIDS diagnosis in comparison to the SHARP participants (OR 0.57; 95% CI: 0.41-0.80) and less likely to be have missed doses of cART in the last two weeks.

The observed age, ethnicity and cART profile of the SHARPN study participants were similar to that observed among HIV positive MSM in the SOPHID survey in London (Health Protection Agency, 2010). Thus, the observed age difference in the SHARP and SHARPN surveys reflects the ageing cohort of PLWH in the UK due to the availability of cART and continued HIV diagnosis in older age groups (Health Protection Agency, 2010). The increase in availability of better and tolerant cART regimens also explains the observed greater proportion of men with an undetectable viral load (74%) and longer duration of living with HIV (median=9 years) in the SHARPN survey compared to the SHARP survey (41%) and (median=5.5 years) respectively (Stephenson et al., 2003).

**Table 24. <sup>1</sup>Comparison of general health and HIV related health indicators of the SHARP and SHARPN survey study participants**

|  | <b>SHARP</b> | <b>SHARPN</b> | <b>p-value</b>                |
|--|--------------|---------------|-------------------------------|
|  | <b>N</b>     | <b>N</b>      | <b>Unadjusted Odds</b>        |
|  | <b>n (%)</b> | <b>n (%)</b>  | <b>ratio</b>                  |
|  |              |               | <b>(95 % CI)</b>              |
| <b>Self-assessed overall health in last 6 months</b>                             | <b>N=413</b> | <b>N=429</b>  | <b>p=0.27</b>                 |
| Good or very good  | 300 (72.6)   | 314 (73.2)    | 0.92 (0.75-1.13)              |
| <b>Time since HIV diagnosis (years)</b>  | <b>N=404</b> | <b>N=428</b>  | <b>p&lt;0.001</b>             |
| Median (range)   | 8 (<1-18)    | 9 (<1 – 28)   | 1.06 (1.04-1.09)              |
| <b>Ever taken ART</b>  | <b>N=410</b> | <b>N=429</b>  | <b>p=0.006</b>                |
| Yes  | 305 (74.4)   | 353 (82.3)    | 1.59 (1.14-2.22)              |
| <b>Currently taking antiretroviral (ART) medication</b>                          | <b>N=410</b> | <b>N=429</b>  | <b>p&lt;0.001</b>             |
| Yes  | 277 (67.6)   | 346 (80.6)    | 2.00 (1.45-2.74)              |
| <b>Time since receiving ART</b>  | <b>N=270</b> | <b>N=345</b>  | <b><sup>2</sup>p&lt;0.001</b> |
| Median (range) years   | 3 (<1-17)    | 6 (<1-24)     | 2/25 (1.81-2.79)              |
| <b>Self-reported recent CD4 cell count</b>                                       | <b>N=408</b> | <b>N=429</b>  | <b>p&lt;0.001</b>             |
| < 200  | 61 (14.9)    | 18 (4.2)      | 1                             |
| 200-499  | 213 (52.2)   | 174 (40.6)    | 2.76 (1.57-4.85)              |
| >499   | 95 (23.3)    | 218 (50.8)    | 7.77 (4.36-13.86)             |
| Don't know   | 39 (9.6)     | 19 (4.4)      | 1.65 (0.77-3.52)              |
| <b>Recent perceived viral load status</b>  | <b>N=407</b> | <b>N=429</b>  | <b>p&lt;0.001</b>             |
| Undetectable   | 151 (37.1)   | 318 (74.0)    | 1                             |
| Low  | 117 (28.8)   | 42 (9.8)      | 0.17 (0.11-0.25)              |
| Medium   | 43 (10.6)    | 39 (9.1)      | 0.43 (0.26-0.69)              |
| High   | 39 (9.6)     | 15 (3.5)      | 0.18 (0.09-0.34)              |
| Don't know   | 57 (14.0)    | 15 (3.5)      | 0.12 (0.06-0.22)              |
| <b>Self-reported recent viral load blood test result (copies/mm<sup>3</sup>)</b> | <b>N=407</b> | <b>N=429</b>  | <b>p&lt;0.001</b>             |
| <50  | 148 (36.4)   | 308 (71.8)    | 1                             |
| 51-10000   | 104 (25.5)   | 31 (7.2)      | 0.14 (0.09-0.22)              |
| 10000-100000   | 69 (16.9)    | 31 (7.2)      | 0.21 (0.13-0.34)              |
| >10000   | 28 (6.9)     | 13 (3.0)      | 0.22 (0.11-0.44)              |
| Don't remember   | 58 (14.3)    | 46 (10.7)     | 0.38 (0.24-0.58)              |
| <b>Adherence to ART (doses missed in the last two weeks)</b>                     | <b>N=277</b> | <b>N=347</b>  | <b>p&lt;0.001</b>             |
| None   | 171 (61.7)   | 287 (82.9)    | 1                             |
| One  | 69 (24.9)    | 47 (13.6)     | 0.40 (0.26-0.61)              |
| >1   | 37 (13.4)    | 12 (3.5)      | 0.19 (0.09-0.38)              |
| <b>Ever had AIDS</b>   | <b>N=409</b> | <b>N=415</b>  | <b>p=0.001</b>                |
| Yes  | 26.6         | 16.8          | 0.57 (0.41-0.80)              |

<sup>1</sup> N varies due to item non-response<sup>2</sup> Derived from using a log of the variable due to skewed nature of the data

The better employment status observed in the SHARPN survey compared to the SHARP survey is likely to be due to the improvement in HIV related health among PLWH.

The overall SHARPN survey response rate, i.e., those who agreed to complete the survey among eligible patients was high (84%). However, the survey completion rate, i.e., actually completing the survey was lower (59%) compared to another study conducted in mid-2000 among PLWH including MSM attending six public hospitals in east London, henceforth referred to as the 'East London study' (Elford et al., 2007).

***Attitudes towards effectiveness of undetectable viral load for HIV prevention and personal health***

Overall, the majority of men did not agree that having an undetectable viral load reduces the risk of HIV transmission during UAI. There was difference in the proportion of men who believed in the effectiveness of undetectable viral load in preventing HIV transmission (30%) and its effectiveness in preventing HIV transmission during UAI (19%). One in five men believed that having an undetectable viral load is beneficial for their own health, i.e., it protects them from other HIV related infections or acquiring other strains of HIV. This finding suggests that men interpret the effectiveness of having an undetectable viral load for HIV prevention in different ways. The rationale for such subtle differences is difficult to measure via quantitative surveys. However, the qualitative study conducted as part of the SHARPN project provides greater insights into this finding and is discussed in the next chapter. Nevertheless, the observed proportion of men who believed that having an undetectable viral load reduces the risk of onward HIV transmission during UAI (19%) was greater than that observed in the SHARP survey (6.3%) (Stephenson et al., 2003). However, a high proportion of

men had missed at least one dose of cART in the last two weeks (17.2%) indicating the need to understand barriers to adherence to cART among these men. A high proportion of men also believed that they can get another strain of HIV if they have unprotected sex with other HIV positive MSM (82%) and were concerned that this could reduce their treatment options.

***Attitudes towards effectiveness of behavioural HIV transmission risk reduction strategies***

Compared to other sexual practices, a high proportion of men (42.2%) believed that withdrawal prior to ejaculation during UAI reduces the risk of HIV transmission. One-sixth of men also believed that strategic positioning reduces the risk of onward HIV transmission and one-third men believed that insertive unsafe oral sex by HIV positive persons is not risky. These findings suggest that studies examining sexual behaviour and practices of HIV positive MSM should examine how beliefs about the effectiveness of such risk reduction strategies interact with the sexual behaviour of these men to inform the development of appropriate interventions.

***Overall sexual behaviour of HIV positive MSM***

The majority of men were sexually active (84.7%) and a high proportion of them had engaged in UAI in the last year (59.7%). This is high compared to the observed UAI prevalence of 37.8% in the last three months reported in the East London study (Elford et al., 2007). Among men who had engaged in UAI, 19.4% of men had done so only with a primary partner and 58.8% with new or regular partners. Similar to the SHARP study (30%), a significant proportion of men had engaged in UAI with concurrent partners (21.8%) (Stephenson et al., 2003). Furthermore, 42% of men had engaged in group sex in the last six months and 33%

of men had engaged in group sex with the most recent non-primary partner. These findings suggest that the majority of sexually active HIV positive MSM engage in sexual behaviours that increase their risk of STI acquisition and transmission and should be tested regularly for STI. The high level of concurrent/group sex partnerships suggests that partner notification among this population is vital to prevent the spread of STI. It also suggests that in the event of STI diagnosis, men should be asked about engagement in group sex and men who have a primary partner should be asked to notify other sex partners. The overall prevalence of serodiscordant UAI in the SHARPN survey was 15.4%. Although this is lower than that observed in the east London study (20%), it can have implications for onward HIV transmission.

#### ***Sexual behaviour with a primary partner***

Similar to several other studies conducted in the UK and abroad, a high proportion of men in the SHARPN survey had a primary partner, and a high proportion of them had a serodiscordant primary partner (Van de Ven et al., 2002; Stephenson et al., 2003; Xia et al., 2006; Bouhnik et al., 2007; Elford et al., 2007; Hasse et al., 2010; Seng et al., 2011). The majority of men who had a primary partner were on cART (93%). Unlike another study conducted abroad (Suzan-Monti et al., 2011), there were no HIV related-health or socio-demographic differences between men who had a seroconcordant primary partner or a serodiscordant primary partner.

Overall, a quarter of the men had not engaged in any sexual activity with their primary partner in the last six months irrespective of their partner's serostatus. This finding suggests that non-engagement in sex with a serodiscordant primary partner may not be intentional to reduce the risk of onward HIV transmission. Overall, a high proportion of men had engaged in UAI with a primary partner

(37.5%) compared to respondents in the east London study (19.2%) (Elford et al., 2007) and the SHARP survey (13%) (Stephenson et al., 2003). However, the overall prevalence of UAI with a primary partner does not reflect the variation in prevalence of UAI by primary partner's HIV status and it's the implications for HIV transmission. Similar to other studies, men were more likely to engage in UAI with a seroconcordant primary partner compared to a serodiscordant primary partner (Glass et al., 2004; Brewer et al., 2006; Bouhnik et al., 2007; Elford et al., 2007). The finding that overall men who were in a serodiscordant partnership were more likely to engage in sexual behaviours that minimise the risk of HIV transmission compared to men who had a seroconcordant primary partner is similar to another study conducted in the USA (Parsons et al., 2005). Men were not specifically asked whether they had engaged in sexual practices with their primary partner because of their sexual preferences, or had consciously made the choice to engage in these behaviours to reduce the risk of HIV transmission. However, the observed lower likelihood of engagement in several risky sexual practices associated with greater risk of HIV transmission among men with a serodiscordant primary partner compared to men with a seroconcordant primary partner suggests that the former consciously make decisions to engage in sexual practices that minimise the risk of onward HIV transmission.

Men with a serodiscordant primary partner were less likely to have engaged in UAI compared to men in a seroconcordant partnership. However, similar to a study conducted in the USA, there were no significant differences by primary partner's serostatus and engagement in RUAI and unsafe receptive oral sex (Parsons et al., 2005) or other risky behaviours like fisting. The proportion of men who had engaged in UAI with a serodiscordant primary partner in the last six



months (18.3%) was higher compared to the SHARP study (13%) (Stephenson et al., 2003). Since 1998, a community based gym survey has been conducted regularly in central London among gay/bisexual men, henceforth referred to as the 'London gym survey' (Elford et al., 1999). This survey reported, for the first time in 2008, an increase in UAI with a serodiscordant primary partner among HIV positive MSM, i.e., from 4.2% in 1998 to 8.1% in 2008 (Lattimore et al., 2011). Therefore, the observed increase in UAI with a serodiscordant primary partner in the SHARPN survey is likely to reflect an actual increase in risky sexual behaviour with a serodiscordant primary partner in the recent years among HIV positive MSM. Men who had engaged in UAI with a serodiscordant primary partner were equally likely to have engaged in IUI and RUI. Moreover, men who had engaged in UAI with a serodiscordant primary partner reported substantial episodes of IUI and especially of RUI. These findings reflect that the sexual practices of some men and their serodiscordant primary partner are likely to have implications for onward HIV transmission.

Engagement in risky sexual behaviours like UAI, particularly RUI, with a serodiscordant primary partner was associated with shorter duration of partnership, and similar to another study, with recreational drug use during sex (Hasse et al., 2010). Unlike other studies, UAI with a serodiscordant primary partner was not associated with plasma viral load status (Van de Ven et al., 2005; Hasse et al., 2010). However, this finding should be interpreted with caution due to the overall small number of men who had a detectable viral load. Both qualitative and quantitative studies among MSM have shown that UAI within a primary partnership is perceived as a symbol of trust and love (Davidovich et al., 2004;

Davis and Flowers, 2011) and probably explains the observed association in the SHARPN survey.

Men who had engaged in risky sexual behaviours with a serodiscordant primary partner like UAI, particularly RUAI, and unsafe insertive oral were more likely to believe that the risk of HIV transmission was reduced due to having an undetectable viral load, or that unsafe insertive oral sex is not risky, respectively. These findings suggest that beliefs about behavioural and biomedical HIV transmission risk reduction strategies influence engagement in risky sexual behaviours with a primary partner.

However, studies conducted among Australian MSM have shown that risk reduction strategies like withdrawal prior to ejaculation during UAI do not eliminate the risk of HIV transmission (Jin et al., 2007, 2009). Moreover, knowledge of a partner's HIV status is a prerequisite to make informed decisions about using risk reduction strategies. The high prevalence of HIV serostatus disclosure to a primary partner was consistent with other studies (Stephenson et al., 2003; Van de Ven et al., 2005; Xia et al., 2006; Elford et al., 2007). However, a minority of men in the SHARPN survey had an unknown status primary partner and 5% of men had not disclosed their HIV status to their primary partner. This finding suggests that HIV testing should be promoted among MSM in serodiscordant steady partnerships. Nevertheless, the proportion of men who had an unknown status primary partner was lower compared to the East London study (Elford et al., 2007), probably reflecting the steady increase in HIV testing among MSM in the last decade (Lattimore et al., 2011).

Studies from the USA, Amsterdam and Netherlands suggest that most HIV transmissions among MSM are from primary partners (Davidovich et al., 2001;

Xiridou et al., 2003; Sullivan et al., 2009). Increases in risky sexual behaviours with serodiscordant primary partners can have greater impact on HIV incidence than the equivalent increases in sexual behaviour with casual partners (Xiridou et al., 2003). The observed risky sexual behaviours with serodiscordant primary partners suggest that there is a need to enhance HIV prevention interventions to support HIV positive MSM in a serodiscordant primary partnership.

***Sexual behaviour with new partners and the most recent non-primary partner***

The median number of new partners in the last year in the SHARPN survey (4) was lower than in the SHARP survey (12) (Stephenson et al., 2003). This is likely to be due to the older study population of the SHARPN survey. However, men had multiple new AI partners, a high proportion of which were anonymous. This presents a challenge for partner notification in the event of STI diagnosis among these men (Ashton et al., 2003; Singh et al., 2007; Jebbari et al., 2011). The prevalence of UAI as well as IUAI with new partners observed in this study was high compared to the SHARP survey (Stephenson et al., 2003). In line with other studies, it was observed that men had a high proportion of unknown or assumed HIV status new partners (Dodds et al., 2007; Williamson et al., 2008; Zablotska et al., 2009). A high proportion of men had an unknown HIV status most recent non-primary partner. This finding suggests that men are less likely to engage in discussions about the HIV status with their new and casual partners. Similar to another study conducted in the USA, a significant proportion of men had not disclosed their HIV status to their most recent non-primary partner (Klitzman et al., 2004), especially if this was a group sex anonymous casual partner because they considered it unimportant to do so or assumed that their partner knew about their serostatus. This finding suggests that health promotion interventions among MSM

should continue to emphasise the significance of engaging in safe sex with partners of unknown HIV status.

There were no significant differences between the sexual behaviour of men who had engaged in one-to-one sex and those who had engaged in group sex with their most recent non-primary partner. However, in line with the observation in the context of a primary partner, men whose most recent non-primary partner was of serodiscordant status were less likely to engage in sexual behaviours that can increase the risk of HIV transmission compared to men with a most recent seroconcordant non-primary partner. These findings suggest that HIV positive MSM are less likely to engage in risky sexual behaviours with serodiscordant partners. Similar to the findings with regards to a primary partner, there was no difference in engagement in RUAI and IUI among men who engaged in UAI with the most recent serodiscordant non-primary partner. Neither was there any difference in engagement in receptive unsafe oral sex and fisting by the most recent non-primary partner's HIV status. This finding suggests that health promotion interventions among MSM should highlight the risk of STI like syphilis and pharyngeal gonorrhoea and chlamydia due to engagement in unsafe oral sex, and risk of HCV due to fisting, and the increased risk of onward HIV transmission due to co-infection with other STI in the context of serodiscordant UAI.

Unlike the findings in the context of a primary partner, there was no association between engagement in risky sexual behaviours with a serodiscordant non-primary partner and attitudes towards various HIV transmission risk reduction strategies. However, similar to the finding among men with a primary partner, recreational drug use during sex was associated with UAI with a serodiscordant non-primary partner. This finding suggests that sexual risk-reduction interventions among

MSM should address issues related to recreational drug use during sex. Men who had directly disclosed their HIV status to their non-primary partner were more likely to engage in UAI. The observed association between direct disclosure of HIV status to the partner and engagement in risky sexual behaviours with a serodiscordant non-primary partner was the reverse of that observed in another study which showed that disclosure of HIV status was associated with reduced risk of engagement in serodiscordant UAI (Bouhnik et al., 2007). The SHARPN findings concur with those of other studies, which have shown that in the context of a non-primary partnership, disclosure of serostatus does not necessarily lead to safe sex (Marks and Crepaz, 2001; Guzman et al., 2006; Zablotska et al., 2009). The observed lack of association between viral load status, cART status and risky sexual behaviour with a serodiscordant most recent non-primary partner is consistent with findings from other studies conducted in the UK (Elford et al., 2007) and aboard (Seng et al., 2011). This finding suggests that irrespective of their viral load status and cART status, men were likely to engage in UAI with a serodiscordant most recent non-primary partner, which can have implications for onward HIV transmission. In contrast with other studies, seeking sex through the internet (Elford et al., 2007) was not associated with UAI with a serodiscordant most recent non-primary partner. Neither was there an association between time since HIV diagnosis and UAI with a serodiscordant primary partner. The findings of this chapter should be interpreted in the context of the limitations described in the following section.

### ***3.5 Strengths and limitations***

In the following section, I discuss the strengths and limitations of the SHARPN survey.

### 3.5.1 **Bias**

#### 3.5.1.1 *Recall bias*

The SHARPN survey is a cross-sectional study. Data on plasma viral load status and CD4 cell count were self-reported and thus amenable to recall bias. Thus, there is some possibility of misclassification bias with regards to the status of these biological markers during the last year. Nevertheless, the majority of the participants reported that their plasma viral load status was stable in the last year.

#### 3.5.1.2 *Sampling bias*

It was not possible to collect data on the socio-demographic profile of men who declined to participate in the study because the survey was anonymised. Data on the socio-demographic profile of men who agreed to complete the SHARPN survey at home but did not do so was not available due to the anonymous nature of survey and delinking with clinic patient number. Therefore, it is difficult to estimate the bias that is likely to be introduced due to the population that declined to participate and those who did not complete the survey. The median age of the study participants was 43 years, which reflects the aging cohort of PLWH and the median age of the MSM accessing the clinic. Therefore the study results reflect the behaviours and attitudes of older HIV positive MSM. However, the SHARPN survey participants' socio-demographic profile is similar to the profile of the HIV positive MSM attending NHS sites in London for HIV related care (Health Protection Agency, 2010) indicating the generalisability of the study results to this population. Nevertheless, future studies should boost the sample of young HIV positive MSM to explore variations in behaviours and attitudes across various age groups.

The SHARPN survey was a cross-sectional survey with a convenience sampling strategy. Random sampling is linked to lower estimates of UAI compared to convenience samples (Dodds et al., 2006; Evans et al., 2007; Crepaz et al., 2009); thus the prevalence of risky sexual behaviours is likely to be over-estimated and should be interpreted with caution. Nevertheless, they depict the prevalence of risky sexual behaviour in this population accessing care in a NHS setting.

### **3.5.1.3     *Response bias***

Some men completed the survey in the clinic, whereas the majority of men completed the survey at home. Men who completed the online survey in the clinic did so in a quiet clinic room. It was not possible to compare the differences in the responses of men who completed the survey at home with those who completed the survey in the clinic because the survey was anonymously administered online and men were automatically allocated a study number. Therefore, it is not possible to estimate the response bias likely to be introduced due to the venue of survey completion. However, it would be safe to assume that men who opted to complete the survey at home had the privacy to do so and thus opted to do so.

The data on sexual behavior was based on self-reported risk and it is likely that high-risk behaviours have been underreported due to social desirability bias (Fenton et al., 2001). Lower UAI is reported in studies conducted using interviewer-administered survey compared to self-administered surveys with or without computers (Crepaz et al., 2009; Fairley et al., 2010). The SHARPN survey was a self-administered computer based survey and thus is likely to have reduced such response bias.

### 3.5.2 **Confounding**

The SHARPN survey was a cross-sectional study and thus the observed association between attitudes towards HIV transmission risk reduction strategies and sexual behaviour with primary partner observed in the study is likely to be due to post-hoc rationalisation of risky sexual behaviour and causation cannot be proved (Stolte et al., 2004). Therefore, there is need to conduct longitudinal cohort studies to examine the association between attitudes towards HIV transmission risk reduction strategies and its impact on engagement in risky sexual behaviour.

### 3.5.3 **Chance**

The prevalence of certain risky sexual behaviours among men who had a serodiscordant primary and the most recent non-primary partner was low. Therefore, the findings related to the association (or lack of it) between attitudes towards HIV transmission risk reduction strategies and sexual behaviour with a serodiscordant primary partner or a serodiscordant non-primary partner should be interpreted with caution. Similarly, the lack of association between risky sexual behaviours with a serodiscordant primary and the most recent non-primary partner and self-reported viral load status should also be interpreted with caution due to the low number of men who had a detectable viral load. Further research studies examining the factors associated with risky sexual behaviour among HIV positive populations should be powered to enable sub-group analysis, particularly taking into consideration the low prevalence of risk factors like detectable viral load and risky sexual behaviours with serodiscordant partners. It is also important to bear in mind that the definition of serodiscordant partnerships vary between studies, i.e., in this study I have treated men who ‘assumed’ the status of their sexual partner to



be HIV positive as engaging in serodiscordant partnership. Not all studies necessarily have this information and can either overestimate or under estimate the prevalence of such behaviours. There is a need to develop standard questions to measure serodiscordant partnerships.

### ***3.6 Implications for clinical practice, policy and further research***

A high prevalence of sexual behaviours that can have implications for STI transmission as well as acquisition, HIV transmission and HIV super-infection was observed among HIV positive MSM accessing care in a NHS HIV clinic. Therefore, there is a need to develop effective interventions to prevent STI and reduce risky sexual behaviours among these men. These men regularly access care in NHS HIV clinics, thus providing an opportunity for implementing clinic-based interventions for sexual risk-reduction and to enhance adherence to cART to prevent onward HIV transmission. Such interventions should be tailored to address the observed risky behaviours in stable as well as casual seroconcordant and serodiscordant partnerships. However, these interventions should be sensitive to the observed efforts of HIV positive MSM to minimize the risk of HIV transmission to serodiscordant partners and should complement them. These interventions should also address issues related to beliefs about various behavioural and biomedical HIV transmission risk reduction strategies, recreational drug use during sex, and disclosure of serostatus and its implications for the risk of HIV transmission. As mentioned previously, the SHARPN survey did not explore whether men had engaged in sexual practices like RUAI due to sexual preferences or had made a conscious decision to engage in such sexual practices to reduce the risk of HIV transmission. Future research should explore these differences as the nature of interventions would have to be different if the

observed risk is due to sexual preference as opposed to the attitudes towards effectiveness of HIV transmission risk reduction strategies. However, it is also important to understand the broader socio-cultural and psychological context of HIV diagnosis and its influence on the formation of the sexual partnerships and sexual behaviours of HIV positive MSM. The results of the qualitative study provide greater insights into these issues and are presented in the next chapter 4.

## **Chapter 4. Sexual identity, disclosure of HIV serostatus and HIV/HCV transmission risk reduction strategies: results of qualitative study**

### **4. Aims**

The overall aim of this chapter is to explore if and how the socio-cultural context, recent debates about the implications of undetectable viral load for prevention of sexual transmission of HIV, attitudes towards behavioural HIV transmission risk reduction strategies, and nonmedical technological innovations (namely, the use of internet for sexual networking) influence and interact with the sexual partnerships, sexual behaviour, and risk management choices made by HIV positive MSM.

#### **4.1 Objectives**

1. To describe HIV positive MSMs' experience of being diagnosed with HIV, being co-infected with HCV, and how it relates to their sexual behaviour and partnership choices.
2. To understand their attitudes towards disclosure of HIV and HCV status, strategies used for (non)disclosure, and factors influencing the formation of these strategies.
3. To explore if and how recent debates about the reduced infectivity due to undetectable viral load and behavioural HIV transmission risk reduction strategies influence the sexual partnerships and sexual behaviour of HIV positive MSM, and HIV/STI risk management.

#### **4.2 Methods**

The details of the methods of the qualitative component of the SHARPN study were presented previously in section 2.6.

### 4.3 *Results*

I interviewed twenty-four purposively selected HIV positive MSM. In the following section, I describe the characteristics of men who participated in these interviews followed by results of analysis of the interview data.

#### 4.3.1 **Study participants**

All the interviews lasted for approximately 45-90 minutes each. As shown in Table 25, it was difficult to recruit men below the age of 30, especially men who were on cART. This is because the overall proportion of men accessing care in the clinic who were below the age of 30 and on cART was low (only 2.7% of the clinic population in this age group were receiving cART at the time this survey was conducted). This is because according to the current clinic policy cART is initiated only for patients with a CD4 cell count of  $\leq 350$  cells/mm<sup>3</sup>. Young men are less likely to have lower CD4 cell counts and thus less likely to be on cART.

**Table 25. Proposed and actual recruitment of the purposive sample based on age and cART status**

| Age Group    | Proposed sample          |                              | Recruited sample         |                              | Total recruited |
|--------------|--------------------------|------------------------------|--------------------------|------------------------------|-----------------|
|              | HIV Positive MSM on cART | HIV Positive MSM not on cART | HIV Positive MSM on cART | HIV Positive MSM not on cART |                 |
| <b>18-29</b> | 1-2                      | 2-3                          | 0                        | 2                            | 2               |
| <b>30-44</b> | 4-5                      | 2-3                          | 8                        | 5                            | 13              |
| <b>45-55</b> | 5-6                      | 1-2                          | 8                        | 1                            | 9               |
| <b>55+</b>   | 5-6                      | 1-2                          | 0                        | 0                            | 0               |
| Total        | 15-19                    | 6-10                         | 16                       | 8                            | 24              |

A greater proportion of men aged 35-55 were recruited and no men aged  $\geq 55$  were recruited. The age range of the participants interviewed was 25-54 years. Sixteen participants were receiving cART and 8 were not on cART, one of them was

previously receiving cART but stopped taking medication due to its side effects. Except for one participant who was bisexual, all participants self-identified as being gay (Table 26). Participants belonged to diverse nationalities and ethnic groups. Eighteen men were White, of whom 13 were White British and 5 were from other White backgrounds (1 Scandinavian, 3 from Southern and Central Europe, and 1 from North Europe). Two men were British Black Caribbean, two East Asians, and two from South America. The majority of men had studied beyond secondary school. Eight men had a post-graduate degree and another nine had completed a university degree. Five men had a diploma or NVQ, one studied up to A levels and one up to O level. Three participants had been diagnosed with HIV before cART became available, five men during 1996-2000, and three men between 2001- 2005. Thirteen participants were diagnosed with HIV during 2006-2011, two of whom had been diagnosed in late 2010.

All participants were sexually active. Ten men reported having sex in the last week, 13 men reported last having sex between seven days to four weeks prior to the interview, and one participant last had had sex more than four weeks prior to the interview. Six men did not have a primary partner. Of the remaining eighteen men who had a primary partner, six men had an HIV negative primary partner and two men did not know the HIV status of their primary partner. Most men who had a primary partner were in an open relationship, i.e., they had other sexual partners or engaged in sex with other partners along with their primary partner. Seven men had not engaged in or had stopped engaging in group sex, whereas the remaining seventeen men had engaged in group sex.

**Table 26. Characteristics of in-depth interview participants**

| <b>Characteristics</b>               | <b>N=24</b> |
|--------------------------------------|-------------|
| <b>Sexual orientation</b>            |             |
| Gay                                  | 23          |
| Bisexual                             | 1           |
| <b>Ethnicity</b>                     |             |
| White British                        | 13          |
| White other                          | 5           |
| British Black Caribbean              | 2           |
| Asian                                | 2           |
| Other                                | 2           |
| <b>Education</b>                     |             |
| Up to secondary school               | 7           |
| Beyond secondary school              | 17          |
| <b>Time since HIV diagnosis</b>      |             |
| Pre-1996                             | 3           |
| 1996-2000                            | 5           |
| 2001-2009                            | 14          |
| 2010-2011                            | 2           |
| <b>Recent sexual activity</b>        |             |
| Last week                            | 10          |
| Three weeks prior to last week       | 13          |
| More than four weeks ago             | 1           |
| <b>Has a primary partner</b>         |             |
| No                                   | 6           |
| Yes                                  | 18          |
| <b>Recently engaged in group sex</b> |             |
| Yes                                  | 17          |
| <b>Recently diagnosed with STI</b>   |             |
| Yes                                  | 20          |

On the occasion of recruitment to the study, eleven men were attending the clinic because they were contacts of an index patient diagnosed with STI. Four participants had not been diagnosed with any STI recently (in the last three months prior to the interviews), and the remaining twenty men had been recently diagnosed with STI. Some men had been diagnosed with more than one STI. Nine men were recently diagnosed with gonorrhoea, seven with chlamydia, four with syphilis, three with LGV and three with HCV. This study draws upon the attitudes, perceptions, and experiences of these HIV positive MSM from diverse age groups,

ethnic background, and variation in the duration since HIV diagnosis, cART status and sexual partnerships. The following section unpacks the factors influencing the sexual behaviour and partnership patterns of these men. The themes presented in the following section are accompanied with quotes of participants from the interviews. Quotes are distinguished by participant's age group, ethnicity, time since HIV diagnosis and cART status. For example: mid-twenty year old Black British man living with HIV since 5 years and not on cART. The interviewer's quotes are titled as 'INT' and the respondents' quotes are titled as 'RES'.

#### 4.3.2 **HIV diagnosis and sexual behaviour: shock and 'new sexual identity'**

The narratives of some men reflect that being diagnosed with HIV has several implications for their mental health and sexual choices. A young participant reported that following his diagnosis he consumed a lot of alcohol and engaged in UAI. He mentioned this towards the end of his interview, prior to which he had consistently mentioned that he did not engage in any sexual activity for almost a year following his HIV diagnosis, demonstrating that it is difficult for a person to acknowledge engaging in activities that are perceived to be socially unacceptable during face-to-face communication.

However, as reflected in the quote below, the majority of men reported that due to the psychological effect of their diagnosis they did not engage in any sexual activity following their HIV diagnosis for approximately two months to a year:

*“The whole first year things just kind of went in one ear and out the other because I wasn't concentrating. Yeah there was basically the whole first year I just didn't have any kind of sexual contact with anyone”.*

Black British man in mid-twenties living with HIV for 4 years, not on cART

The following quote reflects that some men stifled their sexual desires following their diagnosis with HIV due to feelings of shame and guilt:

*“Desire, temptation, hunter feeling has disappeared. If it is there, I suppress it. No adventure, nothing, since I was given the diagnosis.”*

Scandinavian man in late thirties living with HIV for 3 years, not on cART

Most participants felt that they were confronted with a ‘new sexual identity’ due to their HIV diagnosis. A newly diagnosed participant narrated that he did not know what to expect from his sexual partners when he disclosed his HIV status, but was pleasantly surprised when his partner did not reject him. Several participants mentioned that pre-HIV diagnosis they did not like to practise safe anal sex. As reflected in the quotes below, being diagnosed with HIV made it easier for some of them to engage in UAI.

*“I would never have had a profile on there (barebacking website) because I would have just thought, oh that’s a bit sleazy, but I now have a profile on there.”*

White British man in mid-twenties living with HIV for 1 year, not on cART

*“There hasn’t been a change in my sexual behaviour, I am still as promiscuous which is a loaded term. The difference is prior to me being diagnosed with HIV I probably did worry about becoming diagnosed with HIV. Now that I am HIV positive I obviously think that worry’s gone”.*

White British man in mid-thirties living with HIV for 12 years, on cART

#### 4.3.3 **Seroconcordant partnerships: fear of rejection, ‘shared stigma’ and ‘sense of belonging’**

For some men their new sexual identity following HIV diagnosis manifested in seeking UAI partners who were also HIV positive. Tremendous psychological significance as well as feelings of need for sexual pleasure was attached by these men to engagement in “*guilt free*” UAI free of the fear of HIV transmission. Engaging in UAI with other HIV positive men symbolized acceptance of their



‘diseased identity’ by other men and they associated it with “*feeling liberated*” or a “*sense of belonging*”. Having UAI with other HIV positive men helped some men cope with their ‘otherness’. It enabled them to view their diagnosis from a non-isolating, non-threatening perspective and a sense of relief:

*“RES: After the diagnosis I didn’t change anything at all and I continued being as safe as I have always been and then it’s took one chance encounter where we happened to have unprotected sex and, well I can only put it into words now because I’ve talked about it with my therapist. But it was very liberating to feel that whoever I’m having sex with, if it’s unprotected the person knows exactly what they’re in for and I would say ninety five percent of the time they are positive themselves. It’s very liberating to not feel that I’m toxic to the person I’m having sex with. So for me having unprotected sex just lifted up a whole weight and it lifted the part of the pressure but also the feeling of being dirty in a way that we’re both dirty.*

*INT: Do you yourself, in your mind, associate HIV infection with being dirty or was it something you’d seen around you?*

*RES: I did, well I don’t know why but I did because I guess from my own perception, I would have been one of those people who had a slight misgiving towards, I was slightly HIV phobic before and then I became one of them so maybe I have an internalized self-hatred.”*

South European man in mid-thirties living with HIV for 7 years, on cART

The narratives of these men reflect that engaging in “*guilt free*” UAI with seroconcordant partners is not merely a sexual act but symbolizes coming to terms with their identity as an HIV positive person. It represents a ‘shared stigma’ of HIV, which enables HIV positive men to bond together, as is evident from the quote presented below. For some men this bonding was not restricted only to sexual activity but they also engaged in conversations with seroconcordant status partners about their changed sexual identity, fears related to HIV and life in general.

*“I mean the HIV community if I can call it that is quite, what’s the right word? It is a community and HIV positive people do kind of stick together, they have sex together, they do the same things together and you know they were great. They’re quite happy to talk about sex and what they get up to. You can have tons and tons of sex, take loads and loads of drugs and hold down a very good job, as I do for example. Nobody really notices and it’s great and you know it’s really chatty, gossipy, fun, and supportive. Well community’s not quite the*

*right word because that implies a sort of closeness which I don't think is necessarily there, it's meshed together on the basis of just you know everyone's got sort of shared experiences rather than sort of shared culture. But it's definitely there. I'm friends with people I've never met who are HIV positive who I talk to regularly online."*

White British man in mid-thirties living with HIV for 12 years, on cART

Men who had engaged in UAI with seroconcordant partners were aware of the risk of re-infection with HIV. However, the stigma and shame associated with HIV, fear of HIV transmission and rejection by HIV negative men affected their sexual partnership choices. However, not all men had engaged in UAI with other HIV positive men. Some men, particularly men above the age of 40, were concerned about the risk of re-infection with other strains of HIV and practiced safe sex with other HIV positive men. They prioritised their physical health over sexual pleasure and considered it wise to refrain from UAI.

*"I've read that there are different strains of HIV. Some HIV strains are drug resistant to some regimes so on and so forth ... so I'd rather not have unprotected sex. I'd rather have protected sex."*

White British man in mid-forties living with HIV for 2 years, on cART

*"There was this consensus that, if you're HIV positive and I'm HIV positive, to hell with it, let's just have bareback sex. They were just completely ridiculous because again, we can get across our viral varieties. I don't understand that, it's kind of making the situation worse."*

British Black Caribbean man in early fifties living with HIV for 3 years, on cART

Fear of onward HIV transmission among some men was real and intertwined with low self-esteem and low self-worth due to their HIV diagnosis. Some men perceived themselves as "toxic", "dangerous" to their sexual partners, especially if their partner was HIV negative. The following quote reflects that although men were worried about HIV transmission they did not want to be treated or treat HIV negative men with "kid gloves" or be rejected by them:

*“RES: I choose to generally have sex with positive people because it’s less of a head fuck. When someone is negative quite often they bring all their issues to you. I don’t want to be treated with kid gloves, oh lets go and put some latex on and gloves and ... so I’m basically in a surgical gown. It’s like no. I don’t want that which a lot of negative people are. I feel dangerous. I want to have sex with someone because of who they are. Of course, because I want someone to have sex with me for the same reason but if they’re negative I am going to be very, oh are you okay? Are you comfortable? I will treat them like a child. Not so much that I’ll patronise them to death ...but more as in I’ll be like a worried parent. You know, is the condom still there? Has it split? Is there enough lube? All this and I panic probably more than them.*

*INT: Have you had an experience like that since your diagnosis?*

*RES: No, I’ve avoided it. And also I don’t really get the opportunity presented very often ...because most guys are just like, oh no sorry I’d prefer to go and have sex with someone negative and I’m just like, well you just want to have sex with someone who doesn’t tell you (that they have HIV).”*

White British man in mid-twenties living with HIV for a year, not on cART

#### **4.3.4 Serodiscordant primary partner: anxiety, risk management and sexual behaviour**

Some men were in a serodiscordant primary partnership at the time they were interviewed. In this section, I describe the sexual behaviour of these men with their primary partner. The details of men’s attitudes towards various HIV transmission risk reduction strategies are presented later in section 4.3.9. In this section, I contextualize men’s sexual behaviour with their primary partner in the context of their attitudes towards HIV transmission risk reduction strategies. The majority of men who had a serodiscordant status primary partner narrated their anxieties about having sex with them. A participant described having sex with his serodiscordant primary partner as a *“huge inconvenience”*. Another participant’s primary partner was a married bisexual man. According to this participant, his primary partner’s wife was unaware of her husband’s bisexuality and thus he was very concerned about HIV transmission. The following quote reflects how these men attached greater significance to the HIV negative serostatus of their primary partner and wanted to protect them from HIV:

*“I mean the sexual relationship between us is that he is entirely passive in the relationship, it’s the way he is. So I was really worried about the danger. In the past, we’ve had a couple of incidences where the condom had gone on very late so I was really worried that there might have been some transmission. I was more worried about him than about myself if that makes sense.”*

White British man in mid-fifties living with HIV for 2 years, on cART

Some men had chosen not to engage in anal sex with their serodiscordant primary partner and had opted for an open relationship. Whereas some participants had engaged in UAI with their serodiscordant primary partner either because they believed that there is no risk of HIV transmission due to being on cART and undetectable viral load or they practised IUAJ with withdrawal prior to ejaculation. However, the quote below reflects that there are occasional relapses in practicing UAI with withdrawal prior to ejaculation:

*“We have sex without condoms but I don’t penetrate him very much, I never come inside, I never come in him, only one or two time I came inside him.”*

South European man in early thirties living with HIV for 4 years, on cART

#### **4.3.5 Serodiscordant regular and casual partners: sexual pleasure and ‘shared responsibility’**

Some participants reported engaging in anal sex with HIV negative casual or regular partners; however, not all of them had engaged in UAI with them. Some of these men had never been on cART, or had stopped taking cART. When asked about the HIV status of their sexual partners, a participant expressed that he continues to have sex with HIV negative men because he does not want to stigmatise himself:

*“It’s a mixture (HIV status of partners) but I would have to say that they are predominantly positive now. And that’s not something I want to search out. And I certainly don’t want to be the person who says I could never have a relationship with somebody who is not positive because of stigmatising myself or other people.”*

South European man in mid-thirties living with HIV for 7 years, on cART

For some men UAI with a regular or casual partner was an outcome of the need for sexual pleasure and the HIV status of their sexual partner was irrelevant. While some men emphasised that engagement in UAI was a shared responsibility, others felt that they do not want to be solely responsible for preventing HIV transmission. As indicated in the following quotes, some men had engaged in UAI with an HIV negative partner if their partner was willing to take the risk:

*“I don’t believe in nannying people. I believe in people getting sufficient amount of information for them to make an informed decision and if I’ve told them that I’m positive in advance and they still insist on having bare back sex despite being negative, that’s not my problem. It depends how good-looking he was or how big his dick was. I probably would have sex with him but I would obviously have safer sex with him. I mean if he was to say to me in the middle of us having sex can I fuck you bare back, I would say well that’s a decision for you. I am HIV positive but I’m not going to feel obligated, I have told you my status”*

White British man in mid-thirties living with HIV for 12 years, on cART

*“I always put the condoms there. I think that I do my part when I warn them. They are adults. They are older than me. They know what to do. They are completely aware of the risk as everything else. They said that they had already experienced having sex with positive persons. I provided condoms because it’s always in my house. Even after that they decided to have bareback sex, well that’s because they want, and they think they’re not going to get (HIV) because they did not (get it) before.”*

South American man in early-thirties living with HIV for three years, on cART

#### 4.3.6 **Group sex, recreational drugs, UAI and STI**

Irrespective of age or cART status, group sex was a common feature in the discussions about sexual behaviour. As mentioned previously in section 4.3.1, seventeen men reported that they had recently engaged in group sex. Several men had a profile on barebacking websites, i.e., sites for men interested in engaging in UAI. They usually assume that other men who have profiles on such websites are HIV positive. Men had attended group sex parties which were either organized online or arranged with a small group of 3-4 known sex partners, sometimes along

with a seroconcordant primary partner. Men mentioned various reasons for engaging in group sex like the lack of need for disclosure of their HIV status or condom use, feeling a sense of belonging, the lack of pressure to perform sexually if they had sexual health problems, or recreational drug use.

*“Because of my problems with the libido, I need the stimulation of the group. I may choose to stay with one guy only, even just to be an observer. Quite often, I need extra stimulation.”*

North European man in mid-thirties living with HIV for 13 years, on cART

Men narrated their experiences of attending sex parties where both HIV positive and negative men were present. Some men felt that these mixed parties don't work well because of the need to have a conversation about HIV status, wash dildos, and use condoms. Some men mentioned that HIV negative men usually take the role of an insertive anal sex partner at such parties. However, it was a norm to assume that the men present at such parties are HIV positive, unless specified otherwise.

As reflected in the quotes below, it was apparent that recreational drug use is a key feature of sex, particularly group sex. Use of recreational drugs like “crystal meth”, “ice” (methamphetamine), cocaine, “plant food” (mephedrone) was reported. As reflected in the quote below, sex parties with anonymous partners are common and men either intravenously inject recreational drugs or practice “booty bumping”, i.e., taking drugs rectally.

*“I think it's three experiences that I had over the summer of kind of group sessions which were over a weekend so a couple of days. Most people in those groups were sort of people I haven't met before or had only met in the last few months previous. But yes, a few people I've known for a long time I know have moved from sort of, booty bump to injecting.”*

White British man in early forties living with HIV for 11 years, on cART

As reflected in the quote below, men used recreational drugs during sex for various reasons like to relax their anal muscles and reduce pain, lose sexual disinhibitions, and give them energy to engage in group sex:

*“INT: Why do you use poppers when you have sex?”*

*RES: I think sometimes it just relaxes me. Anal penetration for me can be painful ...so I find that it helps to relax me. And I guess the rush really ...It’s a compromising thing but basically it is a relaxation thing. I think it does relax my anal muscles.”*

South Asian man in mid-forties living with HIV for 15 years, on cART

A participant felt that the regular use of crystal meth has had an addictive effect on his sexual behaviour and enhanced his sexual risk-taking behaviour including engagement in group sex. He would engage in UAI with an HIV negative partner if he would be high on crystal meth as it *“impairs”* his judgement. Some men who had a serodiscordant primary partner prior to their seroconversion reported that recreational drug use made them feel uninhibited and engage in UAI with their HIV positive partner despite being aware of the risk of HIV transmission:

*“Yeah it started as a casual relationship and I knew that he’s HIV positive but we decided to pursue it. But I think it was a careless thing because we did involve recreational drugs, which actually led to....unsafe sex. I think...I don’t know at what point I actually got infected with HIV but I think that’s how.”*

South Asian man in late-thirties living with HIV for four years, not on cART

However, some men were bored of attending sex parties because they were also tired of being frequently infected with STI. They had been attending such parties for a long time and eventually ended up seeing the same men attending various group sex parties. On the other hand, some men viewed the risk of STI diagnosis due to engaging in risky sexual behaviour at sex parties as *“it comes with the territory”*:

*“What made me stop? This is going to sound horrendous, I think I’d fucked my way through London. I started seeing the same guys going along to the*

*same ones. And it was like actually I've had you before and you've been at the last party. I don't think I'm going to go to these anymore, maybe I should take a bit of time out. So there was a bit of that going on. And also, and this I think is the main reason, the drugs have just got a lot less good."*

White British man in mid-twenties living with HIV for a year, not on cART

The following quote pointedly reflects why men engaging in group sex parties are at greater risk of STI acquisition and transmission:

*"But I've gone away a bit from party organisers because I once, and I guess they're right but I once said yes to an invite to a party and then at the last minute I didn't particularly want to go and I kind of used the fact that I had chlamydia at the time a bit as a screen so I told them well I really shouldn't, I've been diagnosed with chlamydia and I'm still on antibiotics. And the organiser said well it's really up to you but there's no reason why you should be the only at this party(with an STI) ... I kind of thought yes that's the reality of it, I know that. But I didn't like something in his cavalier attitude of knowingly, if it was him I would have said okay that's nice, stay at home, take your course of antibiotics and deal with it, come back afterwards when you're clean, if you know it, treat it. But there was something quite, well not quite shocking, a little bit shocking, a tiny bit shocking about his attitude in saying I don't care, bring your chlamydia to the party."*

South European man in mid-thirties living with HIV for 7 years, on cART

#### 4.3.7 **HCV co-infection and stigma**

Although several men had engaged in group sex and were unconcerned about being diagnosed with STI, they were concerned about being infected with HCV. Men who were HCV negative felt that they have HIV and do not want to deal with another hassle and were scared of acquiring HCV. Some men stated their unwillingness to engage in sex with a HCV positive person on their online dating and barebacking profiles. They also mentioned their HCV negative status and date of last test on their online dating profiles. Some men specifically asked their sexual partners for their HIV and HCV status prior to engaging in sexual activity with them:

*"I'm really scared about Hepatitis C because they say that Hepatitis C at the moment is a big thing. Everyone's got Hepatitis C so it's the only thing that*



*I'm really, really scared about. I think I'm more scared about Hepatitis C and forget the HIV because I hear about the treatment for Hepatitis C is horrible."*

White British man in late-thirties living with HIV for 7 years, on cART

Some men reported being HCV positive and few of them were recently diagnosed with it. Men who were HCV positive found it more difficult to come to terms with their HCV diagnosis in comparison to their HIV diagnosis. As reflected in the quotes below, this was because men felt that HCV is associated with a "strange stigma" on the London gay scene. HIV positive men co-infected with HCV are not considered to be a part of the "community" by other HIV positive men who are not co-infected. HCV co-infection was perceived as a barrier to engaging in UAI among HIV positive men. As a result HCV co-infected men feared rejection by other HIV positive gay men and experienced isolation.

*"I think it was just kind of what people were saying, how full on the effect of the treatment was and how you effectively had to take a year out of your life to deal with the horrible side effects of it. Within the gay community, people who have Hepatitis C are ostracised. There is already this kind of fear around being accepted with HIV, having to tell people and the fear of abandonment, but within the gay community itself people with Hepatitis C tend not to speak about it."*

South European man in mid-thirties living with HIV for 7 years, on cART (HCV positive)

*"It's difficult being open about having Hep C in London. Even amongst people who are generally quite open minded, there's a tendency to stigmatise if you tell somebody that you've got Hep C. It seems like there's a lot of HIV positive men who would consider having a relationship or having sex with somebody else who was HIV positive with the assumption that they would have unprotected sex. But obviously when you are Hepatitis C positive that is not an option and so I've found that there is more resistance to the idea of being in a relationship with somebody who has Hepatitis C than I experience when I've just had HIV."*

White British man in mid-thirties living with HIV for 7 years, on cART (HCV positive)

Being co-infected with HCV also affected the sexual partnerships of these men because in case of some men it meant the end of their sexual relationship with their HCV serodiscordant partner(s):

*“Both myself and my partner have had Hep C and he went through hell for the first three or four months this year doing interferon tests, treatment and he’s clear now. Which is probably another reason why we won’t probably have sex together again. I’m not prepared to get treated for it until, well treatments more effective.”*

White British man in mid-thirties living with HIV for 12 years, on cART

*“My partner that I had, we’re now separated, ten years ago, I know at the time ten years back, at the beginning of our separation ...he was diagnosed with Hepatitis C. And I think it was probably the reason why he left.”*

British Black Caribbean man in early fifties living with HIV for 3 years, on cART

As indicated in the quotes below, HCV co-infected men were more worried about the implications of HCV rather than HIV on their physical health. They feared that they might be more likely to die due to HCV than HIV.

*“But to have a kind of difficult strain of Hep C, which is what I have got and be co-infected and be in my fifties, it is going to be very difficult for me to kind of get a healthy liver again. It is going to be really tricky. I would be really lucky to clear this. And it could be how I will die, through liver failure and I you know, it is serious.”*

White British man in early fifties living with HIV for 17 years, on cART (HCV positive)

Nevertheless, HCV co-infected men reported that they used to or continue to engage in group sex and/or UAI with other HIV positive men. The stigma associated with HCV affected disclosure about it to sexual partners. Some men had disclosed their HIV status on their online profiles but they had not disclosed their HCV status online due to the fear of rejection. Some men would disclose their HCV status to their sexual partners only if they would be asked about it directly or they felt that there would a potential for a long-term relationship if the partner is HIV positive:

*“I will disclose but Hepatitis C has this very strange stigma on the gay scene that HIV never had. It’s never discussed, ever. And I don’t think there’s any way round of gay men to talk about it. Whenever there is any discussion of Hepatitis C it tends to be quite in a negative way. So people will put on their profiles if you are Hepatitis C do not contact me, I do not want to have sex with you [sternly]. It’s the absolute bad thing to have.” And if you have it then I think it’s quite easy to become ostracised. So most gay men don’t disclose. So I for example, I’ve told very, very, very few people that I’m Hep C positive.”*

White British man in mid-thirties living with HIV for 12 years, on cART (HCV positive)

#### 4.3.8 Disclosure strategies

The narratives of these men indicate that their HIV disclosure strategies evolve over time. Men adopt different disclosure strategies depending on their personal circumstances, perceptions of risk of HIV transmission and fear of rejection. However, there were some commonalities in the disclosure strategies employed by these men in certain venues for meeting sex partners and in the context of engaging in certain types of sexual behaviours.

##### 4.3.8.1 Risk perceptions, stigma, and disclosure of HIV status

The risk perceptions associated with sexual practises influenced men’s decisions about disclosure of HIV status. Disclosure of HIV status was considered irrelevant in the context of one-night stand casual partners, especially if men had engaged in oral sex or practised safe anal sex because they perceived that there was no risk of HIV transmission. The underlying factor for non-disclosure of HIV status was fear of rejection, especially if the partner was HIV negative. As reflected in the quotes below, men would disclose their HIV status to sex partners who they may meet in bars and pubs if there would be scope for sex that is perceived to be associated with risk of HIV transmission. Some men would disclose their HIV status only to casual partners they trust. Whereas, others would disclose their HIV status if they would meet their sex partner more than once.

*“In the bars.....non-disclosure, people don’t. I think you would only disclose when you’ve got that person on the night bus holding your hand going with you ...because you are going to scare that person off. You’ve already given them a stick to beat you with but if you make sure that that person actually really does want to come home with you and you’ve had a good chance to chat to them then I would disclose a little later but I still would.”*

White British man in mid-twenties living with HIV for a year, not on cART

Men, particularly men who had internalized the stigma of HIV diagnosis, felt that disclosure of HIV status to a sex partner is difficult. Some men who had experienced rejection prior to their HIV diagnosis, the experiences of rejection by sexual partners following HIV diagnosis further enhanced their feelings of insecurity and low self-esteem related to seeking sex partners. Several men had faced sexual rejection by an HIV negative partner at some point following their diagnosis but they dealt with it in different ways. The quotes below reflect that while some men were negatively affected by their experiences of rejection and it subsequently made them wary of disclosing their HIV status, others felt that it was a learning curve and the more they disclosed, the more they gained confidence in disclosing their HIV status to sex partners. Some men felt that HIV is a reality of their life and they cannot let rejection affect them.

*“With HIV negative partners, it is difficult to disclose due to fear of rejection and their reaction whereas when others inform me that they are positive, it is easier. I have had unpleasant experience of disclosure 15-16 years ago and faced rejection due to my status in London. It was very sad, disappointing, and hurtful.”*

White British man in mid-forties living with HIV for 20 years, on cART

*“If you mention that you’re HIV positive it puts the other person in a position where they can behave in three different ways. They can say that doesn’t really matter which you know happens, but fairly occasionally and I guess it just happen mostly, in London most often you’ll find that people don’t mind and when I talk about people who I’ve hooked up with who I’ve not disclosed my status to but then had to disclose it afterwards even though we’ve not done anything risky and they’ve still reacted negatively. I mean they are in the minority but it’s the negative experiences that stick really ...they’re the ones*

*that are the most memorable and they're the ones that perhaps have the potential to modify your behaviour because they cause you more hurt."*

White British man in mid-thirties living with HIV for 7 years, on cART

#### **4.3.8.2 Sex venues and 'seroassumption'**

Venues of sex also influenced disclosure of HIV status. An underlying assumption among men engaging in sex in saunas or other sex on premises venues was that non-disclosure of HIV status is the norm. These venues were perceived to be sex-oriented, and discussion of issues like HIV status was perceived to be unnecessary. Thus, the sex partners men meet in such venues are usually anonymous. Men usually assume that all men present in such venues or men who agree to have UAI in such venues are HIV positive.

*"I mean everyone at the sauna has gone there for sex. So you know there's nothing else on the agenda. You don't want their life story, you're not going out for dinner with them you know."*

White British man in late-forties living with HIV for ten years, not on cART

A participant who used the internet to meet sexual partners prior to his HIV diagnosis stopped using it following-HIV diagnosis and started meeting sex partners in saunas due to the lack of the need for disclosure of HIV status. Several participants expressed preference to have sex in such venues because of the lack of need to discuss about HIV. The quotes below highlights the method of HIV status disclosure on dating websites is indirect, i.e., via preference for condom use. Men used various online pre-defined condom use options like *"safe sex is negotiable"*; *"always practise safe sex"*; *"needs discussion"*; *"prefer unsafe sex"* to indicate their HIV status. There was no consensus on which options indicate that a person is HIV positive or HIV negative. Some men use this web information to 'interpret' the HIV and HCV status of the sex partners they meet online. Men search online

for sex partners who express the same condom use preference as them and assume them to be HIV positive.

*“No, usually they put, people who are HIV positive, they put safer sex, needs discussion. So that you know that if it needs discussion then, yeah, probably HIV positive. That’s how you look at that, let’s see who’s HIV positive because they wouldn’t say that.”*

Central European man in early thirties living with HIV for 4 years, on cART

*“People would disclose on line whether they practice safe or unsafe sex which is the kind of primary way of identifying ...status ...even though it doesn’t necessarily, that’s the first line of the code. but also there are, on line profiles on website which proclaim that that person always practices safe sex and they will also be on a bareback website, so there’s this kind of cross referencing thing, and sometimes there’s a sort of a visual code (pictures), which indicates the kind of sex somebody would be having, and the kind of sexual situations they would be engaged in ...”*

White British man in late thirties living with HIV for 4 years, not on cART

#### **4.3.8.3     *Criminalisation of intentional HIV transmission and disclosure of serostatus***

Some participants had a negative experience because they had not disclosed their HIV status to sex partners; for example, a participant was deeply scared of being sued by his HIV negative ex-partner for non-disclosure of HIV status. However, not all men were fully aware of current policy on criminalization of intentional transmission of HIV in the UK. Even though they had heard about it, they were confused about the various elements of the law. Some men felt that they did not know if they could be in trouble for not disclosing their HIV status to a sexual partner if they were engaging in safe sex. As reflected in the quotes below, some men were concerned about the abuse of this law by HIV negative men who engage in UAI despite disclosure of HIV status by the infected person, yet may later threaten to sue the HIV positive person.

*“I know it’s very mean to do it (have unprotected anal sex) on purpose but well it’s word against word. the guy can say that I didn’t warn them .What to do then”*

South American man in early-thirties living with HIV for three years, on cART

Others felt that due to the effectiveness of cART in reducing the risk of HIV transmission, this law is outdated and should be changed:

*“Anyway I am not killing nobody. A person like me can still be alive with the tablets and with the therapy for a long time. Being arrested for killing, for trying to killing somebody must be only when you are really trying to kill somebody, so this law is not good.”*

South European man in early thirties living with HIV for 4 years, on cART

#### **4.3.8.4     *Disclosure of HIV status: a ‘shared responsibility’ versus ‘social responsibility’***

Disclosure of HIV status and practising or negotiating safe sex was considered as a shared responsibility of men engaging in sex, whether on a one-to-one basis or group sex. Blaming only one partner for non-disclosure of HIV status and engaging in consensual UAI was considered inappropriate.

*“It’s your responsibility to protect yourself. If you’re going to a club and you’re going to have sex, chances are there will be guys in there who are HIV positive. There just will be. Anybody with half a brain will know that because they’re sexually very active. I guess not all gay men are so sexually active but a lot are and there’s going to be a lot of it in there. So use your head and use protection – that’s what protection is for. You have some responsibility for yourself.”*

White British man in mid-fifties living with HIV for last 4 years, on cART

*“Most of the situations people don’t talk, therefore I feel comfortable with that and while I’m not satisfied with my behaviour I’m looking for ways to change, but that’s how I go for sex at the moment because it suits my conversation needs. I expect that people are knowledgeable and therefore we are both responsible for what’s going on.”*

North European man in mid-thirties living with HIV for last 13 years, not on cART

However, some men felt otherwise. They considered disclose of HIV status to their sexual partners as a *“social responsibility”*. Men usually disclosed their HIV status to protect themselves from rejection at a later stage and avoid hassle, as reflected in the following quote:

*“Yeah now that I’ve made that choice to just be honest about everything it’s so much easier because I won’t have to worry about anyone’s response to it because I know that I’m being a hundred percent honest. So whatever anyone thinks of that ...it’s not my concern because I’ve been honest so whatever you’re doing that’s you know.”*

Black British man in mid-twenties living with HIV for 4 years, not on cART

#### **4.3.9 Attitudes towards cART, undetectable viral load status and its implications for HIV transmission**

Men were asked if they had read, heard or been advised by their clinicians about the reduced risk of HIV transmission if an HIV positive person is on cART and has an undetectable viral load. The majority of men had read about it in gay magazines or newsletters, whereas some men had heard about it from their friends, clinicians or sexual partners. Few men did not know about it. There were differences in men’s attitudes towards the reduced risk of HIV transmission if an HIV positive person is receiving cART and has an undetectable viral load.

##### **4.3.9.1 ‘Non believers’ of reduced infectivity due to undetectable viral load**

Being on cART and having an undetectable viral load was perceived to reduce the *“degree of infectiousness”*. However, although undetectable viral load was understood as having minimal HIV in the body, it was felt that it is not the same as



having “*no HIV virus in the body*”. They felt that even if an HIV positive person has an undetectable viral load, HIV virus would still be present, either in the anus, semen, pre-cum or somewhere in their anatomy:

*“It’s comforting, because that’s not quite the right word to use but you know what I mean. It’s not like a linear relationship but if you are undetectable you are less infectious. It is a kind of a loaded phrase but yes, you should be less infectious than if you had 500,000 count. I don’t think just because you are undetectable doesn’t mean that you don’t have HIV in your body or that, you are not infectious, you still are high risk.”*

White British man in mid-thirties living with HIV for 3 years, on cART

*“Undetectable means that they couldn’t find any antibody in the blood sample. That doesn’t mean that it is not in the semen or it is not up my backside, you know, it is still there, it is still present somewhere in my physiology, in my anatomy so it is like, no it is just that it wasn’t in that bit of blood. I mean that is no reason to have unsafe.”*

White British man in early fifties living with HIV for 17 years, on cART

Some men felt that even if an HIV positive person has an undetectable viral load, there is still a risk of HIV transmission and thus they would not engage in UAI with HIV negative partners:

*“Yeah so to me it’s like yes okay I’m less likely to pass it on to them. I know you can still pass it on but you are less likely. So the overriding fact is yes you can still pass it on.”*

South Asian man in mid-forties living with HIV for 15 years, on cART

*“How can you be so sure that I couldn’t possibly pass it on because that would mean that living on pills is the equivalent of being negative, can you take that risk? I don’t know, I have almost found it a completely irresponsible comment.”*

South European man in mid-thirties living with HIV for 7 years, on cART

#### **4.3.9.2 Swiss statement about cART, undetectable viral load and risk of HIV transmission**

Some participants who had read about the Swiss Statement felt that publishing research without firm evidence is “*misleading*” and “*irresponsible*”. Some participants were upset with their clinician’s advice that people on cART are non-

infectious if they have an undetectable viral load. They considered such advice to be scary and irresponsible. Fear of HIV transmission, and love towards their partners were of greater significance than having UAI with their partners:

*“Swiss study obviously says that if you are able to get down to an undetectable that it would be the same as a HIV negative person having sex with a HIV negative person. However, I’m not comfortable with that and I think that’s a load of bullshit. I think it’s quite circumstantial. I understand that their thesis is that if you are able to get somebody to an undetectable viral load then the rate of transmission is, therefore, dramatically decreased. I think, of course, you then have a smaller chance of being able to infect somebody through a route of transmission, through anal sex or whatever ..... however; you do still have a risk. That research should only be released when it is finally finished ...not when you are talking about research that is on-going ...because they are going to encourage people and they have, I’ve heard this quite a few times and I find it a bit creepy.”*

White British man in mid-twenties living with HIV for a year, not on cART

Some men were concerned about the implications of engagement in UAI due to attitudes that undetectable viral load reduces the risk of transmission on HIV and STI transmission. They felt that there is an increase in unsafe sexual behaviour among HIV positive and HIV negative men due to beliefs about the reduced risk of HIV transmission due to being on cART and having an undetectable viral load. Few men who disagreed that the risk of HIV transmission was reduced due to cART and undetectable viral load narrated their pre-HIV diagnosis personal experiences when they were approached by HIV positive men on cART with an undetectable viral load to engage in UAI:

*“I’ve heard this quite a few times before my diagnosis and they would say, I’m HIV positive. But it was a few times that I had guys, certainly after the Swiss report came out that they would say, I’m HIV positive and they would be like, oh well I’m undetectable, and on medication therefore, the ability for me to, it’s impossible for me to infect you.”*

White British man in mid-twenties living with HIV for a year, not on cART

*“You know, I think it happens between HIV positive people and negative people. I mean, I’ve had that conversation with somebody once ... quite a while ago. Having an undetectable viral load, therefore unsafe sex is okay. I was negative and he was positive.”*

White British man in late thirties living with HIV for 4 years, not on cART

#### **4.3.9.3    *cART, undetectable viral load and unsafe sex: no protection from STI***

Men were aware that engaging in UAI due to being on cART and having an undetectable viral load would not protect them from the risk of other STI:

*“No, it’s not safe, there’s always the possibility to get infected from the other person. Nobody’s going to tell you their HIV status or nobody anyway will go a lot in the clinic to check, so it’s a possibility that if you have sex with somebody you can get infected with gonorrhoea and chlamydia or any type of virus.”*

South European man in early thirties living with HIV for 4 years, on cART

*“Well my viral load is undetectable and I will not practice unsafe sex. there’s two reasons really. One is the possibility of transmission ...and then there is the possibility of other sexually transmitted diseases as well. So there are two elements.”*

White British man in mid-forties living with HIV for 2 years, on cART

Some men who felt that being on cART and having an undetectable viral load reduces the risk of HIV transmission had engaged in group sex and had anonymous sex partners.

#### **4.3.9.4    *‘Believers’: implications for sexual HIV transmission due to cART and undetectable viral load***

Few participants considered being on cART and having an undetectable viral load as effective means of reducing the risk of sexual transmission of HIV during UAI. However, they differed in their perceptions about the nature of risk that was reduced due to undetectable viral load. Some men felt that having an undetectable viral load reduces the risk of HIV transmission to an HIV negative partner. Few

men reported engaging in UAI with HIV negative partners as a result of these beliefs. Few men also believed that being on cART and having an undetectable viral load reduces the risk of re-infection with other strains of HIV and thus it is safe to engage in UAI with HIV positive partners. A participant who did not believe that having an undetectable viral load reduces the risk of HIV transmission to HIV negative partners and was concerned about the risk of re-infection believed that having an undetectable viral load reduces the risk of HIV transmission during unsafe oral sex.

#### **4.3.9.5     *cART and undetectable viral load: negotiations before engaging in risky sex***

Men who had engaged in UAI with HIV negative men reported that they had discussed about their cART and viral load status with their partner prior to engagement in sex. The quotes presented below reflect the nature of such interactions with HIV negative partners to determine the safety of engaging in UAI due to cART and undetectable viral load status:

*“I tell them that I am positive but I am taking medication and it is under control and you can’t get it, even if we had unprotected sex. My viral load is so low that it is unlikely that you will get.”*

*“My experience is good. I met somebody in a bar and he was negative and I told him I’m positive and he said that’s fine, it is not the end of a world. He just asked are you taking pills, yes, and well he was even curious to see the pills, so I showed him the pills. And he asked are you okay, you’re not having any problems, and I said no, and that was it.”*

Central European man in early thirties living with HIV for 4 years, on cART

*“The last new encounter did ask me about what the status and sort of a general question about my status. He wanted to know more of the finer details, like how my viral load was. He was negative. Oh he still wanted to do things with me.”*

White British man in mid-fifties living with HIV for 20 years, on cART

#### **4.3.9.6     *cART, undetectable viral load: no need for disclosure of HIV status***

As reflected in the quote below, few men considered it unimportant to disclose their HIV status to HIV negative partners prior to engagement in UAI due to the reduced risk of HIV transmission associated with being on cART and having an undetectable viral load status.

*“We had unprotected sex. So after that he asked me ...and I disclosed and he said ok, that’s fine, thank you for letting me know. I’m going to do the PEP and I said don’t. I said it’s up to you but I am having treatment and my viral load is undetectable and you are the top one...so you won’t get HIV but if you want (PEP) to its up to you.”*

White British man in late-thirties living with HIV for 7 years, on cART

#### **4.3.9.7     *cART, undetectable viral load and strategic positioning***

A participant who had engaged in sex with serodiscordant status partners perceived the association between undetectable viral load status and reduced risk of HIV transmission as a “*safety net*” to protect his HIV negative partner in the event of an unplanned UAI. As reflected in the quote presented above in section 4.3.9.6, some men perceived that strategic positioning reduced the risk of HIV transmission, especially if the HIV positive partner is on cART and has an undetectable viral load. Some participants also had misperceptions that being an IUAI partner reduces the risk of HIV transmission:

*“I think that amongst a very small group of people in the on-line community in London there’s a feeling that you know as long as you are not being the passive partner it doesn’t really matter.”*

South European man in mid-thirties living with HIV for 7 years, on cART

#### **4.3.9.8     *Undetectable viral load, reduced risk of re-infection with HIV and sexual behaviour***

As mentioned in section 4.3.9.4, few men felt that having an undetectable viral load reduces the risk of re-infection with other strains of HIV. They prefer to have UAI with other HIV positive men who have undetectable viral load to protect

themselves against the risk of re-infection with HIV. These men specifically look for other HIV positive men with an undetectable viral load on bare backing websites:

*“People who are HIV positive are more likely to have unsafe sex. I suppose for me I feel slightly more the fact that my viral load is undetectable and if I take that to mean that the likelihood is far less, than I suppose I do make an assumption that I am unlikely to infect somebody else who is HIV positive. I’d feel quite wary about possible re-infection with a different strain, if I knew that other person was positive but not on treatment. If I was to take a risk and had unsafe sex and then there’s a definite preference to somebody who would describe their viral load to be undetectable, even if that doesn’t, mean there’s no virus present in their semen or in their pre-cum. There does seem to be some kind of evidence that it’s less likely to have HIV transmission if your treatment is effective and your viral load undetectable.”*

White British man in early forties living with HIV for 11 years, on cART

In the following section, I discuss the findings of the qualitative study and how they complement and contradict the findings of the SHARPN survey presented in chapter 3. I also compare the findings with those of other studies.

#### **4.4 *Discussion of findings and comparison with other studies***

The findings of the qualitative study suggests that a myriad range of socio-cultural, psychological, HIV related factors and HIV positive MSM’s attitudes towards various risk reduction strategies for prevention of HIV transmission influence their sexual partnership patterns, sexual behaviour and risk management.

##### ***Experience of HIV and HCV diagnosis, sexual partnerships and sexual behaviour***

Several epidemiological studies have reported a decline in sexual activity among HIV positive MSM following HIV diagnosis (Gorbach et al., 2006, 2010). The emotional burden experienced by some men due to ‘felt stigma’, i.e., shame associated with being HIV positive, and the fear of ‘enacted stigma’, i.e., being discriminated against due to their HIV positive status (Scambler, 2004) explains

the reduction in sexual activity of some men following their diagnosis with HIV. Men are concerned about being rejected by their sexual partners and some men are concerned about disclosing their HIV status to their sexual partners.

However, in case of some men HIV diagnosis facilitates engagement in guilt-free UAI with other HIV positive men. Studies in the UK have reported an increase in serosorting among HIV positive MSM (Elford, 2006; Lattimore et al., 2011). Similar to other studies, men engaged in UAI with other HIV positive MSM because they were concerned about the risk of onward HIV transmission to HIV negative partners (Cusick and Rhodes, 2000; Frost et al., 2008). However, in line with the findings of other studies, men also engaged in serosorting in the pursuit of sexual and emotional intimacy, the need for sharing the experiences of living with HIV (Cusick and Rhodes, 2000; Frost et al., 2008) and felt barriers to intimacy in serodiscordant partnerships (Frost et al., 2008). Serosorting by HIV positive MSM also needs to be understood in the context of their experience of being confronted with a 'new sexual identity' upon HIV diagnosis. Being diagnosed with HIV poses challenges associated with partner selection, and disclosure of serostatus. Serosorting is not merely a risk reduction strategy to prevent onward HIV transmission but a manifestation of agency exercised by HIV positive MSM against the stigma associated with HIV. It also reflects the need for sexual pleasure and sexual preferences, and acceptance by sexual partners. These qualitative data explain the observed high prevalence of UAI with a seroconcordant primary partner as well as the most recent non-primary partner, and the high prevalence of HIV positive new partners in the SHARPN survey. The sexual boundaries among MSM exist not only between HIV positive and negative MSM but also among HIV positive MSM. Similar to another study, the findings reflect the severe stigma

associated with HCV among HIV positive MSM (Owen, 2008). The lack of effective biomedical treatments and fear of side effects of treatment for HCV exposes men co-infected with HCV to stigma and discrimination from within the gay community. HCV co-infection is a barrier for engagement in UAI with other HIV positive MSM. Fear of stigma, isolation and ostracisation often leads to 'passing', i.e., non-disclosure of HCV status by co-infected men (Nack, 2000) to protect themselves from discrimination.

Most men who had participated in the qualitative interviews had engaged in group sex and were aware of the risk of STI associated with it. The reference by some men to seeing the same men at every group sex party indicates that a subset of MSM engage in multiple sex parties and can contribute to sustaining the transmission of STI in these networks. Thus, men who engage in group sex should be encouraged to test regularly for STI. Recreational drug use during sex was a common feature among men who engaged in group sex.

#### ***Disclosure of HIV and HCV serostatus***

The findings suggest that being confronted with a new sexual identity following HIV/HCV diagnosis is a challenging experience that exposes men to the risk of rejection and discrimination by sex partners, and can be a barrier to disclosure of HIV/HCV status. The SHARPN survey data reported in previous chapters has shown that several men had met their new partners in gay venues like saunas, sex on premises venues etc. The qualitative findings suggest that nondisclosure of HIV status is the norm in such venues, particularly saunas. This explains the high level of unknown serostatus and anonymous partners observed in chapter 3. A substantial proportion of men in this study had also met their new partners and most recent non-primary partner via the internet. Studies have shown that internet



dating can enhance serostatus disclosure (Elford et al., 2001; Bolding et al., 2005). However, the qualitative study findings suggest that online dating profiles can enhance seroassumption. Men who engaged in online dating usually assumed the HIV status of their sex partners based on their condom use preference expressed on their online dating profile as opposed to having a discussion about it. There seems to be no consensus among men about which type of condom preference is associated with HIV positive or HIV negative serostatus. These data suggest that there is a need to promote condom use with partners of unknown HIV status, met online or offline. Similar to other studies, the qualitative findings indicate that the fear of rejection by sexual partners, internalised stigma and shame due to HIV (Klitzman et al., 2004), perceptions that the responsibility for disclosure of serostatus is shared, especially of casual partners (Wolitski et al., 2003); and concerns about ignorance of HIV among HIV negative men affect disclosure of HIV status among these men. Disclosure of HIV status was also closely associated with the type of sexual activity men engaged in with their casual partners. Men considered it unnecessary to disclose their HIV status if they engage in safe sex.

Most men were not fully aware of the guidelines for criminalisation for HIV transmission in the UK (Crown Prosecution Service, 2008). A participant was very worried about being sued for intentional HIV transmission by his serodiscordant ex-partner suggesting that the sexual lives of some HIV positive MSM are likely to be affected by the fear of negative consequences of their sexual behaviour. HIV positive MSM should be informed about the guidelines on criminalisation for HIV transmission and their rights and responsibilities. As shown in the next sub-section, men's beliefs about the reduced risk of HIV transmission due to undetectable viral load can also have implications on disclosure of HIV status to sexual partners.

*Attitudes towards HIV transmission risk reduction strategies and sexual behaviour*

Some HIV positive MSM, especially men above the age of forty, had a preference to engage in UAI with an HIV positive partner who has an undetectable viral load to protect themselves from the risk of super-infection with HIV. Apart from HCV diagnosis, the preference to engage in UAI with other HIV positive MSM who have an undetectable viral load status has further divided HIV positive MSM between those who have a detectable viral load and those who have an undetectable viral load.

Most men were concerned about the presence of HIV in their body despite having an undetectable viral load and the associated risk of HIV transmission. However, in line with other studies, some men who were optimistic about the reduced risk of HIV transmission due to viral suppression had engaged in discussions with HIV negative partners on issues related to their cART and viral load status to facilitate UAI (Horvath et al., 2012). The perceived safety net of undetectable viral load status may enhance disclosure of HIV status among those on cART to facilitate UAI. However, in some cases it appears to encourage non-disclosure due to the perceived lack of risk of HIV transmission. The implications of both these factors need to be investigated further.

Among some HIV positive MSM emotional bond manifests in the integration of HIV prevention rationalities like condom use during sex to prevent HIV transmission to an at-risk primary partner. However in the context of some serodiscordant primary partnerships and casual partnerships, UAI with serodiscordant partners was likely to occur in the context of perceptions of shared responsibility for engagement in UAI. It was also likely to be facilitated by

perceived protection from HIV transmission due to use of risk reduction strategies. However, some men had misperceptions about the effectiveness of these HIV transmission risk reduction strategies. Therefore, health promotion campaigns among MSM should address the HIV transmission risks associated with various risk reduction strategies and emphasise that none of these strategies offer complete protection against HIV transmission and do not offer protection against STI.

#### 4.5 *Strengths and limitations*

As mentioned previously in the chapter 2, in-depth interviews were conducted with HIV positive MSM who were purposively sampled based on age and cART status from a single HIV clinic. In-depth interviews were considered appropriate for data collection to ensure confidentiality to the participants while exploring sensitive issues like attitudes towards cART, other risk reduction strategies and sexual behaviour; and partner notification for STI. A topic guide that was a combination of questions and vignettes on partner notification for STI guided the interviews. The vignettes depicting hypothetical scenarios of STI diagnosis and partner notification scenarios were a useful tool to facilitate discussion, and explore consistently the attitudes of participants towards partner notification for STI. The exploration of issues regarding sexual partnerships, behaviours etc during the interviews enabled contextualizing the participants responses to vignettes on partner notification. The matrix based approach used for data analysis facilitated comparison in a systematic manner across and within cases for emergent themes. This process also facilitated the development of descriptive as well as explanatory narratives. It enabled identification of perspectives which were unique compared to the majority of the participants, and understand the contextual factors of these cases. Nevertheless, the findings of the qualitative study should be interpreted in

the backdrop of the following strengths and limitations.

#### **4.5.1 Transferability and specificity of the study findings**

##### **4.5.1.1 Study sample**

The qualitative study sample was purposively selected based on age and cART status. This sampling strategy enabled exploration of the study aims among men from different age groups and cART status. However, the majority of men who were recruited in this study were receiving cART and aged 29-54. This should be acknowledged when interpreting the results of this study. Epidemiological data presented in chapter 1 indicates that this study sample is representative of the age group of HIV positive MSM more likely to be diagnosed with STI. Therefore this is an appropriate age group to explore attitudes towards partner notification for STI. As mentioned in chapter 4, the overall proportion of men accessing care in the clinic who were below the age of 30 and on cART was low (only 2.7% of the clinic population in this age group were receiving cART at the time this survey was conducted). This explains the under-representation of this group in the study. Nonetheless, further studies should be conducted to explore attitudes of young HIV positive MSM and men older than 55 years towards cART and other risk reduction strategies for HIV prevention and its implications for sexual behaviour, and partner notification for STI.

##### **4.5.1.2 Study setting**

Men for in-depth interviews were recruited from a single HIV clinic in central London. As explained previously in chapter 2, the majority of this clinic's population is White MSM. The study sample recruited for the qualitative study, as reported in chapter 4, was predominantly White MSM and few men were also from a non-White and mixed ethnic background. It is likely that other socio-

demographic characteristics, i.e., age, education, employment status etc of HIV positive MSM attending the HIV study clinic in central London are different from those attending clinics in outer London or outside London and may potentially influence the study findings. Further studies to explore attitudes towards cART and other risk reduction strategies for HIV prevention and partner notification for STI should be conducted among HIV positive MSM in geographical areas outside central London and in other London clinics.

#### **4.5.1.3    *Bias***

One of the aims of the qualitative study was to explore men's attitudes towards partner notification for STI in the future. It is likely that men's reported intentions towards partner notification for STI in the future may not necessarily reflect their future behaviour. Also, men who were recently diagnosed with STI or were contacts of men recently diagnosed with STI were recruited for the qualitative study. Therefore, the positive attitude of the majority of men towards partner notification for STI reported in this study should be interpreted with caution.

It is also likely that men considered it desirable to report acceptability of partner notification of STI and refute engagement in unprotected sexual behaviours with serodiscordant status partners due to having an undetectable viral load. However, the study findings reveal that not all men had positive attitudes towards partner notification for STI. Some men reported engaging in unprotected sex with serodiscordant partners due to being on cART with an undetectable viral load and using behavioural strategies to reduce the risk of HIV transmission. This suggests that desirability bias may not have necessarily influenced the interview process. Also, the observed consistency in the SHARPN survey findings and the qualitative study results on partner notification for STI, and between future willingness to

notify partners of STI and recent partner notification experiences reported during interviews suggest that these data are likely to be reflective of HIV positive MSM's partner notification behaviour and preferences.

#### 4.6 *Implications for clinical practice, policy and future research*

The findings suggest that provision of psychological support to men immediately following their diagnosis with HIV continues to be important. Similar support should be offered by the clinics to men diagnosed with HCV. Serosorting is a deeper issue and not only practised for HIV prevention. It symbolises need for sexual pleasure, bonding due to common experiences related to HIV diagnosis with other HIV positive MSM and need for acceptance from other MSM. The consequences of serosorting and engagement in UAI in terms of risk of STI transmission and acquisition need to be addressed in this larger context. Health promotion campaigns among MSM should also address norms related to disclosure of serostatus in gay venues and on dating websites, and norms of disclosure associated with different types of sex.

These findings confirm that risk-reduction interventions that do not address the socio-cultural and psychological context are likely to yield minimal, non-sustainable results. Interventions for risk-reduction in HIV positive MSM should address the wider issues related to stigma and discrimination, not only from outside the gay community but also between HIV positive and negative MSM, and among HIV positive MSM.

The qualitative study findings corroborate the SHARPN survey findings that attitudes towards the effectiveness of HIV transmission risk reduction strategies can influence engagement in risky sexual behaviours with a serodiscordant status primary partner. There is a need for further research to understand the prevalence

of use of ‘combination of risk reduction strategies’ for prevention of HIV transmission in MSM, i.e., are men more likely to engage in sexual behaviours like strategic positioning that are considered to reduce the risk of HIV transmission if they have an undetectable viral load.

Both, the SHARPN survey and qualitative study findings confirm that a significant proportion of HIV positive MSM engage in sexual behaviours and other risky behaviours like recreational drug use during sex which have implications for both, HIV and STI transmission, and STI acquisition. In the next chapter, I examine STI diagnosis among these men in the last year, and the risk factors for the same. I also examine their attitudes towards partner notification for STI, willingness to notify sexual partners of STI in the future and the willingness to use various traditional and novel methods of partner notification for STI in the future.

## **Chapter 5: STI and partner notification for STI among HIV positive MSM: results of the SHARPN survey**

### **5. Aims**

The aim of this chapter is to understand testing and diagnosis of STI in the last year among HIV positive MSM, and their attitudes towards partner notification for STI and willingness to notify different types of sexual partners of STI in the future to inform the development of partner notification strategies for STI in HIV positive MSM. As mentioned previously in section 1, in this thesis, I have used the term STI to refer to all STI other than HIV.

#### **5.1 *Specific objectives***

1. To describe the SHARPN survey findings on the attitudes of HIV positive MSM towards partner notification for STI.
2. To describe STI testing and diagnosis in the last year, examine the factors associated with STI diagnosis, and describe partner notification following STI diagnosis in the last year.
3. To describe the willingness of HIV positive MSM to notify different types of sex partners of STI in the future and their willingness to use different methods of notification for STI.
4. To examine the factors associated with unwillingness to notify casual partners of STI in the future.
5. To describe the preferred methods to be notified of STI by sexual partners in the future.



## 5.2 *Methods*

The details of the methods were described previously in section 2.5 and data analysis in sub-sections 2.5.13 and 2.5.14.

## 5.3 *Results*

As described in section 3.3.1, 429 participants completed the SHARPN survey. In the following section, I describe these participants' previous experience of notifying sex partners of STI, and attitudes towards partner notification for STI.

### 5.3.1 **Experience of and attitudes towards partner notification for STI**

As shown in Table 27, when asked if they have 'ever' been advised by the clinic staff to notify their sexual partners of STI, 329 (76.7%) of the 429 participants responded positively.

**Table 27. Previous experience of partner notification for STI**

| <b>Factors</b>  | <b><sup>1</sup>n/N</b> | <b>% (95% CI)</b> |
|---|------------------------|-------------------|
| <b>Ever advised by the clinic staff to notify sexual partners following STI diagnosis</b>                             |                        |                   |
| Yes   | 329/429                | 76.7 (72.7-80.7)  |
| <b>Ever worried about breach of HIV related confidentiality as a result of partner notification by self or clinic</b> |                        |                   |
| Yes   | 90/372                 | 24.2 (19.8-28.6)  |
| <b>Ever notified sexual partners of STI</b>   |                        |                   |
| Yes   | 281/429                | 65.6 (61.0-70.0)  |
| <b><sup>2</sup>Ever experienced physical violence</b>   |                        |                   |
| Yes   | 8/278                  | 2.9 (0.90-0.48)   |
| <b><sup>2</sup>Ever experienced verbal abuse</b>  |                        |                   |
| Yes   | 30/276                 | 10.9 (7.17-14.5)  |
| <b><sup>2</sup>Ever experienced a break-up as a result of PN</b>  |                        |                   |
| Yes   | 58/264                 | 22.0 (16.9-26.9)  |

<sup>1</sup>Base varies due to item non-response  
<sup>2</sup>Includes only men who had ever notified sexual partners of STI

Approximately a quarter of the men reported being worried about breach of HIV related confidentiality as a result of partner notification for STI. With regards to

previous experience of notifying sexual partners, 281 (65.6%) men had notified partners of STI. Of these, 2.9% of men had experienced physical violence from their partner following notification, 10.9% of men had experienced verbal violence, and approximately 22% of men had experienced a break-up with their partner as a result of notifying them of STI.

As shown in Table 28, 11.4% of men agreed that notifying sexual partners for exposure to curable STI is not their responsibility. However, the majority of men disagreed that it is not their responsibility to notify their sexual partners of STI (75.2%). A further 13.5% of men were not sure about it. Compared to attitudes towards responsibility of notifying sexual partners for exposure to STI, a greater proportion of men felt that their sexual partners should notify them if they are diagnosed with STI, but this difference was not statistically significant (83.6% vs. 75.2%,  $p=0.84$ ). 7.8% of men disagreed that their sexual partners should notify them if they are diagnosed with STI. A sizable number of men were concerned about the negative impact of notifying their primary partner for exposure to STI (30%). 15.8% of men agreed that notification of sexual partners should be made legally binding for those diagnosed with STI whereas 62.2% of men disagreed/strongly disagreed and 22% of men were not sure about it.

**Table 28. Attitudes towards partner notification for STI**

|  | <sup>1</sup> n/N | % (95% CI)       |
|--|------------------|------------------|
| <b>I do not have any responsibility to contact my sexual partners if I am diagnosed with any curable STI</b>       |                  |                  |
| Strongly agree/Agree   | 48/423           | 11.4 (8.3-14.4)  |
| Strongly disagree/Disagree   | 318/423          | 75.2 (71.0-79.3) |
| Not sure   | 57/423           | 13.5 (10.2-16.7) |
| <b>My sexual partners should inform me if they are diagnosed with any curable STI</b>                              |                  |                  |
| Strongly agree/Agree   | 356/426          | 83.6 (80.0-87.1) |
| Strongly disagree/Disagree   | 33/426           | 7.8 (5.1-10.2)   |
| Not sure   | 37/426           | 8.7 (6.0-11.4)   |
| <b>A sexual partner of a person diagnosed with curable STI has a right to be informed for STI exposure</b>         |                  |                  |
| Strongly agree/Agree   | 342/426          | 80.3 (76.5-84.1) |
| Strongly disagree/Disagree   | 41/426           | 9.6 (6.8-12.4)   |
| Not sure   | 43/426           | 10.1 (7.2-12.9)  |
| <b>I fear that contacting primary partner following diagnosis with STI can lead to break-up of the partnership</b> |                  |                  |
| Strongly agree/Agree   | 117/415          | 30.0 (25.4-34.6) |
| Strongly disagree/Disagree   | 120/415          | 30.8 (26.2-35.4) |
| Not sure   | 153/415          | 39.2 (34.4-44.1) |
| <sup>2</sup> Not applicable  | 25/415           | 6.0 (3.7-8.3)    |
| <b>It should be legally binding for a patient diagnosed with curable STI to contact their sexual partner</b>       |                  |                  |
| Strongly agree/Agree   | 66/418           | 15.8 (12.3-19.3) |
| Strongly disagree/Disagree   | 260/418          | 62.2 (57.5-66.9) |
| Not sure   | 92/418           | 22.0 (18.0-26.0) |

<sup>1</sup>Base varies due to missing response

<sup>2</sup>85% of the men who chose 'not applicable' as their option did not have a primary partner

### 5.3.2 Testing and diagnosis of STI in the last year

Of the 429 men, the majority of men had tested for STI since their diagnosis with HIV (85.9%). As mentioned in section 3.3.5, 380 men were diagnosed with HIV more than a year ago and only these men were included in the analysis. As reported in Table 5, of these 380 men, 322 (84.7%) men reported being sexually active in the last year. As shown in Table 29, among men who were sexually active, 261 (82.6%) men had tested for STI in the last year

**Table 29. STI testing and diagnosis among sexually active HIV positive MSM in the last year**

|   | <sup>1,2</sup> n/N | % (95% CI)       |
|---|--------------------|------------------|
| <b>Tested for STI</b>                                 |                    |                  |
| Yes   | 261/316            | 82.6 (78.4-86.8) |
| <b>Diagnosed with STI</b>                             |                    |                  |
| Yes   | 81/321             | 25.2 (20.5-30.0) |
| <b>Sexual orientation of those diagnosed with STI</b> |                    |                  |
| Gay   | 79/81              | 97.5 (91.3-99.7) |
| Bisexual  | 2/81               | 2.5 (0.1-8.6)    |
| <b>Diagnosed with any bacterial STI</b>               |                    |                  |
| Yes   | 69/321             | 21.5 (16.9-26.0) |
| <sup>3,4</sup> <b>Type of STI diagnosis</b>           |                    |                  |
| Syphilis  | 22/81              | 27.2 (17.3-37.1) |
| Pharyngeal chlamydia                                  | 4/81               | 4.9 (1.4-12.1)   |
| Rectal chlamydia                                      | 20/81              | 24.7 (15.1-34.3) |
| Urethral chlamydia                                    | 16/81              | 19.8 (10.9-28.6) |
| Rectal gonorrhoea                                     | 21/81              | 25.9 (16.2-35.7) |
| Urethral gonorrhoea                                   | 19/81              | 23.5 (14.0-32.9) |
| Pharyngeal gonorrhoea                                 | 4/81               | 4.9 (1.4-12.1)   |
| Lymphogranuloma venereum                              | 10/81              | 12.4 (6.1-21.5)  |
| Hepatitis A   | 2/81               | 2.5 (0.3-8.6)    |
| Hepatitis B   | 2/81               | 2.5 (0.3-8.6)    |
| Hepatitis C   | 6/81               | 7.4 (2.8-15.4)   |
| Genital warts   | 10/81              | 12.4 (6.1-21.5)  |
| Genital herpes  | 2/81               | 2.5 (0.3-8.6)    |

<sup>1</sup>Base varies due to item non-response  
<sup>2</sup>Only among men who were sexually active in the last year  
<sup>3</sup>Only among men who were sexually active and diagnosed with STI in the last year  
<sup>4</sup>Percentages will not add up to 100 because this was a multiple choice question

Among men who had tested for STI, 81 (25.2%) men were diagnosed with one or more STI. 97.5% of men who were diagnosed with STI self-identified as being gay men. The majority of men were diagnosed with bacterial STI (21.5%). Among men who reported being diagnosed with STI, the most common were syphilis (27.2%), rectal gonorrhoea and rectal chlamydia (approximately a quarter of men for each), urethral gonorrhoea (23.5%), urethral chlamydia (19.8%), pharyngeal

chlamydia (4.9%) and pharyngeal gonorrhoea (4.9%). Among viral infections, HCV diagnosis was reported by 7.4% of men, and genital warts (12.4%), Hepatitis A (2.5%) and B (2.5%), genital herpes (2.5%) diagnosis were also reported.

In the following sub-section, I examine the factors influencing STI diagnosis in the last year.

### 5.3.3 Factors associated with STI diagnosis in the last year

As mentioned in 2.5.14.4, this analysis examined the association of STI diagnosis with sexual behaviour and partnership patterns of HIV positive MSM to understand its implications for partner notification, after adjusting for socio-demographic and HIV related factors associated with STI diagnosis. As indicated in Table 30, in the univariate analysis, ethnicity, education, employment status, country of birth and recent CD4 cell count were not significantly associated with STI diagnosis in the last year. Age, time since HIV diagnosis, self-reported recent viral load status, and cART status were significantly associated with STI diagnosis in the last year. Men in the age-range of 35-44 (OR 0.21, 95% CI: 0.10-0.42) and men aged  $\geq 45$  years (OR: 0.23, 95% CI: 0.11-0.47) were less likely to be diagnosed with STI compared to men aged below 35 years ( $p < 0.001$ ). Men were also less likely to be diagnosed with STI if they were receiving cART compared to those not on cART (OR: 0.39, 95% CI: 0.21-10.76;  $p = 0.006$ ), and had self-reported undetectable viral load compared to men who had a detectable viral load (OR: 0.39, 95% CI: 0.21-0.72;  $p = 0.003$ ). Every year increase in time since HIV diagnosis was associated with reduced risk of STI diagnosis (OR: 0.95, 95% CI: 0.90-0.99;  $p = 0.02$ ).

**Table 30. Socio-demographic and HIV related health factors associated with STI diagnosis in the last year among HIV positive MSM (N=322)**

| Factors                                       | Factor distribution in the sample | Diagnosed with STI | Unadjusted odds ratio  | <sup>3</sup> Adjusted odds ratio (base model) |
|---|-----------------------------------|--------------------|------------------------|---|
|   | <sup>1,2</sup> n/N (%)            | n (%)              | p-value<br>OR (95% CI) | p-value<br>AOR (95% CI)                       |
| <sup>3</sup> Age                              |                                   |                    | p<0.001                | p=0.0001                                      |
| <=34  | 49/317 (15.5)                     | 26 (54.2)          | 1                      | 1   |
| 35-44   | 137/317 (43.2)                    | 27 (19.7)          | 0.21(0.10-0.42)        | 0.21 (0.09-0.44)                              |
| >=45  | 131/317 (41.3)                    | 28 (21.4)          | 0.23 (0.11-0.47)       | 0.27 (0.13-0.58)                              |
| <b>Time since HIV diagnosis (years)</b>       |                                   |                    | p=0.02                 | -   |
| Median (IQR)                                  | 10 (6-14)                         | 8 (4-12)           | 0.95 (0.90-0.99)       | -   |
| <b>Ethnicity</b>                              |                                   |                    | p=0.44                 | -   |
| White   | 276/319 (86.5)                    | 68 (24.7)          | 1                      | -   |
| Non-White                                     | 43/319 (13.5)                     | 13 (30.2)          | 1.31 (0.65-2.67)       | -   |
| <b>Education</b>                              |                                   |                    | p=0.53                 | -   |
| Up to secondary school                        | 88/322 (27.3)                     | 20 (22.7)          | 1                      | -   |
| Beyond secondary school                       | 234/322 (72.7)                    | 61 (26.8)          | 1.20 (0.67-2.15)       | -   |
| <b>Employment</b>                             |                                   |                    | p=0.59                 | -   |
| Working                                       | 251/321 (78.2)                    | 65 (26.0)          | 1                      | -   |
| Not working                                   | 70/321 (21.8)                     | 16 (22.9)          | 0.84 (0.45-1.57)       | -   |
| <b>Born in the UK</b>                         |                                   |                    | p=0.06                 | -   |
| No  | 124/322 (38.5)                    | 38 (30.9)          | 1                      | -   |
| Yes   | 198/322 (61.5)                    | 43 (21.7)          | 0.62 (0.37-1.03)       | -   |
| <b>Recent CD4 cells/mm<sup>3</sup></b>        |                                   |                    | p=0.40                 | -   |
| >=200   | 299/313 (95.5)                    | 77 (25.8)          | 1                      | -   |
| <200  | 14/313 (4.5)                      | 2 (15.4)           | 0.52 (0.11-2.41)       | -   |
| <b>Self-reported plasma viral load status</b> |                                   |                    | p=0.003                | p=0.05  |
| Detectable                                    | 54/311 (17.4)                     | 22 (40.7)          | 1                      | 1   |
| Undetectable                                  | 257/311 (82.6)                    | 54 (21.1)          | 0.39 (0.21-0.72)       | 0.51 (0.25-1.00)                              |
| <b>Receiving cART</b>                         |                                   |                    | p=0.006                | <sup>5</sup> NI                               |
| No  | 45/322 (13.9)                     | 19 (42.2)          | 1                      | <sup>5</sup> NI                               |
| Yes   | 277/322 (86.0)                    | 62 (22.5)          | 0.39 (0.21-0.76)       | <sup>5</sup> NI                               |

<sup>1</sup>Includes only men who were sexually active in the last year and were diagnosed with HIV >1 year ago.

<sup>2</sup>Base varies due to missing values

<sup>3</sup>Age was specified as a *a priori* factor to be retained in the model

<sup>4</sup>All demographic and HIV related variables significantly associated in univariate analysis with the outcome variable (p<0.2) were included in model and dropped using a stepwise backward selection model with variables significant at p<0.2 being retained to form the base model.

<sup>5</sup>NI: indicates variables not included in the model due to collinearity

-These variables were dropped during multivariate analysis conducted using stepwise backward selection model (p<0.2)

When all the socio-demographic and HIV related health factors that were associated with the outcome variable in univariate analysis ( $p < 0.2$ ) were entered in a multivariate model, age and self-reported viral load status continued to be significantly associated with STI diagnosis in the last year and formed the base model. Men in the age-range of 35-44 (AOR: 0.21, 95% CI: 0.09-0.44) and men aged  $\geq 45$  years (AOR: 0.27, 95% CI: 0.13-0.58) were less likely to be diagnosed with STI compared to men younger than 35 years ( $p = 0.0001$ ). Men with self-reported undetectable plasma viral load were less likely to be diagnosed with STI compared to those with self-reported detectable plasma viral load (AOR: 0.51, 95% CI: 0.25-1.00;  $p = 0.05$ ), although the 95% CI was wide.

As shown in Table 31, after adjusting for the base model, men who had reported greater number of new AI partners in the last year were more likely to report having been diagnosed with STI in the last year ( $p < 0.001$ ). However, the association between the number of new AI partners and the risk of STI diagnosis was not linear (Log likelihood ratio test for linearity:  $\chi^2 = 48.3$ ,  $p < 0.001$ ). Men who reported 5-10 new anal sex partners were more likely to report being diagnosed with STI in the last year compared to men with no or one new AI partner (AOR: 4.99; 95% CI: 1.85-13.49). Similarly, men who reported  $> 10$  new AI partners were more likely to report being diagnosed with STI in the last year compared to men with no or one new AI partner (AOR: 15.9; 95% CI: 6.59-38.59).

After adjusting for the base model, men who had engaged in group sex 1-5 times in the last six months were more likely to be diagnosed with STI in the last year (AOR 4.47, 95% CI: 2.27-8.81;  $p < 0.001$ ) compared to those who had not engaged in group sex. Men who had engaged in group sex  $> 5$  times were also more likely

to report being diagnosed with STI in the last year compared to those who had not engaged in group sex (AOR: 9.07, 95% CI: 3.50-23.48;  $p < 0.001$ ) (Table 31).

After adjusting for the base model, men who had engaged in UAI with their sexual partners in the last year were more likely to report being diagnosed with STI in the last year compared to men who were sexually active but had not engage in UAI with their sexual partners (AOR: 3.60, 95% CI: 1.95-6.65;  $p < 0.001$ ). Adjusted analysis indicated that men who had engaged in UAI with casual partners as well as a primary partner were more likely to be diagnosed with STI in the last year compared to men who had engaged in UAI only with a primary partner (AOR: 7.64, 95% CI: 2.22-26.23;  $p = 0.005$ ). Similarly, as shown in Table 31, men who had engaged in UAI with casual partners or regular partners were also more likely to be diagnosed with STI compared to those who had engaged in UAI only with a primary partner (AOR: 4.14, 95% CI: 1.34-12.77).

After adjusting for the base model, men who had a serodiscordant primary partner were less likely to report STI diagnosis in the last year compared to those who had a seroconcordant status primary partner (AOR: 0.23, 95% CI: 0.09-0.53;  $p = 0.001$ ). There was no significant difference between self-reported STI diagnosis among men who had engaged in UAI with a serodiscordant primary partner and those who had not (AOR: 0.94, 95% CI: 0.29-3.02;  $p = 0.81$ ).

After adjusting for the base model, the HIV status of the most recent non-primary partner was no longer significantly associated with STI diagnosis in the last year (AOR: 0.59; 95% CI: 0.28-1.28;  $p = 0.18$ ). Similarly, there was no significant association between self-reported STI diagnosis among men who had engaged in UAI with a serodiscordant most recent non-primary partner and those who did not (AOR: 1.57, 95% CI: 0.54-4.49;  $p = 0.39$ ).



**Table 31. Sexual behaviour and partnership factors associated with STI diagnosis in the last year among sexually active HIV positive MSM**

| Factors  | Distribution in the sample | Diagnosed with STI | Unadjusted odds ratio  | <sup>5</sup> Adjusted odds ratio |
|--|----------------------------|--------------------|------------------------|----------------------------------|
|  | <sup>1</sup> n/N (%)       | n (%)              | p-value<br>OR (95% CI) | p-value<br>AOR (95% CI)          |
| <b>Number of new anal sex partners in the last year</b>                        |                            |                    | <b>p&lt;0.001</b>      | <b><sup>6</sup>p&lt;0.001</b>    |
| 0-1  | 118/319 (36.9)             | 8 (6.8)            | 1                      | 1                                |
| 2-4  | 44/319 (13.8)              | 5 (11.4)           | 1.74 (0.53-45.66)      | 2.22 (0.65-7.56)                 |
| 5-10   | 59/319 (18.5)              | 15 (25.4)          | 4.64 (1.83-11.73)      | 4.99 (1.85-13.49)                |
| >10  | 98/319 (30.7)              | 52 (53.1)          | 15.4 (6.78-34.97)      | 15.90 (6.59-38.59)               |
| <b>Group sex</b>   |                            |                    | <b>p&lt;0.001</b>      | <b>p&lt;0.001</b>                |
| No group sex   | 155/284 (54.6)             | 22 (14.9)          | 1                      | 1                                |
| 1-5 times in last six months   | 98/284 (34.5)              | 38 (38.8)          | 3.82 (2.08-7.02)       | 4.47 (2.27-8.81)                 |
| >5 times in last six months  | 31/284 (10.9)              | 19 (61.3)          | 9.57 ( 4.08-22.43)     | 9.07 (3.50-23.48)                |
| <b><sup>2</sup>UAI in the last year</b>  |                            |                    | <b>p&lt;0.001</b>      | <b>p&lt;0.001</b>                |
| Sexually active but no UAI   | 170/321 (52.9)             | 20 (13.3)          | 1                      | 1                                |
| UAI  | 151/321 (47.1)             | 61 (35.9)          | 3.66 (2.08-6.45)       | 3.60 (1.95-6.65)                 |
| <b><sup>2</sup>Type of UAI partner</b>   |                            |                    | <b>p=0.01</b>          | <b>p=0.005</b>                   |
| UAI only with a primary partner  | 33/170 (19.4)              | 5 (15.2)           | 1                      | 1                                |
| UAI with a primary partner and casual/regular partners                         | 37/170 (21.8)              | 19 (51.4)          | 5.91 (1.87-18.65)      | 7.64 (2.22-26.23)                |
| UAI with casual/regular partners   | 100/170 (58.8)             | 37 (37.0)          | 3.29 (1.16-9.25)       | 4.14 (1.34-12.77)                |
| <b><sup>3</sup>HIV status of primary partner</b>                               |                            |                    | <b>p&lt;0.001</b>      | <b>p=0.001</b>                   |
| HIV positive   | 73/176 (41.5)              | 25 (34.3)          | 1                      | 1                                |
| HIV negative/unknown status  | 103/176 (58.5)             | 11 (10.8)          | 0.23 (0.11-0.51)       | 0.23 (0.09-0.53)                 |
| <b><sup>3,4</sup>UAI with a serodiscordant primary partner</b>                 |                            |                    | <b>p=0.92</b>          | <b>p=0.81</b>                    |
| No   | 153/175 (87.9)             | 32 (20.9)          | 1                      | 1                                |
| Yes  | 22/175 (12.1)              | 4 (20.0)           | 0.94 (0.29-3.02)       | 0.86 (0.26-2.90)                 |
| <b><sup>4</sup>HIV status of the most recent non-primary partner</b>           |                            |                    | <b>p=0.04</b>          | <b>p=0.18</b>                    |
| HIV positive   | 51/186 (27.4)              | 21 (41.2)          | 1                      | 1                                |
| HIV negative/unknown status  | 135/186 (72.6)             | 33 (24.4)          | 0.48 (0.24-0.97)       | 0.59 (0.28-1.28)                 |
| <b><sup>4,7</sup>UAI with a serodiscordant most recent non-primary partner</b> |                            |                    | <b>p=0.07</b>          | <b>p=0.39</b>                    |
| No   | 112/135 (82.9)             | 24 (21.4)          | 1                      | 1                                |
| Yes  | 23/135 (17.1)              | 9 (39.1)           | 2.35 (0.91-6.10)       | 1.57 (0.54-4.49)                 |

<sup>1</sup>Includes only men who were sexually active in the last year and diagnosed with HIV more than a year ago; <sup>2</sup>Includes only men who had UAI in the last year

<sup>3</sup>Includes only men who had a primary partner; <sup>4</sup>Serodiscordant UAI was defined as UAI with HIV negative/HIV unknown status partner(s) ; <sup>5</sup> Adjusted for age, and self-reported viral load status (base model); <sup>6</sup>The log likelihood test for linearity was:  $\chi^2=48.3$ ,  $df=3$ ,  $p<0.001$ ; <sup>7</sup>Includes only men whose most recent sex partner was a serodiscordant non-primary partner

The following section describes partner notification following STI diagnosis in the last year.

#### **5.3.4 Clinic support and partner notification following STI diagnosis in the last year**

In this section, I describe men's experiences of interaction with the clinic staff regarding partner notification following STI diagnosis in the last year. As described previously in Table 29, 81 men had been diagnosed with STI in the last year. Of these 81 men, data on advice given by the clinic for partner notification was missing for five participants. As shown in Table 32, of the 75 men for whom this data was available, 67 men (89.3%) were advised by the clinic to notify their sexual partner(s) to test for STI and 66.7% of these men were also given one or more types of assistance to notify their sexual partner: 28% of men were given a referral slip with the clinic details, 22% of men were given written information for their partner about the STI they were diagnosed with and 4% of men were given written information about where their partner can obtain a test for STI.

Of these 75 men, data on partner notification was reported by 70 men. As shown in Table 32, of these 70 men, 42 (60%) men had notified at least one partner to test for STI. Of these 42 men, overall 17 men (40.5%) had notified their primary partner, 22 men (52.4%) and 24 men (57%) had notified their regular and casual partners respectively, and one man had notified his ex-partner. Men were asked if they had notified more than one sexual partner of STI and the methods of notification used by them. Of the 42 men who had notified at least one partner of STI, five men (11.9%) had notified only their primary partner, 7 men (16.7%) had notified only regular partners and 9 men (21.4%) had notified only casual partners.

**Table 32. Clinic support and partner notification following STI diagnosis in the last year**

|   | <sup>1</sup> n/N | % (95% CI)        |
|---|------------------|-------------------|
| <b><sup>2</sup>Advised by the clinic to notify sexual partners for STI</b>  |                  |                   |
| Yes   | 67/75            | 89.3 (82.2-96.6)  |
| <b><sup>2</sup>Provided additional assistance by the clinic for notification of sexual partner</b>                        |                  |                   |
| Yes   | 50/75            | 66.7 (55.74-77.6) |
| <b><sup>3</sup>Type of assistance provided</b>  |                  |                   |
| Referral slip with clinic details   | 14/50            | 28.0 (15.1-40.9)  |
| Written information about STI they were diagnosed with for their partners   | 11/50            | 22.0 (10.1-33.9)  |
| Written information about where their partner can obtain a test for STI   | 2.0/50           | 4 (1.6-9.6)       |
| <b><sup>2</sup>Notified partners of STI</b>   |                  |                   |
| Yes   | 42/70            | 60.0 (48.2-71.8)  |
| <b><sup>4</sup>Types of sexual partners notified</b>  |                  |                   |
| Primary partner   | 17/42            | 40.5 (24.9-55.9)  |
| Regular partners  | 22/42            | 52.4 (36.6-68.1)  |
| Casual partners   | 24/42            | 57.1 (41.5-72.8)  |
| Ex-partners   | 1/42             | 2.4 (0.1-12.6)    |
| <b><sup>4,5</sup>Methods used for notifying partners</b>  |                  |                   |
| Via an health advisor   | 1/42             | 2.4 (0.1-12.6)    |
| In-person   | 14/42            | 33.3 (18.5-48.2)  |
| Via a text message  | 13/42            | 30.9 (16.4-45.5)  |
| Via a phone call  | 20/42            | 47.6 (31.9-63.4)  |
| Via an email or online message  | 6/42             | 14.3 (3.2-25.3)   |
| <sup>1</sup> N varies due to item non-response  |                  |                   |
| <sup>2</sup> Includes only men who were diagnosed with STI in the last year   |                  |                   |
| <sup>3</sup> Includes only men who were given clinic advice and assistance following their STI diagnosis in the last year |                  |                   |
| <sup>4</sup> Includes only men who had notified their sexual partners of STI  |                  |                   |
| <sup>5</sup> Percentages will not add up to 100 because of multiple choice question                                       |                  |                   |

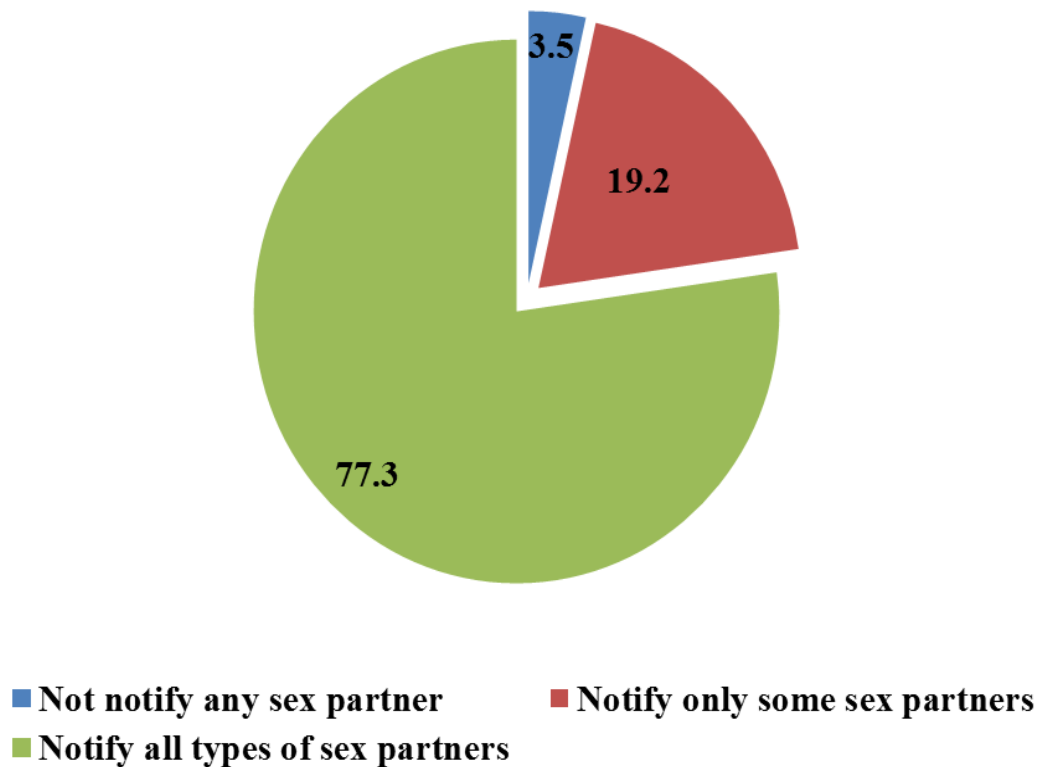
Only one man had notified his partners via a health advisor, 14 (33.3%) men had notified in person, 20 (47.6%) men via a phone call, 13 (30.9%) via a text message, and 6 (14.3%) men had notified their partners either via an email or an online message.

In the following section, I examine the willingness of men to notify different types of sexual partners for exposure to STI in the future and the willingness to use different methods of notification for STI.

### 5.3.5 Willingness to notify sexual partners of STI in the future and use different methods of notification

As shown in Figure 10, of the 427 men who responded, 330 (77.3%) men expressed willingness to notify all sexual partners if they were diagnosed with STI in the future. A further 19.2% of men would be willing to notify only some sexual partners, whereas 3.5% of men would be unwilling to notify any sexual partners if they were diagnosed with STI in the future.

**Figure 10. Willingness to notify different types of sex partners of STI in the future**



As indicated in Table 33, men would be less willing to notify casual partners of STI in the future (21.1%) compared to primary partner (5.2%) or regular partners (7.5%). Similarly, men would be more willing to notify casual partners only via provider referral or an anonymous e-card (5.4%) compared to primary partner (0.2%) or regular partners (0.5%).

**Table 33. Willingness to notify different types of sexual partners and use different methods of notification by partnership type**

| Preferred methods of notification  | <sup>1</sup> Type of sexual partners |                                      |                                     |
|--|--------------------------------------|--------------------------------------|-------------------------------------|
|  | Primary partner<br>(N=423)<br>n (%)  | Regular partners<br>(N=427)<br>n (%) | Casual partners<br>(N=426)<br>n (%) |
| Not notify   | 22 (5.3)                             | 32 (7.5)                             | 90 (21.1)                           |
| Notify only via provider referral or anonymous e-card                        | 1 (0.2)                              | 2 (0.5)                              | 23 (5.4)                            |
| Notify only themselves (patient referral)                                    | 297 (70.2)                           | 237 (55.5)                           | 191 (44.8)                          |
| Notify via any methods (patient referral/provider referral/anonymous e-card) | 103 (24.4)                           | 156 (36.5)                           | 122 (28.6)                          |

<sup>1</sup>N varies due to item non-response

The majority of men would be willing to notify their primary partner only via patient referral (70.2%) compared to regular partners (55.5%) and casual partners (44.8%). 24.4% of men would be willing to notify their primary partner via any method, (i.e., patient or provider referral or anonymous e-cards), whereas 36.5% and 28.6% of men would be willing to notify their regular and casual partners respectively by any methods. Overall, among men who reported willingness to notify sex partners of STI in the future, patient referral was preferable compared to other methods for notifying all types of sexual partners.

Men were asked to rate their willingness to use different types of patient-led and provider-led methods of notification of STI for different types of sexual partners in

the future. Face-to-face notification was the most preferred method to notify of STI to both a primary partner (91.8%) and regular partners (69.7%), whereas phone call (38.9%) was the most preferred method for notifying casual partners in the future (Table 34). 45.2% of men also expressed preference to call a primary partner to notify him of STI and 59.9% of men to notify regular partners of STI in the future.

Men reported greater willingness to use other remote methods like SMS via a cell phone and send email from their personal mail account in the future to notify regular partners and casual partners of STI compared to a primary partner. 31% of men would be willing to notify casual partners anonymously or non-anonymously via a health advisor, whereas 24% of men would be willing to use these methods to notify regular partners of STI. A smaller proportion of men would also prefer to notify their primary partner via a health advisor, either anonymously or non-anonymously (8.9%). Similarly, men would be more willing to send anonymous e-cards to notify casual partners of STI (15.2%) compared to a primary partner (4.7%) or regular partners (10.9%) in the future.

Men were also asked about their willingness to take home sampling kit for chlamydia and gonorrhoea for their sexual partners in the future. Men would be more willing to take a home sampling kit for their primary partner (32.9%) compared to regular partners (9.8%) and casual partners (4.2%). Similarly, men would be more willing to take treatment for STI for their primary partner after his telephone assessment by a clinic staff (17.9%) compared to for their regular partners (5.8%) or casual partners (4.2%).

**Table 34: HIV positive MSM's willingness to notify different types of sexual partners of STI in the future via conventional and novel methods (N=429)**

|  | <sup>1</sup> Type of sexual partners |                                 |                                 |
|--|--------------------------------------|---------------------------------|---------------------------------|
|  | Primary partner                      | Regular partner(s)              | Casual partner(s)               |
| Methods of PN                              | Very likely/<br>likely<br>n (%)      | Very likely/<br>likely<br>n (%) | Very likely/<br>likely<br>n (%) |
| <b>Conventional methods</b>                |                                      |                                 |                                 |
| Face-to-face                               | 394 (91.8)                           | 299 (69.7)                      | 143 (33.3)                      |
| Email                                      | 21 (4.9)                             | 74 (17.3)                       | 62 (14.5)                       |
| Phone call                                 | 194 (45.2)                           | 277 (59.9)                      | 167 (38.9)                      |
| SMS via cell phone                         | 58 (13.5)                            | 116 (27.0)                      | 112 (26.1)                      |
| Anonymously via a health advisor           | 24 (5.6)                             | 79 (18.4)                       | 111 (25.9)                      |
| Non-anonymously via a health advisor       | 14 (3.3)                             | 24 (5.6)                        | 22 (5.1)                        |
| <b>Novel methods</b>                       |                                      |                                 |                                 |
| Anonymous e-card                           | 20 (4.7)                             | 47 (10.9)                       | 65 (15.2)                       |
| Take a home sampling kit                   | 141 (32.9)                           | 42 (9.8)                        | 18 (4.2)                        |
| Take medication after telephone assessment | 77 (17.9)                            | 25 (5.8)                        | 11 (2.6)                        |

<sup>1</sup>Multiple response question so men could chose more than one method they were willing to use to notify their sexual partners for STI so the percentages will not add up to 100

As shown previously in Figure 10, only 3.5% of men would be unwilling to notify any sexual partners of STI in the future. The following Figure 11 shows in greater detail the willingness of men to notify (or not notify) different types of sexual partners, i.e., primary partner, regular partners and casual partners, and preferred methods of notification for STI by partnership type. 3% of men would be willing to only notify primary partner, of which 1.9% of men would be willing to notify them only face-to-face and 1.2% would be willing to notify only via any patient referral methods. 0.9% of men would be willing to notify only regular partners. 0.2% of men would be willing to notify their regular partner only face-to-face, 0.2%

would be willing to notify via any patient referral methods and 0.5% were willing to notify them via any patient or provider referral method. No men expressed preference to notify only casual partners of STI in the future.

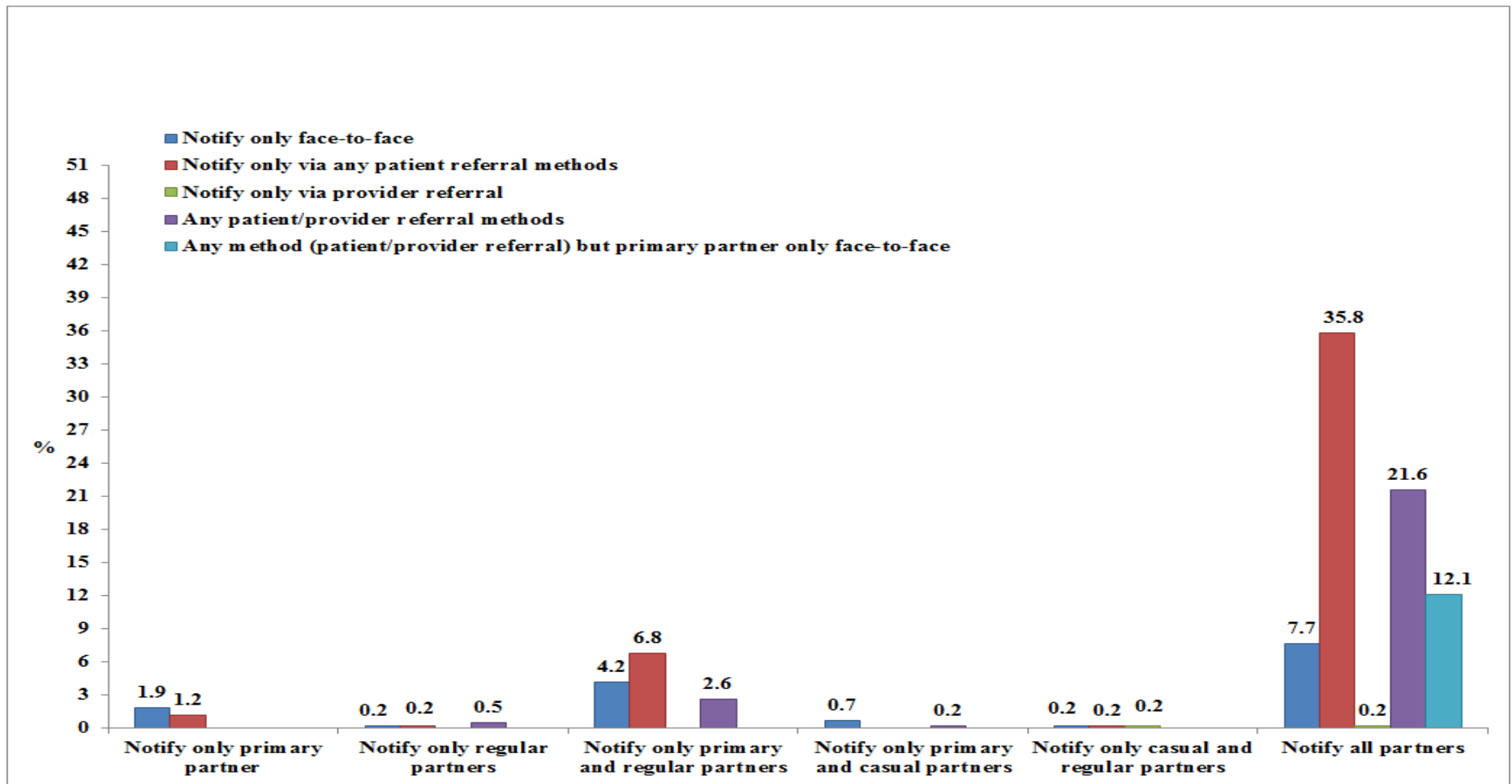
13.6% of men would be willing to notify only primary partner and regular partners of STI in the future. Of these, 4.2% would be willing to do so only face-t-face, 6.8% only via any patient referral methods, and 2.6% of men via any patient or provider referral method. A minority of men would be willing to notify only primary partner and casual partners (0.9%). They would be willing to notify these partners only face-to-face (0.7%) and a further 0.2% of men via any patient or provider referral methods.

Further 0.6% of men would be willing to notify only regular and casual partners of STI. 0.2% of these men would be willing to do so only face-to-face, 0.2% of men only via any patient referral methods and 0.2% of men would be willing to notify them only via provider referral methods.

The majority of men (77.4%) who would be willing to notify all types of sex partners of STI in the future. 7.7% of men who would be willing to notify them only face-to-face, 35.8% of men who would be willing to do so only via any patient referral methods. 21.6% of men would be willing to notify all types of sex partners of STI via any methods (patient or provider referral methods). The proportion of men who would be willing to notify all types of sexual partners of STI only via provider referral was low (0.2%). 12% of men would be willing to notify all types of sexual partners of STI in the future but they would be willing to notify their primary partner only face-to-face and use other methods to notify their regular and casual partners.



**Figure 11. HIV positive MSM's willingness to use different methods of notification to notify different types of sex partners: detailed overview**



### 5.3.6 Willingness to notify casual partners of STI in the future

As mentioned previously in Table 33, 90 (21.1%) men would be unwilling to notify casual partners of STI in the future. 23 (5.4%) men would be willing to notify them only via provider referral or anonymous methods and 191 (44.8%) men would be willing to notify them only via patient referral methods. A further 122 (28.6%) men would be willing to notify their casual partners of STI via any patient or provider referral methods. In the following section, I examine the univariate association between various socio-demographic factors, HIV related factors, attitudes towards partner notification, self-efficacy to notify partners of STI, and willingness and preferred methods to notify casual partners of STI in the future (i.e., unwilling to notify any casual partners of STI, willing to notify casual partners of STI only via provider referral/anonymous methods, willing to notify casual partners only via patient referral methods and willing to notify casual partners via any method of partner notification).

#### 5.3.6.1 *Univariate analysis of factors associated with willingness and preferred methods of notification of casual partners for STI in the future*

In the univariate analysis, age, cART status and ethnicity were associated with willingness and preferred methods of notifying casual partners of STI in the future (Table 35). Men aged 35-44 years and  $\geq 45$  reported greater unwillingness to notify any casual partners of STI in the future (23.1% and 21.8% respectively) compared to men aged  $\leq 34$  years (15.5%). Younger men would be more willing to notify their casual partners in the future only via provider referral or anonymous methods (7%) compared to men of other age groups. Men aged  $\geq 45$  years would be more willing to notify casual partners in the future only via patient referral methods (52.5%) compared to men aged  $\leq 34$  years (36.6%). Young men ( $\leq 34$

years) reported greater willingness to notify casual partners of STI via any methods of partner notification in the future (40.9%) compared to men aged 35-44 years (32.5%) and  $\geq 45$  years (20.7%) ( $p=0.02$ ). Men from non-White ethnic background were more willing to use both patient and provider referral methods to notify casual partners of STI in the future (46.6%) compared to men from White ethnic background (26%). Men from White ethnic background would be more willing to notify casual partners only via patient referral methods in the future (47.4%) compared to men from non-White background (27.6%) ( $p=0.008$ ). Men on cART would be more willing to notify casual partners of STI only via provider referral methods or anonymous methods in the future (6.4%) compared to those not on cART (1.2%). However, there was no association between the outcome variable of interest and education ( $p=0.41$ ), employment status ( $p=0.53$ ), country of birth ( $p=0.39$ ), time since HIV diagnosis ( $p=0.41$ ), recent CD4 cell count ( $p=0.64$ ) or recent self-reported viral load status ( $p=0.34$ ).

**Table 35. Socio-demographic and HIV related factors associated with variation in preferred methods for notifying casual partners for STI in the future (N=429)**

| Factors                                 | <sup>1</sup> Unwilling to notify (n=90) | <sup>1</sup> Willing to notify only via provider referral/ anonymous methods (n=23) | <sup>1</sup> Willing to notify only via patient referral methods (n=191) | <sup>1</sup> Willing to notify via any methods (patient or provider) (n=122) | p-value        |
|---|---|---|--|--|----------------|
|   | n/N (%)                                 | n/N (%)   | n/N (%)  | n/N (%)  |                |
| <b>Age</b>                              |   |   |  |  | <b>p=0.02</b>  |
| <=34                                    | 11/89 (15.5)                            | 5/23 (7.0)  | 26/186 (36.6)  | 29/121 (40.9)  |                |
| 35-44                                   | 39/89 (23.1)                            | 9/23 (5.3)  | 66/186 (39.1)  | 55/121 (32.5)  |                |
| >=45                                    | 39/89 (21.8)                            | 9/23 (5.0)  | 94/186 (52.5)  | 37/121 (20.7)  |                |
| <b>Time since HIV diagnosis (years)</b> |   |   |  |  | <b>p=0.41</b>  |
| Median (IQR)                            | 9 (4-14)                                | 11 (8-15)   | 9 (5-15)   | 9 (4-14)   |                |
| <b>Ethnicity</b>                        |   |   |  |  | <b>p=0.008</b> |
| White                                   | 77/89 (21.1)                            | 20/23 (5.5)   | 173/189 (47.4)   | 95/122 (26.0)  |                |
| Non-White                               | 12/89 (20.7)                            | 3/23 (5.2)  | 16/189 (27.6)  | 27/122 (46.6)  |                |
| <b>Education</b>                        |   |   |  |  | <b>p=0.41</b>  |
| Up to secondary school                  | 21/90 (17.7)                            | 4/23 (3.4)  | 59/191 (49.6)  | 35/122 (29.4)  |                |
| Beyond secondary school                 | 69/90 (22.5)                            | 19/23 (6.2)   | 132/191 (43.0)   | 87/122 (28.3)  |                |
| <b>Employment</b>                       |   |   |  |  | <b>p=0.53</b>  |
| Yes                                     | 65/89 (20.4)                            | 20/23 (6.3)   | 145/191 (45.5)   | 89/122 (27.9)  |                |
| No                                      | 24/89 (22.6)                            | 3/23 (2.8)  | 46/191 (43.4)  | 33/122 (31.3)  |                |
| <b>Born in the UK</b>                   |   |   |  |  | <b>p=0.39</b>  |
| No                                      | 36/90 (21.6)                            | 12/23 (7.2)   | 68/191 (40.7)  | 51/122 (30.5)  |                |
| Yes                                     | 54/90 (20.9)                            | 11/23 (4.3)   | 123/191 (47.5)   | 71/122 (27.4)  |                |
| <b>Recent CD4 cell count</b>            |   |   |  |  | <b>p=0.64</b>  |
| >/=200                                  | 80/83 (20.6)                            | 22/22 (5.7)   | 172/182 (44.2)   | 115/120 (29.6)   |                |
| <200                                    | 3/83 (16.7)                             | 0/22 (0.0)  | 10/182 (55.6)  | 5/120 (27.8)   |                |
| <b>Currently receiving cART</b>         |   |   |  |  | <b>p=0.02</b>  |
| No                                      | 18/90 (21.7)                            | 1/23 (1.2)  | 31/191 (37.4)  | 33/122 (39.8)  |                |
| Yes                                     | 72/90 (20.9)                            | 22/23 (6.4)   | 160/191 (46.7)   | 89/122 (25.9)  |                |
| <b>Perceived viral load status</b>      |   |   |  |  | <b>p=0.34</b>  |
| Detectable                              | 2/862 (22.9)                            | 2/23 (2.1)  | 42/185 (43.8)  | 30/117 (31.3)  |                |
| Undetectable                            | 64/86 (20.3)                            | 21/23 (6.7)   | 143/185 (45.5)   | 87/117 (27.6)  |                |

<sup>1</sup>N varies due to item non-response

The attitudes of men towards partner notification of STI were significantly associated with preferred methods to notify casual partners of STI (Table 36). Men who were concerned about the breach of HIV related confidentiality would be more willing to use only provider-led methods in the future (33.3%) compared to men who were not concerned about the breach of confidentiality (5.7%). Men who were less concerned about breach of HIV-related confidentiality would be more willing to notify casual partners of STI via any patient referral methods in the future (48.8%) compared to men who were concerned about it (35.6%). Men who disagreed that it is the right of their sexual partners to be notified for STI would be less willing to notify casual partners of STI in the future (37.4%) compared to men who agreed that it is the right of their sex partners (17%). Men who agreed or strongly agreed that it is the right of their sexual partners to be notified of STI would be more willing to themselves notify their casual partners of STI in the future (47.8%) compared to men who disagreed or were unsure about it (32.5%) ( $p=0.001$ ). Men who disagreed that their sex partners should notify them of STI would be less willing to notify casual partners in the future (31.9%) compared to men who agreed (18.9%). Similarly, men who agreed or strongly agreed that their sexual partners should notify them of STI would be more willing to notify their casual partners via patient referral methods (47.9%) compared to men who disagreed or strongly disagreed (28.9%) ( $p=0.01$ ).

**Table 36. Attitudes, perceived self-efficacy, and sexual behaviour and partnership related factors associated with preferred methods for notifying casual partners of STI in the future**

| <sup>1</sup> Factors  | <sup>1</sup> Unwilling to notify (n=90) | <sup>1</sup> Willing to notify only via provider referral/ anonymous methods (n=23) | <sup>1</sup> Willing to notify only via patient referral methods (n=191) | <sup>1</sup> Willing to notify via any methods (patient or provider) (n=122) | p-value        |
|---|---|---|--|--|----------------|
|   | n/N (%)                                 | n/N (%)   | n/N (%)  | n/N (%)  |                |
| <b>Attitudes towards partner notification for STI</b>                                 |   |   |  |  |                |
| <b>Worried about breach of HIV-related confidentiality</b>                            |   |   |  |  | <b>p=0.03</b>  |
| No  | 55/73 (19.7)                            | 16/19 (5.7)   | 136/168 (48.8)   | 72/109 (25.8)  |                |
| Yes   | 18/73 (20.0)                            | 3/19 (33.3)   | 32/168 (35.6)  | 37/109 (41.1)  |                |
| <b>It is the right of the sexual partner to be notified of curable STI</b>            |   |   |  |  | <b>p=0.001</b> |
| Agree/strongly agree  | 58/89 (17.0)                            | 18/23 (5.3)   | 163/190 (47.8)   | 102/122 (29.9)   |                |
| Disagree/not sure/strongly disagree   | 31/89 (37.4)                            | 5/23 (6.0)  | 27/190 (32.5)  | 20/122 (24.1)  |                |
| <b>My sexual partners should inform me if they are diagnosed with any curable STI</b> |   |   |  |  | <b>p=0.01</b>  |
| Agree/strongly agree  | 67/89 (18.9)                            | 20/23 (5.6)   | 170/190 (47.9)   | 98/122 (27.6)  |                |
| Disagree/not sure/strongly disagree   | 22/89 (31.9)                            | 3/23 (4.4)  | 20/190 (28.9)  | 24/122 (34.8)  |                |
| <b>Perceived self-efficacy</b>  |   |   |  |  |                |
| <b>Comfort level to discuss about sexual contacts with clinic staff</b>               |   |   |  |  | <b>p=0.78</b>  |
| Uncomfortable   | 38/90 (23.0)                            | 8/23 (4.9)  | 70/191 (42.4)  | 49/122 (29.7)  |                |
| Comfortable   | 52/90 (19.9)                            | 15/23 (5.8)   | 121/191 (46.4)   | 73/122 (27.9)  |                |
| <b>Ever notified sexual partners of STI</b>   |   |   |  |  | <b>p=0.001</b> |
| No  | 45/90 (30.4)                            | 9/23 (6.1)  | 49/191 (33.1)  | 45/122 (30.4)  |                |
| Yes   | 45/90 (16.2)                            | 14/23 (5.0)   | 142/191 (51.1)   | 77/122 (27.7)  |                |

Table 36. Continued

| <b>Factors</b>   | <b>Unwilling to notify (n=90)</b> | <b>Willing to notify only via provider referral/ anonymous methods (n=23)</b> | <b>Willing to notify only via patient referral methods (n=191)</b> | <b>Willing to notify via any methods (patient or provider) (n=122)</b> | <b>p-value</b> |
|--|-----------------------------------|---|--|--|----------------|
|  | <b>n/N (%)</b>                    | <b>n/N (%)</b>  | <b>n/N (%)</b>   | <b>n/N (%)</b>   |                |
| <b>Sexual behaviour and sexual partnership related factors</b> |                                   |   |  |  |                |
| <b>New anal sex partners in last year</b>                      |                                   |   |  |  | <b>p=0.04</b>  |
| 0-1  | 38/89 (20.7)                      | 15/23 (8.2)   | 85/190(46.2)   | 46/122 (25.0)  |                |
| 2-4  | 7/89 (13.7)                       | 4/23 (7.8)  | 26/190 (50.9)  | 14/122 (27.5)  |                |
| 5-10   | 16/89 (22.5)                      | 3/23 (4.2)  | 23/190 (32.4)  | 29/122 (40.9)  |                |
| >10  | 28/89 (23.7)                      | 1/23 (0.9)  | 56/190 (47.5)  | 33/122 (27.9)  |                |
| <b>Had UAI</b>   |                                   |   |  |  | <b>p=0.31</b>  |
| No   | 52/90 (22.8)                      | 14/23 (6.1)   | 105/191 (46.1)   | 57/122 (25.0)  |                |
| Yes  | 38/90 (19.2)                      | 9/23 (4.6)  | 86/191 (43.4)  | 65/122 (32.8)  |                |
| <b>Met new partners via internet</b>                           |                                   |   |  |  | <b>p=0.005</b> |
| No   | 51/90 (20.7)                      | 21/23 (8.5)   | 104/191 (42.3)   | 70/122 (28.5)  |                |
| Yes  | 39/90 (21.7)                      | 2/23 (1.1)  | 87/191 (48.3)  | 52/122 (28.9)  |                |

<sup>1</sup>N varies due to item non-response

With regards to perceived self-efficacy to discuss details of sexual partners with clinic staff, men who had not notified sexual partners for STI in the past would be less willing to notify casual partners in the future (30.4%) compared to men who had notified sexual partners of STI in the past (16.2%) ( $p=0.001$ ). The latter would be more willing to notify their casual partners via any patient referral methods in the future (51.1%) compared to men who had not notified partners of STI previously (33.1%). There was no association between the outcome variable of interest and comfort level to discuss about sexual partners with the clinic staff ( $p=0.78$ ).

With regards to sexual partnership patterns and sexual behaviour, men with less than four new AI partners in the last year would be more willing to notify their casual partners of STI via provider-led or anonymous methods in the future

compared to men with greater number of new AI partners ( $p=0.04$ ). Men who had not met their sex partners via the internet would be more willing to notify their casual partners of STI via provider referral or anonymous methods (8.5%) compared to men who had met their partners online (1.1%). There was no association between preferred methods to notify casual partners of STI in the future and engagement in UAI in the last year with any type of sex partners ( $p=0.31$ ).

#### **5.3.6.2** *Factors associated with unwillingness to notify casual partners of STI in the future*

In the following section, I examine the factors associated with unwillingness to notify casual partners of STI in the future (versus willingness to notify). The methods of analysis were described in section 2.5.14.5. As mentioned earlier in Table 33, approximately 21% of men would not be willing to notify casual partners of STI in the future. In the univariate analysis, none of the socio-demographic, or HIV related factors were associated with unwillingness to notify casual partners of STI (Table 37).



**Table 37. Univariate analysis of the association between socio-demographic and HIV related factors with unwillingness to notify casual partners of STI (N=429)**

| <b>Factors</b>                         | <b>Unadjusted OR (Unwillingness to notify versus willingness to notify)</b> |
|--|---|
|  | <b>p-value</b>  |
|  | <b>OR (95% CI)</b>  |
| <b>Age</b>                             | <b>p=0.42</b>   |
| <=34                                   | 1   |
| 35-44                                  | 1.63 (0.78-3.41)  |
| >=45                                   | 1.48 (0.71-3.09)  |
| <b>Time since HIV diagnosis</b>        | <b>p=0.42</b>   |
| Median (IQR)                           | 0.99 (0.95-1.02)  |
| <b>Ethnicity</b>                       | <b>p=0.97</b>   |
| White                                  | 1   |
| Non-White                              | 0.99 (0.49-1.95)  |
| <b>Education</b>                       | <b>p=0.27</b>   |
| Beyond secondary school                | 1   |
| Up to secondary school                 | 0.73 (0.42-1.26)  |
| <b>Employment</b>                      | <b>p=0.59</b>   |
| Yes                                    | 1   |
| No                                     | 1.16 (0.68-1.97)  |
| <b>Born in the UK</b>                  | <b>p=0.81</b>   |
| No                                     | 1   |
| Yes                                    | 0.94 (0.58-1.51)  |
| <b>Recent CD4 cell count</b>           | <b>p=0.70</b>   |
| >/=200                                 | 1   |
| <200                                   | 0.78 (0.22-2.76)  |
| <b>Currently receiving cART</b>        | <b>p=0.86</b>   |
| No                                     | 1   |
| Yes                                    | 1.05 (0.59-1.89)  |
| <b>Self-reported viral load status</b> | <b>p=0.55</b>   |
| Detectable                             | 1   |
| Undetectable                           | 0.84 (0.49-1.47)  |

With regards to attitudes towards partner notification for STI, as shown in Table 38, men who disagreed that it is the right of the sex partner to be notified of STI would be more likely to not notify casual partners of STI in the future compared to men who agreed with it (36.9% vs. 16.9%; OR: 2.86; 95% CI: 1.69-4.84; p<0.001).

**Table 38. Attitudes, perceived self-efficacy, sexual behaviour, and partnership factors associated with unwillingness to notify casual partners of STI (N=429)**

| <b>Factors</b>  | <b>Unadjusted OR<br/>(Unwillingness to<br/>notify vs. willingness<br/>to notify)</b> |
|---|--|
|   | <b>p-value<br/>OR (95% CI)</b>   |
| <b>Attitudes towards partner notification for STI</b>                                 |  |
| <b>Worried about breach of HIV-related confidentiality</b>                            | <b>p=0.92</b>  |
| No  | 1  |
| Yes   | 1.03 (0.57-1.87)   |
| <b>It is the right of the sexual partner to be notified of curable STI</b>            | <b>p&lt;0.001</b>  |
| Agree/strongly agree  | 1  |
| Disagree/not sure/strongly disagree   | 2.86 (1.69-4.84)   |
| <b>My sexual partners should inform me if they are diagnosed with any curable STI</b> | <b>p=0.02</b>  |
| Agree/strongly agree  | 1  |
| Disagree/not sure/strongly disagree   | 1.98 (1.11-3.49)   |
| <b>Perceived self-efficacy</b>  |  |
| <b>Comfort level to discuss about sexual contacts with clinic staff</b>               | <b>p=0.41</b>  |
| Uncomfortable   | 1  |
| Comfortable   | 0.81 (0.51-1.32)   |
| <b>Ever notified sexual partners of STI</b>   | <b>p=0.001</b>   |
| No  | 1  |
| Yes   | 0.43 (0.27-0.70)   |
| <b>Sexual partnerships and sexual behaviour</b>                                       |  |
| <b>Had UAI</b>  | <b>p=0.40</b>  |
| No  | 1  |
| Yes   | 0.81 (0.51-1.31)   |
| <b>New anal sex partners in last year</b>   | <b>p=0.53</b>  |
| 0-1   | 1  |
| 2-4   | 0.61 (0.26-1.47)   |
| 5-10  | 1.10 (0.57-2.14)   |
| >10   | 1.20 (0.69-2.09)   |
| <b>Met at least some new sex partners via the internet</b>                            | <b>p=0.84</b>  |
| Yes   | 1  |
| No  | 1.04 (0.66-1.68)   |

Similarly, as shown in Table 38, men who disagreed that partners should notify them of STI (31.4%) would be more likely to be unwilling to notify casual partners of STI in the future compared to men who agreed with it (18.8%) (OR: 1.98; 1.11-3.49;  $p=0.02$ ). Men who had previously notified partners of STI would less likely to be unwilling to notify casual partners of STI in the future (16%) compared to men who had ever notified partners of STI (30.4%) (OR: 0.43; 95% CI: 0.27-0.70;  $p=0.001$ ). There was no association between the outcome variable of interest, and any sexual partnership or sexual behaviour related factors and comfort level to discuss about sex with clinic staff.

As shown in Table 39, when the variables associated with the outcome variable of interest in univariate analysis ( $p<0.2$ ) were incorporated in a multivariate model, ever notification of sex partners of STI and attitudes towards partner notification like it is the right of the sex partner to be notified of STI continued to remain significantly associated with the outcome variable. Men who disagreed that it is the right of the sex partner to be notified of STI would be more likely to be unwilling to notify casual partners of STI in the future compared to men who agreed (AOR: 3.35; 95% CI: 1.60-7.01;  $p=0.001$ ). Men who had notified sex partners of STI in the past would be less likely to be unwilling to notify casual partners of STI compared to men who had never done so in the past (AOR: 0.45; 95% CI: 0.28-0.75;  $p=0.002$ ). Attitudes that sexual partner should notify me if they are diagnosed with STI was no longer significantly associated with the outcome variable in the multivariate analysis.

**Table 39. Factors associated with unwillingness to notify casual partners of STI (N=419)**

| <b>Factors</b>  | <b>Adjusted odds ratios<br/>(Unwillingness to<br/>notify vs. willingness<br/>to notify)</b> |
|---|---|
|   | <b>p-value<br/>AOR (95% CI)</b>   |
| <b><sup>1</sup>Age</b>  | <b>p=0.77</b>   |
| <=34  | 1   |
| 35-44   | 1.31 (0.62-2.81)  |
| >=45  | 1.19 (0.56-2.53)  |
| <b>It is the right of the sexual partner to be notified<br/>of curable STI</b>            | <b>p&lt;0.001</b>   |
| Agree/strongly agree  | 1   |
| Disagree/not sure/strongly disagree   | 3.35 (1.60-7.01)  |
| <b>My sexual partners should inform me if they are<br/>diagnosed with any curable STI</b> | <b>p=0.44</b>   |
| Agree/strongly agree  | 1   |
| Disagree/not sure/strongly disagree   | 0.72 (0.32-1.63)  |
| <b>Ever notified sexual partners of STI</b>   | <b>p=0.002</b>  |
| No  | 1   |
| Yes   | 0.46 (0.28-0.75)  |
| <sup>1</sup> Age was specified <i>a priori</i> to be retained in the model                |   |

In the following section, I describe men's attitudes referring members of their sexual and social network for STI testing in the event of a STI outbreak.

### 5.3.7 Views towards notifying members of social network for STI

Men were asked about their views towards notifying sexual partners and members of their social network who are not their sexual partners to test for STI in the event of outbreak of STI like LGV, Syphilis or HCV. 65% of men would be willing to advise their sexual partner to test for STI in the future if they were informed about an outbreak. 53% of men would be willing to notify members of their social network if they perceived them to be at risk of STI or know that they engage in

risky sexual behaviour. The majority of men would be willing to be informed of an STI outbreak by the clinic (81.6%).

In the following section, I describe men's preferred methods to be notified of STI by their sexual partners in the future.

### **5.3.8 Preferred methods to be notified by sexual partners of STI in the future**

Men were asked if they would be willing to be notified of STI by their sexual partners in the future. The majority of men felt that it was 'important' or 'extremely important' that their sexual partners should notify them for exposure to STI in the future (97.5%). As shown in Table 40, the majority of men would prefer to be notified of STI in the future by their partners face-to-face (72%) and/or by telephone (58.4%). Approximately 30% of men would be willing to be notified via an email from their partner. 15% of men would be willing to be notified via an anonymous e-card. A few men (4.8%) would be willing to be notified of STI by their sexual partners in the future via any of these methods, whereas 13.9% of men would be willing to be notified only face-to-face. Some men would also be willing to be notified of STI in the future via provider-led methods. 44% of men would be willing to be notified of STI via a phone call from a health advisor, 34.2% of men would be willing to be notified via an email sent by the clinic and 23% via a text message sent by a health advisor and 20.8% of men via a letter from the clinic. There was a greater preference to be notified of STI in the future only via partner-led methods (35.4%) as opposed to being notified only via provider-led methods (10.8%). No participants expressed a preference to be notified of STI in the future only via an anonymous e-card.

**Table 40. Preferred methods to be notified by sexual partners for exposure to STI in the future (N=418)**

| Methods of notifying partners                           | <sup>1</sup> n | <sup>2</sup> % (95%CI) |
|---|----------------|------------------------|
| <b>Partner-led methods</b>                              |                |                        |
| Face-to-face  | 302            | 72.0 (67.7-76.3)       |
| Email   | 131            | 31.3 (26.8-35.8)       |
| Phone call  | 244            | 58.4 (53.6-63.1)       |
| Mobile text message                                     | 127            | 30.4 (25.9-34.8)       |
| Anonymous e-card  | 63             | 15.1 (11.6-18.5)       |
| <b>Clinic-led methods (health advisor/clinic staff)</b> |                |                        |
| Email   | 143            | 34.2 (29.6-38.7)       |
| Phone call  | 185            | 44.0 (39.2-48.8)       |
| Text message  | 96             | 23.0 (18.9-27.0)       |
| Letter  | 87             | 20.8 (16.9-24.7)       |

<sup>1</sup>Excludes men who were not willing to be notified by their sexual partners of STI in the future  
<sup>2</sup>Percentages will not add up to 100 because this was a multiple choice question

In the following section, I discuss the findings of this chapter and compare them with those of other studies and the findings of the SHARPN survey presented in chapter 3.

#### 5.4 *Discussion of findings*

In this chapter, I examined HIV positive MSM's attitudes towards partner notification for STI, previous experience of partner notification for STI, STI testing and diagnosis in the last year, and factors associated with STI diagnosis among HIV positive MSM. I examined men's willingness to notify different types of sexual partners of STI and to be notified of STI, willingness to use various methods of partner notification and factors associated with unwillingness to notify casual partners of STI.

In the following sub-sections, I discuss the findings and compare them with those of other studies.

*Attitudes towards partner notification for STI and previous experience of notifying partners of STI*

Almost a quarter of the men reported never having been advised by the clinic staff to notify their partners of STI following STI diagnosis. This finding suggests that the clinic staff should offer partner notification advice to all patients diagnosed with STI. Consistent with findings from another study, one in five men were worried about the breach of HIV related confidentiality as a result of partner notification (Woodward et al., 2010). Therefore, the clinic staff should discuss with patients about perceived threats to confidentiality due to partner notification for STI, and discuss strategies considered to be confidential to enhance partner notification.

The majority of men perceived notifying partners of STI as their responsibility and considered that partners had a right to be notified of exposure to STI. However, one in ten men had experienced verbal abuse, and a small proportion of men had experienced physical violence following partner notification for STI. One in five men had experienced a break-up of partnership following notification for STI. One third of the men expressed fear of break-up with a primary partner following notification of STI in the future. The clinic staff as well as health promotion campaigns among MSM should promote normalisation of partner notification for STI to prevent the negative effects of notification and enhance its acceptability. It is important to explore the context and circumstances that are likely to lead to negative experiences following partner notification for STI. This is explored further in the qualitative study presented in Chapter 6. Although the majority of men considered partner notification for STI to be their personal responsibility, they

were unwilling for it to be a legal obligation. The majority of men expressed willingness to be notified of STI by their partners in the future.

***STI testing, diagnosis and factors associated with STI diagnosis in the last year***

Almost 20% of sexually active men had not tested for STI in the last year. Similar to other studies conducted in London and abroad, the burden of STI, particularly bacterial STI among HIV positive MSM was high (Elford et al., 2007; Wayal et al., 2008; Mayer et al., 2010) and similar to that reported in the SHARP survey (Stephenson et al., 2003) indicating no substantial change in the risk of STI among these men over the last decade. Thus, there is a need for interventions to reduce the risk of STI diagnosis among HIV positive MSM. Although a majority of men reported being diagnosed with bacterial infections like syphilis, LGV, rectal and urethral chlamydia and gonorrhoea, a minority of men were diagnosed with HCV (7.4%) and genital warts (12.4%). Similar to a study conducted in the USA (Mayer et al., 2010), young age was associated with increased risk of STI diagnosis in the last year. Having a detectable plasma viral load, more than four new AI partners, greater frequency of engagement in group sex, engagement in UAI, engagement in UAI with concurrent partners were also independently associated with STI diagnosis.

The distribution of number of sex partners and the sexual mixing patterns between those with different number of sex partners (Garnett et al., 1996; Aral et al., 1999) influences the individual as well as population level prevalence of STI and risk of STI acquisition or transmission. The SHARPN survey findings reported in chapter 3 have shown that the proportion of men who had multiple new AI partners and/or had engaged in UAI with concurrent partners and/or had engaged in group sex, is high. Therefore, the observed association between having more than four new AI



partners, engagement in UAI with concurrent partners, greater frequency of engagement in group sex, and STI diagnosis has implications not only for the risk of STI acquisition among HIV positive MSM but also for the rate of spread of STI in this population.

Men who had a serodiscordant primary partner were less likely to be diagnosed with STI compared to men who had a seroconcordant primary partner reiterating the SHARPN survey findings reported in Chapter 3 that the former are less likely to engage in risky behaviours with their primary partner compared to the latter. However, 11% of men who had a serodiscordant primary partner and 24.4% of men who had sex with the most recent serodiscordant non-primary partner were diagnosed with a STI. There was no difference in the risk of STI diagnosis among men who had or did not have UAI with their most recent non-primary serodiscordant or a serodiscordant primary partner. This finding is not surprising given the high level of multiple non-primary partnerships, the high proportion of concurrent/open partnerships observed among men who had a primary partner, and the engagement in risky behaviours other than UAI observed among these men in Chapter 3. The observed high prevalence of serodiscordant partnerships among these men, and the association between detectable plasma viral load status and STI diagnosis has implications not only for STI transmission and acquisition but also for onward HIV transmission.

***Willingness to notify partners of STI in the future and factors associated with lack of willingness to notify casual partners of STI***

A significant proportion of men would be willing to notify partners of STI in the future. However, the overall willingness to notify partners of STI conceals the variation in willingness to notify different types of sex partners. Similar to other

studies, a greater proportion of men would not be willing to notify their casual partners of STI compared to a primary partner or regular partners in the future (Gorbach et al., 2000; Levine et al., 2008).

Previous experience of notification for STI, and attitudes towards partner notification for STI were independently associated with the lack of willingness to notify casual partners of STI in the future. The observed association between the lack of previous experience of notification for STI and unwillingness to notify casual partners of STI in the future suggests that variables other than those included in the model influence the outcome. The qualitative study results presented in Chapter 6 provide greater insight into the reasons for unwillingness to notify casual partners compared to a primary partner or regular partners. The finding that men who disagree that it is the partner's right to be notified of STI would be more unwilling to notify casual partners suggests that there is a need to promote personal and public health benefits of notification of casual partners of STI, given the high rate of partner change among HIV positive MSM observed in chapter 3.

*Willingness to use traditional methods of partner notification for STI in the future*

Similar to other studies conducted in the UK and abroad, the survey findings suggest that overall, patient referral would be the most preferred method for notifying partners of STI in the future (Gorbach et al., 2000; Levine et al., 2008; Coleman and Lohan, 2009; Rietmeijer et al., 2011). While face-to-face methods of notification would be the most preferred method to notify partners of STI in the future, a substantial proportion of men would be willing to notify their partners via

remote self-led methods of notification like a phone call or SMS sent from their personal mobile phones.

However, the preferred methods of partner notification for STI varied according to the nature of sex partnership. Compared to other partners, a greater proportion of men would be willing to notify casual partners of STI only via provider referral. These findings suggest that the clinic should offer provider referral, especially for notification of casual partners of STI.

***Willingness to use novel methods of notification of STI in the future***

Overall, the willingness to use anonymous e-cards to notify partners of STI was low. Approximately one in eight men would be willing to notify regular or casual partners of STI via an anonymous e-card, while only one in twenty men would be willing to notify their primary partner via this method. A RCT conducted recently among MSM in the USA showed that the majority of MSM were unwilling to use the InSPOT, an anonymous e-card service to notify partners of STI (Kerani et al., 2011). A similarly low level of acceptability of anonymous e-cards was reported in an evaluation of this service in another State in USA, which had also used advertisement campaigns to raise awareness of this service (Rietmeijer et al., 2011). The use of InSPOT anonymous e-card notification was also associated with decreased HIV testing among sexual partners (Kerani et al., 2011). Thus an anonymous e-card service appears to have limited acceptability and utility among MSM.

Internet-based partner notification via dating sites by clinic staff using email address given by index cases or by patients themselves to notify sex partners was not explored as part of the SHARPN project. However, studies conducted in the USA have reported that notification of partners via an anonymous email sent by a

public health specialist from a dating website was acceptable to notify partners other than regular partners of STI (Mimiaga et al., 2008). Such internet based partner notification by the health professionals via dating websites and also via closed emails like Yahoo for syphilis led to increase in the number of partners located, notified, tested and treated (Ehlman et al., 2010). Internet based partner notification via dating websites is currently not used in the UK. However, the GMFA, a gay men's health charity in the UK, is currently piloting the acceptability of a sexual health messaging service in some London clinics that enables notification of sexual partners met via three gay dating websites (GMFA, 2012). This service allows men to send emails via this service to partners met on these sites either anonymously or otherwise. The results of this pilot will provide greater insight into the acceptability of this method of notification of STI among MSM.

A greater proportion of men would be willing to take a home sampling kit for STI or take medication for a primary partner following telephone assessment by clinic staff, compared to regular and casual partners. Overall, a greater proportion of men would be willing to take a home sampling kit for their partners compared to taking medication for partners after partner's telephone assessment by a clinic staff. The reasons for this variation are explored in the following chapter.

Similar to another study, half of the respondents would be willing to refer men in their social network to test for STI if they perceived that these men engage in risky sex (Woodward et al., 2010). A high proportion of men would also be willing to be notified by the clinic of an STI outbreak. This finding suggests that a notification by the clinic of an outbreak of STI could encourage men to test for STI.

### ***Preferred methods to be notified of STI by partners***

The majority of men (97.5%) considered it important to be notified of STI in the future. In line with the preferred methods for notifying sexual partners of STI, men would be willing to be notified of STI by their sex partners in the future either face-to-face or via a phone call. None of these men wanted to be notified via anonymous methods. However, there was greater acceptability to be notified of STI compared to notifying partners of STI via provider referral methods. These data suggest that being an index or a contact can influence the preferred methods of notification for STI.

In the following section, I discuss the limitations of the partner notification component of the SHARPN survey and the implications of the findings.

### ***5.5 Limitations***

Strengths and limitations of the SHARPN survey were described previously in section 3.5. In addition, there are following limitations. Participants were asked to self-report STI diagnoses in the last year and this is likely to be influenced by recall bias and social desirability bias. Men were asked about their willingness to notify sex partners of STI in the future and the willingness to use traditional and novel methods of notification for STI in the future. These data on willingness may not necessarily reflect actual behaviour in the future. A recent exploratory trial on partner notification for STI reported a lack of correlation between perceived uptake of contacts' testing for HIV and syphilis after receiving remote partner notification (Sutcliffe et al., 2009) and actual behaviour after using remote partner notification methods (Estcourt et al., 2012). However, I have triangulated data on partner notification for STI using the SHARPN survey data and qualitative interview data.

### 5.6 *Implications for clinical practice, health policy and future research*

The findings of this chapter suggest that not all sexually active men had tested for STI in the last year. The burden of STI among HIV positive MSM was high. Thus, there is a need for interventions to reduce the risk of STI and increase testing for STI among these men. The observed high level of concurrency, multiple AI partnerships and engagement in group sex among HIV positive MSM and their association with STI diagnosis in the last year suggests that partner notification could be effective in preventing onward STI transmission among HIV positive MSM. The observed high prevalence of serodiscordant partnerships also suggests that partner notification could lead to HIV case finding, and early diagnosis. It can enhance timely STI diagnosis and is vital to prevent increased infectivity of HIV due to co-infection with STI.

Partner notification for STI was considered to be a responsibility towards sex partners by the majority of HIV positive MSM. However, partner notification interventions among HIV positive MSM should address the observed variation in willingness to notify partners of STI by partnership type by offering support tailored according to the nature of sexual partnerships. Although patient referral was the most preferred method to notify sexual partners of STI, a greater choice of partner notification options for men who have casual partners and engage in group sex may enhance notification of these types of sex partners. Such interventions should be sensitive to the need for HIV-related confidentiality and negative implications of partner notification for STI in certain circumstances.

Currently proposed novel methods of partner notification for STI appear to have limited acceptability among HIV positive MSM. Nevertheless a minority of men

were willing to be notified of STI via these methods in the future. In the next Chapter, I present the results of the qualitative study that provide greater insights into the observed variation in willingness to notify different types of sexual partners of STI, particularly the lack of willingness to notify casual partners, and variation in the willingness to use traditional and novel methods of notification for STI.

## **Chapter 6: Attitudes towards partner notification for STI and preferred methods of partner notification: results of qualitative study**

### **6. Aims**

The aim of this chapter is to understand in greater detail the influence of socio-cultural context of STI/HIV diagnosis and biomedical advances in HIV treatment and care on HIV positive MSM's attitudes towards partner notification for STI and the willingness to notify different types of sexual partners and willingness to use different methods to notify different types of sexual partners of STI.

#### **6.1 Objectives**

The specific objectives of this chapter are:

1. To explore the attitudes of HIV positive MSM towards partner notification for STI and perceived barriers and facilitators for notifying sexual partners of STI.
2. To explore their attitudes towards notifying different types of sexual partner of STI and being notified of STI in the future, and their willingness to use different types of partner notification methods for STI in the future.
3. To describe their recent experiences of STI diagnosis and partner notification and explore their attitudes towards being notified by sexual partners of STI in the future.

#### **6.2 Methods**

The details of the methods of the qualitative component of the SHARPN study were presented previously in section 2.6.



### 6.3 *Results*

The results presented in this chapter are based on the analysis of the data collected during the in-depth interviews conducted with a purposive sample of 24 men. The details of the sample recruited for these interviews were described in section 4.3.1.

#### 6.3.1 **Attitudes of the participants towards partner notification for STI**

As described in the following section, there were several similarities in men's attitudes towards partner notification for STI.

##### 6.3.1.1 *Partner notification as a 'right thing to do'*

The following quotes reflect men's moralistic perspective towards partner notification for STI. They viewed partner notification for STI as a "*moral thing*", "*responsible thing*", "*common sense*" and non-notification of partners for STI was considered as being "*irresponsible*".

*"Actually most gay men are responsible. If they get something (STI), like I just have, they won't just go to the clinic, get it sorted and not tell the people they've fucked. They generally will tell people."*

White British man in mid-thirties living with HIV since 12 years, on cART

This sense of morality was heightened in the context of concurrent partnerships. A few participants who had a bisexual partner felt that it was particularly important to notify these partners to prevent onward STI transmission to their partner's partner(s):

*"It's like a personal obligation really and if this person is not openly gay, on the down, who has a family ...it happens often unfortunately, then his family need to be taken into consideration as well. I think this is one of the things in the back of my mind as well. So yes for me it's a personal obligation."*

South Asian man in mid-forties living with HIV since 15 years, on cART

### **6.3.1.2 Perceived health benefits of partner notification**

Most men viewed partner notification for STI to be important due to its personal sexual health benefits and to facilitate their sexual partners' testing and treatment, especially if they are asymptomatic. Men also considered partner notification as important to prevent onward transmission of STI.

*“If someone’s given you an infection (STI) and they don’t know and then you find out that you have it, obviously if they don’t know then they could be passing it to other people so it’s just kind of common sense to let the previous partners know so that they can get tested and make sure they’re not putting other people at risk.”*

Black British man in mid-twenties living with HIV since 4 years, not on cART

However, some men felt that notifying partners for STI is not easy. In the following section, I discuss the overall perceived barriers to partner notification for STI expressed by these men.

## **6.3.2 Barriers associated with partner notification for STI**

Perceived barriers to partner notification for STI among these men were influenced by the socio-cultural context of STI diagnosis, and partnership factors.

### **6.3.2.1 Fear of stigma and blame**

Several men felt that notifying partners of STI is a “difficult task” due to the stigma attached to STI. The following quote reflects that men perceived the stigma associated with STI as a barrier to notifying sexual partners of STI:

*“There’s like, oh my God you’ve given me gonorrhoea. It’s just like, well I could have given you a cold but you are not going to send me snivels. You are not going to contact that person by text message saying I hate you, look what you’ve done to me. There’s just so much stigma and I think that if people continue to do things like that, it’s not exactly going to help.”*

White British man in mid-twenties living with HIV since a year, not on cART

A participant who had multiple casual partners was worried about notifying his partners due to the fear of being perceived as a “*slut*”:

*“because it is not clear who you got the disease (STI) from then yes, but how you’re going to know if you have so many partners and it is a bit embarrassing as well and it can affect your personal relationships because you might meet somebody you like and then get a disease from somebody else and you have to contact all of them, so then it might be bad for your reputation.”*

Central European man in early thirties living with HIV since 4 years, on cART

### **6.3.2.2 Low self-esteem**

As reflected in the quote below, the stigma associated with homosexuality can manifest in low self-worth and low self-esteem due to the internalisation of stigma and can affect partner notification for STI. A participant who engaged in deliberate self-harm when he was young, and another participant felt that being repeatedly diagnosed with STI is a “*deeper issue*” linked to lack of self-respect and a tendency to deliberately self-harm among gay men.

*“I think if the intention of coercing people to make contact and get them to go and have a test because they have got something. Why you have had unprotected sex with someone anyway, and having numerous kind of sexual partners and spreading something around, is to do with one’s self esteem.”*

White British man in early fifties living with HIV since 17 years, on cART

### **6.3.2.3 Venues for meeting sexual partners and anonymity**

Some men described practical barriers to notifying sexual partners, i.e., their sexual partners may not be contactable, especially if they met them in saunas or other sex on premises venues.

*“I think it is a good idea but lots of people get, usually gay men have lots of sex, especially with people who have some kind of infection and it is very difficult to trace and ... get their partners.”*

Central European man in early thirties living with HIV since 4 years, on cART

#### 6.3.2.4 *Be responsible for your own health*

Some men were opposed to the idea of notifying sexual partners of STI, especially casual partners, due to beliefs that men who engage in risky sex should take responsibility for their behaviour and test regularly.

*“I think that you have to allow people to develop some form of ... rely on people to take their regular tests, rely on people to look after themselves. They’ll always be rogues out there and you can’t do anything about it because if you tell them, they won’t do anything about it if they don’t want to.”*

White British man in mid-fifties living with HIV since 2 years, on cART

#### 6.3.3 **Facilitator of partner notification for STI: ‘negotiated risk’**

Some men considered notifying sexual partners of STI as being respectful of the partnership. The following quote illustrates why notification for STI may not come as a surprise for some men and is perceived as the ‘right thing to do’ by men who mutually agree to engage in UAI with seroconcordant status primary partner and/or regular partners or have open relationship with their primary partner. In such situation, partner notification is perceived as the ‘social norm’. The destigmatisation of having multiple sex partners and STI diagnosis in the context of open sexual partnerships facilitates self-led partner notification for STI:

*“I have become really close friends and we always have really great chilled time together. If I gave them something and didn’t tell them that would be a pretty shitty thing to do. The guys I have sex with they’re all positive, they’re very open about sex, I’ve shagged them loads of times, and they’ve all had STI god knows how many times over the years and they’re just not going to care. I mean they care but they’re not going to be embarrassed about it, it’s just you know part and parcel of having sex without condoms.”*

White British man in mid-thirties living with HIV since 12 years, on cART

In the following section, I describe the participants’ attitudes towards using various methods of notifying partners of STI in the future and the variations in their preferences to use (or not to use) these methods. I explore if their preferences

vary by the nature of sexual partnerships. I also describe the perceived challenges and facilitators to use these methods in the future.

#### 6.3.4 **Attitudes towards notifying different types of sexual partners and willingness to use different methods of partner notification for STI**

Men's attitudes towards notifying different types of sexual partners for different types of STI and using different types of partner notification methods in the future were explored using vignettes depicting hypothetical scenarios as described earlier in section 2.6.3.

In response to vignette 1, which listed various self-led and provider led methods of notifying partners of STI, men's preferred methods of partner notification for STI varied according to the nature of sexual partnerships. The following quote reflects that one of the reasons for variation in the preferred methods of notifying different types of sexual partners of STI was due to the mode of communication with different types of sexual partners:

*“INT: You said you would prefer to contact your primary partner in a different way compared to your other partners?”*

*RES: Oh yes because I mean I'd just go home and tell him (primary partner).*

*INT: So your primary partner you prefer telling face to face?*

*RES: Oh yes.*

*INT: And if it is a casual sex partner?*

*RES: I would rather prefer to text from cell or online or email them, you know by whichever method I'd contact them before.”*

White British man in mid-forties living with HIV since 6 months, on cART

In the following section, I describe men's attitudes towards notifying a primary partner of STI and preferred methods for notifying a primary partner.

#### 6.3.4.1 *Attitudes towards and preferred methods for notifying a primary partner of STI in the future*

The nature of partnership with a primary partner influenced men's attitudes towards notifying him of STI. Men who were in an open relationship with their primary partner felt that notifying their primary partner of STI would be easy and acceptable. However, men who were not in a consensual open relationship with their primary partner and had sex with other men felt that they would be worried about notifying him. Nevertheless, despite the perceived barriers to notifying a primary partner of STI like the fear of blame and anger, the 'emotional connectedness' and sense of responsibility towards him was reflected in men's preference to notify him themselves.

*“RES: I would tell him (primary partner), it would take me some time to build the courage and find the right time but I guess I would have to, I would tell him yes, eventually, and it would be sort of not good.*

*INT: And would you be telling him face to face or would you choose any other way of telling him?*

*RES: I think if you are in a relationship with somebody, you know a stable relationship, you owe them the courtesy of face to face.”*

White British man in mid-thirties living with HIV since 3 years, on cART

The responses of men to vignette 2 about notifying a primary partner of HCV diagnosis after a sexual encounter with a casual partner indicates that despite the stigma associated with HCV, and the fear of negative implications of notifying their primary partner for it, men would be willing to notify him due to issues related to sexual intimacy. Engagement in UAI, especially with a seroconcordant primary partner, in the event of diagnosis with HCV could lead to onward HCV transmission, thereby making it necessary to disclose their diagnosis. Few men who had engaged in UAI with their serodiscordant primary partner because they were on cART and had an undetectable viral load felt that notification will be important to protect their primary partner from HCV. Men also felt that if they

would decide to get treatment for HCV, the longer duration of treatment and the side effects of the medication would make it necessary for them to disclose about their HCV diagnosis to their primary partner. Men also felt a sense of emotional responsibility towards their primary partner, which would facilitate partner notification, especially for infections like HCV which was perceived to be “*nasty*”.

*“I would definitely tell the primary partner straight away (about HCV). You know it’s uncomfortable and really difficult situation but how could you have any kind of emotional connection with somebody and allow them potentially to become ill, and also re-infecting yourself as well, so it’s a personal thing too. There’s an emotional responsibility to a primary partner and you have to be up front about it, if you have done something that’s outside your agreement with them then you have to be sensible, adult about facing up to that.”*

White British man in early forties living with HIV since 11 years, on cART

Participants considered it their “*duty*”, “*responsibility*” to notify their primary partner themselves because STI were considered to be a personal issue. Men felt that notifying a primary partner of STI via the clinic or a health advisor would be “*impersonal*” and “*unfair*”. Some men would be wary of providing their partner’s contact details to the clinic. However, a participant who had not disclosed about his sexual engagement with other casual partners to his primary partner would prefer to notify his primary partner and other partners anonymously via the clinic.

#### **6.3.4.2     *Attitudes towards and preferred methods for notifying regular partners of STI in the future***

In response to vignette 1 and 4 about notifying regular partners of HCV and syphilis diagnosis, the majority of men felt that they would be willing to notify their regular partners for these STI. As reflected in the quotes below, the nature of relational dynamics with the regular partner influenced men’s choices of methods for notifying them. The majority of men felt that they would feel comfortable and confident to notify their regular partners. They would be willing to notify them

using patient referral methods compared to provider referral due to the mutual understanding of the risk of STI diagnosis associated with unprotected sex.

*“No I don’t think that’s (provider referral) a good idea. I don’t want no-one involved. I’d rather me contacted them face to face. I don’t have any problem. I think either because of the people that have contact with are older than me. So all these people that’s older than me they are more like, I wouldn’t say open minded but they are more mature. They are likely to completely understand it (being diagnosed with STI) because we don’t use condoms.”*

White British man in late-thirties living with HIV since 7 years, on cART

*“It depends on how close I am to them. I mean if it was a regular partner and I had symptoms and I came down here, if it were a close partner it’s quite likely they would know I was coming down for a check-up and I would call them immediately or text them immediately in that context. If it was a regular partner who was also a friend but not a sort of very close friend I would let them know as soon as possible.”*

White British man in early forties living with HIV since 11 years, on cART

Due to practical reasons like not living together, not meeting regular partners on a daily basis, some men would prefer to call, or send a SMS or email their regular partner to speed up the process of notifying them of STI:

*“The two regulars, I feel confident enough to tell them personally. I call them because I don’t see them enough. Well one I call and spoke to, the other one I sent a text.”*

South European man in mid-thirties living with HIV since 7 years, on cART

A participant felt that even though provider referral may solve “*medical issues*”, it could create a lot of “*interpersonal issues*”, for example, it could lead to sexual rejection by the partners.

### **6.3.4.3 *Attitudes towards and preferred methods for notifying casual partners of STI in the future***

In response to vignette 4 about notifying casual partners of HCV and syphilis diagnosis, some men felt that since there were no personal health benefits of



notifying casual, especially men with whom they have a one-night stand and no emotional connectedness with casual partners, they would not feel the same level of responsibility to notify casual partners of STI. Similarly, for some men structural barriers like the fear of being blamed and the risk of criminal action for HIV transmission were barriers to notifying casual partners of STI. Some men, for whom anonymity was of paramount importance, felt that provider referral would be an acceptable way to notify casual partners of STI in the future. Some of these men expressed the view that they would have preferred to notify their casual partners via provider referral when they were recently diagnosed with STI. These men were willing to share the phone numbers or dating website details (like chat IDs) of their casual partners with the clinic staff if they had offered to notify them. Some participants would be willing to use other discreet methods of notification i.e. send an anonymous e-card or ask the clinic to anonymously notify their casual partners of STI in the future. A participant who had not disclosed his HIV status to his sexual partners and engaged in UAI with them felt that it is the personal responsibility of men to protect themselves and if at all he notifies his partners of STI in the future, he would do so via anonymous e-cards.

*“INT: Would you prefer the nurse to contact your primary partner and tell him?”*

*RES: No not my primary partner, my primary partner I would contact him. I will tell him. I would prefer the clinic to tell the ones that I met online and I have the number. I'd only met once. Yes I wouldn't mind the clinic doing it.”*

South American man in early-thirties living with HIV since three years, on cART

However, some men would be willing to themselves notify their casual partners of STI in the future. Men who were willing to themselves notify casual partners of STI in the future expressed a preference to notify them either via an online message sent from the dating website where they had met these partners or via a

SMS, depending on the mode of communication used to keep in touch with these partners. However, a participant felt that not all men check their online profiles regularly so their partners might not get the message immediately. In addition, some participants also felt that only paid members can send messages via some of the dating websites. Although sending messages from a website may be free, there is usually an upper limit on the number of free messages that can be sent and people may not want to use them for notifying partners for STI.

#### **6.3.4.4** *Attitudes towards and preferred methods for notifying group sex partners of STI in the future*

In vignette 5 described in section 2.6.3, men were asked about the feasibility and willingness of notifying group sex partners met at a sex party which was organised via a dating website for syphilis. Two key barriers to notify group sex partners of STI were expressed: fear of being blamed and anonymity of sex partners. Most men who were diagnosed with HCV had engaged in group sex. They blamed their group sex partners for infecting them with HCV. In contrast to the willingness to notify a primary partner of HCV diagnosis as reported in section 6.3.4.1, men were sceptical about notifying casual partners of HCV diagnosis. Assumptions like deliberate transmission of HCV by someone during group sex, and the fear of being blamed for transmitting HCV, which is associated with greater fatality, and stigma are barriers for notification of casual partners for HCV. As shown in the quote below, a participant who had notified his regular partner of HCV did not notify his group sex partners due to assumptions that someone at the party deliberately transmitted HCV:

*“RES: Yes the most recent time was when I was diagnosed with Hepatitis C, which was in 2007. And as soon as I had that result I just phoned this guy I was having unprotected sex with. He was also HIV positive and we made this decision to have unprotected sex. We had discussed it and I knew the risks,*

*and lo and behold I had contracted Hepatitis C. I remember there were two other occasions when I had unprotected sex. One was in a group sex situation with two other guys and the other one was a one to one situation. I didn't contact them.*

*INT: Why do you think you didn't contact them?*

*RES: It is a tricky question; it is tied up with blaming and this kind of balance between blaming and not taking responsibility. I remember thinking it is either these two in this group sex situation or it is either this other guy, not the one I had told. I just had a feeling it wasn't him, I don't know why. And there was a lot of blaming around it and I mean it felt like what I had contracted was like grievous bodily harm. Why I didn't contact either is something to do with, well one of these two groups in my mind has given it to me. It is something to do with blaming and not being able to kind of accept responsibility for what had happened, something to do with that.*

*INT: have you met them after that incident?*

*RES: Yes I have met one of them after that. Yes in a sauna. and I didn't say anything."*

White British man in early fifties living with HIV since 17 years, on cART

Some men had attended group sex parties which were organised by them or their friends, usually with a small group of known people, or were organised online via a gay/MSM website. As reflected in the quotes below, men felt that they would be able to contact the group sex partners they had met during a party organised by them or their friends because they may have their contact details. However, some men felt that they are usually unlikely to have the contact details of other men attending parties that are organised online and thus would not be able to contact them.

*"I just contact the people with whom I have contact, it is parties I have organised and it's no more than three people. Then I have the telephone number which I can contact them."*

White British man in late-thirties living with HIV since 7 years, on cART

Some men felt that they would be able to contact men they had met at a party if they would keep in touch with them after the party. They would be able to contact the party host and ask him to contact other members of the group. However, as shown in the quote below, some men felt that given the nature of group sex, while

notifying the party organiser of their STI diagnosis, they can easily deflect the blame away from them:

*“I would contact the organiser and say I’m sorry I have Syphilis. In people’s minds if you tell the group oh I’ve got Syphilis then somehow subconsciously they will blame you if they get it as well. But I guess in that sort of circumstance, well it’s fine and I guess the anonymity of it which makes it easier to say well I’m sorry I’ve just got diagnosed with Syphilis, I guess I would word it somehow that after the party I developed this, that somehow deflects the onus on I didn’t have it, I’m not to blame, it’s somebody there but I guess that’s just human psychology.”*

South European man in mid-thirties living with HIV since 7 years, on cART

However, a participant who was told to attend a sex party despite his chlamydia diagnosis felt that the party organisers might not necessarily notify other members, especially for minor STI like chlamydia or gonorrhoea. Nevertheless, some men reported that a party organiser had contacted them after a group sex event to notify them to test for STI. As shown in the quote below, men who had engaged in group sex were notified to screen for STI despite the embarrassment associated with it:

*“That’s happened to me a few times actually where I’ve been to a party and then literally you know by the Tuesday or Wednesday texts start going around oh you know X has got the clap ... you better go and get yourself tested. People never call each other. There’s obviously an embarrassment factor there which is curious considering what you’ve been doing with the guy for two days. So you just send online message or text message where you’re not actually having to verbally communicate with them. It’s a bit of a cop out but at the same time you feel like you’ve ticked the box”*

White British man in mid-thirties living with HIV since 12 years, on cART

However, some men felt that they would not bother to notify the partners they had met at sex parties due to the lack of emotional connectedness with them. Some men also felt that men who engage in group sex should be aware of the risks associated with it and screen for STI regularly instead of relying on someone to notify them.

*“I think again it's kind of you must be responsible if you go to something like that. It's like if you see the boiling water in there and if you want to go and put your hand there then obviously you will burn your hand. So it's the dangers, it's your responsibility.”*

White British man in late-thirties living with HIV since 7 years, on cART  
Perceptions that men who attend bare backing parties don't care about being diagnosed with STI and would not care about being notified or notifying the sexual partners they meet at such parties were also barriers to notifying group sex partners:

*“Usually these people have HIV, they test regularly for syphilis, so they're not really bothered about contacting others, not for syphilis.”*

Central European man in early thirties living with HIV since 4 years, on cART

In the following section, I describe men's attitudes towards using novel methods of partner notification like anonymous e-cards, home sampling kits, telephone assessment of partners and notifying social network members to test for STI.

### **6.3.5 Acceptability of novel methods of notifying partners for STI**

Men's willingness to use novel methods like home sampling kits, telephone assessment model, sending anonymous e-cards and notifying members of social network to test for STI were explored using vignettes 1, 3 and 6 described previously in section 2.6.3. In the following section, I describe the attitudes of men towards these novel methods of partner notification for STI and their willingness to use these methods in the future.

#### **6.3.5.1 Attitudes towards using anonymous e-cards for notifying partners of STI in the future**

Men were asked about their willingness to anonymously notify their sexual partners of STI and the situations in which they were most likely to use this method of notification in the future. The option of notifying sexual partners of STI

via an anonymous e-card message was one of the options (option 7) in vignette 1 which examined the preferred methods of partner notification for STI. Two divergent perspectives emerged from men's responses towards sending an anonymous e-card to sex partner for notification of STI. While the majority of men would be unwilling to notify their partners via this method, a small minority of them would be willing to do so.

As reflected in the quotes below, the majority of men across all age groups considered notifying partners of STI via an anonymous e-card as not taking responsibility for one's own sexual behaviour. They felt that it is likely to create "confusion", "panic", and "anxiety" among those notified via this method.

*"The idea of anonymous contact feels cowardly to me. I think it would be very scary to get an anonymous contact and personally it would scare me because I'd think why haven't they spoken to me. And just to have that sense of reassurance that I can talk to the person who is infecting me, even if they didn't do that it is just nice, just sort of human. I hate the idea, I think I've said that many times."*

White British man in early forties living with HIV since 11 years, on cART

*"I just think seriously are you that weak? Just bloody say. You know even if the person is going to be a bit pissed at you, so what. These things happen. People don't get pissed at each other when you pass a cold on. They are just like, well you know never mind, sorry, shit happens ...but I don't understand why the same thing doesn't happen when you end up, for the want of better words, fucking someone."*

White British man in mid-twenties living with HIV since a year, not on cART

On the other hand, as indicated in the quote below, the preference for anonymity among a small group of men was reflected in their willingness to send an anonymous e-card to notify their sexual partners of STI in the future:

*"I can imagine that maybe in some people's circumstances that would make sense for whatever reason, I don't know, depending on their personal, family circumstances or something where there is someone who is seriously at risk and wouldn't be aware of it but for particular reasons it would be very*

*difficult for them to contact partners directly. So I can see that in limited circumstances that might be helpful.”*

White British man in mid-forties living with HIV since 6 months, on cART

The following narrative of a participant who had engaged in UAI without disclosing his HIV status to his serodiscordant partners was willing to use this method due to the fear of being sued for HIV transmission. It also reflects that this method, albeit acceptable only to a few, may reach those who may be at greater risk of HIV:

*“INT: Why do you think you would prefer this (anonymous e-card)?*

*RES: My identity is going to remain anonymous and just the clinic will ask him to come to the clinic for checking himself.*

*INT: Will you be able to provide email addresses of your sexual partners to send an e-card or would you prefer to yourself send them an e-card using their email address?*

*RES: No, I can provide maybe their email address to the clinic, and the clinic can send it.*

*INT: and why do you think it is important to protect your identity, like why wouldn't you want to tell your name to the person?*

*RES: For the things like, I don't want to say nothing, it is a risk to being arrested.”*

South European man in early thirties living with HIV since 4 years, on cART

Despite these concerns, some men felt that if they were to receive an anonymous e-card they would go to the clinic to test for STI. However, as indicated in the quote below, some men were concerned about the authenticity of the message. They felt that there should be a clinic logo or some indication that they have received an email from a reliable service to avoid it being treated as a spam or a hoax.

*“RES: I think awareness is important for this (anonymous e-card service). If it's found that yes there is this service that you may get an e-mail or something then I think possibly the effectiveness will be greater and they will say well hang on this is a legitimate source. So you better go and get it checked out. But I guess for a lot them, they would rather not be contacted that (anonymous e-card) way.*

*INT: What if you got a message from such an anonymous website?*

*RES: I would definitely follow it up because of my condition, it's like well no I think you'd better go and get."*

South Asian man in mid-forties living with HIV since 15 years, on cART

### **6.3.5.2 Attitudes towards using home sampling kits and telephone assessment method for partner notification in the future**

Men were asked about their willingness to use a home sampling kit and a telephone assessment model (vignette 3) to notify their primary partner who lives with them in the event of being diagnosed with chlamydia/gonorrhoea. Some men would be willing to use both these methods in the future, whereas some men were opposed to using both these methods. Some men would be willing to use a home sampling kit compared to the telephone assessment method to notify their primary partner in the future. In the following section, I describe the perceived facilitators and barriers to use both or either of these methods in the future.

#### ***Reasons for lack of willingness to use these methods***

The lack of willingness to use these methods was linked to the greater significance men attached to the expertise of the clinic staff in matters related to sexual health. Men were concerned about their partners' ability to collect their specimens accurately and valued the face-to-face interactions with the clinic staff. A participant felt that both these methods were "bureaucratic" and "impersonal".

*"INT: How would you prefer to let your primary partner know if this kind of situation arises?*

*RES: I would let him know and bring him back to the clinic.*

*INT: Why do you think that you would want to do that?*

*RES: I think it's just more ... the nurses or the doctors to take the samples is more thorough than just kind of trying to follow instructions at home. And I'm not sure if they, can they assess for Gonorrhoea or Chlamydia over the phone? And even if they can, no I think I would want him to come to the clinic."*

Black British man in mid-twenties living with HIV since 4 years, not on cART



Men, especially older men, were worried about the reliability of the test results of self-taken specimens, whether using a home sampling kit would be faster than testing in the clinic, and the effects of posting specimens via mail, as expressed in the following quote:

*“Coming to the clinic sometimes is incredibly traumatic, but on the other hand, you assume that everything will be done correctly. I suppose with a home sampling kit you’d have to have reason to believe that it would be as accurate or virtually close to the same levels of accuracy and there’d be a worry that you might be doing it wrong.”*

White British man in early forties living with HIV since 11 years, on cART

Some men who were in a partnership with bisexual men felt that home sampling kits lack confidentiality which is vital in such situations, especially if their partners have not disclosed their bisexuality to their female partners/wives.

*“However, there is another person who due to his domestic situation does go for fairly regular check-ups but I mean he wouldn’t be able to use a kit, God knows what his wife would do if she found a home sampling kit.”*

White British man in mid-fifties living with HIV since 20 years, on cART

As shown in the quote below, the telephone assessment model was also disliked due to practical concerns like the primary partner might be at work or might be busy when they call him. Some men would be wary of sharing their primary partner’s telephone number with the clinic. Similarly, some participants raised concerns about the reliability of telephone assessments. They were also concerned about the emotional response of their primary partner if he was unaware of their visit to the clinic and felt that they would not use this option without talking to him in advance.

*“I am not sure about the phone assessment because well there’s two things, one surely it can be asymptomatic so a phone assessment wouldn’t be possible anyway but other than that I think the whole issue of disclosure, where you might be seen as the person who has been the infector, you hope that the other person’s reaction will be straight forward and understanding. However, if you*

*call from the clinic and say right I am going to put you onto a doctor and they feel quite angry about a situation or angry at you. I wouldn't like to do that unless I were perhaps at home with them and talk through it with them. You can then call the doctor, that would be more straight forward."*

White British man in early forties living with HIV since 11 years, on cART

***Reasons for willingness to use these methods***

Some men who were willing to take a home sampling kit for their partner in the future felt that it is a "non-intimidating" alternative to the clinic environment. The following quotes indicate that a home sampling kit was considered to be "convenient" and "easy to use" as it would mean that their primary partner would not have to travel to the clinic for an STI screen. A participant felt that he would prefer to use a home sampling kit not only to test for bacterial STI, like gonorrhoea or chlamydia, but also to test for all STI, including HIV. He was diagnosed with HIV three years ago and had not disclosed his HIV status to his primary partner, and was scared to attend an HIV clinic due to fear of being seen at the clinic.

*"I would support it not only for Gonorrhoea or Chlamydia but other infections as well. At home, people behave differently. Tests, clinic environments are intimidating. No issues about doing it at home as it is a safe environment and would find it easier to recommend. I prefer it in comparison to health advisors or doctors calling my partner because if they called then it's different, they don't know where partner is or his situation."*

Scandinavian man in late thirties living with HIV since 3 years, not on cART

However, as shown in the following quote, a home sampling kit was not perceived as a viable option by men who had multiple sex partners:

*INT: Why do you think he would prefer a home sampling kit?*

*RES: He (primary partner) wouldn't need to come here to get a test.*

*INT: What if your partner gets a home sampling kit for you?*

*RES: I would do it yeah.*

*INT: And the main reason that you both may want to use it?*

*RES: Yes just to save time but only with my primary partner. Yeah I think for buddies I wont use it because of going to each of them to give this thing."*

South American man in early-thirties living with HIV since three years, on cART

Men who had a steady primary partner felt that telephone assessment of their partner would be a “*quick*” way to ensure his treatment and resume sexual activity. However, men would be willing to use this method to notify only their primary partner and not for notifying other types of sexual partners.

*“I think the second option (telephone assessment) makes more sense. I mean if I’m having regular sex with my partner then it probably makes sense for him to just take the medication anyway.”*

White British man in mid-thirties living with HIV since 7 years, on cART

Some men would be willing to use either of these methods to enable testing and treatment of their primary partner. As reflected in the following quote, some men felt that although these methods are acceptable to them, ultimately it would be their partners’ choice to use them and they may decide to come to the clinic instead.

*“My feeling would be that it probably makes sense for him to take the medication anyway but I guess that if he was the type of person who didn’t like taking medication unnecessarily, then if he wanted to do the home sampling kit then he could do but that would be his choice rather than mine.”*

White British man in mid-thirties living with HIV since 7 years, on cART

Although the discussion focused on using these methods to notify a primary partner, willingness to use of these methods for other partners was explored with men who reported having multiple sex partners. Some men who had regular partners would be willing to take a home sampling kit for them. However, as reflected in the following quote, they were cautious about maintaining their role as a ‘sex buddy’ and not taking on the role of a health care practitioner.

*“RES: I probably would not have a preference; I think I’d be happy to do either. I mean my other half wouldn’t have any issues at all with a doctor calling him while I’m sat next to the doctor saying I’ve got X and the doctor would like to ask something, or would you come in and do the same?”*

*Conversely he wouldn't mind if I went home with a home testing kit, sounds fun.*

*INT: And would you use any of these methods for your regular partners?*

*RES: Yeah. I think the vast majority of my regular partners would have no problems at all if I gave the clinic their phone number. So yeah that wouldn't be problematic. A home testing kit that would seem a little bit like I was playing district nurse I think. I'm not here for a fuck, I brought you this, bend over I'm going to shove something else up your arse. Yeah I wouldn't have any problems with it at all."*

White British man in mid-thirties living with HIV since 12 years, on cART

### **6.3.5.3 Attitudes towards notifying members of social network of STI in the future**

Vignette 6, described in section 2.6.3, was used to explore mens' views towards referring friends and acquaintances who they think engage in risky sexual behaviour, to test for STI in the event of a LGV outbreak. All but one participant felt that if there would be an outbreak of LGV or any other STI, they would be willing to inform their sexual partners and gay friends about it, either directly or if such a conversation comes up. However, they were divided in their attitudes towards referring members of their social network to *test* for these infections. Some men felt that they would inform their friends about the outbreak but not ask them to test for the STI even though they openly discuss issues related to sex. They associated asking friends to test for STI with being "*self-righteous*", "*playing the role of a doctor*" or "*stepping a line*". A participant felt that he would ask his friends to test only if they have symptoms. The following quotes reflect these varied views:

*"Would I ask my gay friends to test for LGV if there is an outbreak? I'm not sure I would ask them to test. I think I would ask them to make themselves aware that there is an outbreak of things like that."*

White British man in mid-thirties living with HIV since 12 years, on cART

*“I would expect people to be generally aware that there are things out there anyway. So me saying oh there’s something out there I haven’t got it but you might want to test. Unless that topic came up in a conversation, otherwise it seems like why, I can’t imagine why I would do that (talk about it).”*

White British man in mid-forties living with HIV since 6 months, on cART

However, some men were willing to refer their friends (as well as their primary partner and other sexual partners) to test for LGV if there was an LGV outbreak. As reflected in the following quote, some participants who were recently diagnosed with LGV had notified their sexual partners:

*“RES: Yes, I would most definitely ask friends to test for LGV out of concern for their health and to inform them. I have done that before because it is important to pass on knowledge given to me.*

*INT: You have done that before?*

*RES: I was given a leaflet for LGV in this clinic and talked to a nurse who told me about LGV and how it is becoming a problem. So I mentioned it to at least a few friends in discussion.*

*RES: What was their reaction?*

*INT: Some had never heard of LGV and were pleased that I told them; others had already heard of this.”*

White British man in mid-forties living with HIV since 20 years, on cART

The significance men attach to medical expertise was a perceived barrier to inform peers about STI outbreak and to ask them to test for STI in the future. Need for provision of supporting information by the clinic to ensure the authenticity of the information they provide was expressed. An email link sent by the clinic providing information about the outbreak was considered sufficient to enhance the authenticity and accuracy of information they would provide to their peers. Some men also felt that the clinic should inform them via an email or a letter if such an outbreak occurred in the future.

*“INT: So you would tell your friends to go to the clinic for a test?*

*RES: I’d certainly discuss that with my gay friends. I mean the best way to do that to be honest with you is to get an article...on-line that you can use as an*

*attachment and send it to all my friends saying, look I read this really interesting article, I think you should all read it.”*

White British man in mid-forties living with HIV since 2 years, on cART  
 However, a young participant felt that being contacted by the clinic to test for STI during an outbreak would make him feel that they are being presumptuous about his sexual behaviour. Nevertheless, he felt that he would like to receive information from the clinic about the outbreak so he can be careful and test for STI if he develops any symptoms.

In the following section, I describe men’s experiences of interacting with the clinic staff following recent experience of STI diagnosis and partner notification.

### **6.3.6 Shame, stigma and interaction with clinic staff for partner notification**

Most men usually screen for STI once in 4-6 months, whereas some men would screen for STI only if they are symptomatic. Men who had engaged in group sex screened for STI regularly, usually a week after group sex. As mentioned in section 4.3.1, of the twenty-four men who were interviewed, eleven were recent contacts, and twenty men were recently diagnosed with STI. In the following section, I describe men’s attitudes towards and experiences of interaction with the clinic staff following STI diagnosis.

#### **6.3.6.1 Perceived stigma and shame**

Most men who were recently diagnosed with STI had met a health advisor after their STI diagnosis. Some men complained about a long wait prior to meeting a health advisor on the day of their STI diagnosis. The following quote reflects a commonly expressed initial scepticism about meeting a health advisor, yet participants appreciated their interaction with an advisor. The fear of stigma,

shame and guilt associated with group sex was a barrier to disclosure of this behaviour to a health advisor.

*“INT: What did you think about meeting a person like X (health advisor) when you were diagnosed with an infection?”*

*RES: Initially I was quite sceptical. There is a feeling of doing something that is in the eyes of the clinic wrong, and in very personal terms, I was feeling quite ashamed. It's very difficult to talk about sexual acts in most circumstances and to talk about the associated feeling of shame at having caught something and Syphilis is, you know it's got a bit sort of cache, a big history. I thought I was going to be essentially told off. I assumed that it was just going to be a, sort of, a lesson in how to not contract sexually transmitted diseases.”*

White British man in early forties living with HIV since 11 years, on cART

Few participants who had been diagnosed with chlamydia and syphilis were asked to notify their sexual partners by a health advisor. A week later they were informed of LGV diagnoses and again asked to notify their partners. These men had already notified their partners of chlamydia and syphilis diagnosis and felt embarrassed to notify them again for LGV. As the following quote indicates, their experience of re-notifying their sexual partners was unpleasant.

*“I mean when I contacted them to say, you know about Syphilis and then later I contacted them for LGV, they said well you have just recently told me about syphilis, I went for my check up and I was fine... I stopped contacting, I stopped going through the list because everybody seemed to be saying hey I've just been for a check-up, if it were there they would have found it.”*

White British man in early forties living with HIV since 11 years, on cART

### **6.3.6.2 Disclosure of unsafe sex**

The following quote reflects that judgemental behaviour on part of the clinic staff may lead to losing opportunities of health promotion and providing risk reduction advice and support to the patients:

*“INT: How was your experience of talking to a health advisor?”*

*RES: They are very helpful. I had one, just once, it was here. When I got this nurse, she was black; I was doing unprotected sex with my ex-partner who was*

*HIV negative. I wanted to know what to do if he came inside me... you never know whether he can do anything about it. But she really, really criticised me. I wasn't rude and didn't reply, I didn't answer her but I think it was very unprofessional for her”.*

White British man in late thirties living with HIV since 4 years, not on cART

### **6.3.6.3 Useful advice**

The following quotes reflect that some men had pre-conceived negative notions about meeting a health advisor after being diagnosed with STI. Despite such preliminary scepticism, irrespective of the age group, the majority of men felt that their interaction with a health advisor following their STI diagnosis was useful for understanding the mode of transmission of STI, and helped them understand how to notify partners of STI, and determine the time frame and the number of sex partners they had to notify. Some men were unaware about the non-sexual routes of HCV transmission or probability of oral transmission of syphilis prior to being diagnosed with it and prior to their discussion with a health advisor.

*“I didn't know that there'd be anything about partner notification, about that whole process. I thought it would just be about me and so I felt quite defensive about sort of sitting in front of someone, it felt like going to the headmaster. When he began to talk it was immediately clear that it was actually about a cooperative approach to looking at, possibly a range of problems that have led to the situation I was in, rather than just being told you shouldn't have done this, next time do this or don't do that which is what I'd imagined. I was incredibly pleased to have the opportunity to sit down and talk to him, with the way the conversation went. I thought he was brilliant in the way that he handled the issues and talked through quite gently. A lot of the issues that I was having which some of them I guess are more psychological than just the sort of matter of how to use condoms, how to avoid picking up sexually transmitted diseases. I do remember coming out and having a plan in my head, for how far back I needed to go and how I was going to contact and who, and also having a sense of how I was going to pitch that when I am speaking to them, which I didn't have when I went in.”*

White British man in early forties living with HIV since 11 years, on cART

*“We (he and health advisor) spoke about sexual partners... He just kind of gave me some advice on the best way to sort of bring up the conversation and*



*how to prevent any further infections at the time that I was, that I had gonorrhoea and yeah it was just kind of educational like and useful.”*

Black British man in mid-twenties living with HIV since 4 years, not on cART

In the following section I describe if men had notified their partners after their recent STI diagnosis and if so, how had they notified their partners.

### **6.3.7 Non-notification of partners following-STI diagnosis**

Most participants who were recently diagnosed with STI had notified some or all of their sexual partners. Of those who had not notified their sexual partners of STI, some men were diagnosed with gonorrhoea, either rectal or pharyngeal, and one was diagnosed with syphilis. These men were unable to notify their partners because their contacts were anonymous. When the attitudes of men towards partner notification for STI in the future were explored, these men had expressed a preference for notifying partners anonymously via the clinic or an anonymous e-card. A participant who had not notified his partners of STI recently had never notified his partners in the past and chose not to do so this time. He felt that it is not his responsibility to notify partners of STI and there is “*too much bureaucratisation around STI*”. With regards to notifying partners of STI in the future, this participant had stated that he would not notify his partners of STI in the future.

### **6.3.8 Experience of notifying sexual partners following STI diagnosis**

Men who had a primary partner had notified them about their STI diagnosis in person, except for one participant who had notified his primary partner via a phone call. A participant’s serodiscordant primary partner was unaware that he had other sex partners and was upset at being notified. Another participant blamed his

unknown status primary partner for his diagnosis with latent syphilis. Some men who were recently diagnosed with STI had a serodiscordant primary partner and were in an open relationship. Some men had engaged in threesomes or group sex and some had done so along with their primary partner. Therefore, their STI diagnosis was not a surprise for them. These men had notified their primary partner and some of their group sex partners.

These men had largely notified their regular partners either via a text message or a phone call. A participant had not notified one of his regular partners because he was abroad. Casual partners were notified via a text message or an online message. One participant, who was recently diagnosed with chlamydia, had notified a casual partner via Facebook. However, he felt that he would have preferred the clinic to anonymously notify his sexual partner who was his primary partner's friend and thus, he was embarrassed to notify him. In addition, the notification led to complications as his message was interpreted as an attempt to blame this partner.

A participant who had notified his regular partners for HCV was unable to contact approximately 20 anonymous contacts he had met at a recent group sex party. Few men who had engaged in a group sex party organised online had notified some of their partners to test for STI because they were in touch with them after the party or had engaged in group sex with a small group of known men and had texted all of them asking them to test for STI.

The following narrative indicates that partners usually appreciated being notified of STI. However, there were a few instances where participants reported that their partners sent them a nasty text in return following notification.

*"I personally felt it would be irresponsible not to. Obviously, it's a difficult thing, much nicer not to be in the situation to have to do that. But given that I'd discovered it and that there was a risk either from me to other people or*

*that I'd got it from other people or that particularly in a group situation it could have been passed around, you know it's better to know than not know. So my view was to let as many people know as possible in the nicest possible way and certainly not sort of saying I think it's your fault. Just saying this has happened to me. I think the messages I sent all have that sort of fairly non-committal way of saying it's probably a good idea that you get checked out too. And most of the people who replied to me, I was very surprised, they were all saying thanks, that's good of you and a lot of people don't get in touch in that situation and I really appreciate that. And some people didn't reply so I wonder what they think, or they just ignored it."*

White British man in early forties living with HIV since 11 years, on cART

### 6.3.9 **Attitudes towards being notified by sexual partners of STI**

Men's attitudes towards being notified by their sex partners of STI were assessed using vignette 7. Most men perceived being notified for STI as a necessary evil with health benefits. Being notified by sex partners was considered to be important to prevent onward STI transmission, and facilitate timely treatment, especially in case of asymptomatic STI. Although some men considered it unpleasant to attend the clinic to test for STI following notification, men were willing to take the responsibility, especially if they had engaged in unsafe sex.

*"I really appreciated the fact that he did it (contacted me) and I thanked him for it. In terms of what preference I have for contacting me, I actually wouldn't really care as long as they told me. I mean they could ring me, they could do the earnest chat. They could get a health visitor to do it. They could do it however they wanted. If I had something I wouldn't really want to be spreading it around for weeks and weeks without knowing."*

White British man in mid-thirties living with HIV since 12 years, on cART

*"Absolutely yes and as quickly as possible in whatever means possible so that if I have contracted it I can get treatment and I am not passing it on to anyone else if I have contracted it."*

White British man in early fifties living with HIV since 17 years, on cART

For the majority of men the mechanism by which they are notified for STI by their sex partners does not matter as long as they are notified. However, there was a strong preference among men to be notified by their partners face-to-face, especially by their primary partner. As the quotes below indicate, men were willing to be notified via a phone call, an online message, a text message, or any method of communication that they used to keep in touch with their casual and regular partners. Some men felt that notification may not be easy for everyone and were willing to be notified either via an anonymous e-card or by the clinic.

*“I’d prefer if they did it either over the phone or in person. But if they felt they couldn’t do that and they asked the clinic to do it or asked someone else to do it ... as long as they tell me.”*

Black British man in mid-twenties living with HIV since 4 years, not on cART

*“Well again I’d go back to that same principle, by the normal method I communicate with them. So if it’s somebody I see every day, I suppose it would not be inappropriate for them to text but I would imagine they would speak to me. But if it’s somebody I see quite rarely but text every so often, a text would be how I’d expect. Or online messages.”*

White British man in early forties living with HIV since 11 years, on cART

However, some participants were against being notified via an anonymous e-card. Some men felt that they would not blame, ostracize, or break-up with a partner who notifies them because being notified is important for them. However, there was an element of blame in the narrative of a participant who felt that he would regret having had sex with such a person. The following narrative reflects men’s dislike of being notified via provider referral:

*“No, I hate that idea (provider referral), I really do. It sounds so impersonal and if I was told by somebody I didn’t know or by some anonymous machine or an anonymous e-mail or text message I would find it, for some reason, I’d find it far more scary than being told by somebody I know, and I don’t know. It just feels, there’s almost a sense of responsibility, if you have sex with somebody there is, for me there’s an assumption that however small, there is*

*some kind of risk, even if you are as safe as you can possibly be, and you know to run away from that responsibility that goes with that is just, it feels completely wrong. It's really bizarre because I almost feel like saying I prefer not to know and be contacted by something anonymous but of course that's not the case. It would make me feel impersonal, it would make the whole thing feel dirty and more horrible and more sordid."*

White British man in early forties living with HIV since 11 years, on cART

### **6.3.9.1 Experience of being notified by sexual partners of STI**

As mentioned previously, eleven men were recently notified by their partners of STI. As reflected in the quote below, those with regular partners were notified via a phone call. Men with casual partners were notified via an email, a text message or an online message. All these participants subsequently screened for and were diagnosed with STI; they were grateful for being notified by their partners.

*"RES: I've got the text in my bag. The guy who texted me, I think it was the day before yesterday, just saying oh I, I just found out I might have LGV you might want to go and get yourself checked out. So as soon as I got that I sent a similar text to the two guys I played with at the weekend and the guy last week which basically said, the guy I had sex with a couple of weeks ago just texted me to tell me he might have LGV. I'm going to go to the clinic today you might want to go and get yourself checked out. Simple as that. And you know every one of them come back saying thank you very much for coming back to me.*

*INT: What was your reaction when you got this text?*

*RES: mild irritation but nothing more than that. These things happen. In fact that was my response to him, I said thank you very much for telling me, these things happen. If we're going to bare back then you know you've got to accept sometimes these things will happen."*

White British man in mid-thirties living with HIV since 12 years, on cART

Nevertheless, as reflected in the following quote, some men blamed their partner for putting them at risk of STI:

*"INT: What was your reaction to getting a call from him?*

*RES: I was really, really, well the call fine, the news extremely angry actually. He said that I'd have to go and check myself out because he had been tested for syphilis and gonorrhoea. I immediately thought, did he know beforehand, you know etc. So I was pretty upset with him actually."*

White British man in mid-forties living with HIV since 2 years, on cART

#### 6.4 *Discussion of the findings and comparison with other studies*

In this chapter, I explored the attitudes of HIV positive MSM towards partner notification for STI and notifying different types of partners of STI, and their willingness to use traditional and novel methods of partner notification for STI. I also described their experience of recent STI diagnosis and interaction with the clinic staff about partner notification for STI, and recent experiences of notifying partners of STI or being notified of STI. In this following section, I discuss the key findings and compare them with those of other studies.

##### *Attitudes towards partner notification for STI, willingness to notify sexual partners of STI and being notified by sexual partners of STI in the future*

Similar to other studies, the study results show that men valued the health benefits, and benefits related to sexual pleasure as a result of notifying partners of STI (Gorbach et al., 2000; Coleman and Lohan, 2009). In line with the SHARPN survey data presented in chapter 5, the qualitative findings reflect the variation in willingness to notify different types of sexual partners of STI. This observed variation is due to the nature of relational dynamics with sexual partners which not only influences men's willingness to notify different types of sexual partners of STI but also the preferred methods of notification. Partner notification for STI symbolises moral and emotional obligation towards partners and mutual respect in the context of a primary partner, in partnerships where men mutually agree to engage in UAI, and have open non-monogamous partnerships. These findings concur with those of another study conducted in the USA (Gorbach et al., 2000). The normalisation and destigmatisation of STI diagnosis within open relationships, and among men who engage in UAI with seroconcordant partners is a facilitator of partner notification for STI.

However, consistent with the findings from other studies conducted in the USA, this study indicates men's lack of willingness to notify casual partners of STI (Gorbach et al., 2000; Levine et al., 2008). Due to the lack of emotional connectedness, and lack of sexual health benefits of notifying casual partners of STI, men do not feel the sense of moral or emotional responsibility towards casual partners, which is felt towards notifying a primary partner and regular partners of STI. In line with the findings of other studies, some men also considered notifying partners of STI, especially casual partners and group sex partners, to be a difficult task (Gorbach et al., 2000; Coleman and Lohan, 2009) due to the stigma attached to STI diagnosis, and fear of being blamed for transmitting STI, particularly HCV; and internalized stigma. This is the first study in the UK to show that the fear of being criminalized for HIV transmission can be a barrier to notifying partners of STI, especially casual partners in circumstances of non-disclosure of HIV status. Anonymity of contacts and conferring greater significance to personal responsibility for one's own health can also lead to non-notification for STI. Given the high prevalence and the association of multiple new partnerships and UAI with new partners in this population with STI diagnosis reported in chapters 3 and 5 respectively, the observed lack of willingness to notify casual partner of STI has implications for onward STI transmission. It is important to encourage men who have multiple partners to test regularly for STI and notify casual partners of STI and develop effective strategies for achieving this.

Nevertheless, the majority of men were willing to be notified of STI by their sexual partners. Although there was a greater preference to be notified via patient referral methods, a substantial proportion of men were willing to be notified via provider referral methods as well. Thus, in the context of partner notification for

STI, the clinic staff and health promotion campaigns should encourage men to do unto others what they want others to do for them.

***Experiences of interaction with clinic staff for partner notification of STI***

Some men were sceptical about meeting a health advisor following their STI diagnosis due to preconceived notions that they would be told off for their sexual behaviour or would have to wait for a long time. Therefore, clinics should make attempts to minimise the waiting time to be seen by a health advisor. Men are sceptical about disclosing engagement in group sex to a health advisor or clinic staff due to the fear of being told off for their sexual behaviour or fear of being judged.

The findings also highlight the important role of the health advisors in educating patients diagnosed with STI about modes of STI transmission, particularly in the context of changing epidemiology of some STI like HCV, and charting out a plan and time frame for notifying sex partners of STI. Historically, the main route of HCV transmission was parenteral (Balogun et al., 2003). However, from 2000 onwards in the UK and other European countries, USA, Canada and Australia, there have been reports of sexual transmission of HCV, particularly among HIV positive MSM (Turner et al., 2006; Bottieau et al., 2010, 2010; van de Laar et al., 2010). Some MSM were not aware that HCV could be transmitted sexually confirming the need to promote awareness about these issues among MSM.

***Experience of partner notification following recent STI diagnosis***

Overall, there was concordance between men's attitudes towards partner notification, willingness to notify partners of STI in the future, preferred methods of notification of STI reported in chapter 5 and chapter 6 and men's partner notification behaviour following recent STI diagnosis. Following their recent STI



diagnosis, the majority of men had notified at least some sexual partners. Men who had a primary partner and were in a seroconcordant open partnership had notified their primary partner in person. Some men had notified their regular and casual partners via remote self-led methods like a text message, a phone call or an online message. However, some men had not notified all their sexual partners because some of their partners were anonymous. This was the case particularly among men diagnosed with STI after participation in a sex party organised via a commercial website. Some men had attempted to notify group sex partners via party organisers or themselves if they had their contact details. Therefore men who engage in group sex should be encouraged to notify partners or in case of anonymous partners, contact the party organiser for contact details of other men at the party or ask the party organiser to contact other men on their behalf following their STI diagnosis. However, this can be a difficult task and there is need for further research on the acceptability of these methods among men who engage in group sex and among commercial group sex website moderators.

The majority of men had not experienced severe negative outcomes following partner notification for STI. However, some men had been worried prior to notification of partners of STI and some were blamed by their partners following notification of STI. Men appreciated being notified of STI by their partners. All men who had screened for STI following notification by their partners were diagnosed with one or more STI. This finding reiterates that partner notification is an important tool for STI case finding in this at-risk group and can reduce onward STI transmission among MSM.

***Willingness to use novel methods of partner notification for STI***

Men were sceptical about using anonymous e-cards to notify any types of sex partner for STI in the future because they equated it with cowardice and lack of taking responsibility for one's own sexual behaviour. The majority of men were also concerned about the authenticity of such e-cards and feared that they would be treated as a spam or hoax. However, a few men for whom confidentiality was of paramount significance were willing to notify partners, especially serodiscordant partners via this method in the future. Although this method is not acceptable to the majority of men, it is likely to enhance notification of some partners who may be at risk of STI as well as HIV.

Some men were willing to use methods like the telephone assessment model or take a home sampling kit for a primary partner and regular partners for chlamydia and gonorrhoea in the future. However, with regards to the telephone assessment model, men were concerned about providing the contact details of their primary partner to the clinic and the feasibility of contacting a primary partner directly from the clinic. Nevertheless, some men welcomed the ease and speed with which their primary partner could be treated via this option. An exploratory trial conducted in the STI clinics in the UK showed that overall the telephone assessment model had higher and faster rates of partner treatment compared to routine notification (Estcourt et al., 2012). However, the uptake of HIV and syphilis testing among the users of this method was low (Estcourt et al., 2012), raising concerns about using this method in this population which has high proportion of serodiscordant partners and are at risk of syphilis.

With regards to home sampling kits for chlamydia and gonorrhoea, some men, especially younger men, were willing to take a home sampling kit for their primary

partner and regular partners; especially if distance and time was a barrier for STI testing for their partners. However, men were concerned about the reliability and effectiveness of these remote methods of partner management and lack of interaction with the clinic staff. This result concurs with the results from other studies conducted among MSM in the UK (Sutcliffe et al., 2009; Wayal et al., 2011). Studies conducted in the UK and abroad have shown the reliability of using self-taken specimens to screen MSM for pharyngeal and rectal chlamydia and gonorrhoea (Lampinen et al., 2006; Papp et al., 2007; Alexander et al., 2008) and HIV (personal communication with Fisher M., 2011). High acceptability to use a home sampling kit to screen for STI among MSM in comparison to a clinic visit has also been reported (Wayal et al., 2009). A RCT comparing offering a home sampling kit with conventional partner notification for chlamydia to male partners of women has shown that a greater proportion of partners of women who were given a home sampling kit were examined at a faster rate than partners in the conventional arm (Andersen et al., 1998).

These findings suggest that home sampling kits could be a viable option to facilitate timely screening of a primary partner and regular partners of MSM. However, there is a need to address the above-mentioned concerns related to self-sampling for specimens and the accuracy of results of self-taken specimens to enhance its acceptability. The acceptability of home sampling for HIV among MSM (personal communication with Fisher M., 2011) indicates that this method can enable to overcome barriers to HIV testing due to remote partner management for STI and accelerated methods of partner notification.

The observed high level of anonymous new partners in the last year reported in chapter 3 indicates that strategies like notification of sexual partners for STI alone

may not be effective for STI control in this population. The SHARPN survey results have shown that approximately 50% of men expressed willingness to advise members of their social network to test for STI. However, the qualitative findings suggest that although the majority of men were willing to talk about issues related to STI outbreaks with members of their social network, they were sceptical about asking them to test for STI due to the need to maintain boundaries in their social relationships. They also wanted the clinic to provide them with some published literature about the STI outbreak to ensure the members of their social network that this information is authentic. The majority of men were willing to be notified by the clinic in event of an outbreak of STI. This can be one of the mechanisms to improve STI testing among MSM in the event of STI outbreak.

### ***6.5 Strengths and limitations***

The strengths and limitations of the qualitative study were presented previously in section 4.5. The focus of the in-depth interviews was to explore men's attitudes towards partner notification for STI in the future. It is likely that men's reported intentions towards partner notification for STI in the future may not necessarily reflect their future behaviour. However, the consistency between the results on partner notification of the SHARPN survey and the qualitative study, and between future willingness and recent partner notification experiences suggest that these data are likely to be a useful guide to partner notification behaviour of these men.

### ***6.6 Implications for clinical practice, health policy and future research***

The findings of this chapter suggest that in theory, partner notification for STI (both notifying and being notified) is acceptable to HIV positive MSM. The significance of interaction with the clinic staff following STI diagnosis was also

evident. However, in order to improve the uptake of partner notification, there is a need to address various perceived and experienced barriers associated with partner notification for STI. These include fear of criminalisation for HIV transmission, fear of being blamed for STI transmission and fear of being judged by the clinic staff. There is also a need to highlight the personal and public health benefits of notifying casual partners of STI in the context of high rate of partner change. Partner notification methods like sending anonymous e-cards have limited acceptability among HIV positive MSM but can enhance notification of at-risk partners. There is a need to conduct further research to assess the effectiveness and uptake of such methods of partner notification for STI. The development of novel methods of remote management of partners for STI should integrate mechanisms for enabling remote testing for HIV and syphilis. They also need to address concerns related to reliability and accuracy of such methods and concerns about the lack of interaction with clinic staff to improve their uptake. One of the ways of addressing the latter concern could be offering web-based interaction with the clinic staff if needed.

The next chapter is the last chapter of the thesis. In the last chapter I discuss the relevance of the SHARPN findings for clinical practice, policy and research.

## **Chapter 7: Implications of the SHARPN study findings**

### **7. Introduction**

As mentioned previously in section 1.7, the overall aim of my thesis was to inform strategies for HIV/STI prevention among MSM in the UK in the context of increasing emphasis on HIV testing and cART for HIV prevention.

As mentioned in section 1.10, in this thesis I explored the following research questions:

1. What are the implications of the sexual behaviour and sexual partnership patterns of HIV positive MSM for HIV transmission, STI transmission and acquisition, and partner notification for STI?
2. How does the socio-cultural context of HIV/STI diagnoses, beliefs about the effectiveness of biomedical and behavioural risk reduction strategies for preventing HIV transmission influence and interact with sexual partnerships, sexual behaviour, and risk management choices among HIV positive MSM?
3. What are the factors associated with STI diagnosis and willingness to notify sexual partners of STI amongst HIV positive MSM?
4. What are the attitudes of HIV positive MSM towards partner notification for STI, and perceived and experienced barriers and facilitators for partner notification of STI?
5. What are their attitudes towards notifying different types of sexual partners of STI and being notified of STI via various traditional and novel methods of partner notification in the future?

In the following section, I will summarise the findings of the SHARPN study.

## 7.1 *Summary of the findings of SHARPN study*

### 7.1.1 **Sexual partnership patterns and sexual behaviour of HIV positive MSM**

The majority of HIV positive MSM in the SHARPN survey were on cART, were sexually active, and had multiple AI partners (seroconcordant and/or serodiscordant). The prevalence of anonymous new partners was high. Men who had non-primary/new partners were less likely to disclose their serostatus to their partners or be aware of their partners' HIV status. The survey findings highlight that a high proportion of men had a serodiscordant primary partner, or a serodiscordant most recent non-primary partner, or unknown/serodiscordant new AI partners. Overall, men who had a serodiscordant primary partner or a most recent serodiscordant non-primary partner were less likely to engage in sexual behaviours that increase the risk of HIV transmission compared to men who had a seroconcordant primary partner or a most recent seroconcordant non-primary partner. Nevertheless, a significant minority of men had engaged in UAI and fisting with a serodiscordant primary partner or a most recent serodiscordant non-primary partner. Duration of partnership and recreational drug use during sex were independently associated with HIV transmission risk behaviours with a serodiscordant primary partner. Age, time since HIV diagnosis, disclosure of HIV status was not associated with transmission risk behaviours with a serodiscordant primary partner. Recreational drug use and direct disclosure of HIV status were independently associated with transmission risk behaviours with a most recent serodiscordant non-primary partner. Plasma viral load status was also not associated with engagement in UAI with a serodiscordant primary or the most

recent serodiscordant non-primary partner suggesting that men engaged in UAI with these partners irrespective of their plasma viral load status, which has implications for onward HIV transmission. A high proportion of men had engaged in UAI and other risky practices like fisting and group sex with a seroconcordant primary and a most recent seroconcordant non-primary partner. These findings suggest that the sexual behaviour of HIV positive MSM has implications for the risk of sustaining STI transmission and acquisition.

### **7.1.2 Attitudes towards HIV transmission risk reduction strategies and sexual behaviour**

Although a significant minority of HIV positive MSM were optimistic about the reduced risk of HIV transmission and re-infection with HIV due to viral suppression; the majority of men were concerned about the risk of HIV transmission despite having an undetectable viral load. A significant minority of men were also optimistic about behavioural risk reduction strategies like strategic positioning and withdrawal prior to ejaculation during UAI. However, some men had misperceptions about the effectiveness of behavioural HIV transmission risk reduction strategies.

There was an association between positive attitudes towards reduced risk of HIV transmission due to undetectable viral load and engagement in UAI/RUAI, and an association between attitudes that there is no risk of HIV transmission due to unsafe oral sex and practicing insertive unsafe oral sex with a serodiscordant primary partner. But no association between attitudes towards various HIV transmission risk reduction strategies and engagement in transmission risk behaviours with a most recent serodiscordant non-primary partner was observed.



The qualitative findings suggest that some men engage in negotiations based on cART and viral load status prior to engagement in UAI and/or engage in URAI or withdrawal prior to ejaculation during UAI with serodiscordant partners to reduce the risk of HIV transmission. However, the notions of shared responsibility and sexual pleasure assume greater significance in the context of non-primary partners. These data suggest that the scientific debates about cART for prevention of sexual transmission of HIV, and attitudes towards behavioural risk reduction strategies for preventing HIV transmission influence sexual behaviour of some HIV positive MSM.

### 7.1.3 **Risk context of HIV/STI diagnosis**

The qualitative data indicates that being confronted with a ‘new sexual identity’ following HIV-diagnosis; the fear of stigma, rejection, and discrimination influence sexual partnerships and sexual behaviour of HIV and HCV co-infected men and serostatus disclosure strategies. Serosorting based on HIV status symbolises the agency exercised by HIV positive MSM in response to the ‘felt stigma’ and ‘enacted stigma’, especially among men newly diagnosed with HIV, and their efforts to prevent onward HIV transmission. Some men not only serosorted by partner’s HIV status but also viral load status due to the perceptions of reduced risk of re-infection with HIV.

However, serosorting or ability to use other HIV transmission risk reduction strategies is likely to be compromised due to the lack of discussion about serostatus with sexual partners or ‘seroassumption’, i.e., assuming the HIV status of sexual partners. The qualitative data suggests that seroassumption among these men was influenced by the social norms of serostatus disclosure in different types of venues of meeting sexual partners including online. However, the survey data

indicates that disclosure of HIV serostatus does not necessarily lead to safer sex with a serodiscordant non-primary partner.

Men were concerned about being co-infected with HCV. Those who were co-infected with HCV faced or feared isolation due to their co-infected status, as it is a barrier to serosorting and engagement in UAI. These data bring to the fore the sub-divisions within HIV positive MSM based not only on their viral load status but also HCV status, and the stigma and discrimination within HIV positive MSM.

#### 7.1.4 **STI diagnosis and risk factors for STI**

Although a high proportion of sexually active men had tested for STI in the last year, one in six men had not. The observed high level of unprotected sexual behaviour was reflected in the high burden of STI diagnosis among HIV positive MSM. Young age, detectable viral load status, greater number of new AI partners, engagement in UAI, engagement in UAI with concurrent partners, having a seroconcordant primary partner, greater frequency of engagement in group sex were independently associated with the risk of STI diagnosis. The observed high prevalence of engagement in group sex, concurrent and multiple new partnerships, and its association with STI diagnosis has implications not only for the risk of STI acquisition and transmission but also the rapid spread of STI in these sexual networks. Time since HIV diagnosis, ethnicity, education status, employment status, country of birth, recent CD4 cell count were not associated with STI diagnosis in the last year. A significant proportion of men did not believe that being co-infected with STI could increase the risk of onward HIV transmission. The observed high prevalence of STI among men who had sex with a serodiscordant primary and most recent serodiscordant non-primary partner

suggests that partner notification among HIV positive MSM provides opportunities for STI as well as HIV case finding and timely treatment.

#### **7.1.5 Attitudes towards partner notification for STI and willingness to notify sexual partners and be notified of STI in the future**

Both the survey and qualitative study findings suggest that the majority of men were willing to notify their primary partner and regular partners of STI compared to notifying casual partners. Men acknowledged the personal health benefits of partner notification for STI and reported a greater sense of moral and emotional responsibility towards notifying primary and regular partners during the qualitative interviews. Therefore, patient referral methods were the most preferred methods for notifying sexual partners of STI in the future, especially a primary partner and regular partners.

Attitudes like it is not my responsibility to notify sexual partners of STI and previous non-notification of sexual partners for STI were independently associated with the lack of willingness to notify casual partners of STI in the future. The qualitative findings suggest that the lack of emotional connectedness with casual partners was a barrier to notify casual partners of STI in the future. Socio-cultural and psychological factors like the fear of blame and stigma associated with STI/HIV, fear of breach of HIV-related confidentiality, fear of criminalisation for HIV transmission and other negative implications of notifying partners of STI like break-up were also perceived barriers to notify sexual partners, especially casual/group sex partners of STI in the future. Men willing to notify casual partners would be willing to do so using remote self-led, provider-led methods or via an anonymous e-card method. The majority of men wanted their partners to

notify them for STI in the future via patient referral methods. However, greater acceptability to be notified via provider referral methods compared to using these methods for notifying their partners for STI was observed in both the survey and qualitative study. Group sex partner notification via the party organiser or directly notifying some group sex partners of STI was reported but perceived to be unlikely majority of the time due to anonymity of partners. Overall these data highlight the need to enhance regular screening for STI among MSM, especially among men who have casual partners and engage in group sex.

Men's recent experience of interaction with the clinic staff following STI diagnosis highlights their scepticism towards interaction with the clinic staff due to the fear of being judged for their sexual behaviour. However, some men felt that their interactions with the clinic staff were informative and useful to understand the epidemiology of STI transmission, and look-back period and devise strategies to notify their partners of STI.

#### **7.1.6 Attitudes towards using novel methods of partner notification for STI in the future**

Both, the survey and qualitative findings suggest that although unacceptable to the majority of men, few men would be willing to use anonymous e-card method to notify partners of STI in the future, especially casual partners. This method of notification may increase notification among men who engage in risky sex with serodiscordant partners or unknown HIV status partners, and among men who are worried about confidentiality related to HIV.

Similarly, the findings suggest that some men were willing to take home sampling kits, or medication for their primary partner and regular partners after a telephone assessment by a health care professional following their diagnosis with

chlamydia/gonorrhoea. However, they were concerned about the accuracy of these methods and the lack of opportunity to seek advice from a medical expert due to remote partner management. Some men were also concerned about the impact of using these methods on confidentiality.

The survey results suggest that a significant proportion of men would be willing to be notified by the clinic in event of STI outbreak and refer men from their social network to the clinic to reduce the undiagnosed burden of STI. However, the qualitative findings highlight the scepticism of HIV positive MSM to directly ask men from their social network to test for STI, but they would be willing to mention about an STI outbreak to them. They felt the need to have additional information from the clinic about an outbreak of STI to support their discussion with their peers about this matter. Overall, the findings of the SHARPEN study highlight that men's preference for specialised sexual health care and advice can be a barrier for novel methods of remote management of partners for STI.

In the following section, I will examine the overall strengths and limitations of the SHARPEN study.

## ***7.2 Overall strengths and limitations of the SHARPEN study***

As mentioned previously in chapter 2, mixed methods approach was used in the SHARPEN study. Mixed methods design was considered appropriate to enable comparison, validation, and triangulation of the study results. The survey enabled examining the prevalence of variables of interest (i.e. sexual behaviours and partnership patterns) and the relationship between variables of interest. Whereas face-to-face interviews enabled understanding the meanings men attach to the phenomena of interest and the range of experiences and perspectives of HIV positive MSM. The survey and in-depth face-to-face interviews were conducted

simultaneously. The decision to use a concurrent study design was made for pragmatic reasons like time constraints, i.e., to maximize data collection in the PhD timeframe. The quantitative and qualitative study results are presented in separate chapters; however the discussion of the chapters subsequent to the first results chapter based on the survey results compared and contrasted the quantitative and qualitative study findings reported in the previous chapters. This allowed identification of divergent study findings as well as similarities in the phenomena under investigation and provided contextual insights into the observed phenomena.

Overall, the results of the survey and qualitative study complemented each other as described in the discussion of results chapters and the summary of the key findings presented in this chapter. For example, the survey results suggest that a small minority of men believe that having an undetectable viral load reduces the risk of HIV transmission and engaged in UAI due to such beliefs. The qualitative study findings indicate that these survey findings may be because overall the majority of HIV positive MSM were skeptical about the effectiveness of reduced risk of HIV transmission due to undetectable viral load. There was also subtle divergence in the survey and qualitative study findings. For example, the survey data indicates that a significant proportion of men were willing to notify members of their social network to test for STI in the event of an STI outbreak. However, the qualitative findings suggest that although men were willing to discuss about an outbreak of STI with members of their social network they were not comfortable to refer them to test for STI. They felt so due to the need to maintain boundaries in their social relationships. These insights are important in understanding the feasibility of developing peer referral methods for HIV or STI testing in the future. They also

highlight the significance of conducting qualitative research prior to developing questionnaire for measuring new concepts to understand such subtle differences.

Given the limited data on partner notification for STI among HIV positive MSM in the UK, it would have been ideal to conduct the qualitative study prior to conducting the survey. However, as mentioned previously, concurrent design was used for data collection. The qualitative study findings highlight the significance of factors like self-efficacy, perceived social norms, level of emotional connectedness with sexual partners, nature of sexual partnership categorized as open/closed influence attitudes towards and preferences for partner notification for STI. Therefore, future studies can potentially draw on the results of this study to inform development of constructs to examine the attitudes and preferences to partner notification for STI in this population.

During the course of the SHARPN study, several policy and research developments occurred in the field of HIV in the UK and globally. Thereby, I will provide a brief overview of the relevant HIV/STI prevention, and HIV treatment and care policies, and the legal framework for criminalisation for sexual transmission of HIV/STI to contextualize the SHARPN findings.

### ***7.3 Policies and legal framework of relevance to HIV/STI prevention in MSM***

In the UK, the current policies for sexual health, and HIV prevention and treatment and care have evolved over the last decade and are continually changing with developments in the field of research, and changes in government funding strategies. In the following sections, I will provide a brief overview of these changes.

### **7.3.1 Current policies and programmes for sexual health, HIV/STI prevention and HIV treatment**

The Department of Health (DH) in England published the first National Strategy for Sexual Health and HIV in 2001 (Department of Health, 2001). Reducing HIV transmission and the prevalence of undiagnosed HIV, improving health and social care for PLWH, and reducing stigma associated with HIV are some of the key aims of this strategy. Improving sexual health was also prioritised in the 2004 White Paper ‘Choosing Health: making health choices easier’ (Department of Health, 2004), which emphasised the need for national campaigns for promoting safer sex, especially among young people; modernising sexual health services; and national screening for chlamydia. Thus, promoting sexual health and HIV prevention is recognised as an important aspect of health care and service provision in the UK.

The DH supports targeted HIV prevention in MSM through the Community HIV and AIDS Prevention Strategy (CHAPS), which is co-ordinated by the Terrence Higgins Trust (Department of Health, 2002). ‘Making it Count’ is a collaborative planning framework developed by CHAPS since 2002 for HIV prevention and health promotion in MSM. The key focus of this framework is on ‘benefits-driven change’, i.e., emphasising the positive aspects of precaution rather than the downside of risk and making such precautionary alternatives available. It draws on health promotion and social marketing models for developing interventions in MSM for HIV/STI prevention. The DH encourages commissioners and providers of sexual health and HIV prevention services to adopt this framework for local prevention activity.



However, the Health and Social Care Act 2012 which will be implemented from April 2013 will change the existing mechanisms of planning and funding of the NHS in the UK (Health and Social Care Act, 2012). This Act abolishes the Strategic Health Authorities (SHAs) and Primary Care Trusts (PCTs) that are currently responsible for development and provision of health services. The PCTs were responsible for engaging with their local populations to improve health and well-being, commissioning comprehensive services within allocated resources across all service sectors and directly providing services where this gives best-value (National Health Service Reform and Health Care Professions Act, 2002). The SHAs provided strategic leadership and were responsible for ensuring that local systems operate effectively and deliver improved performance. The Health and Social Care Act 2012 proposes to create a NHS Commissioning Board and establish Clinical Commissioning Groups (CCGs), which will commission the majority of NHS services. While the responsibility for HIV treatment and care commissioning will lie with the NHS Commissioning Board, i.e., nationally managed; the Local Authorities, advised by the CCGs, will be responsible for provision of other sexual health and STI services, sexual health promotion, and HIV prevention and testing services. Public Health England will be responsible for improving public health through expert advice, including HIV testing and prevention, by working closely with the local authorities. The Public Health Outcomes Framework will be used to assess the performance of local authorities; for example, late HIV diagnosis is one of the proposed outcomes to assess the performance of local authorities.

However, there are concerns that the proposed changes may lead to fragmentation and lack of coordination between HIV treatment and care, STI service provision,

and HIV prevention. This may potentially affect the health and social care needs of PLWH in the UK. For example, it is not clear, as of now, who will be responsible for commissioning services for provision of PEP under this new Act. Appropriate measures need to be taken to ensure that HIV prevention needs of PLWH are not neglected due to the fragmentation of HIV treatment and prevention service, which as reflected by the SHARPN findings are vital for HIV/STI prevention in MSM.

Ongoing research has played a significant role in the development of cART as well as informing policies about when to start cART. In the UK, the guidelines on who should be offered cART changed over the period of the SHARPN study. I describe these changes in the following section.

### **7.3.2 Revised guidelines for offering cART to PLWH**

In early 2012 the British HIV Association (BHIVA) amended the guidelines on when to start cART. The revised guidelines suggest that evidence regarding the reduced risk of sexual transmission of HIV due to cART should be discussed with all patients, and those with a CD4 cell count of  $>350$  cells/mm<sup>3</sup> willing to start cART to reduce the risk of HIV transmission should be offered cART (Williams et al., 2012). However, the guidelines emphasize that initiating cART in such scenarios should be the patient's choice, and recommends condom use to protect from STI and residual risk, and that patients should be informed that the evidence on effectiveness of cART in reducing the risk of HIV transmission relates to vaginal and not anal sex (Williams et al., 2012). The BHIVA guidelines also recommend that cART can be initiated for primary HIV infection if the person's CD4 cell count is  $<350$  cells/mm<sup>3</sup> or they have any AIDS-defining illness.

### 7.3.3 Criminalisation of HIV/STI transmission

In England and Wales, in the past persons have been convicted for HIV/STI transmission under the Offences against the Person Act 1861 (Offences against the Persons Act, 1861). This Act has been used for convictions for ‘intentional’ or ‘reckless’ transmission of HIV/STI as these infections are considered to cause ‘grievous bodily harm’ to the infected persons. However this Act was originally not designed to deal with HIV transmission and the number of prosecutions due to this Act caused controversy. In March 2008 the Crown Prosecution Service (CPS) published a policy statement which clarifies that charges of reckless or intentional transmission of HIV/STI can be made if the person knows that they have HIV/STI, understands how these infections are transmitted, knows that the partner is HIV negative and engaged in unprotected sex, and HIV/STI transmission occurs (Crown Prosecution Service, 2008). CPS has also clarified that prosecutions are unlikely to take place as a result of one-off sexual encounters due to the challenges of proving recklessness in such situations, and scientific evidence must be used to show that the defendant actually infected the complainant. A person cannot be convicted under the Offences against the Person Act 1861 for HIV/STI transmission if the person had engaged in unprotected sex with informed consent of the complainant to the risk of HIV/STI infection, if disclosure of serostatus had occurred, or if condoms were used consistently. Since 2003, the majority of convictions in the UK have been for reckless transmission as opposed to intentional transmission, and for HIV transmission (National Aids Trust, 2011). The public debates surrounding these convictions and the CPS statement have given rise to concerns about criminalisation among PLWH. At the time of writing

this thesis, there is an ongoing debate about how clinicians could support patients in the current policy climate.

In the following section, I discuss the relevant SHARPN findings and implications for HIV/STI prevention in MSM.

#### 7.4 *SHARPN findings: implications for policy, clinical practice and research*

Subsequent to the publication of the Swiss Statement in 2008, the SHARPN study is the first study to re-examine the association between cART and sexual behaviour in the UK. It is also the first study conducted in the UK to provide insights into the attitudes, barriers and preferences of HIV positive MSM towards partner notification of STI. The findings re-confirm that being on cART with an undetectable viral load is not associated with risky sexual behaviour among HIV positive MSM. On the contrary, the observed lack of association between viral load status and engagement in HIV transmission risk behaviours, and the high prevalence of serodiscordant partnerships lend support to the revised BHIVA guidelines of offering cART for HIV prevention irrespective of CD4 cell count to reduce the risk of HIV transmission in this population. The findings suggest that STI testing and partner notification should be offered during routine clinic visits to sexually active men to reduce the risk of infectivity due to co-infection and re-infection with STI, and transmission risk behaviours. HIV/STI prevention interventions in this population cannot ignore the wider socio-cultural determinants of health like stigma, fear of criminalisation and rejection. The SHARPN findings highlight the urgent need to conduct research studies to develop, and assess the feasibility, acceptability, effectiveness and cost effectiveness of

brief interventions offered to PLWH during routine clinic visits to reduce STI, transmission risk behaviours, and provide psychological and adherence support. In the following section, I discuss the relevant SHARPN findings and how they support the proposed combination prevention strategies specified in Box 1.

#### **7.4.1 Recommendations for clinical practice and policy**

##### **7.4.1.1 *cART for prevention of sexual transmission of HIV***

The observed lack of association between plasma viral load status and engagement in HIV transmission risk behaviours signifies that men engaged in these behaviours irrespective of their plasma viral load status. This is a concern because plasma viral load status is a vital factor in onward sexual HIV transmission. This is especially important because there has been an increase in new HIV diagnoses in MSM in the UK in 2011 despite almost 80% of the HIV positive persons being on cART (as per previous guidelines they would have started cART when their CD4 cell count was less than or equal to 350 cells/mm<sup>3</sup>) and had an undetectable viral load (Health Protection Agency, 2011a). Undiagnosed HIV infections may partly explain this observed increase in new HIV diagnosis among MSM. However, the role of untreated diagnosed HIV infections among HIV positive MSM who also have a high burden of co-infection with other STI remains unclear but an important parameter in HIV transmission dynamics. Therefore, the revised 2012 BHIVA guidelines that recommend offering cART to patients with a CD4 cell count of >350 cells/mm<sup>3</sup> willing to start cART to reduce the risk of HIV transmission (Williams et al., 2012) is a significant step in enhancing the public health benefits of cART for prevention of sexual transmission of HIV. However, adherence to cART of PLWH who start cART for prevention of sexual transmission of HIV should be monitored regularly.

Some MSM use cART and viral load status to guide their decisions about engagement in HIV transmission risk behaviours. Knowledge of viral load status depends on monitoring via regular blood testing. In the UK, those on cART are usually tested for viral load once every six months. Therefore, it is likely that changes in viral load status due to treatment failure, co-infection with STI, or other health related problems might go unnoticed. This can have implications for onward HIV transmission. Thus, HIV positive MSM who decide to start cART to reduce the risk of HIV transmission may need to be tested more frequently for viral load, and screened regularly for STI. MSM should also be informed about the availability of PEP for HIV prevention and the need to start PEP within 78 hours (Benn et al., 2011).

The observed association between attitudes towards effectiveness of undetectable viral load in preventing HIV transmission and engagement in HIV transmission risk behaviours with a serodiscordant primary partner demonstrates the behavioural challenges associated with promoting cART for HIV prevention. The revised UK safer sex guidelines stipulate that effective cART and undetectable viral load significantly reduces the risk of HIV transmission and advice using condoms to further minimise the risk of HIV transmission (Clutterbuck et al., 2012).

**Box 1. Combination HIV/STI prevention strategies among MSM**

- Offer cART for HIV prevention to sexually active men, especially men in serodiscordant partnerships with a CD4 cell count  $>350$  cells/mm<sup>3</sup> and monitor adherence to cART
- Promote awareness about the partial effectiveness of cART for HIV prevention and other behavioural risk reduction strategies
- Promote HIV testing among sexually active serodiscordant partners
- Increase frequency of STI testing among sexually active men
- Improve sexual history taking parameters to enhance sexual risk assessment and effectiveness of partner notification for STI
- Offer choices of partner notification strategies for STI
- Spread awareness about sexual transmission of HCV and risk factors associated with HCV transmission
- Address internalised stigma and stigma towards HIV and HCV among HIV positive MSM
- Address social norms of serostatus disclosure
- Improve awareness of the legal framework for criminalisation for HIV/STI transmission
- Conduct periodic surveillance of sexual behaviour and partnership patterns of MSM
- Develop and evaluate interventions to promote safer sex, improve HIV testing among serodiscordant couples, and frequency of STI testing and partner notification
- Model the impact of STI partner notification on STI transmission dynamics among MSM

However, it is vital that HIV prevention messages about safer sex targeting MSM should also emphasize the limited effectiveness of cART for prevention of sexual transmission of HIV due to co-infection with STI, and promote awareness that being on cART with an undetectable viral load does not protect against STI and the existing evidence on the effectiveness of cART for HIV prevention relates to predominantly heterosexual population.

#### **7.4.1.2 *Promote awareness about partial effectiveness of behavioural risk reduction strategies for prevention of sexual transmission of HIV***

Beliefs about behavioural HIV transmission risk reduction strategies such as withdrawal prior to ejaculation during UAI or strategic positioning were also associated with UAI with a serodiscordant primary partner. However, there was no association between such beliefs and UAI with a most recent serodiscordant non-primary partner. Factors associated with risky sexual behaviour with a serodiscordant primary partner are different from those with a serodiscordant non-primary partner. Nevertheless, HIV prevention campaigns among MSM should address the partial effectiveness of behavioural risk reduction strategies for prevention of sexual HIV transmission (Jin et al., 2009) and lack of effectiveness of these strategies against the risk of STI.

#### **7.4.1.3 *Promote regular HIV testing of serodiscordant partners***

Awareness of sexual partners' HIV status is vital for prevention of HIV transmission/acquisition. As described in section 3.4, although the majority of HIV positive MSM in a serodiscordant primary partnership had disclosed their HIV status to their primary partner, some men had not. A significant proportion of men had an unknown status primary partner. Therefore, primary partners of HIV positive MSM who are unaware of their HIV status should be encouraged to test for HIV, and serodiscordant partners who engage in UAI with their partner should be encouraged to test for HIV regularly.

#### **7.4.1.4 *Increase frequency of STI testing***

The observed high STI prevalence among HIV positive MSM is a challenge to the effectiveness of cART for prevention of sexual transmission of HIV. The recent Health Select Committee on HIV/AIDS has emphasised the significance of STI control for HIV prevention (House of Lords: Select Committee on HIV and AIDS



in the United Kingdom, 2011). Currently, national guidelines recommend an annual full sexual health screen for PLWH regardless of their sexual history (Fakoya et al., 2008). However, given the observed risk factors associated with STI diagnosis among HIV positive MSM, i.e., multiple new partners, engagement in group sex, engagement in UAI with serodiscordant partners and concurrent partners, developing interventions that not only enhance STI testing but also the frequency of STI testing are vital for timely STI diagnosis and treatment, and partner notification.

A review of studies conducted between 1990-2011 among MSM has shown that syphilis serology included with blood tests performed as part of HIV monitoring is effective for syphilis retesting in MSM and detection of asymptomatic syphilis (Zou et al., 2012). This review also reported that other clinic-based interventions like use of a computer alert on an electronic medical record, recall for retesting post STI diagnosis, introduction of clinic guidelines on STI screening are effective in increasing screening rates for chlamydia and gonorrhoea. These data suggest that integrating STI testing with existing routine monitoring of PLWH, and using novel technologies may enhance STI testing in HIV positive MSM.

#### **7.4.1.5 *Improve sexual history taking for sexual risk assessment and partner notification***

Sexual history taking from patients attending sexual health clinics for STI screening is an integral part of sexual risk assessment and essential to identify the anatomical sites that should be screened for STI. This data is also important to inform partner notification in the event of STI diagnosis and has implications for HIV/STI case finding. Engagement in group sex was one of the risk factors for STI diagnosis among HIV positive MSM. A high prevalence of serodiscordant partnerships was also observed among these men. The current national guidelines

for sexual history taking suggest that all individuals being assessed for risk of STI should be asked about the gender of their partners, type of sexual contact (anal, oral etc.), condom/barriers use, relationship with the partner (live-in, regular, casual partner), duration of relationship and ability to contact the partner, time interval since the last sexual contact, and symptoms in the partner including known or suspected STI, and if applicable, any risk of sexual infection presented by the partner (Brook, G et al., 2012). These guidelines do not propose collecting data on the HIV status of sexual partners or whether the sexual encounter with the partner was in the context of one-to-one sex or group sex. However, this information is vital to assess the feasibility of offering PEP to serodiscordant/unknown HIV status sexual partners and implications of partner notification for STI on HIV/STI transmission dynamics.

Collection of these data is not recommended in the guidelines probably due to issues related to sensitivity of the nature of these questions, and concerns about confidentiality and its implications for the risk of criminalisation for HIV transmission. The SHARPN findings confirm that HIV positive MSM were reluctant to disclose engagement in group sex to a health care professional. Currently, data on sexual behaviour is collected by the STI clinics either using a self-administered pen and paper proforma which is completed by the patients or by the clinic staff offering STI screen using a computer assisted interview or pen and paper. Using confidential methods like CASI to collect sexual behaviour history may encourage reporting of such sensitive sexual behaviours and facilitate effective partner notification for STI. A RCT conducted in the UK has shown that CASI or computer-assisted personal interview encourages greater disclosure of sensitive information compared to traditional method. However it also highlighted

the need to ensure that the clinic staff acts upon disclosures made during self-interview (Richens et al., 2010). An Australian study reported that using CASI approach is acceptable to patients as well as the clinic staff in a sexual health setting and does not increase the time of consultation (Vodstrcil et al., 2011). With increasing emphasis on using electronic patient records, electronic methods of data collection for sexual history should be used to enhance reporting of sensitive sexual behaviours.

In the UK, the National Audit Group conducts audit of clinical practice in sexual health clinics against the British Association of Sexual Health and HIV (BASHH) Clinical Effectiveness Group National Guidelines (McClean et al., 2012). Currently, the process outcome measures for partner notification for STI are the percentage of index cases documented as offered at least one discussion for partner notification with a health care worker, percentage of index cases having the outcome of an agreed contact action or decision not to contact documented for all contacts, the number of contacts whose attendance for STI care is documented, and the number of all contacts whose attendance at a sexual health service is documented as verified by health care worker within the four weeks of the date of first partner notification discussion. Given the multiplicity of new partnerships, concurrent partnerships, engagement in group sex observed among HIV positive MSM, notifying different types of sexual partners is likely to have varying degrees of impact on STI transmission dynamics. For example, notifying a primary partner and new partners of a HIV positive person diagnosed with STI will have different implications for preventing onward STI transmission and re-infection rates compared to notifying only the primary partner of a person who has concurrent partners. Therefore, the documentation of the nature of sexual partnership with

contacts and the type of contacts with successful verification of attendance at a sexual health service should also be included as auditable measures to understand the effectiveness of partner notification in this population.

#### **7.4.1.6 *Offering choices of partner notification strategies for STI***

Given the nature of sexual partnerships and behaviours observed among HIV positive MSM, partner notification strategies among MSM should be tailored according to the nature of sexual activity (not only anal or oral etc. but also whether it was one-to-one sex or in a group setting). The association between attitudes like ‘it is not my responsibility to notify sexual partners for STI’ and the lack of willingness to notify casual partners of STI indicates that health promotion campaigns should emphasise the relevance of notifying all sex partners to prevent STI transmission and risk of re-infection. Given the strong preference to be notified by sexual partners for STI, ‘Do unto others as you would have others do unto you’ should be evaluated as a health promotion message to promote partner notification. As mentioned previously, the stigma associated with STI/HIV, especially with HCV cannot be ignored in efforts to improve uptake of partner notification and its effectiveness. Therefore a wide range of notification methods including provider referral should be offered to override some of these personal, partnership, and structural barriers to partner notification.

#### **7.4.1.7 *Spread awareness about sexual transmission of HCV***

HIV positive MSM were concerned about being infected with HCV. Some men were unaware that engagement in fisting is one of the risk factors for HCV. Although the mechanisms of how HCV is transmitted sexually are not fully understood, there is a need to promote safer sex education, and advice use of gloves, and use of water based lubricant among men who engage in fisting

(National Institute for Health and Clinical Excellence, 2007) via clinic-based as well as community based interventions. The risk of reinfection with HCV also needs to be emphasized.

#### **7.4.1.8 *Address internalised stigma and stigma towards HIV and HCV within MSM community***

The SHARPN qualitative findings confirmed that stigma continues to be a significant barrier to disclosure of serostatus and partner notification for STI. There have been a variety of policy initiatives aimed at reducing HIV/STI related stigma. Reducing stigma associated with HIV/STI is one of the key aims of the 2001 National Strategy for Sexual Health and HIV (Department of Health, 2001). CHAPS implements programmes to reduce stigma related to HIV. The focus of these programmes has been on normalisation of HIV by disseminating information about HIV, training of health care staff about stigma reduction, empowering PLWH via outreach programmes to challenge stigma through skill based programmes and counselling, and greater involvement of PLWH in health promotion and commissioning of services. Print media is used to raise awareness about the 2005 Disability Discrimination Act (DDA). According to the DDA 2005, definition of disability includes PLWH from the point of diagnosis and it is illegal to discriminate against PLWH in employment, education, and provision of services (Department of Health, 2007). The latest Health Select Committee on HIV/AIDS has suggested that HIV awareness should be incorporated in national sexual health campaigns to promote public health and prevent stigmatisation of PLWH (House of Lords: Select Committee on HIV and AIDS in the United Kingdom, 2011). However, the SHARPN findings revealed that internalised stigma, and stigma within HIV positive MSM community is also a powerful barrier to disclosure of HCV status, and to notify partners of HCV diagnosis.

Therefore policies and programmes addressing HIV related stigma should also address stigma within HIV positive MSM community towards those co-infected with HCV and internalised stigma.

**7.4.1.9 *Address social norms of serostatus disclosure***

The observed high prevalence of unknown status sexual partners and assumptions about the sexual partners' serostatus especially casual/anonymous partners' is a concern from HIV transmission perspective. HIV negative MSM who engage in UAI, especially with unknown HIV status and/or anonymous contacts should be encouraged to screen regularly for HIV. Health promotion campaigns among MSM should continue to address social norms of serostatus disclosure in different venues for meeting sexual partner, especially the internet, saunas and sex clubs, and its impact on HIV and STI transmission, and STI acquisition.

**7.4.1.10 *Improve awareness of the legal framework relating to HIV/STI transmission***

The lack of awareness and confusion about the legal framework relating to HIV/STI transmission observed in the SHARPN qualitative interviews are barriers to serostatus disclosure and partner notification for STI. Health promotion campaigns among PLWH should promote awareness about the revised CPS guidelines and mechanisms to protect oneself against the fear of conviction for HIV/STI transmission, i.e., by using condoms, disclosure of HIV status prior to sexual intercourse etc. As expressed by some participants, the law needs to be revisited in the light of the revised BHIVA guidelines that recommend offering cART to PLWH who want to prevent onward HIV transmission. Legal implications of subsequent HIV transmission in such situations need to be delineated and made clear to PLWH and clinicians alike.

## 7.4.2 **Recommendations for research**

In the following section I will discuss the relevance of SHARPN findings for further research.

### 7.4.2.1 *Periodic behavioural surveillance of sexual partnership patterns and sexual behaviour*

As reported in chapter 3, overall UAI with sexual partners, and UAI with a serodiscordant primary partner observed in the SHARPN survey has increased compared to the SHARP survey. Similarly, the prevalence of optimism about the reduced risk of HIV transmission during UAI due to viral suppression has increased since the SHARP survey. However it is important to examine whether these observed changes in sexual behaviour and attitudes of HIV positive MSM are real or chance findings. This will be explored in a comparative analysis of the SHARP and SHARPN survey data, which as mentioned in chapter 2, is not within the scope of this thesis, but a wider aim of the SHARPN project.

Nevertheless, given the substantial risk of STI and high prevalence of unsafe sexual behaviour in this population, periodic assessment of changes in sexual partnership patterns, sexual behaviour and attitudes of MSM is crucial to understand its implications for developing HIV/STI prevention strategies. As mentioned previously in chapter 3, data on epidemiological, socio-demographic profile and prevalence of PLWH in England, Wales and Northern Ireland is currently collected bi-annually in London and annually outside London through the SOPHID cross-sectional survey of all individuals with diagnosed HIV infection who attend the NHS for HIV-related care. For each survey, providers of HIV care collate a list of all individuals who have attended for HIV-related care and provide anonymised epidemiological (cART status, viral load status, CD4 cell count) and demographic data (age, sex, ethnicity, post code etc.) on each patient to

the HPA. However, currently no data on sexual behaviour or partnership patterns is collected as part of this survey. At the time of writing this thesis a project conducted by UCL in collaboration with HPA was underway to examine the feasibility of using SOPHID as a sampling frame to roll-out a longitudinal behavioural and healthcare needs survey in a random sample of PLWH. It aims to examine their sexual and other health-related risks, prevalence of chronic diseases and patterns of accessing care. These data will enable assessment of trends in sexual behaviour of PLWH, and inform the development of sexual behaviour and other health related interventions for PLWH. However, it is important to ensure the anonymity of PLWH who participate in such surveys due to the sensitive nature of these data and potential risk of criminalisation for HIV transmission.

#### **7.4.2.2     *Interventions to promote safer sex***

The recent Health Select Committee on HIV/AIDS acknowledges the significance of behavioural risk reduction interventions to prevent HIV in the UK (House of Lords: Select Committee on HIV and AIDS in the United Kingdom, 2011). Reducing rates of UAI without disclosing HIV status to sexual partners or knowing partners' HIV status is one of the strategic programme goals of the CHAPS 2011 *Making it Count* framework to reduce HIV incidence in MSM in England (CHAPS Partnership, 2011). In this study, paradoxically direct disclosure of HIV status was independently associated with UAI with a most recent serodiscordant non-primary partner, irrespective of cART/viral load status. As described in section 3.4, this finding is in line with findings from other studies conducted in the USA and Australia. This signifies the complex relationship between disclosure of serostatus and sexual behaviour, and challenges for developing appropriate interventions to enhance disclosure.



The CHAPS framework for HIV prevention in MSM uses a benefits-driven approach to reduce risky behaviours (CHAPS Partnership, 2011). This is contradictory to the data available from a RCT conducted in the USA among predominantly HIV positive MSM in a clinical care setting which showed the effectiveness of using a loss-framed approach (focusing on negative consequences of unsafe sex) compared to gain-framed approach (focusing on positive consequences of safe sex) in reducing HIV transmission risk behaviours (Richardson et al., 2004). As described in chapter 1, studies conducted in the USA have shown that interventions using cognitive behavioural therapy or motivational interviewing over several sessions are effective in promoting safer sex. However, there has been no research conducted in the UK to examine the effectiveness of such interventions for risk reduction. Thus, there is a need to conduct research to develop, and examine the feasibility, acceptability of integrating risk reduction interventions with routine care and assess their effectiveness.

#### **7.4.2.3 *Interventions to improve HIV testing among serodiscordant partner***

The BHIVA 2011 guidelines for routine monitoring of PLWH, and management of sexual and reproductive health of PLWH propose that a full sexual health screen should be offered to all PLWH following HIV diagnosis and at least annually thereafter (Fakoya et al., 2008; Asboe et al., 2012). The annual sexual health screen provides an opportunity to invite the primary serodiscordant partner of an HIV positive person for a sexual health screen. Novel methods like offering a home sampling kit for saliva collection to a serodiscordant primary partner and returning specimens by post can also be used to facilitate HIV testing. However, the acceptability and feasibility of using these methods for improving HIV testing among serodiscordant couples should be piloted.

#### **7.4.2.4 *Interventions to improve frequency of STI testing***

Recall of predominantly HIV negative MSM in London for STI testing after three months of being diagnosed with bacterial STI using a telephone reminder was shown to be feasible and led to STI and HIV case-finding (Harte et al., 2011). In Australia, sending a SMS reminder to high-risk MSM was also a successful recall strategy for STI/HIV testing (Bourne et al., 2011). Existing data from the USA of various recall strategies for gonorrhoea and chlamydia screening at three months showed that the telephone recall method was the least costly method in terms of cost per new infection treated compared to counselling with a brief recommendation to return followed by a telephone reminder after 3 months; a brief recommendation to return with no reminder; and a \$20 incentive received on return (Gift et al., 2005). However, these studies have been conducted predominantly among HIV negative MSM.

Given the high prevalence of STI among HIV positive MSM, there is a need for further research to examine the effectiveness of recall strategies for STI testing among HIV positive MSM who have multiple and concurrent sexual partners, engage in UAI, and group sex. Similarly, no research studies have been conducted in the UK to examine the effectiveness and cost-effectiveness of using electronic medical record alerts or linking routine blood monitoring with STI testing among HIV positive MSM. Research should be conducted to examine the effectiveness and cost-effectiveness of such strategies to improve STI testing and retesting among HIV positive MSM.

#### **7.4.2.5 *Anonymity of sexual partners and partner notification for STI***

Individual level partner notification methods are likely to have limited impact on STI control among HIV positive MSM due to the observed high prevalence of

anonymous sexual partnerships. Development of novel methods like internet-based partner notification via dating websites, and increasing testing and retesting for STI via methods described in section 7.4.1.4 is vital to curb the prevalence of STI in this population. There was some evidence of the acceptability of referring members of social network among men in the SHARPN study. In the USA, offering HIV counselling and testing via HIV positive MSM as peers; offering MSM peer recruiters financial incentives to refer their peers for HIV, STI and viral hepatitis testing; and offering financial incentives to the recruits who test for STI/HIV have all been shown to be effective strategies to identify new HIV cases and the latter was also a cost-effective strategy (Jordan et al., 1998; Golden et al., 2006). However, no studies have been conducted in the UK to explore the acceptability and feasibility of such approaches. Men were also willing to be notified by the clinic in the event of an outbreak of STI like LGV. This can be one of the methods to recall MSM to test for STI but again currently, there is no evidence on the uptake of STI testing among MSM as a result of recall for STI testing in the context of an STI outbreak and this warrants further research.

#### **7.4.2.6 *Further research on partner notification for STI in MSM***

Developing interventions to improve partner notification for STI/HIV in clinical and community settings was one of the research priorities of the 2001 National Strategy for Sexual Health and HIV (Department of Health, 2001). However, as reported in the systematic review of studies on partner notification for STI in section 1.9.3.1 and appendix 1, there are very few studies examining partner notification for STI in MSM and no studies have been conducted on partner notification for STI among HIV positive MSM/PLWH (Low et al., 2012). Therefore, there is a need to conduct further research among PLWH on partner

notification for STI. However, studies conducted to evaluate partner notification for STI in MSM should be designed to address the following challenges.

The results of the SHARPN study have shown that men would prefer to use different methods of partner notification for STI for different types of sex partners. For example, they would be more willing to notify primary partner of STI via patient referral methods and use remote self-led methods or provider-led methods to notify casual partners. This was also observed in an exploratory non-randomised comparative study conducted in the UK where index patients, who were predominantly heterosexual, expressed strong preferences for particular methods of notification for STI for different types of sexual partners (Estcourt et al., 2011). Another major challenge in evaluating the effectiveness of partner notification strategies reported by Estcourt and colleagues is that the sexual partners might decide to achieve treatment via some other method. Recently a study was conducted in the USA among MSM to assess the efficacy of PDPT and a web-based partner notification service for improving partner treatment and notification compared to standard partner management (Kerani et al., 2011). This study showed that conducting partner notification RCTs among MSM might not be feasible due to difficulty in enrolling MSM in the trial. However, the authors felt that this may be because the enrolment was done via telephone. This trial also showed that men had strong preferences for partner notification methods and were unwilling to use web-based partner notification method. Another challenge in assessing the effectiveness of partner notification strategies is the variation in the primary and secondary outcomes measured in the trials, which makes it difficult to compare the results of the trials (Trelle et al., 2007). This review by Trelle and

colleagues also highlights that very few trials have examined the impact of partner notification methods on reducing transmission of STI.

These data indicate that prior to proceeding to an RCT, it is important to conduct formative research to assess the feasibility and acceptability of the interventions that have been developed. The MRC framework for development and evaluation of complex interventions provides a useful iterative pathway for developing and evaluating interventions (Craig et al., 2008). The study conducted by Estcourt and colleagues shows the feasibility of using this framework for developing partner notification intervention (Estcourt et al., 2012). Given the limited evidence on the acceptability and feasibility of various methods of partner notification of STI in MSM, there is a need to conduct non-randomised controlled studies in this population prior to conducting definitive RCTs. Moreover, due to the above-mentioned challenges and achieving enrolment at an individual level, the feasibility of using other study designs like cluster RCTs should be explored. There may also be a need to define outcome measures based on the type of sexual partnership and consider its impact on estimating the required sample size.

#### **7.4.2.7 *Modelling the impact of partner notification for STI among MSM***

A study estimating the impact of partner notification for chlamydia on the prevention of secondary infections among heterosexual populations in the UK has shown that partner notification of casual partners rather than regular/live-in partner is likely to prevent more secondary transmissions per partnership (Mercer et al., 2011). Several participants in the SHARPN survey had multiple new casual partners. Thus, the observed lack of willingness among HIV positive MSM to notify casual partners can have negative implications for the prevention of secondary STI transmission. Moreover, as reported in chapter 3, a substantial

proportion of MSM who had a primary partner also had concurrent partners, and a substantial proportion of men perceived that their primary partner has concurrent sexual partners. Thus, treating a primary partner of HIV positive MSM may have greater public health impact in preventing secondary STI transmissions compared to the heterosexual population, and in reducing STI re-infection rates among these men. However, it is important to bear in mind that Mercer and colleagues have estimated the impact of partner notification in heterosexual population. There is a need to estimate the impact of partner notification for different STI on prevention of secondary infections in MSM.

### **7.5 Conclusions**

The SHARPN findings reiterate the significance of HIV/STI prevention among HIV positive MSM. They support the current debate that cART should be offered to sexually active HIV positive MSM, especially those in serodiscordant partnerships, irrespective of CD4 cell count to minimize the risk of onward HIV transmission in this population. Frequent STI testing of sexually active men, and interventions to support and maintain adherence to cART should be offered as part of routine HIV care to ensure effectiveness of cART for HIV prevention. Various partner notification choices should be offered to those diagnosed with STI. Interventions to reduce stigma associated with homosexuality and HIV continue to remain vital in this population. In the UK, research examining the feasibility, acceptability, effectiveness, and cost effectiveness of integrating brief behavioural interventions to enhance regular STI testing, adherence to cART, address recreational drug use and mental health needs, and promote safer sex with routine HIV care among PLWH is urgently needed.

## References

- Aboulker, J.P., Swart, A.M., 1993. Preliminary analysis of the Concorde trial. Concorde Coordinating Committee. *Lancet* 341, 889–890.
- Adler, M.W., 1980. The terrible peril: a historical perspective on the venereal diseases. *Br Med J* 281, 206–211.
- Alexander, S., Ison, C., Parry, J., Llewellyn, C., Wayal, S., Richardson, D., et al. 2008. Self-taken pharyngeal and rectal swabs are appropriate for the detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* in asymptomatic men who have sex with men. *Sex Transm Infect* 84, 488–492.
- Andersen, B., Ostergaard, L., Møller, J.K., Olesen, F., 1998. Home sampling versus conventional contact tracing for detecting *Chlamydia trachomatis* infection in male partners of infected women: randomised study. *BMJ* 316, 350–351.
- Apoola, A., Radcliffe, K.W., Das, S., Robshaw, V., Gilleran, G., Kumari, B.S., et al. 2006. Patient preferences for partner notification. *Sex Transm Infect* 82, 327–329.
- Aral, S.O., Hughes, J.P., Stoner, B., Whittington, W., Handsfield, H.H., Anderson, R.M., Holmes, K.K., 1999. Sexual mixing patterns in the spread of gonococcal and chlamydial infections. *Am J Public Health* 89, 825–833.
- Aral, S.O., Padian, N.S., Holmes, K.K., 2005. Advances in Multilevel Approaches to Understanding the Epidemiology and Prevention of Sexually Transmitted Infections and HIV: An Overview. *The Journal of Infectious Diseases* 191, S1–S6.
- Arthur, G., Lowndes, C.M., Blackham, J., Fenton, K.A., 2005. Divergent approaches to partner notification for sexually transmitted infections across the European union. *Sex Transm Dis* 32, 734–741.

Asboe, D., Aitken, C.K., Boffito, M., Booth, C., Cane, P., Fakoya, A., et al. 2012. British HIV Association guidelines for the routine investigation and monitoring of adult HIV-1 infected individuals 2011. *HIV Medicine* 13, 1–44.

Ashton, M., Sopwith, W., Clark, P., McKelvey, D., Lighton, L., Mandal, D., 2003. An outbreak no longer: factors contributing to the return of syphilis in Greater Manchester. *Sex Transm Infect* 79, 291–293.

Attia, S., Egger, M., Müller, M., Zwahlen, M., Low, N., 2009. Sexual transmission of HIV according to viral load and antiretroviral therapy: systematic review and meta-analysis. *AIDS* 23, 1397–1404.

Auerbach, J.D., 2004. Principles of positive prevention. *J. Acquir. Immune Defic. Syndr* 37 Suppl 2, S122–125.

Baggaley, R.F., White, R.G., Boily, M.-C., 2010. Infectiousness of HIV-infected homosexual men in the era of highly active antiretroviral therapy. *AIDS* 24, 2418–2420.

Balogun, M.A., Ramsay, M.E., Parry, J.V., Donovan, L., Andrews, N.J., Newham, J.A., et al. 2003. A national survey of genitourinary medicine clinic attenders provides little evidence of sexual transmission of hepatitis C virus infection. *Sex Transm Infect* 79, 301–306.

Barré-Sinoussi, F., Chermann, J.C., Rey, F., Nugeyre, M.T., Chamaret, S., Gruest, J., et al. 1983. Isolation of a T-lymphotropic retrovirus from a patient at risk for acquired immune deficiency syndrome. *Science* 220, 868–871.

Bayer, R., Toomey, K.E., 1992. HIV prevention and the two faces of partner notification. *Am J Public Health* 82, 1158–1164.



Bell, G., Ward, H., Day, S., Ghani, A., Goan, U., Claydon, E., Kinghorn, G., 1998. Partner notification for gonorrhoea: a comparative study with a provincial and a metropolitan UK clinic. *Sex Transm Infect* 74, 409–414.

Benn, P., Fisher, M., Kulasegaram, R., 2011. UK guideline for the use of post-exposure prophylaxis for HIV following sexual exposure. *Int J STD AIDS* 22, 695–708.

Bernard, E., 2008a. Swiss statement that “undetectable equals uninfected” creates more controversy in Mexico City [online]. Available from: <http://www.aidsmap.com/Swiss-statement-that-undetectable-equals-uninfectious-creates-more-controversy-in-Mexico-City/page/1431075/> [Accessed 15<sup>th</sup> December 2008].

Bernard, E., 2008b. Swiss experts say individuals with undetectable viral load and no STI cannot transmit HIV during sex [online]. Available from: <http://www.aidsmap.com/Swiss-experts-say-individuals-with-undetectable-viral-load-and-no-STI-cannot-transmit-HIV-during-sex/page/1429357/> [Accessed 15<sup>th</sup> December 2008].

Bezemer, D., de Wolf, F., Boerlijst, M.C., van Sighem, A., Hollingsworth, T.D., Prins, M., et al. 2008. A resurgent HIV-1 epidemic among men who have sex with men in the era of potent antiretroviral therapy. *AIDS* 22, 1071–1077.

Blower, S.M., Gershengorn, H.B., Grant, R.M., 2000. A Tale of Two Futures: HIV and Antiretroviral Therapy in San Francisco. *Science* 287, 650–654.

Boerma, J.T., Weir, S.S., 2005. Integrating demographic and epidemiological approaches to research on HIV/AIDS: the proximate-determinants framework. *J Infect Dis* 191 Suppl 1, S61–7.

Bofill, M., Janossy, G., Lee, C.A., MacDonald-Burns, D., Phillips, A.N., Sabin, C., et al. 1992. Laboratory control values for CD4 and CD8 T lymphocytes. Implications for HIV-1 diagnosis. *Clin. Exp. Immunol.* 88, 243–252.

Bolding, G., Davis, M., Hart, G., Sherr, L., Elford, J., 2005. Gay men who look for sex on the Internet: is there more HIV/STI risk with online partners? *AIDS* 19, 961–968.

Bolding, G., Davis, M., Hart, G., Sherr, L., Elford, J., 2007. Where young MSM meet their first sexual partner: the role of the Internet. *AIDS Behav* 11, 522–526.

Bottieau, E., Apers, L., Van Esbroeck, M., Vandembroucke, M., Florence, E., 2010. Hepatitis C virus infection in HIV-infected men who have sex with men: sustained rising incidence in Antwerp, Belgium, 2001-2009. *Euro Surveill.* 15, 19673.

Bouhnik, A.D., Préau, M., Schiltz, M.-A., Lert, F., Obadia, Y., Spire, B., 2007. Unprotected sex in regular partnerships among homosexual men living with HIV: a comparison between sero-nonconcordant and seroconcordant couples (ANRS-EN12-VESPA Study). *AIDS* 21 Suppl 1, S43–48.

Bourne, C., Knight, V., Guy, R., Wand, H., Lu, H., McNulty, A., 2011. Short message service reminder intervention doubles sexually transmitted infection/HIV re-testing rates among men who have sex with men. *Sex Transm Infect* 87, 229-31.

Brennan, R.O., Durack, D.T., 1981. Gay compromise syndrome. *Lancet* 2, 1338–1339.

Brenner, B.G., Roger, M., Routy, J.-P., Moisi, D., Ntemgwa, M., Matte, C., et al. 2007. High Rates of Forward Transmission Events after Acute/Early HIV-1 Infection. *J Infect Dis.* 195, 951–959.

Brewer, D.D., 2005. Case-finding effectiveness of partner notification and cluster investigation for sexually transmitted diseases/HIV. *Sex Transm Dis* 32, 78–83.

Brewer, D.D., Golden, M.R., Handsfield, H.H., 2006. Unsafe sexual behavior and correlates of risk in a probability sample of men who have sex with men in the era of highly active antiretroviral therapy. *Sex Transm Dis* 33, 250–255.

Brook, G., Bacon, L., Evans, C., McClean, H., Roberts, C., Tipple, C., et al. 2012. Draft 2012 UK national guideline for consultations requiring sexual history taking. British Association for Sexual Health and HIV.

Buchacz, K., Patel, P., Taylor, M., Kerndt, P.R., Byers, R.H., Holmberg, S.D., Klausner, J.D., 2004. Syphilis increases HIV viral load and decreases CD4 cell counts in HIV-infected patients with new syphilis infections. *AIDS* 18, 2075–2079.

Caceres, C.F., van Griensven, G.J.P., 1994. Male homosexual transmission of HIV-1. *AIDS* 8, 1051–1062.

Campbell, M., Fitzpatrick, R., Haines, A., Kinmonth, A.L., Sandercock, P., Spiegelhalter, D., Tyrer, P., 2000. Framework for design and evaluation of complex interventions to improve health. *BMJ* 321, 694–696.

Campbell, R., Pound, P., Pope, C., Britten, N., Pill, R., Morgan, M., Donovan, J., 2003. Evaluating meta-ethnography: a synthesis of qualitative research on lay experiences of diabetes and diabetes care. *Social Science & Medicine* 56, 671–684.

Castilla, J., Del Romero, J., Hernando, V., Marincovich, B., García, S., Rodríguez, C., 2005. Effectiveness of highly active antiretroviral therapy in reducing heterosexual transmission of HIV. *J. Acquir. Immune Defic. Syndr.* 40, 96–101.

Centers for Disease Control and Prevention, 1981a. Pneumocystis Pneumonia --- Los Angeles. *MMWR weekly* 30, 1–3.

Centers for Disease Control and Prevention, 1981b. Kaposi's Sarcoma and Pneumocystis Pneumonia Among Homosexual Men-New York City and California. *MMWR weekly* 4, 306–8.

Centers for Disease Control and Prevention, 1982a. A Cluster of Kaposi's Sarcoma and Pneumocystis carinii Pneumonia among Homosexual Male Residents of Los Angeles and range Counties, California. [online]. Available from: <http://www.cdc.gov/mmwr/preview/mmwrhtml/00001114.htm> [Accessed 30th May 2010].

Centers for Disease Control and Prevention, 1982b. Current Trends Acquired Immune Deficiency Syndrome (AIDS): Precautions for Clinical and Laboratory Staffs. *MMWR weekly* 31, 577–80.

Centers for Disease Control and Prevention, 1982c. Opportunistic Infections and Kaposi's Sarcoma among Haitians in the United States. *MMWR weekly* 31, 353–4.

Centers for Disease Control and Prevention, 2003. Increases in HIV diagnoses-29 States, 1999-2002. *MMWR weekly* 52, 1145–1148.

Centers for Disease Control and Prevention, 2012. CDC Statement on FDA Approval of Drug for HIV Prevention. [online]. Available from: [http://www.cdc.gov/hiv/prep/pdf/CDC\\_FDA\\_Approval\\_Truvada.pdf](http://www.cdc.gov/hiv/prep/pdf/CDC_FDA_Approval_Truvada.pdf) [Accessed 30th May 2010].

Chacko, M.R., Smith, P.B., Kozinetz, C.A., 2000. Understanding partner notification (Patient self-referral method) by young women. *J Pediatr Adolesc Gynecol* 13, 27–32.

CHAPS Partnership, 2011. Making It Count: a collaborative planning framework to minimise the incidence of HIV infection during sex between men, 4th edition. Sigma Research, London.

- Chauhan, M., Serisha, B., Sankar, K.N., Pattman, R.S., Schmid, M.L., 2006. Audit of the use of benzathine penicillin, post-treatment syphilis serology and partner notification of patients with early infectious syphilis. *Int J STD AIDS* 17, 200–202.
- Ciesielski, C., Kahn, R.H., Taylor, M., Gallagher, K., Prescott, L.J., Arrowsmith, S., 2005. Control of syphilis outbreaks in men who have sex with men: the role of screening in nonmedical settings. *Sex Transm Dis* 32, S37–42.
- Clutterbuck, D.J., Flowers, P., Barber, T., Wilson, H., Nelson, M., Hedge, B., et al. 2012. UK national guideline on safer sex advice. *Int J STD AIDS* 23, 381–388.
- Coates, T.J., Richter, L., Caceres, C., 2008. Behavioural strategies to reduce HIV transmission: how to make them work better. *Lancet* 372, 669–684.
- Coffin, J., Haase, A., Levy, J.A., Montagnier, L., Oroszlan, S., Teich, N., et al. 1986. What to call the AIDS virus? *Nature* 321, 10.
- Cohen, M.S., Chen, Y.Q., McCauley, M., Gamble, T., Hosseinipour, M.C., Kumarasamy, N., et al. 2011. Prevention of HIV-1 infection with early antiretroviral therapy. *N. Engl. J. Med.* 365, 493–505.
- Cohen, M.S., Hoffman, I.F., Royce, R.A., Kazembe, P., Dyer, J.R., Daly, C.C., et al. 1997. Reduction of concentration of HIV-1 in semen after treatment of urethritis: implications for prevention of sexual transmission of HIV-1. AIDSCAP Malawi Research Group. *Lancet* 349, 1868–1873.
- Coleman, C., Lohan, M., 2009. Men Who Have Sex with Men and Partner Notification in Ireland: Beyond Binary Dualisms of Gender and Healthcare. *Current Sociology* 57, 211–230.

Collins, C., Robles, R., Marrero, C., Reyes, J., Sahai, H., 2000. Designing primary prevention for people living with HIV. (Policy Monograph Series). AIDS Policy Research Center and Center for AIDS Prevention Studies.

Coutinho, F.A., Lopez, L.F., Burattini, M.N., Massad, E., 2001. Modelling the natural history of HIV infection in individuals and its epidemiological implications. *Bull. Math. Biol* 63, 1041–1062.

Cowan, F.M., French, R., Johnson, A.M., 1996. The role and effectiveness of partner notification in STD control: a review. *Genitourin Med* 72, 247–252.

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., Petticrew, M., 2008. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ* 337, a1655.

Crepaz, N., Hart, T.A., Marks, G., 2004. Highly active antiretroviral therapy and sexual risk behavior: a meta-analytic review. *JAMA* 292, 224–236.

Crepaz, N., Lyles, C.M., Wolitski, R.J., Passin, W.F., Rama, S.M., Herbst, J.H., Purcell, D.W., Malow, R.M., Stall, R., 2006. Do prevention interventions reduce HIV risk behaviours among people living with HIV? A meta-analytic review of controlled trials. *AIDS* 20, 143–157.

Crepaz, N., Marks, G., Liau, A., Mullins, M.M., Aupont, L.W., Marshall, K.J., et al. 2009. Prevalence of unprotected anal intercourse among HIV-diagnosed MSM in the United States: a meta-analysis. *AIDS* 23, 1617–1629.

Crown Prosecution Service, 2008. Policy for prosecuting cases involving the intentional or reckless sexual transmission of infection. [online]. Available from: <http://www.cps.gov.uk/publications/prosecution/sti.html> [Accessed 12th March 2009].

Cunningham, W.E., Rana, H.M., Shapiro, M.F., Hays, R.D., 1997. Reliability and Validity of Self-Report CD4 Counts in Persons Hospitalized with HIV Disease. *Journal of Clinical Epidemiology* 50, 829–835.

Cusick, L., Rhodes, T., 2000. Sustaining Sexual Safety in Relationships: HIV Positive People and Their Sexual Partners. *Culture, Health & Sexuality* 2, 473–487.

Daker-White, Mills, N., Campbell, R., the ClaSS co-operative publication group, n.d. Patient views of sexual partner notification and the relative acceptability of primary care and GUM as venues for contact tracing in genital Chlamydia trachomatis infections: a qualitative study nested within a randomised controlled trial. (Unpublished manuscript).

Darroch, J., Myers, L., Cassell, J., 2003. Sex differences in the experience of testing positive for genital chlamydia infection: a qualitative study with implications for public health and for a national screening programme. *Sex Transm Infect* 79, 372–373.

Das, M., Chu, P.L., Santos, G.-M., Scheer, S., Vittinghoff, E., McFarland, W., Colfax, G.N., 2010. Decreases in community viral load are accompanied by reductions in new HIV infections in San Francisco. *PLoS ONE* 5, e11068.

Davidovich, U., de Wit, J., Albrecht, N., Geskus, R., Stroebe, W., Coutinho, R., 2001. Increase in the share of steady partners as a source of HIV infection: a 17-year study of seroconversion among gay men. *AIDS* 15, 1303–1308.

Davidovich, U., de Wit, J.B.F., Stroebe, W., 2004. Behavioral and cognitive barriers to safer sex between men in steady relationships: implications for prevention strategies. *AIDS Educ Prev* 16, 304–314.

Davis, M., Flowers, P., 2011. Love and HIV serodiscordance in gay men's accounts of life with their regular partners. *Culture, Health & Sexuality* 13, 737–749.

Day, S., Ward, H., Ghani, A., Bell, G., Goan, U., Parker, M., et al. 1998. Sexual histories, partnerships and networks associated with the transmission of gonorrhoea. *Int J STD AIDS* 9, 666–671.

DeGruttola, V., Seage, G.R., Mayer, K.H., Horsburgh, C.R., 1989. Infectiousness of HIV between male homosexual partners. *J Clin Epidemiol* 42, 849–856.

Department of Health, 2001. Better prevention, better services, better sexual health. The national strategy for sexual health and HIV. Department of Health, London.

Department of Health, 2002. Better prevention, better services, better sexual health: the national strategy for sexual health and HIV: implementation action plan. Department of Health, London.

Department of Health, 2004. Choosing health: making healthy choices easier. Department of Health, London.

Department of Health, 2007. Tackling stigma and discrimination-Department of Health implementation plan. Department of Health, London.

Dilley, J.W., Woods, W.J., Sabatino, J., et al., 2002. Changing sexual behaviour among gay male repeat testers for HIV: a randomised, controlled trial of a single session intervention. *Journal of Acquired Immune Deficiency Syndromes* 30, 177–86.

Dodds, J.P., Johnson, A.M., Parry, J.V., Mercey, D.E., 2007. A tale of three cities: persisting high HIV prevalence, risk behaviour and undiagnosed infection in



community samples of men who have sex with men. *Sex Transm Infect* 83, 392–396.

Dodds, J.P., Mercer, C.H., Mercey, D.E., Copas, A.J., Johnson, A.M., 2006. Men who have sex with men: a comparison of a probability sample survey and a community based study. *Sex Transm Infect* 82, 86–87.

Dougan, S., Elford, J., Chadborn, T.R., Brown, A.E., Roy, K., Murphy, G., Gill, O.N., 2007. Does the recent increase in HIV diagnoses among men who have sex with men in the UK reflect a rise in HIV incidence or increased uptake of HIV testing? *Sex Transm Infect* 83, 120–125.

Dougan, S., Evans, B.G., Elford, J., 2007. Sexually transmitted infections in Western Europe among HIV-positive men who have sex with men. *Sex Transm Dis* 34, 783–790.

Dougan, S., Evans, B.G., Macdonald, N., Goldberg, D.J., Gill, O.N., Fenton, K.A., Elford, J., 2008. HIV in gay and bisexual men in the United Kingdom: 25 years of public health surveillance. *Epidemiol. Infect* 136, 145–156.

Du Bois, R.M., Branthwaite, M.A., Mikhail, J.R., Batten, J.C., 1981. Primary *Pneumocystis Carinii* and Cytomegalovirus infections. *Lancet* 318, 1339.

Duncan, B., Hart, G., Scoular, A., Bigrigg, A., 2001. Qualitative analysis of psychosocial impact of diagnosis of *Chlamydia trachomatis*: implications for screening. *BMJ* 322, 195–199.

Dyer, J.R., Eron, J.J., Hoffman, I.F., Kazembe, P., Vernazza, P.L., Nkata, E., et al. 1998. Association of CD4 cell depletion and elevated blood and seminal plasma human immunodeficiency virus type 1 (HIV-1) RNA concentrations with genital ulcer disease in HIV-1-infected men in Malawi. *J. Infect. Dis.* 177, 224–227.

Ehlman, D.C., Jackson, M., Saenz, G., Novak, D.S., Kachur, R., Heath, J.T., Furness, B.W., 2010. Evaluation of an innovative internet-based partner notification program for early syphilis case management, Washington, DC, January 2007-June 2008. *Sex Transm Dis* 37, 478–85.

Elford, J., 2006. Changing patterns of sexual behaviour in the era of highly active antiretroviral therapy. *Curr. Opin. Infect. Dis* 19, 26–32.

Elford, J., Bolding, G., Davis, M., Sherr, L., Hart, G., 2004a. Trends in sexual behaviour among London homosexual men 1998-2003: implications for HIV prevention and sexual health promotion. *Sex Transm Infect* 80, 451–454.

Elford, J., Bolding, G., Davis, M., Sherr, L., Hart, G., 2004b. Web-based behavioral surveillance among men who have sex with men: a comparison of online and offline samples in London, UK. *J. Acquir. Immune Defic. Syndr* 35, 421–426.

Elford, J., Bolding, G., Maguire, M., Sherr, L., 1999. Sexual risk behaviour among gay men in a relationship. *AIDS* 13, 1407–1411.

Elford, J., Bolding, G., Sherr, L., 2001. Seeking sex on the Internet and sexual risk behaviour among gay men using London gyms. *AIDS* 15, 1409–1415.

Elford, J., Bolding, G., Sherr, L., 2002. High-risk sexual behaviour increases among London gay men between 1998 and 2001: what is the role of HIV optimism? *AIDS* 16, 1537–1544.

Elford, J., Hart, G., 2005. HAART, viral load and sexual risk behaviour. *AIDS* 19, 205–207.

Elford, J., Ibrahim, F., Bukutu, C., Anderson, J., 2007. Sexual behaviour of people living with HIV in London: implications for HIV transmission. *AIDS* 21 Suppl 1, S63–70.

Emerson, C.R., Lynch, A., Fox, R., Smyth, B., Gray, S., Dinsmore, W.W., Maw, R.D., 2007. The syphilis outbreak in Northern Ireland. *Int J STD AIDS* 18, 413–417.

Engelgau, M.M., Woernle, C.H., Rolfs, R.T., Greenspan, J.R., O’Cain, M., Gorsky, R.D., 1995. Control of epidemic early syphilis: the results of an intervention campaign using social networks. *Sex Transm Dis* 22, 203–209.

Estcourt, C., Sutcliffe, L., Cassell, J., Mercer, C.H., Copas, A., James, L., et al. 2012. Can we improve partner notification rates through expedited partner therapy in the UK? Findings from an exploratory trial of accelerated partner therapy (APT). *Sex Transm Infect* 88, 21-26.

Evans, A.R., Wiggins, R.D., Mercer, C.H., Bolding, G.J., Elford, J., 2007. Men who have sex with men in Great Britain: comparison of a self-selected internet sample with a national probability sample. *Sex Transm Infect* 83, 200–205.

Fairley, C.K., Sze, J.K., Vodstrcil, L.A., Chen, M.Y., 2010. Computer-assisted self interviewing in sexual health clinics. *Sex Transm Dis* 37, 665–668.

Fakoya, A., Lamba, H., Mackie, N., Nandwani, R., Brown, A., Bernard, E., et al. 2008. British HIV Association, BASHH and FSRH guidelines for the management of the sexual and reproductive health of people living with HIV infection 2008. *HIV Med.* 9, 681–720.

Fang, C.T., Hsu, H.M., Twu, S.-J., Chen, M.-Y., Chang, Y.-Y., Hwang, J.-S., et al. 2004. Decreased HIV transmission after a policy of providing free access to highly active antiretroviral therapy in Taiwan. *J. Infect. Dis.* 190, 879–885.

Fenton, K.A., Johnson, A.M., McManus, S., Erens, B., 2001. Measuring sexual behaviour: methodological challenges in survey research. *Sex Transm Infect* 77, 84–92.

Fischl, M.A., Richman, D.D., Grieco, M.H., Gottlieb, M.S., Volberding, P.A., Laskin, O.L., et al. 1987. The efficacy of azidothymidine (AZT) in the treatment of patients with AIDS and AIDS-related complex. A double-blind, placebo-controlled trial. *N. Engl. J. Med* 317, 185–191.

Fischl, M.A., Richman, D.D., Hansen, N., Collier, A.C., Carey, J.T., Para, M.F., et al. 1990. The safety and efficacy of zidovudine (AZT) in the treatment of subjects with mildly symptomatic human immunodeficiency virus type 1 (HIV) infection. A double-blind, placebo-controlled trial. The AIDS Clinical Trials Group. *Ann. Intern. Med* 112, 727–737.

Fisher, M., Pao, D., Murphy, G., Dean, G., McElborough, D., Homer, G., Parry, J.V., 2007. Serological testing algorithm shows rising HIV incidence in a UK cohort of men who have sex with men: 10 years application. *AIDS* 21, 2309–2314.

Fleming, D.T., Wasserheit, J.N., 1999. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sex Transm Infect* 75, 3–17.

Flowers, P., 2001. Gay Men and HIV/AIDS Risk Management. *Health* 5, 50–75.

Francis, D.P., Anderson, R.E., Gorman, M.E., Fenstersheib, M., Padian, N.S., Kizer, K.W., Conant, M.A., 1989. Targeting AIDS prevention and treatment toward HIV-1-infected persons. The concept of early intervention. *JAMA* 262, 2572–2576.

Freeman, E.E., Orroth, K.K., White, R.G., Glynn, J.R., Bakker, R., Boily, M.-C., et al. 2007. Proportion of new HIV infections attributable to herpes simplex 2

increases over time: simulations of the changing role of sexually transmitted infections in sub-Saharan African HIV epidemics. *Sex Transm Infect* 83, i17–i24.

Frost, D.M., Stirratt, M.J., Ouellette, S.C., 2008. Understanding why gay men seek HIV-seroconcordant partners: Intimacy and risk reduction motivations. *Culture, Health & Sexuality* 10, 513–518.

Gable, L., Gamharter, K., Gostin, L.O., Hodge, J.G., Puymbroeck, R., 2007. Legal aspects of HIV/AIDS: a guide for Policy and Law reform. The World Bank, Washington, DC.

Gallo, R.C., Salahuddin, S.Z., Popovic, M., Shearer, G.M., Kaplan, M., Haynes B.F. et al. 1984. Frequent Detection and Isolation of Cytopathic Retroviruses (HTLV-III) from Patients with AIDS and at Risk for AIDS. *Science* 224, 500–503.

Garnett, G.P., 2002. The geographical and temporal evolution of sexually transmitted disease epidemics. *Sex Transm Infect* 78 Suppl 1, i14–19.

Garnett, G.P., Hughes, J.P., Anderson, R.M., Stoner, B.P., Aral, S.O., Whittington, W.L., et al. 1996. Sexual mixing patterns of patients attending sexually transmitted diseases clinics. *Sex Transm Dis* 23, 248–257.

Gazzard, B.G., Anderson, J., Babiker, A., Boffito, M., Brook, G., Brough, G., et al. 2008. British HIV Association Guidelines for the treatment of HIV-1-infected adults with antiretroviral therapy 2008. *HIV Med.* 9, 563–608.

Ghys, P.D., Fransen, K., Diallo, M.O., Ettiègne-Traoré, V., Coulibaly, I.M., Yeboué, K.M., et al. 1997. The associations between cervicovaginal HIV shedding, sexually transmitted diseases and immunosuppression in female sex workers in Abidjan, Côte d'Ivoire. *AIDS* 11, F85–93.

- Gift, T.L., Malotte, C.K., Ledsky, R., Hogben, M., Middlestadt, S., VanDevanter, N.L., St Lawrence, J.S., 2005. A cost-effectiveness analysis of interventions to increase repeat testing in patients treated for gonorrhoea or chlamydia at public sexually transmitted disease clinics. *Sex Transm Dis* 32, 542–549.
- Girardi, E., Sabin, C.A., Monforte, A.D., 2007. Late diagnosis of HIV infection: epidemiological features, consequences and strategies to encourage earlier testing. *J. Acquir. Immune Defic. Syndr* 46 Suppl 1, S3–8.
- Giraudon, I., Ruf, M., Maguire, H., Charlett, A., Ncube, F., Turner, J., et al. 2008. Increase in diagnosed newly acquired hepatitis C in HIV-positive men who have sex with men across London and Brighton, 2002–2006: is this an outbreak? *Sex Transm Infect* 84, 111–115.
- Glass, T.R., Young, J., Vernazza, P.L., Rickenbach, M., Weber, R., Cavassini, M., et al. 2004. Is unsafe sexual behaviour increasing among HIV-infected individuals? *AIDS* 18, 1707–1714.
- GMFA, 2012. Sexual Health Messaging Service. [online]. Available from: <http://www.gmfa.org.uk/aboutgmfa/our-work/partner-notification> [Accessed December 2010].
- Golden, M.R., Gift, T.L., Brewer, D.D., Fleming, M., Hogben, M., St. Lawrence, J.S., et al. 2006. Peer referral for HIV case-finding among men who have sex with men. *AIDS* 20, 1961–68.
- Golden, M.R., Whittington, W.L.H., Handsfield, H.H., Hughes, J.P., Stamm, W.E., Hogben, M., et al. 2005. Effect of expedited treatment of sex partners on recurrent or persistent gonorrhoea or chlamydial infection. *N. Engl. J. Med.* 352, 676–685.
- Golin, C.E., Earp, J.A., Grodensky, C.A., Patel, S.N., Suchindran, C., Parikh, M., Kalichman, S., Patterson, K., Swygard, H., Quinlivan, E.B., Amola, K., Chariyeva,

Z., Groves, J., 2012. Longitudinal effects of SafeTalk, a motivational interviewing-based program to improve safer sex practices among people living with HIV/AIDS. *AIDS Behav* 16, 1182–1191.

Gorbach, P.M., Aral, S.O., Celum, C., Stoner, B.P., Whittington, W.L., Galea, J., et al. 2000. To notify or not to notify: STD patients' perspectives of partner notification in Seattle. *Sex Transm Dis* 27, 193–200.

Gorbach, P.M., Drumright, L.N., Daar, E.S., Little, S.J., 2006. Transmission behaviors of recently HIV-infected men who have sex with men. *J. Acquir. Immune Defic. Syndr* 42, 80–85.

Gorbach, P.M., Weiss, R.E., Jeffries, R., Javanbakht, M., Drumright, L.N., Daar, E.S., Little, S.J., 2010. Behaviors of recently HIV-infected men who have sex with men in the year post-diagnosis: effects of drug use and partner types. *J Acquir Immune Defic Syndr* 56, 176-82.

Gostin, L.O., Hodge, J.G., 1998. Piercing the veil of secrecy in HIV/AIDS and other sexually transmitted diseases: theories of privacy and disclosure in partner notification. *Duke J Gend Law Policy* 5, 9–88.

Grant, R.M., Lama, J.R., Anderson, P.L., McMahan, V., Liu, A.Y., Vargas, L., et al. 2010. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N. Engl. J. Med* 363, 2587–2599.

Gray, R.H., Wawer, M.J., Polis, C.B., Kigozi, G., Serwadda, D., 2008. Male circumcision and prevention of HIV and sexually transmitted infections. *Curr Infect Dis Rep* 10, 121–127.

Greub, G., Cozzi-Lepri, A., Ledergerber, B., Staszewski, S., Perrin, L., Miller, V., et al. 2002. Intermittent and sustained low-level HIV viral rebound in patients receiving potent antiretroviral therapy. *AIDS* 16, 1967–1969.

Grierson, J., Misson, S., McDonald, K., Pitts, M., 2006. HIV Futures 5: life as we know it. Australian Research Centre in Sex, Health and Society, La Trobe University, Melbourne, Australia.

Grosskurth, H., Mosha, F., Todd, J., Mwijarubi, E., Klokke, A., Senkoro, K., et al. 1995. Impact of improved treatment of sexually transmitted diseases on HIV infection in rural Tanzania: randomised controlled trial. *Lancet* 346, 530–536.

Gupta, P., Mellors, J., Kingsley, L., Riddler, S., Singh, M.K., Schreiber, S., et al. 1997. High viral load in semen of human immunodeficiency virus type 1-infected men at all stages of disease and its reduction by therapy with protease and nonnucleoside reverse transcriptase inhibitors. *J. Virol* 71, 6271–6275.

Guzman, R., Buchbinder, S., Mansergh, G., Vittinghoff, E., Marks, G., Wheeler, S., Colfax, G.N., 2006. Communication of HIV viral load to guide sexual risk decisions with serodiscordant partners among San Francisco men who have sex with men. *AIDS Care* 18, 983–989.

Halkitis, P.N., Parsons, J.T., 2003. Intentional unsafe sex (barebacking) among HIV-positive gay men who seek sexual partners on the internet. *AIDS Care* 15, 367–378.

Hammer, S.M., Katzenstein, D.A., Hughes, M.D., Gundacker, H., Schooley, R.T., Haubrich, R.H., et al. 1996. A trial comparing nucleoside monotherapy with combination therapy in HIV-infected adults with CD4 cell counts from 200 to 500 per cubic millimeter. AIDS Clinical Trials Group Study 175 Study Team. *N. Engl. J. Med.* 335, 1081–1090.

Hammer, S.M., Squires, K.E., Hughes, M.D., Grimes, J.M., Demeter, L.M., Currier, J.S., et al. 1997. A controlled trial of two nucleoside analogues plus indinavir in persons with human immunodeficiency virus infection and CD4 cell



counts of 200 per cubic millimeter or less. AIDS Clinical Trials Group 320 Study Team. *N. Engl. J. Med.* 337, 725–733.

Harte, D., Mercey, D., Jarman, J., Benn, P., 2011. Is the recall of men who have sex with men (MSM) diagnosed as having bacterial sexually transmitted infections (STIs) for re-screening a feasible and effective strategy? *Sex Transm Infect* 87, 577–582.

Hasse, B., Ledergerber, B., Hirschel, B., Vernazza, P., Glass, T.R., Jeannin, A., et al. 2010. Frequency and Determinants of Unprotected Sex among HIV-Infected Persons: The Swiss HIV Cohort Study. *Clinical Infectious Diseases* 51, 1314 – 1322.

Havlir, D.V., Bassett, R., Levitan, D., Gilbert, P., Tebas, P., Collier, A.C., et al. 2001. Prevalence and predictive value of intermittent viremia with combination HIV therapy. *JAMA* 286, 171–179.

Hayes, R., Mosha, F., Nicoll, A., Grosskurth, H., Newell, J., Todd, J., et al. 1995. A community trial of the impact of improved sexually transmitted disease treatment on the HIV epidemic in rural Tanzania: 1. Design. *AIDS* 9, 919–926.

Health and Social Care Act, 2012. HMSO London. [online]. Available from: <http://www.legislation.gov.uk/ukpga/2012/7/contents/enacted> [Accessed May 2012].

Health Protection Agency, 2008a. Sexually transmitted infections and men who have sex with men in the UK: 2008 report. Health Protection Agency, Colindale, London.

Health Protection Agency, 2008b. HIV in the United Kingdom: 2008 report. Health Protection Agency, Colindale, London.

Health Protection Agency, 2010. Survey of prevalent HIV infections diagnosed (SOPHID): men who have sex with men data tables. [online]. Available from: [http://www.hpa.org.uk/webc/HPAwebFile/HPAweb\\_C/1221482345551](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1221482345551) [Accessed December 2010].

Health Protection Agency, 2011a. HIV in the United Kingdom: 2011 Report. London: Health Protection Services, Colindale.

Health Protection Agency, 2011b. Sexually transmitted infections in men who have sex with men in the UK: 2011 report. Health Protection Services, Colindale, London.

Hethcote, H.W., Yorke, J.A., 1984. Gonorrhea transmission dynamics and control. Springer-Verlag, Berlin and New York.

Hogben, M., Kachur, R., 2008. Internet partner notification: another arrow in the quiver. *Sex Transm Dis* 35, 117–118.

Hogben, M., St Lawrence, J.S., Montaña, D.E., Kasprzyk, D., Leichter, J.S., Phillips, W.R., 2004. Physicians' opinions about partner notification methods: case reporting, patient referral, and provider referral. *Sex Transm Infect* 80, 30–34.

Horvath, K.J., Smolenski, D., Iantaffi, A., Grey, J.A., Rosser, B.R.S., 2012. Discussions of viral load in negotiating sexual episodes with primary and casual partners among men who have sex with men. *AIDS Care* 24, 1052–1055.

Hosseinipour, M., Cohen, M.S., Vernazza, P.L., Kashuba, A.D.M., 2002. Can antiretroviral therapy be used to prevent sexual transmission of human immunodeficiency virus type 1? *Clin. Infect. Dis.* 34, 1391–1395.

House of Lords: Select Committee on HIV and AIDS in the United Kingdom, 2011. No vaccine, no cure: HIV and AIDS in the United Kingdom. London.

<http://www.niaid.nih.gov/topics/HIVAIDS/Understanding/Biology/Pages/hivRepliationCycle.aspx> [Accessed May 2010]

Hymes, K.B., Cheung, T., Greene, J.B., Prose, N.S., Marcus, A., Ballard, H., William, D.C., Laubenstein, L.J., 1981. Kaposi's sarcoma in homosexual men—a report of eight cases. *Lancet* 2, 598–600.

International Alliance for HIV/AIDS, 2003. Positive prevention: prevention strategies for people with HIV/AIDS. London.

Jacquez, J.A., Koopman, J.S., Simon, C.P., Longini, I.M., 1994. Role of the primary infection in epidemics of HIV infection in gay cohorts. *J. Acquir. Immune Defic. Syndr* 7, 1169–1184.

Janssen, R.S., Holtgrave, D.R., Valdiserri, R.O., Shepherd, M., Gayle, H.D., De Cock, K.M., 2001. The Serostatus Approach to Fighting the HIV Epidemic: prevention strategies for infected individuals. *Am J Public Health* 91, 1019–1024.

Jebbari, H., Simms, I., Conti, S., Marongiu, A., Hughes, G., Ward, H., et al. 2011. Variations in the epidemiology of primary, secondary and early latent syphilis, England and Wales: 1999 to 2008. *Sex Transm Infecti* 87, 191-198.

Jin, F., Crawford, J., Prestage, G.P., Zablotska, I., Imrie, J., Kippax, S.C., et al. 2009. Unprotected anal intercourse, risk reduction behaviours, and subsequent HIV infection in a cohort of homosexual men. *AIDS* 23, 243–252.

Jin, F., Jansson, J., Law, M., Prestage, G.P., Zablotska, I., Imrie, J.C.G., et al. 2010. Per-contact probability of HIV transmission in homosexual men in Sydney in the era of HAART. *AIDS* 24, 907–913.

Jin, F., Prestage, G.P., Ellard, J., Kippax, S.C., Kaldor, J.M., Grulich, A.E., 2007. How homosexual men believe they became infected with HIV: the role of risk-reduction behaviors. *J. Acquir. Immune Defic. Syndr* 46, 245–247.

Jin, F., Prestage, G.P., Imrie, J., Kippax, S.C., Donovan, B., Templeton, D.J., et al. 2010. Anal sexually transmitted infections and risk of HIV infection in homosexual men. *J. Acquir. Immune Defic. Syndr* 53, 144–149.

Johnson, A.M., Mercer, C.H., Erens, B., Copas, A.J., McManus, S., Wellings, K., et al. 2001. Sexual behaviour in Britain: partnerships, practices, and HIV risk behaviours. *The Lancet* 358, 1835–1842.

Jordan, W.C., Tolbert, L., Smith, R., 1998. Partner notification and focused intervention as a means of identifying HIV-positive patients. *J Natl Med Assoc* 90, 542–546.

Kalichman, S.C., Pellowski, J., Turner, C., 2011. Prevalence of sexually transmitted co-infections in people living with HIV/AIDS: systematic review with implications for using HIV treatments for prevention. *Sexually Transmitted Infections* 87, 183 –190.

Kalichman, S.C., Rompa, D., Cage, M., 2000. Reliability and validity of self-reported CD4 lymphocyte count and viral load test results in people living with HIV/AIDS. *Int J STD AIDS* 11, 579–585.

Kennedy, C.E., Medley, A.M., Sweat, M.D., O'Reilly, K.R., 2010. Behavioural interventions for HIV positive prevention in developing countries: a systematic review and meta-analysis. *Bull World Health Organ* 88, 615–623.

Kerani, R.P., Fleming, M., Deyoung, B., Golden, M.R., 2011. A Randomized, Controlled Trial of inSPOT and Patient-Delivered Partner Therapy for Gonorrhea

and Chlamydial Infection Among Men Who Have Sex With Men. *Sex Transm Dis* 38, 941–946.

King-Spooner, S., 1999. HIV prevention and the positive population. *Int J STD AIDS* 10, 141–150.

Kissinger, P., Mohammed, H., Richardson-Alston, G., Leichliter, J.S., Taylor, S.N., Martin, D.H., Farley, T.A., 2005. Patient-delivered partner treatment for male urethritis: a randomized, controlled trial. *Clin. Infect. Dis.* 41, 623–629.

Klausner, J.D., Wolf, W., Fischer-Ponce, L., Zolt, I., Katz, M.H., 2000. Tracing a syphilis outbreak through cyberspace. *JAMA* 284, 447–449.

Klitzman, R.L., Kirshenbaum, S.B., Dodge, B., Remien, R.H., Ehrhardt, A.A., Johnson, M.O., et al. 2004. Intricacies and inter-relationships between HIV disclosure and HAART: a qualitative study. *AIDS Care* 16, 628–640.

Lampinen, T.M., Latulippe, L., van Niekerk, D., Schilder, A.J., Miller, M.L., Anema, A., Hogg, R.S., 2006. Illustrated instructions for self-collection of anorectal swab specimens and their adequacy for cytological examination. *Sex Transm Dis* 33, 386–388.

Lattimore, S., Thornton, A., Delpech, V., Elford, J., 2011. Changing patterns of sexual risk behavior among London gay men: 1998-2008. *Sex Transm Dis* 38, 221–229.

Levine, D., Woodruff, A.J., Mocello, A.R., Lebrija, J., Klausner, J.D., 2008. inSPOT: the first online STD partner notification system using electronic postcards. *PLoS Med* 5, e213.

Levine, D.K., Scott, K.C., Klausner, J.D., 2005. Online syphilis testing--confidential and convenient. *Sex Transm Dis* 32, 139–141.

Lichtenstein, B., 2003. Stigma as a barrier to treatment of sexually transmitted infection in the American deep south: issues of race, gender and poverty. *Soc Sci Med* 57, 2435–2445.

Lichtenstein, B., Schwebke, J.R., 2005. Partner notification methods for African American men being treated for trichomoniasis: a consideration of main men, Second Hitters, and Third Players. *Med Anthropol Q* 19, 383–401.

LikataVICIUS, G., Klavs, I., Devaux, I., Alix, J., Nardone, A., 2008. An increase in newly diagnosed HIV cases reported among men who have sex with men in Europe, 2000-6: implications for a European public health strategy. *Sex Transm Infect* 84, 499–505.

Lim, M.S.C., Hocking, J.S., Hellard, M.E., Aitken, C.K., 2008. SMS STI: a review of the uses of mobile phone text messaging in sexual health. *Int J STD AIDS* 19, 287–290.

Low, N., Spencer, B., Andersen, B., Hawkes, S., Herrmann, B., et al., 2012. Evaluation of the public health benefits of partner notification. European Center for Disease Prevention and Control.

Low, N., Welch, J., Radcliffe, K., 2004. Developing national outcome standards for the management of gonorrhoea and genital chlamydia in genitourinary medicine clinics. *Sex Transm Infect* 80, 223–229.

Macke, B.A., Maher, J.E., 1999. Partner notification in the United States: an evidence-based review. *Am J Prev Med* 17, 230–242.

Marks, G., Crepaz, N., 2001. HIV-positive men's sexual practices in the context of self-disclosure of HIV status. *J. Acquir. Immune Defic. Syndr.* 27, 79–85.

- Marmor, M., Friedman-Kien, A., Laubenstein, L.J., Byrum, R., William, D.C., D'Onofrio, S., et al., 1982. Risk factors for Kaposi's sarcoma in homosexual men. *Lancet* 1, 1083–87.
- Martin, J., 2006. Transcendence among gay men: implications for HIV prevention. *Sexualities* 9, 214–235.
- Mascolini, M., 1996. An FDA-ok'd viral load test? The wait may be nearly over. Food and Drug Administration. *J Int Assoc Physicians AIDS Care* 2, 6–9.
- Mastro, T.D., de Vincenzi, I., 1996. Probabilities of sexual HIV-1 transmission. *AIDS* 10 Suppl A, S75–82.
- Mathews, C., Coetzee, N., Zwarenstein, M., Lombard, C., Guttmacher, S., Oxman, A., Schmid, G., 2002. A systematic review of strategies for partner notification for sexually transmitted diseases, including HIV/AIDS. *Int J STD AIDS* 13, 285–300.
- May, M., Gompels, M., Delpech, V., Porter, K., Post, F., Johnson, M., et al. 2011. Impact of late diagnosis and treatment on life expectancy in people with HIV-1: UK Collaborative HIV Cohort (UK CHIC) Study. *BMJ* 343.
- May, R.M., Anderson, R.M., 1987. Transmission dynamics of HIV infection. *Nature* 326, 137–142.
- Mayer, K.H., O'Cleirigh, C., Skeer, M., Covahey, C., Leidolf, E., Vanderwarker, R., Safren, S.A., 2010. Which HIV-infected men who have sex with men in care are engaging in risky sex and acquiring sexually transmitted infections: findings from a Boston community health centre. *Sexually Transmitted Infections* 86, 66–70.

McClean, H., Radcliffe, K.W., Sullivan, A.K., Ahmed-Jushuf, I.H., 2012. BASHH Statement on partner notification for sexually transmitted infections. British Association of Sexual Health and HIV.

McCune, J.M., 2001. The dynamics of CD4+ T-cell depletion in HIV disease. *Nature* 410, 974–979.

Mellors, J.W., Muñoz, A., Giorgi, J.V., Margolick, J.B., Tassoni, C.J., Gupta, P., et al. 1997. Plasma viral load and CD4+ lymphocytes as prognostic markers of HIV-1 infection. *Ann. Intern. Med.* 126, 946–954.

Mellors, J.W., Rinaldo, C.R., Gupta, P., White, R.M., Todd, J.A., Kingsley, L.A., 1996. Prognosis in HIV-1 infection predicted by the quantity of virus in plasma. *Science* 272, 1167–1170.

Menza, T.W., De Lore, J.S., Fleming, M., Golden, M.R., 2008. Partner notification for gonococcal and chlamydial infections in men who have sex with men: success is underestimated by traditional disposition codes. *Sex Transm Dis* 35, 84–90.

Mercer, C.H., Aicken, C.R.H., Brook, M.G., Estcourt, C.S., Cassell, J.A., 2011. Estimating the likely public health impact of partner notification for a clinical service: an evidence-based algorithm. *Am J Public Health* 101, 2117–2123.

Mercer, C.H., Fenton, K.A., Copas, A.J., Wellings, K., Erens, B., McManus, S., et al. 2004. Increasing prevalence of male homosexual partnerships and practices in Britain 1990-2000: evidence from national probability surveys. *AIDS* 18, 1453–1458.

Merson, M., Padian, N., Coates, T.J., Gupta, G.R., Bertozzi, S.M., Piot, P., et al. Lancet HIV Prevention Series Authors, 2008. Combination HIV prevention. *Lancet* 372, 1805–1806.



- Mimiaga, M.J., Fair, A.D., Tetu, A.M., Novak, D.S., Vanderwarker, R., Bertrand, T., et al. 2008. Acceptability of an internet-based partner notification system for sexually transmitted infection exposure among men who have sex with men. *Am J Public Health* 98, 1009–1011.
- Mocroft, A., Phillips, A.N., Gatell, J., Ledergerber, B., Fisher, M., Clumeck, N., et al. 2007. Normalisation of CD4 counts in patients with HIV-1 infection and maximum virological suppression who are taking combination antiretroviral therapy: an observational cohort study. *Lancet* 370, 407–413.
- Mocroft, A., Vella, S., Benfield, T.L., Chiesi, A., Miller, V., Gargalianos, P., et al. 1998. Changing patterns of mortality across Europe in patients infected with HIV-1. EuroSIDA Study Group. *Lancet* 352, 1725–1730.
- Mofenson, L.M., McIntyre, J.A., 2000. Advances and research directions in the prevention of mother-to-child HIV-1 transmission. *Lancet* 355, 2237–2244.
- Montaner, J.S.G., Hogg, R., Wood, E., Kerr, T., Tyndall, M., Levy, A.R., Harrigan, P.R., 2006. The case for expanding access to highly active antiretroviral therapy to curb the growth of the HIV epidemic. *Lancet* 368, 531–536.
- Morin, S.F., Shade, S.B., Steward, W.T., Carrico, A.W., Remien, R.H., Rotheram-Borus, M.J., Kelly, J.A., Charlebois, E.D., Johnson, M.O., Chesney, M.A., Healthy Living Project Team, 2008. A behavioral intervention reduces HIV transmission risk by promoting sustained serosorting practices among HIV-infected men who have sex with men. *J. Acquir. Immune Defic. Syndr.* 49, 544–551.
- Mortimer, P., Loveday, C., 2001. The virus and the tests, in: Adler, M.W. (Ed.), *ABC of AIDS*. BMJ Books, London.
- Nack, A., 2000. Damaged goods: women managing the stigma of STDs. *Deviant Behavior* 21, 95.

National Centre in HIV Epidemiology and Clinical Research, 2004. HIV/AIDS, viral hepatitis and sexually transmitted infections in Australia. (Annual surveillance report 2004). National Centre in HIV Epidemiology and Clinical Research, The University of New South Wales, Sydney, NSW; Australian Institute of Health and Welfare, Canberra.

National Health Service Reform and Health Care Professions Act, 2002. HMSO, London.

National Institute for Health and Clinical Excellence, 2005. Guideline Development Methods: Information for National Collaborating Centres and Guideline Developers. National Institute for Health and Clinical Excellence, London.

National Institute for Health and Clinical Excellence, 2007. One to one interventions to reduce the transmission of sexually transmitted infections (STIs) including HIV, and to reduce the rate of under 10 conceptions, especially among vulnerable and at risk groups. National Institute for Health and Clinical Excellence, London.

National Institute of Allergy and Infectious Diseases, 2012. HIV Replication Cycle. [online]. Available from:

(<http://www.niaid.nih.gov/topics/HIVAIDS/Understanding/Biology/pages/hivrepliationcycle.aspx>)

Noblit, G., Hare, R., 1988. Meta-Ethnography: synthesizing qualitative studies. Sage Publications Ltd, California.

Offences against the Persons Act, 1861. HMSO, London.

Ogilvie, G., Knowles, L., Wong, E., Taylor, D., Tigchelaar, J., Brunt, C., et al. 2005. Incorporating a social networking approach to enhance contact tracing in a heterosexual outbreak of syphilis. *Sex Transm Infect* 81, 124–127.

Østergaard, L., Andersen, B., Møller, J.K., Olesen, F., Worm, A.-M., 2003. Managing partners of people diagnosed with *Chlamydia trachomatis*: a comparison of two partner testing methods. *Sex Transm Infect* 79, 358–361.

Owen, G, 2008. An ‘elephant in the room’? Stigma and hepatitis C transmission among HIV-positive ‘serosorting gay men. *Culture Health and Sexuality* 10, 601-610.

Padian, N.S., Buvé, A., Balkus, J., Serwadda, D., Cates, W., 2008. Biomedical interventions to prevent HIV infection: evidence, challenges, and way forward. *Lancet* 372, 585–599.

Padian, N.S., McCoy, S.I., Balkus, J.E., Wasserheit, J.N., 2010. Weighing the gold in the gold standard: challenges in HIV prevention research. *AIDS* 24, 621–635.

Pao, D., Fisher, M., Hué, S., Dean, G., Murphy, G., Cane, P.A., et al. 2005. Transmission of HIV-1 during primary infection: relationship to sexual risk and sexually transmitted infections. *AIDS* 19, 85–90.

Papp, J.R., Ahrens, K., Phillips, C., Kent, C. k, Philip, S., Klausner, J.D., 2007. The use and performance of oral-throat rinses to detect pharyngeal *Neisseria gonorrhoeae* and *Chlamydia trachomatis* infections. *Diagn. Microbiol. Infect. Dis* 59, 259–264.

Parran, T., 1937. *Shadow on the land: Syphilis*. American Social Hygiene Association.

- Parsons, J.T., Schrimshaw, E.W., Wolitski, R.J., Halkitis, P.N., Purcell, D.W., Hoff, C.C., Gómez, C.A., 2005. Sexual harm reduction practices of HIV-seropositive gay and bisexual men: serosorting, strategic positioning, and withdrawal before ejaculation. *AIDS* 19 Suppl 1, S13–25.
- Passin, W.F., Kim, A.S., Hutchinson, A.B., Crepaz, N., Herbst, J.H., Lyles, C.M., 2006. A systematic review of HIV partner counseling and referral services: client and provider attitudes, preferences, practices, and experiences. *Sex Transm Dis* 33, 320–328.
- Patel, P., Bush, T., Mayer, K., Milam, J., Richardson, J., Hammer, J., et al. 2012. Routine Brief Risk-Reduction Counseling With Biannual STD Testing Reduces STD Incidence Among HIV-Infected Men Who Have Sex With Men in Care. *Sex Transm Dis* 39, 470–474.
- Pilcher, C.D., Joaki, G., Hoffman, I.F., Martinson, F.E.A., Mapanje, C., Stewart, P.W., et al. 2007. Amplified transmission of HIV-1: comparison of HIV-1 concentrations in semen and blood during acute and chronic infection. *AIDS* 21, 1723–1730.
- Porco, T.C., Martin, J.N., Page-Shafer, K.A., Cheng, A., Charlebois, E., Grant, R.M., Osmond, D.H., 2004. Decline in HIV infectivity following the introduction of highly active antiretroviral therapy. *AIDS* 18, 81–88.
- Potterat, J.J., Rothenberg, R.B., Muth, S.Q., 1999. Network structural dynamics and infectious disease propagation. *Int J STD AIDS* 10, 182–185.
- Poudel, K.C., Poudel-Tandukar, K., Yasuoka, J., Jimba, M., 2007. HIV superinfection: another reason to avoid serosorting practice. *Lancet* 370, 23.

Pound, P., Britten, N., Morgan, M., Yardley, L., Pope, C., Daker-White, G., Campbell, R., 2005. Resisting medicines: a synthesis of qualitative studies of medicine taking. *Social Science & Medicine* 61, 133–155.

Presanis, A.M., De Angelis, D., Goubar, A., Gill, O.N., Ades, A.E., 2011. Bayesian evidence synthesis for a transmission dynamic model for HIV among men who have sex with men. *Biostatistics* 12, 666–681.

Quinn, T.C., Wawer, M.J., Sewankambo, N., Serwadda, D., Li, C., Wabwire-Mangen, et al. 2000. Viral load and heterosexual transmission of human immunodeficiency virus type 1. Rakai Project Study Group. *N. Engl. J. Med* 342, 921–929.

Rajasingham, R., Mimiga, M.J., White, J.M., Pinkston, M.M., Baden, R.P., Mitty, J.A., 2012. A systematic review of behavioral and treatment outcome studies among HIV-infected men who have sex with men who abuse crystal methamphetamine. *AIDS Patient Care and STDs* 26, 36–52.

Rawstorne, P., Prestage, G., Grierson, J., Song, A., Grulich, A., Kippax, S., 2005. Trends and predictors of HIV-positive community attachment among PLWHA. *AIDS Care* 17, 589–600.

Richardson, J.L., Milam, J., McCutchan, A., Stoyanoff, S., Bolan, R., Weiss, J., et al. 2004. Effect of brief safer-sex counseling by medical providers to HIV-1 seropositive patients: a multi-clinic assessment. *AIDS* 18, 1179–1186.

Richens, J., Copas, A., Sadiq, S.T., Kingori, P., McCarthy, O., Jones, V., et al. 2010. A randomised controlled trial of computer-assisted interviewing in sexual health clinics. *Sex Transm Infect* 86, 310–314.

- Rietmeijer, C.A., Westergaard, B., Mickiewicz, T.A., Richardson, D., Ling, S., Sapp, T., et al. 2011. Evaluation of an online partner notification program. *Sex Transm Dis* 38, 359–364.
- Ritchie, J., Lewis, J. (Eds.), 2006. *Qualitative research practice: a guide for social science students and researchers*. Sage Publications, London.
- Rodger, A.J., Curtis, H., Sabin, C., Johnson, M., 2010. Assessment of hospitalizations among HIV patients in the UK: a national cross-sectional survey. *Int Journal of STD & AIDS* 21, 752–754.
- Rogstad, K.E., Clementson, C., Ahmed-Jushuf, I.H., 1999. Contact tracing for gonorrhoea in homosexual and heterosexual men. *Int J STD AIDS* 10, 536–538.
- Rosenthal, S., Baker, J., Biro, F., Stanberry, L., 1995. Secondary prevention of STD transmission during adolescence: Partner notification. *Adolescent & Pediatric Gynecology* 8, 183–7.
- Rothenberg, R., Kimbrough, L., Lewis-Hardy, R., Heath, B., Williams, O.C., Tambe, P., et al. 2000. Social network methods for endemic foci of syphilis: a pilot project. *Sex Transm Dis* 27, 12–18.
- Sabin, C.A., Devereux, H., Phillips, A.N., Hill, A., Janossy, G., Lee, C.A., Loveday, C., 2000. Course of viral load throughout HIV-1 infection. *J. Acquir. Immune Defic. Syndr* 23, 172–177.
- Sadiq, S.T., McSorley, J., Copas, A.J., Bennett, J., Edwards, S.J., Kaye, S. et al. 2005. The effects of early syphilis on CD4 counts and HIV-1 RNA viral loads in blood and semen. *Sex Transm Infect* 81, 380–385.

Sadiq, S.T., Taylor, S., Copas, A.J., Bennett, J., Kaye, S., Drake, S.M., et al. 2005. The effects of urethritis on seminal plasma HIV-1 RNA loads in homosexual men not receiving antiretroviral therapy. *Sex Transm Infect* 81, 120–123.

Safren, S.A., O’Cleirigh, C., Skeer, M.R., Driskell, J., Goshe, B.M., Covahey, C., Mayer, K.H., 2011. Demonstration and evaluation of a peer-delivered, individually-tailored, HIV prevention intervention for HIV-infected MSM in their primary care setting. *AIDS Behav* 15, 949–958.

Scambler, G., 2004. Re-framing stigma: felt and enacted stigma and challenges to the sociology of chronic and disabling conditions. *Social Theory and Health* 2, 29–46.

Seng, R., Rolland, M., Beck-Wirth, G., Souala, F., Deveau, C., Delfraissy, J.-F., et al. 2011. Trends in unsafe sex and influence of viral load among patients followed since primary HIV infection, 2000–2009. *AIDS* 25, 977–988.

Serovich, J., Reed, S., Grafsky, E., Andrist, D., 2009. An intervention to assist men who have sex with men disclose their serostatus to casual sex partners: results from a pilot study. *AIDS Education and Prevention* 21, 207–209.

Shivasankar, S., Challenor, R., Ekanayaka, R., 2008. Patient-delivered partner therapy in the UK: what do patients think? *Int J STD AIDS* 19, 433–436.

Singh, S., Bell, G., Talbot, M., 2007. The characterisation of a recent syphilis outbreak in Sheffield, UK, and an evaluation of contact tracing as a method of control. *Sex Transm Infect* 83, 193–199.

Snowden, J.M., Raymond, H.F., McFarland, W., 2009. Prevalence of seroadaptive behaviours of men who have sex with men, San Francisco, 2004. *Sex Transm Infect* 85, 469–476.

- Society of Sexual Health Advisers, 2004. *The Manual for Sexual Health Advisers*.
- Stekler, J., Collier, A.C., 2004. Primary HIV Infection. *Curr HIV/AIDS Rep* 1, 68–73.
- Stephenson, J.M., Imrie, J., Davis, M.M.D., Mercer, C., Black, S., Copas, A.J., et al. 2003. Is use of antiretroviral therapy among homosexual men associated with increased risk of transmission of HIV infection? *Sex Transm Infect* 79, 7–10.
- Steward, W.T., Herek, G.M., Ramakrishna, J., Bharat, S., Chandy, S., Wrubel, J., Ekstrand, M.L., 2008. HIV-related stigma: Adapting a theoretical framework for use in India. *Social Science & Medicine* 67, 1225–1235.
- Stolte, I., Dukers, N.H.T.M., Geskus, R., Coutinho, R.A., De Wit, J., 2004. Homosexual men change to risky sex when perceiving less threat of HIV/AIDS since availability of highly active antiretroviral therapy: a longitudinal study. *AIDS* 18, 303–309.
- Sullivan, A.K., Curtis, H., Sabin, C.A., Johnson, M.A., 2005. Newly diagnosed HIV infections: review in UK and Ireland. *BMJ* 330, 1301–1302.
- Sullivan, P.S., Salazar, L., Buchbinder, S., Sanchez, T.H., 2009. Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities. *AIDS* 23, 1153–1162.
- Sutcliffe, L., Brook, M.G., Chapman, J.L., Cassell, J.M., Estcourt, C.S., 2009. Is accelerated partner therapy a feasible and acceptable strategy for rapid partner notification in the UK?: a qualitative study of genitourinary medicine clinic attenders. *Int J STD AIDS* 20, 603–606.
- Suzan-Monti, M., Préau, M., Blanche, J., Cabut, S., Carrieri, P.M., Lert, F., Obadia, Y., Spire, B., 2011. The burden of HIV experience and care among MSM having



an HIV-positive seroconcordant steady partner: a possible research hypothesis. Results from the French VESPA ANRS EN-12 study. *Sex Transm Infect* 87, 396–398.

Tomnay, J.E., Pitts, M.K., Fairley, C.K., 2005. New technology and partner notification--why aren't we using them? *Int J STD AIDS* 16, 19–22.

Trelle, S., Shang, A., Nartey, L., Cassell, J.A., Low, N., 2007. Improved effectiveness of partner notification for patients with sexually transmitted infections: systematic review. *BMJ* 334, 354.

Turner, J.M., Rider, A.T., Imrie, J., Copas, A.J., Edwards, S.G., Dodds, J.P., Stephenson, J.M., 2006. Behavioural predictors of subsequent hepatitis C diagnosis in a UK clinic sample of HIV positive men who have sex with men. *Sex Transm Infect* 82, 298–300.

Tydén, T., Ramstedt, K., 2000. A survey of patients with Chlamydia trachomatis infection: sexual behaviour and perceptions about contact tracing. *Int J STD AIDS* 11, 92–95.

U.S. Department of Health and Human Services, Panel on Antiretroviral Guidelines for Adults and Adolescents, 2012. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. Department of Health and Human Services. [online]. Available from: <http://aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf>. [Accessed in November 2012].

UNAIDS, 2010. Global report: UNAIDS report on the global AIDS epidemic 2010.

UNAIDS/WHO, 2000. Opening up the HIV/AIDS epidemic: Guidance on encouraging beneficial disclosure, ethical partner counselling and appropriate use

of HIV case-reporting, UNAIDS Best Practice Collection, Key Material. UNAIDS/WHO, Geneva.

van de Laar, T.J., Matthews, G.V., Prins, M., Danta, M., 2010. Acute hepatitis C in HIV-infected men who have sex with men: an emerging sexually transmitted infection. *AIDS* 24, 1799–1812.

Van de Ven, P., Mao, L., Fogarty, A., Rawstorne, P., Crawford, J., Prestage, G., et al. 2005. Undetectable viral load is associated with sexual risk taking in HIV serodiscordant gay couples in Sydney. *AIDS* 19, 179–184.

Van de Ven, P., Rawstorne, P., Nakamura, T., Crawford, J., Kippax, S., 2002. HIV treatments optimism is associated with unprotected anal intercourse with regular and with casual partners among Australian gay and homosexually active men. *Int J STD AIDS* 13, 181–183.

van Duynhoven, Y.T., Schop, W.A., van der Meijden, W.I., van de Laar, M.J., 1998. Patient referral outcome in gonorrhoea and chlamydial infections. *Sex Transm Infect* 74, 323–330.

Vandenbrouaene, M., 2007. King Kennard Holmes-Chair of the department of global health of the University of Washington. *Lancet Infectious Diseases* 7, 516–20.

Velasco-Hernandez, J.X., Gershengorn, H.B., Blower, S.M., 2002. Could widespread use of combination antiretroviral therapy eradicate HIV epidemics? *Lancet Infect Dis* 2, 487–493.

Vernazza, P., Hirschel, B., Bernasconi, E., Flepp, M., 2008. Les personnes séropositives ne souffrant d'aucune autre MST et suivant un traitement antirétroviral efficace ne transmettent pas le VIH par voie sexuelle. *Bulletin des médecins suisses* 89, 165–169.

Vernazza, P.L., Eron, J.J., Fiscus, S.A., Cohen, M.S., 1999. Sexual transmission of HIV: infectiousness and prevention. *AIDS* 13, 155–166.

Vernazza, P.L., Gilliam, B.L., Flepp, M., Dyer, J.R., Frank, A.C., Fiscus, S.A., et al. 1997. Effect of antiviral treatment on the shedding of HIV-1 in semen. *AIDS* 11, 1249–1254.

Vittinghoff, E., Douglas, J., Judson, F., McKirnan, D., MacQueen, K., Buchbinder, S.P., 1999. Per-contact risk of human immunodeficiency virus transmission between male sexual partners. *Am. J. Epidemiol.* 150, 306–311.

Vodstrcil, L.A., Hocking, J.S., Cummings, R., Chen, M.Y., Bradshaw, C.S., Read, T.R.H., et al. 2011. Computer assisted self interviewing in a sexual health clinic as part of routine clinical care; impact on service and patient and clinician views. *PLoS ONE* 6, e18456.

Volberding, P.A., Lagakos, S.W., Koch, M.A., Pettinelli, C., Myers, M.W., Booth, D.K., et al. 1990. Zidovudine in asymptomatic human immunodeficiency virus infection. A controlled trial in persons with fewer than 500 CD4-positive cells per cubic millimeter. The AIDS Clinical Trials Group of the National Institute of Allergy and Infectious Diseases. *N. Engl. J. Med* 322, 941–949.

Walker, K., Seaman, S.R., De Angelis, D., Presanis, A.M., Dodds, J.P., Johnson, A.M., et al. 2011. A synthesis of convenience survey and other data to estimate undiagnosed HIV infection among men who have sex with men in England and Wales. *Int J Epidemiol* 40, 1358–1366.

Ward, H., Rönn, M., 2010. Contribution of sexually transmitted infections to the sexual transmission of HIV. *Curr Opin HIV AIDS* 5, 305–310.

Wasserheit, J.N., Aral, S.O., 1996. The dynamic topology of sexually transmitted disease epidemics: implications for prevention strategies. *J. Infect. Dis* 174 Suppl 2, S201–213.

Wawer, M.J., Gray, R.H., Sewankambo, N.K., Serwadda, D., Li, X., Laeyendecker, O., et al. 2005. Rates of HIV-1 transmission per coital act, by stage of HIV-1 infection, in Rakai, Uganda. *J. Infect. Dis.* 191, 1403–1409.

Wayal, S., Fuller, S., Copas, A., Hart, G., Nardone, A., Johnson, A., Mercey, D., 2008. *Gay Men's Sexual Health Survey*, London. University College London and Health Protection Agency, London.

Wayal, S., Llewellyn, C., Smith, H., Fisher, M., 2011. Home sampling kits for sexually transmitted infections: preferences and concerns of men who have sex with men. *Culture, Health & Sexuality* 13, 343–353.

Wayal, S., Llewellyn, C., Smith, H., Hankins, M., Phillips, A., Richardson, D., Fisher, M., 2009. Self-sampling for oropharyngeal and rectal specimens to screen for sexually transmitted infections: acceptability among men who have sex with men. *Sex Transm Infect* 85, 60–4.

Weatherburn, P., Hickson, F., Reid, D., Jessup, K., Hammond, G., 2008. Multiple chances: findings from the United Kingdom Gay Men's Sex Survey 2006. *Sigma Research*, London.

White, R.G., Moodley, P., McGrath, N., Hosegood, V., Zaba, B., Herbst, K., et al. 2008. Low effectiveness of syndromic treatment services for curable sexually transmitted infections in rural South Africa. *Sex Transm Infect* 84, 528–534.

Williams, I., Churchill, D., Anderson, J., Boffito, M., Bower, M., et al., 2012. *BHIVA guidelines for the treatment of HIV-1 positive adults with antiretroviral treatment*.

Williamson, L.M., Dodds, J.P., Mercey, D.E., Hart, G.J., Johnson, A.M., 2008. Sexual risk behaviour and knowledge of HIV status among community samples of gay men in the UK. *AIDS* 22, 1063–1070.

Williamson, L.M., Hart, G.J., 2007. HIV prevalence and undiagnosed infection among a community sample of gay men in Scotland. *J. Acquir. Immune Defic. Syndr* 45, 224–230.

Willis, G., 2005. *Cognitive interviewing: a tool for improving questionnaire design*. Sage Publications, London.

Wilson, D.P., Law, M.G., Grulich, A.E., Cooper, D.A., Kaldor, J.M., 2008. Relation between HIV viral load and infectiousness: a model-based analysis. *Lancet* 372, 314–320.

Wolitski, R.J., Bailey, C.J., O’Leary, A., Gómez, C.A., Parsons, J.T., 2003. Self-perceived responsibility of HIV-seropositive men who have sex with men for preventing HIV transmission. *AIDS Behav* 7, 363–372.

Wolitski, R.J., Parsons, J.T., Gómez, C.A., Purcell, D.W., Hoff, C.C., Halkitis, P.N., 2005. Prevention with gay and bisexual men living with HIV: rationale and methods of the Seropositive Urban Men’s Intervention Trial (SUMIT). *AIDS* 19 Suppl 1, S1–11.

Woodward, C.L.N., Roedling, S., Edwards, S.G., Armstrong, A., Richens, J., 2010. Computer-assisted survey of attitudes to HIV and sexually transmissible infection partner notification in HIV-positive men who have sex with men. *Sex Health* 7, 460–462.

World Health Organisation, 2011. WHO Progress report 2011: Global HIV/AIDS response. [online]. Available from:

[http://www.who.int/hiv/pub/progress\\_report2011/en/](http://www.who.int/hiv/pub/progress_report2011/en/) [Accessed November 2011].

World Health Organisation/UNAIDS, 1999. Sexually transmitted diseases: policies and principles for prevention.

Xia, Q., Molitor, F., Osmond, D.H., Tholandi, M., Pollack, L.M., Ruiz, J.D., Catania, J.A., 2006. Knowledge of sexual partner's HIV serostatus and serosorting practices in a California population-based sample of men who have sex with men. *AIDS* 20, 2081–2089.

Xiridou, M., Geskus, R., De Wit, J., Coutinho, R., Kretzschmar, M., 2003. The contribution of steady and casual partnerships to the incidence of HIV infection among homosexual men in Amsterdam. *AIDS* 17, 1029–1038.

Zablotska, I.B., Imrie, J., Prestage, G., Crawford, J., Rawstone, P., Grulich, A., et al. 2009. Gay men's current practice of HIV seroconcordant unprotected anal intercourse: serosorting or seroguessing? *AIDS Care* 21, 501–510.

Zou, H., Fairley, C.K., Guy, R., Chen, M.Y., 2012. The Efficacy of Clinic-Based Interventions Aimed at Increasing Screening for Bacterial Sexually Transmitted Infections Among Men Who Have Sex With Men. *Sex Transm Dis* 39, 382–387.

## **Appendices**

### **Appendix 1: Systematic review of qualitative literature on partner notification**

#### **Introduction**

In this appendix, I report the findings of a systematic review of qualitative literature on the attitudes, experiences, and preferences regarding partner notification for STI and HIV among adolescents, and adult men and women. I briefly describe the history of partner notification followed by an overview of the existing systematic reviews on partner notification. Then I describe the aims of this review, methodology used and findings.

#### **History of partner notification**

It was introduced in the mid-nineteenth century Europe and early 20th century USA in response to the syphilis epidemic (Gostin and Hodge, 1998). The earliest references to partner notification were made in Europe in the contagious disease laws in the mid-nineteenth century (Adler, 1980) and the 1930s in the USA (Parran, 1937). In the UK, the Contagious Disease Acts of 1864 and 1866 were passed in response to the increasing incidence of STI, particularly syphilis, amongst the military that led to the establishment of open-access STI clinics (Cowan et al., 1996). Unlike Sweden and Norway where partner notification is mandatory, in the UK partner notification is voluntary (Arthur et al., 2005).

Since its origin, partner notification has generated debate about the right to confidentiality of the infected person (i.e., the index case) and the right of the infected person's partners (i.e., the contact) to be informed about the risk of STI/HIV. The recognition of syphilis as a STI, and the availability of diagnostic

tests and treatments shifted the focus from the right to privacy of the index patient to the contact's right to be informed about exposure to STI (Gostin and Hodge, 1998). However, with the emergence of HIV in the early 1980's and the criticism of HIV partner notification by the gay and civil rights groups, in the absence of HIV treatment, the index patients' privacy was emphasised (Bayer and Toomey, 1992) re-problematising partner notification.

Currently, partner notification is most commonly practiced in European countries and the USA for gonorrhoea, chlamydia, syphilis, and HIV (Low et al., 2012). Partner notification usually takes the form of patient referral or provider referral. Some countries encourage index patients to inform their contacts, with or without the assistance of a health care provider (i.e., voluntary partner notification), for example the UK. Other countries oblige the health care providers to inform the contacts with or without the index patients' consent (i.e., compulsory partner notification), for example Sweden. The majority of European Union (EU) countries carry out partner notification within specialist STI clinics with a focus on bacterial STI (Arthur et al., 2005).

### **Evidence on effectiveness of partner notification**

A key question with regards to partner notification is whether it is effective in reducing onward STI/HIV transmission. A review of the empirical evidence of case finding effectiveness partner notification for syphilis, gonorrhoea and chlamydia in the USA showed that a new case of these STI was found every 4-5 cases interviewed and for HIV partner notification a new case was found every 2-3 cases (Brewer, 2005). It also highlighted that provider referral is effective and plays a central role in case finding, and cluster investigations can play a vital role in case finding in settings with high disease incidence. Another review of studies



conducted in the USA also reported that partner notification can lead to case finding (gonorrhoea, chlamydia, HIV, syphilis) while provider referral results in more partners being notified and evaluated compared to patient-referral (Macke and Maher, 1999).

A review of RCTs has shown that in patients with HIV or any STI, provider referral alone or a choice between patient and provider referral increases the rate of partners presenting for medical evaluation when compared with patient referral alone (Mathews et al., 2002). It also showed that contract referral, when compared with patient referral among patients with gonorrhoea, results in more partners presenting for medical evaluation; and that verbal, nurse-given health education together with patient-centred counselling by lay workers, when compared with standard care among patients with any STI, results in small increases in the rate of partners treated (Mathews et al., 2002). These reviews indicate that partner notification leads to new case-finding for STI and HIV, and partner notification for STI and HIV via provider referral or choice of patient referral or provider referral is effective compared to only patient referral.

However, despite increasing evidence of the effectiveness of provider referral, patient referral remains the most commonly used method of partner notification. Most EU countries use a patient referral method, whereas contract referral methods are used sometimes in Sweden, Ireland, and the UK (Arthur et al., 2005). Some studies have also shown that both patients (Apoola et al., 2006) and providers (Hogben et al., 2004) prefer patient referral. However, current methods of patient referral only reach 40-60% of named sexual partners (Low et al., 2004; Arthur et al., 2005).

Another systematic review of RCTs (Trelle et al., 2007) examined the effectiveness of novel patient referral methods for chlamydia, gonorrhoea, trichomonas, and non-specific urethritis like PDPT and Home sampling kits. As described in chapter 1, PDPT is used in the USA where the index case is given medication to hand it to their sexual partners without prior medical assessment of their partners by a healthcare professional (Golden et al., 2005; Kissinger et al., 2005). Home sampling kits are given to index patients diagnosed with STI like chlamydia for their sex partners to collect urine specimens at home to improve uptake of testing among partners (Andersen et al., 1998; Østergaard et al., 2003). This review concluded that PDPT reduces the risk of re-infection compared to patient referral, especially for patients with chlamydia, gonorrhoea and syndromic diagnosis, but not in women with trichomonas. It also reported that the use of a home sampling kit for partner notification for chlamydia and gonorrhoea showed weak evidence of an increase in partner notification among those whose partners were given a kit and asked to post specimens to the laboratory instead of bringing them in person to the clinic. It also indicated that interventions that combine patient referral with some additional written or verbal information might be superior to simple patient referral. PDPT and patient referral, with additional information given to the index case for their partner, showed an increase in the number of partners treated but had no effect on the recurrence/persistence of these infections.

Irrespective of the method of partner notification, the co-operation of the index cases is a pre-requisite for its success. If the index cases withhold the details of their contacts, partner notification in any form, patient-driven or provider-driven may be ineffective. Given the inherent conflict between the index patient's need

for confidentiality and the contact's right to know, and the interdependence of sexual health of partners, it is crucial to understand the barriers and challenges to partner notification among patients. A narrative review of studies on HIV conducted in the USA (Passin et al., 2006) indicates that type of sexual partnership, sexual orientation, drug-use, and cultural and regional factors can affect partner notification choices. However, this review was restricted to studies conducted in the USA and related to HIV.

### **Systematic review of qualitative literature on partner notification**

The aim of the systematic review presented in this chapter was to synthesise qualitative literature on adolescents and adult men and women's attitudes to and experiences of STI and HIV partner notification, and preferred methods of partner notification in industrialised countries. In this chapter I present a systematic review only for STI partner notification (excluding HIV partner notification) STI partner notification is the focus of this thesis. The review of qualitative literature on partner notification was considered important to enable exploration of the 'meanings' of the phenomenon under investigation and understand the contextual factors that may influence attitudes towards partner notification for STI. In the following section, I describe the scope, methodology, and results of this systematic review.

### **Scope of the review and study inclusion criteria**

Studies conducted in any industrialised country, as defined by the Development Assistance Committee of the Organisation for Economic Co-operation and Development (OECD) were included. The details of the inclusion criteria for the review are presented in Table 41.

**Table 41: Inclusion criteria for selection of studies for the systematic review**

| <b>Category</b>         | <b>Criteria for inclusion</b>  |
|-------------------------|--|
| <b>Intervention</b>     | Any intervention described as partner notification, contact tracing or any activities describing location and notification of partner  |
| <b>Setting</b>          | Health care settings (specialist i.e. STI clinics and non-specialist clinics), and non-health care settings (e.g. needle exchanges, homeless shelters)<br><br>Any industrialised country (OECD). |
| <b>STI</b>              | Chlamydia, gonorrhoea, non-gonococcal urethritis; syphilis; trichomonas; Hepatitis B or HCV  |
| <b>Study population</b> | No restrictions  |
| <b>Study design</b>     | Studies using any method of collecting qualitative data e.g. focus group discussions, individual in-depth interviews, in-depth interviews.   |

Studies that used any qualitative data collection method such as focus group discussions, individual in-depth or in-depth interviews were included in the review. Any intervention described as partner notification, contact tracing or any activities describing location and notification of sexual or needle-sharing partners of people with STI specified in the search strategy was included. Studies conducted in health care settings (specialist or non-specialist), and non-health care settings (e.g. needle exchanges, homeless shelters) were eligible for inclusion. There were no restrictions on the study population: studies conducted among adolescent heterosexual girls and boys, MSM, IDUs were included. The scope of this review was not restricted to partner notification only among PLHIV or MSM due to the lack or paucity of data on partner notification among these groups.

### **Search Strategy**

The following databases: MedLine, Embase, PsychoINFO, CINHALL, and JSTOR were searched using a pre-specified search strategy for literature on partner

notification for syphilis, gonorrhoea, chlamydia, non-specific urethritis, genital herpes, warts. An example of the search strategy used for Medline is specified in Table 42 and similar search strategies were used for other databases. These search strategies were used earlier for a systematic review of quantitative studies on partner notification from 1990 to 2005 for similar STI (Trelle et al., 2007). The search strategy was updated to identify papers published from January 1, 2006 through August 31, 2009, and search for literature on STI like trichomonas, Hepatitis B and C, Human Papilloma Virus (HPV), which were not included in the NICE review, from 1990 through August 31, 2009. Medical subject headings or thesaurus terms and free text covering different STI including HIV were used. These were combined with free text terms for partner notification methods including EPT and PDPT. The reference lists of retrieved articles for publications before 1990 were also searched and researchers who work in the field of partner notification were contacted for unpublished papers or reports.

### **Selection of studies**

I, along with another independent reviewer, screened titles and abstracts of all potentially relevant articles identified during the search. Discrepancies were resolved by discussion or through adjudication by a third reviewer.

**Table 42. Search strategy for systematic review**

1. exp Sexually Transmitted Diseases/
2. exp HIV Infections/
3. exp Chlamydia Infections/
4. exp Condylomata Acuminata/
5. exp Gonorrhea/
6. exp Herpes Genitalis/
7. exp Syphilis/
8. sexually transmitted infection\$.mp.
9. sexually transmitted disease\$.mp.
10. venereal disease\$.mp.
11. (STI or STIs or STD or STDs).mp.
12. (Acquired Immunodeficiency Syndrome or HIV or AIDS).mp.
13. chlamydia.mp.
14. genital wart\$.mp.
15. (gonorrhea or gonorrhoea).mp.
16. genital herpes.mp.
17. or/1-16
18. exp Contact Tracing/
19. partner notification.mp.
20. contact tracing.mp.
21. (contract referral or conditional referral).mp.
22. provider referral.mp.
23. patient referral.mp.
24. (patient\$ adj deliver\$ adj (treat\$ or therap\$)).mp.
25. (patient\$ adj partner\$ adj (treat\$ or therap\$)).mp.
26. expedited partner.mp.
27. or/18-26
28. 17 and 27
29. limit 28 to (humans and yr="1990 - 2006")
30. exp Sexually Transmitted Diseases/
31. exp HIV Infections/
32. exp Chlamydia Infections/
33. exp Condylomata Acuminata/
34. exp Gonorrhea/
35. exp Herpes Genitalis/
36. exp Syphilis/
37. sexually transmitted infection\$.mp.

## Results

A total 3480 references were identified; of which 400 potentially relevant references were identified (Figure 12). The abstracts of these references were screened and 132 references were included for full-text manuscript review. During the initial screening of the manuscripts, it was obvious that there were very few qualitative studies on partner notification. Thus, in addition to the qualitative studies, quantitative studies that also collected data using open-ended questions were also included in the review. One unpublished article from a researcher related to the focus of the review was acquired.

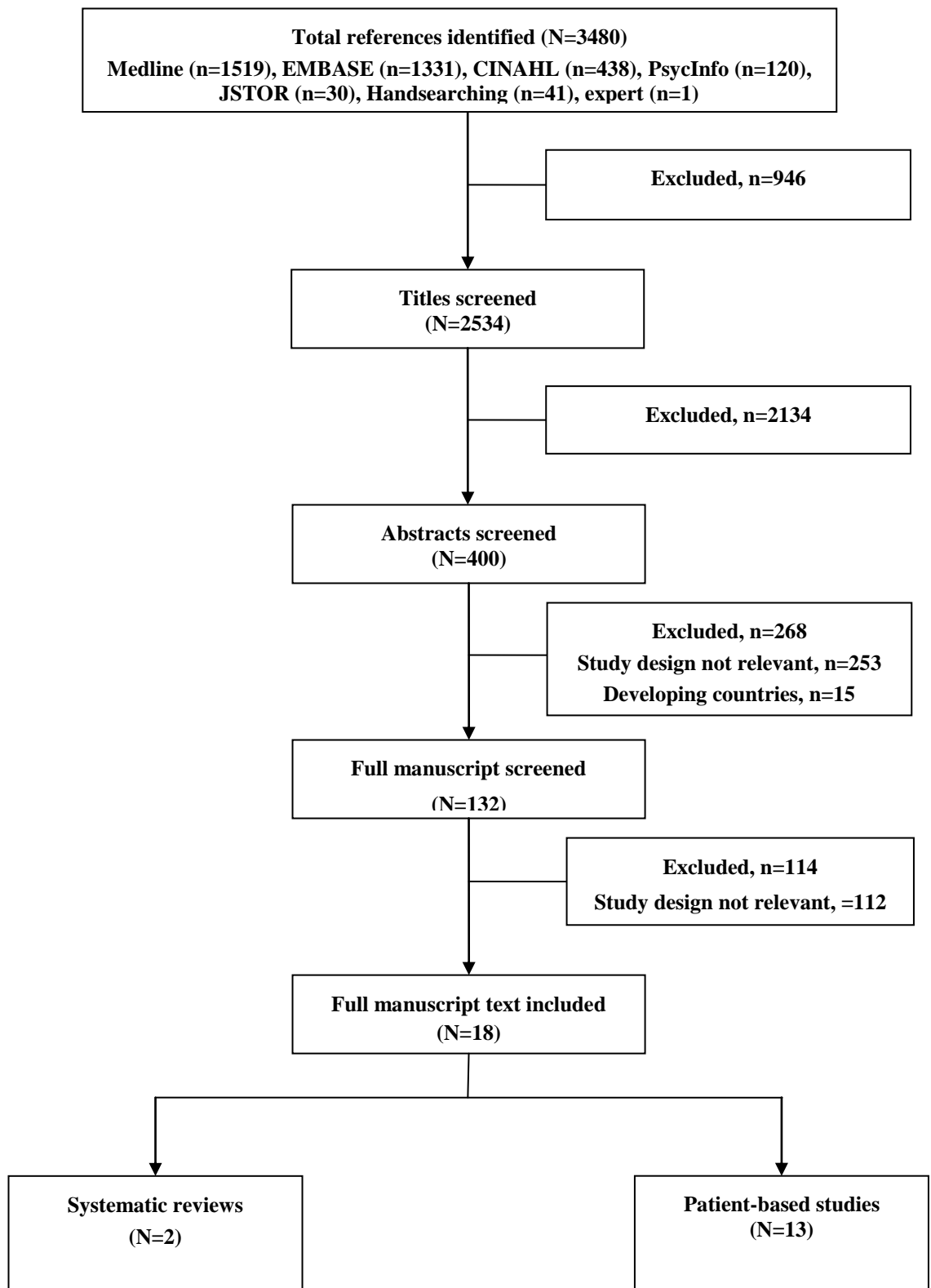
In total 13 articles that met the inclusion criteria were included in the synthesis. A brief summary of the characteristics of all these studies is presented in Table 43 and the quality assessment of these studies is presented in Table 44. Three of these were quantitative studies that used open-ended questions to collect qualitative data (Rosenthal et al., 1995; Tydén and Ramstedt, 2000; Shivasankar et al., 2008). Of the 13 studies, 6 studies were conducted in the USA, 5 in the UK, 1 in Ireland and 1 in Sweden. The American studies were largely conducted among African-American population.

The majority of these studies were conducted among patients recently diagnosed with STI and two studies included contacts (Gorbach et al., 2000; Coleman and Lohan, 2009). Studies were conducted on partner notification for bacterial STI, particularly chlamydia. One study was conducted among women diagnosed with genital warts/HPV (Nack, 2000). Some studies were conducted among at-risk populations such as MSM, African American men (Lichtenstein, 2003; Lichtenstein and Schwebke, 2005; Coleman and Lohan, 2009). The majority of

studies were conducted among heterosexual men and women but three studies included MSM (Gorbach et al., 2000; Coleman and Lohan, 2009; Sutcliffe et al., 2009). The assessment of the studies included in the review was conducted using NICE guidelines (National Institute for Health and Clinical Excellence, 2005) and it showed that only a handful of good qualitative studies have been conducted on partner notification.



**Figure 12. Flow diagram of the studies from 1990- August 2009 screened and included in the review**



**Table 43. Summary of all the studies included in the systematic review**

| <b>First author, date published and study aims</b>   | <b>Disease(s) studied</b>        | <b>Setting, study duration</b>   | <b>Sample size and characteristics</b>   | <b>Data collection and analysis</b>  |
|--|----------------------------------|--|--|--|
| <p>Chacko et al (2000)</p> <p>-To qualitatively assess patient-referral method from the perspective of the adolescent and young adult female who either did or did not notify their sexual partners.</p> | <p>-Chlamydia and gonorrhoea</p> | <p>Urban hospital based family planning clinic, Houston, Texas, USA</p> <p>-1995-96</p>                                | <p>-54 females, aged 14-20 years (median 18); 81% diagnosed with chlamydia and 15% with gonococcal cervicitis and 4% had both</p>                        | <p>-Structured face-to-face interview by trained nurse</p> <p>-Two reviewers conducted content analysis.</p> |
| <p>Coleman and Lohan (2007)</p> <p>-To explore experiences of partner notification from the perspective of gay, bisexual and other MSM.</p>  | <p>-Syphilis</p>                 | <p>-2 STI clinic and gay venues (2 bars, 2 clubs and 1 sauna), Greater Dublin, Ireland</p> <p>-Dec 2002 - Feb 2004</p> | <p>-40 gay/ bisexual MSM</p> <p>-Age range 20-60 years, 15 cases, 15 contacts and 10 non-patient with an urban-rural, age and social class diversity</p> | <p>-In-depth interviews</p> <p>- NUD*IST was used for systematic thematic analysis</p>                       |

**Table 43. Continued**

| First author, date and study aims   | Disease(s) studied | Setting, study duration                  | Sample size and characteristics   | Data collection and analysis  |
|---|--------------------|--|---|---|
| Daker-White et al (Unpublished)<br>-To assess social and emotional effects of PN<br>-To compare subjective acceptability of primary care and STI clinics as settings for partner notification for Chlamydia | -Chlamydia         | -UK                                      | -25 participants (8 men and 17 women) aged 18-28 years  | -In-depth interviews conducted after partner notification was completed using a topic guide<br>- Participants in both the trial arms and those who refused randomisation were compared during the analysis. |
| Darroch et al (2003)<br>-To explore men's and women's accounts of Chlamydia testing with a view to understand sex differences in attitudes and in behaviours  | -Chlamydia         | -STI clinic,UK                           | -24 index cases (12 men and 12 women)<br>-Mean age 27 years (29 in men and 24 in women), mixed ethnicity, employed and educated till A levels | -In-depth interviews  |
| Duncan et al (2001)<br>- To explore psychosocial impact of Chlamydia diagnosis on women   | -Chlamydia         | -STI family planning clinic, Glasgow, UK | and -17 women (10 GUM and 7 family planning clinic), aged 18 -28 years  | -In-depth interviews  |

**Table 43. Continued**

| <b>First author, date and study aims</b>  | <b>Disease(s) studied</b>                               | <b>Setting, study duration</b>   | <b>Sample size and characteristics</b>   | <b>Data collection and analysis</b>   |
|---|---|--|--|---|
| <p>Gorbach et al (2000)</p> <p>- To describe self-reported patterns of partner notification among STI clients diagnosed with gonorrhoea, chlamydia, nongonococcal urethritis and understand reasons for notifying or not notifying partners and examine differences, if any, by gender and sexual orientation</p> | <p>Chlamydia, gonorrhoea, non-gonococcal urethritis</p> | <p>-STI clinic and referrals from private practitioners, Seattle, USA</p> <p>-June 1996-June 1998</p>    | <p>-79 patients (30 women, 30 heterosexual men and 19 MSM)</p> <p>-Women: mean age 22 (15-46 range),</p> <p>-Mixed ethnic group (white/black/other)</p> <p>-Men: mean age 28 (18-46 range), mixed ethnic group (white/black/other)</p> | <p>-Interviewers were gender-matched</p> <p>-In-depth interviews using ethnographic techniques were conducted.</p> <p>-Ethnograph software was used for content-analysis.</p> |
| <p>Lichtenstein (2003)</p> <p>-To identify stigma related barriers to treatment that affect screening, treatment and partner services</p>   | <p>-Any STI</p>   | <p>-Public health clinics and students from a college and high school, West and Central Alabama, USA</p> | <p>-42 heterosexual men and women from mixed ethnic background, aged 15-53, predominantly African-American, unemployed, single with children and uninsured.</p>  | <p>-4 Focus group discussions (1 with only women, 1 with only men and 2 mixed groups)</p> <p>-Transcripts were analysed to study effect of stigma on partner notification</p> |

**Table 43. Continued**

| <b>First author, date and study aims</b>  | <b>Disease(s) studied</b> | <b>Setting, study duration</b>       | <b>Sample size and characteristics</b>   | <b>Data collection and analysis</b>   |
|---|---------------------------|--------------------------------------|--|---|
| Lichenstein and Schwebke (2005)<br>- To assess African-American men's preferences in relation to 3 partner notification methods i.e. patient referral, provider referral and PDPT | -Trichomoniasis           | -Public clinic, Southern city in USA | STI -FGD 1: 10 African-American heterosexual men aged 21-51, (mean: 32 years); FGD 2: men aged 21-27, (mean: 22 years) | -2 Focus group discussions and a short questionnaire on socio-demographic background.<br>-Data was analysed using constant comparison for thematic patterns i.e. age, social and partnership status |
| Nack (2000)<br>-To understand how sexual self-concept is transformed among women diagnosed with chronic STI   | -Genital herpes and HPV   | -Women's health care clinic, USA     | - Snowball sample of 28 women aged 19-56 years   | -Unstructured interviews<br>-Data analysed according to the principles of grounded theory   |
| Rosenthal et al, (1995)<br>-To examine adolescent girls discussion of STI acquisition with partners.  | - Any STI                 | -Urban Hospital, USA                 | -182 sexually active girls who had history of STI, mean age: 17 (12-21 years), majority African American               | -Interviewer administered questionnaire with in-depth questions on experience of having told/been told about STI acquisition and reasons for not telling.   |

**Table 43. Continued**

| <b>First author, date and study aims</b>   | <b>Disease(s) studied</b> | <b>Setting, study duration</b>                           | <b>Sample size and characteristics</b>   | <b>Data collection and analysis</b>  |
|--|---------------------------|--|--|--|
| Shivasankar et al (2008)<br>To investigate patient's opinions regarding acceptability of PDPT  | -Any bacterial STI        | -STI clinic, Plymouth, UK                                | -599 participants of whom 47% were men and 53% women. 97% were heterosexual and 28% educated up to university degree   | -Questionnaire with open ended questions were completed after consultation of these patients<br>-No information on analysis of open-ended data |
| Sutcliffe et al (2009)<br>To explore factors that influence STI clinic attenders choice of PN method and the acceptability and feasibility of two partner notification strategies i.e. accelerated partner therapy (APT) in form of telephone consultation of sexual partners and treatment, and pharmacy consultation and treatment | -Bacterial STI            | -STI clinic in Central Middlesex Hospital, London, UK    | -37 participants diagnosed with an acute STI or contacts of people with acute STI, aged 16to >30, mixed ethnicity, 14 and 21 heterosexual men and women respectively and 2 MSM | -In-depth interviews with STI clinic attenders.<br>-Analysis using Framework approach  |
| Tyden and Ramstedt (2000)<br>-To evaluate patients perceptions towards legal enforcement of partner notification and their views about impact on legislation on their sexual behaviour   | -Chlamydia                | - STI clinics in 4 hospitals, Stockholm, Sweden<br>-1997 | -240 consecutive patients diagnosed with Chlamydia<br>-46% men and 54% women, mean age: 25 years (16-52)   | - Cross sectional survey with open-ended questions<br>-No information on analysis of open-ended data was provided                              |

**Table 44. Quality assessment of studies included in the systematic review**

| <b>First author, (date)</b>            | <b>Appropriate and clearly focused question</b> | <b>Study type and appropriate</b> | <b>Recruitment/ sampling strategy appropriate</b> | <b>Methods of data collection appropriate</b> | <b>Ethical issues addressed</b> | <b>Data analysis appropriate</b> | <b>Methods adequate to research question</b> | <b>Reflexivity to addressed</b> | <b>Clear statement of findings</b> | <b>Implications of study reported clearly</b> | <b>Discussion of limitations performed</b> | <b>Overall assessment</b> |
|--|---|-----------------------------------|---|---|---------------------------------|----------------------------------|--|---------------------------------|------------------------------------|---|--|---------------------------|
| Chacko et al, (2000)                   | Yes   | Yes                               | No  | No  | Yes                             | Yes                              | No   | No                              | Yes                                | Yes   | Yes  | (-)                       |
| Coleman and Lohan, (2007)              | Yes   | Yes                               | Yes   | Yes   | Yes                             | Yes                              | Yes  | No                              | Yes                                | Yes   | No   | (+)                       |
| Darroch et al, (2003)                  | Yes   | Yes                               | Yes   | Inadequate information                        | Yes                             | Inadequate information           | Yes  | No                              | Yes                                | Yes   | Yes  | (-)                       |
| Duncan et al, (2001)                   | Yes   | Yes                               | Yes   | Yes   | Yes                             | Yes                              | Yes  | No                              | Yes                                | Yes   | Yes  | (+)                       |
| Gavin Daker-White et al, (Unpublished) | Yes   | Yes                               | Yes   | Yes   | Yes                             | Yes                              | Yes  | No                              | Yes                                | Yes   | No   | (+)                       |

**Table 44. Continued**

| <b>First author, (date)</b>      | <b>Appropriate &amp; clearly focused question</b> | <b>Study type appropriate</b> | <b>Recruitment or sampling strategy appropriate</b> | <b>Methods of data collection appropriate</b> | <b>Ethical issues addressed</b> | <b>Data analysis appropriate</b> | <b>Methods adequate to research question</b> | <b>Reflexivity addressed</b> | <b>Clear statement of findings</b> | <b>Implications of study reported clearly</b> | <b>Discussion of limitations performed</b> | <b>Overall assessment</b> |
|----------------------------------|---|-------------------------------|---|---|---------------------------------|----------------------------------|--|------------------------------|------------------------------------|---|--|---------------------------|
| Gorbach et al, (2000)            | Yes   | Yes                           | Yes   | Yes   | Yes                             | Yes                              | Yes  | No                           | Yes                                | Yes   | No   | (+)                       |
| Lichenstein and Schwebke, (2005) | Yes   | Yes                           | Yes   | Yes   | yes                             | Yes                              | Yes  | Yes                          | Yes                                | Yes   | Yes  | (++)                      |
| Lichenstein, (2003)              | Yes   | Yes                           | Yes   | Yes   | Yes                             | Yes                              | Yes  | Yes                          | Yes                                | Yes   | Yes  | ++                        |
| Nack, (2000)                     | Yes   | Yes                           | Yes   | Yes   | Yes                             | Yes                              | Yes  | Yes                          | Yes                                | Yes   | No   | (+)                       |
| Rosenthal et al, (1995)          | Yes   | Yes                           | Inadequate information                              | Inadequate information                        | Yes                             | No                               | Yes  | No                           | Yes                                | Yes   | Yes  | (-)                       |
| Shivasankar et al, (2008)        | Yes   | Yes                           | Yes   | Yes   | No                              | No                               | Yes  | NA                           | Yes                                | Yes   | No   | (-)                       |



**Table 44. Continued**

| <b>First author, (date)</b> | <b>Appropriate clearly focused question</b> | <b>Study type and appropriate</b> | <b>Recruitment/ sampling strategy appropriate</b> | <b>Methods of data collection appropriate</b> | <b>Ethical issues addressed</b> | <b>Data analysis appropriate</b> | <b>Methods adequate research question</b> | <b>Reflexivity to addressed</b> | <b>Clear statement of findings</b> | <b>Implications of study reported clearly</b> | <b>Discussion of limitations performed</b> | <b>Overall assessment</b> |
|-----------------------------|---|-----------------------------------|---|---|---------------------------------|----------------------------------|---|---------------------------------|------------------------------------|---|--|---------------------------|
| Sutcliffe et al, (2009)     | Yes   | Yes                               | Yes   | Yes   | Yes                             | No                               | Yes                                       | No                              | Yes                                | Yes   | No   | (-)                       |
| Tyden and Ramstedt (2000)   | Yes   | Yes                               | Yes   | No  | Yes                             | No                               | No  | NA                              | Yes                                | Yes   | Yes  | (-)                       |

## **Data Synthesis**

I used an interpretative approach called meta-ethnography for data synthesis. This approach was developed by Noblit and Hare (Noblit and Hare, 1988) and is interpretative rather than aggregative in nature. Meta-ethnography aims to maintain the uniqueness of individual accounts by translating the meanings of these accounts into each other (Noblit and Hare, 1988 pp10). They have proposed the stages described in Box 3 during the process of translating studies. As indicated in Box 3, once the area of research interest is specified, studies included in the review are read and re-read following which key themes and metaphors that convey the meaning of the study are identified. The themes identified from one study are compared and contrasted with those from the other studies. These similarities and differences identified in the studies are collectively examined to enable further interpretation of these studies.

I organised studies into the following groups: 1) studies on views, and attitudes of patients towards partner notification, 2) studies on the perceived barriers and experiences of notifying partners, 3) studies on the preferred methods for notifying partners or being notified. Studies were further organised according to the population studied: for example, studies conducted among adolescents, women, or MSM. I extracted pre-defined data items into standardised tables and identified key themes and metaphors to reflect the essence of each study. A second reviewer checked these for completeness and accuracy.

The themes or metaphors identified in each study were compared with those identified in other studies to enable ‘comparative explanation’ (Noblit and Hare, 1988). I used the process adopted by Pound and co-authors (Pound et al., 2005) and Campbell and co-authors (Campbell et al., 2003) to enable comparison of

these studies. I compared key themes, metaphors, and concepts from one study with those of another study for similarities and differences. I also identified any new themes from the second study and documented any contradictions in the studies. These themes were then compared in a similar fashion to themes and metaphors from another study and so on.

### **Box 3. Phases of Meta-Ethnography**

- 1) Identifying the area of interest or research question (Determined as per ECDC project goals)
- 2) Deciding what is relevant to initial interest (We defined the aims of synthesis and decided the nature of the studies to be included in the synthesis)
- 3) Reading the studies (We read and reread the studies to understand their meaning and identify the key themes and metaphors that convey the key sense/meaning of the study)
- 4) Determining how the studies are related (We prepared lists of the key metaphors of different studies and did a preliminary review to identify if these metaphors, themes were similar or contradictory in their understanding of the phenomenon)
- 5) Translating the studies into one another (We compared the metaphors and themes of studies to identify similarities and differences)
- 6) Synthesizing these translations to provide a further interpretation of the translations (We compared the translations of studies and brought together these translations to further interpret them)
- 7) Expressing the synthesis in the form considered most appropriate by the synthesiser and serves the purpose for which synthesis was undertaken (We prepared a written report based on the synthesis)

The data synthesis is presented in the following categories: 1) social meanings of STI diagnosis, 2) views towards partner notification and perceived barriers to partner notification, 3) experiences of partner notification and 4) preferences regarding partner notification.

#### **Social meanings of STI diagnosis**

Several studies reported that STI diagnosis evoked feelings of guilt and shame. Participants, mainly adolescent girls and women, reported experiencing a range of negative emotions due to their STI diagnosis such as feeling of contamination, delinquency, being dirty, disgust, shock, distress (Rosenthal et al., 1995; Chacko et

al., 2000; Nack, 2000; Duncan et al., 2001; Darroch et al., 2003; Lichtenstein, 2003). For some women these reactions were linked to perceptions of lack of personal vulnerability to STI (Daker-White et al., n.d.; Duncan et al., 2001; Darroch et al., 2003). Chlamydia diagnosis led to anxiety among women about their reproductive health (Duncan et al., 2001; Darroch et al., 2003). Older African-American heterosexual men in Southern USA were embarrassed due to their diagnosis with trichomoniasis (Lichtenstein, 2003). They were concerned about the religious connotations of homosexuality, drug-use, and extra-marital sex as “sins” and STI diagnosis as “wages of sin” and immoral. Men also feared loss of sexual capital due to the socio-cultural association of STI diagnosis with homosexuality in their community (Lichtenstein and Schwebke, 2005). However, some young men interpreted STI diagnosis as a sign of sexual machismo (Lichtenstein, 2003). African-American men were suspicious of the ‘blackness’ of STI rates in USA and did not trust the healthcare system due to a history of racial discrimination against Black population in the USA. Thus, the meanings of STI are embedded in socio-cultural norms which influence the experience of being diagnosed with STI.

### **Views towards and perceived barriers to partner notification**

Studies reflect that the connotations of STI as stigmatised conditions shape people’s views towards partner notification. At the partnership level, STI diagnosis is a proof of current or previous non-exclusivity in the partnership and partner notification a threat to the secrecy engulfing this lack of exclusivity. However, in the context of partner notification for STI, some studies report that the participants viewed partner notification with a moralistic perspective. Partner notification was considered as ‘a right thing to do’ (Daker-White et al., n.d.), a moral responsibility

to others and to control disease, and its rejection was seen as evidence of not having a conscience (Gorbach et al., 2000; Coleman and Lohan, 2009). Among MSM, these altruistic connotations also had a subtext of self-protection from re-infection (Gorbach et al., 2000) and freedom of sexual pleasure (Coleman and Lohan, 2009). Despite these positive attitudes, the stigma associated with STI diagnosis led to feelings of guilt and ‘embodied shame’ (Coleman and Lohan, 2009). Men who are not ‘out’ as gay or bisexual were worried about being exposed due to partner notification and MSM feared being perceived as ‘carriers of infection’ among their peers (Gorbach et al., 2000; Coleman and Lohan, 2009).

Women were concerned about being labelled as ‘loose’ women (Gorbach et al., 2000) or ‘freaks’ if they disclosed information about multiple sexual partners to health care providers (Lichtenstein, 2003). Some men who had a “main woman” (not necessarily a wife but someone with whom they have children) were concerned about the negative implications of partner notification on their relationship with their main woman which was considered important for their social status (Lichtenstein and Schwebke, 2005).

All these factors make ‘breaking the bad news’ (Coleman and Lohan, 2009) to the partners a difficult and potentially ‘troublesome task’ (Daker-White et al., n.d.). Participants experienced range of emotions like stress, anxiety, guilt, discomfort, lack of trust, anger, embarrassment, fear, apprehension prior to notifying their partners (Rosenthal et al., 1995; Chacko et al., 2000; Gorbach et al., 2000; Nack, 2000; Duncan et al., 2001; Coleman and Lohan, 2009; Sutcliffe et al., 2009). Women were more likely to be concerned about their partner’s negative reaction (Rosenthal et al., 1995; Chacko et al., 2000; Darroch et al., 2003). Both, men and women, feared gossip, abuse, and isolation and were worried about the impact of

partner notification on their social standing (Daker-White et al., n.d.; Rosenthal et al., 1995; Chacko et al., 2000; Gorbach et al., 2000; Duncan et al., 2001; Lichtenstein and Schwebke, 2005) Adolescent girls and women were concerned about violence from their partner, irrespective of the nature of infection they were diagnosed with (Rosenthal et al., 1995; Chacko et al., 2000; Gorbach et al., 2000).

### **Experiences of notifying partners**

These above-mentioned factors translated into either the index patients avoiding disclosure of their diagnosis by ‘passing’ (i.e. concealing their diagnosis) (Nack, 2000) or ‘covering’ (i.e. using deceptive stories to cover their diagnosis) (Gorbach et al., 2000; Nack, 2000; Lichtenstein, 2003) or ‘stigma transference’ i.e. blaming their partner for their diagnosis (Nack, 2000) acting as a catalyst for partner notification (Gorbach et al., 2000).

Despite intense emotional experiences post-diagnosis and concerns about negative implications of notifying partners, several studies indicate that participants usually notified their main current sexual partner (Daker-White et al., n.d.; Rosenthal et al., 1995; Chacko et al., 2000; Gorbach et al., 2000; Nack, 2000; Duncan et al., 2001; Darroch et al., 2003; Sutcliffe et al., 2009). Acceptance and openness of non-monogamy symbolised trust and facilitated partner notification (Daker-White et al., n.d.; Gorbach et al., 2000). However, the experience of notifying a long-term and serially monogamous partner was stressful (Daker-White et al., n.d.; Gorbach et al., 2000; Coleman and Lohan, 2009). While notifying their partners women sometimes resorted to ‘covering’ by using non-incriminating explanations, for example saying that they got ‘yeast infection from a toilet seat’ (Gorbach et al., 2000). Similarly, one study indicates that a bisexual man informed his female partner that his infection was a result of sexual encounter with a woman (Coleman

and Lohan, 2009) instead of disclosing his bisexuality. In the context of recurrent infections where the symptoms can resolve after a few days, some women resorted to passing by insisting on condom use (Nack, 2000). Men avoided disclosure to partners either by not seeing them or not having sex with them until their treatment was completed (Lichtenstein and Schwebke, 2005) or expected their partners to read between the lines (Daker-White et al., n.d.).

However, for participants' who had notified their partners, the experience was not as bad as they had expected (Daker-White et al., n.d.; Nack, 2000; Duncan et al., 2001; Coleman and Lohan, 2009). Nevertheless, blaming appears to be a commonly accompanied with partner notification, with men being more likely to blame their female partners for the diagnosis (Darroch et al., 2003; Lichtenstein, 2003). Some women and adolescent girls reported being blamed by their male partner for chlamydial infection (Rosenthal et al., 1995; Chacko et al., 2000; Duncan et al., 2001; Darroch et al., 2003). Men blamed their female partners, especially for STI like trichomoniasis, under the guise that 'it's a woman's disease' (Lichtenstein and Schwebke, 2005). Women too confronted their partners and retaliated by 'outing' them i.e. telling others about their diagnoses or blaming them for their diagnoses (Daker-White et al., n.d.; Gorbach et al., 2000; Nack, 2000; Lichtenstein, 2003). This process of deflecting responsibility usually resulted from feelings of betrayal by partner and from an attempt avoid negative labelling, nevertheless leading to informing the partner about the diagnosis (Chacko et al., 2000; Gorbach et al., 2000; Nack, 2000; Darroch et al., 2003; Lichtenstein, 2003; Lichtenstein and Schwebke, 2005). Only one study reported that notifying partners had led to the end of long-term relationships (Coleman and Lohan, 2009).

Participants felt it was important to convey the bad news to their partners themselves, especially their current main partner, rather than via a health professional (Daker-White et al., n.d.; Chacko et al., 2000; Gorbach et al., 2000; Darroch et al., 2003; Coleman and Lohan, 2009) to avoid gossip. Notifying partners face-to-face (Daker-White et al., n.d.; Chacko et al., 2000; Gorbach et al., 2000; Darroch et al., 2003; Coleman and Lohan, 2009) or via phone (Chacko et al., 2000) was common. Provider referral was equated with confusion about the identity of the transmitter of infection and a sense of powerlessness (Coleman and Lohan, 2009). However, some men resorted to help from health advisors to overcome their reluctance to notify partners (Darroch et al., 2003). Women who feared violence chose to notify their partner via provider referral (Gorbach et al., 2000).

Studies that included contacts showed that the lack of knowledge about asymptomatic nature of STI and perceptions of low severity of the infection, particularly among men, led to delays in seeking care despite notification (Nack, 2000; Darroch et al., 2003; Lichtenstein, 2003). Contacts expressed feeling ambivalent, humiliated and at times preferred not to attend the clinic (Coleman and Lohan, 2009). Men were also less likely to seek care despite notification due to denial, pride, or fear of being seen in clinic (Darroch et al., 2003; Lichtenstein, 2003).

Misconceptions like the lack of STI symptoms at the time of sex, in some cases, led to non-notification of the partners with whom they had had sex, especially by adolescent girls (Rosenthal et al., 1995; Gorbach et al., 2000). Some gay men did not perceive oral sex as a risk factor for transmission, leading to oral sex partners not being notified (Gorbach et al., 2000). Heterosexual men and MSM were



unlikely to notify partners perceived as deliberate transmitters of infection, although the means by which they classified partners in this way were unreliable (Gorbach et al., 2000; Coleman and Lohan, 2009). Participants were also less likely to contact ex-partner(s) if the break-up was difficult, while casual and one-night stand partners were less likely to be contacted due to concerns of ensuing gossip or fear of being blamed (Daker-White et al., n.d.; Rosenthal et al., 1995; Chacko et al., 2000; Gorbach et al., 2000; Tydén and Ramstedt, 2000; Duncan et al., 2001). However, in some situations, the lack of a social relationship with the ex-partners or casual partners facilitated partner notification as it was considered harmless for their social standing (Gorbach et al., 2000; Lichtenstein and Schwebke, 2005). In such scenarios, provider-led notification was often preferred (Gorbach et al., 2000). Difficulty in locating ex-partners, particularly among IDUs or anonymity of partners were practical barriers to partner notification (Gorbach et al., 2000; Tydén and Ramstedt, 2000; Coleman and Lohan, 2009).

### **Preferences regarding partner notification in the future**

Overall, provider referral was considered intrusive, confusing, and associated with social stigma. Paradoxically, it was preferred to avoid negative impact of partner notification on social standing, violence, abuse, or gossip. As shown in a study conducted among African-American men in Southern USA, men's economic position influenced the nature of their sex partnerships and their perceptions of control (or lack of it) over female partner's sexuality. For example: Men in casual partnerships and who were relatively less well-off financially reported being aware of their position as a 'throw away guy' and felt that their female partners would not notify them and thus preferred provider referral (Lichtenstein and Schwebke, 2005). Wealthier men did not want to be notified by health providers due to the

fear of implications for their partnership with their main woman. However, these men viewed health provider led outreach as being ‘chased down’ for their masculinity and treated as vectors of disease (Lichtenstein, 2003; Lichtenstein and Schwebke, 2005).

Studies reported reluctance among participants to use PDPT due to fear of allergies and lack of trust in their partners (Lichtenstein, 2003; Lichtenstein and Schwebke, 2005; Shivasankar et al., 2008). However, some considered it useful for couples and to reduce embarrassment associated with coming to the clinic (Shivasankar et al., 2008). With regards to the acceptability of APT, there was greater preference for telephone assessment of main sexual partner by a health advisor and taking medication for him post-assessment due to its convenience in terms of time and the need for re-assurance, especially among older participants. The telephone model was also preferred for being notified by their partners and was influenced by the need for interaction with a health professional (Sutcliffe et al., 2009). Compared to the older participants, younger participants reported the self-test kits for partners to be acceptable.

With regards to the venue for STI care, index patients diagnosed with chlamydia preferred to attend primary care compared to a STI clinic (Daker-White et al., n.d.). STI clinics were perceived as an “*unknown quantity*” and a dirty place for unpleasant people (Daker-White et al., n.d.; Duncan et al., 2001; Lichtenstein, 2003), affecting its acceptability. However, some considered them as a necessary evil (Daker-White et al., n.d.; Coleman and Lohan, 2009). ‘Visibility’ i.e. being seen in a sexual health clinic was perceived as a challenge to ‘passing’ by men, especially from small cities, who were concerned about being ‘spotted’ and feared ensuing gossip (Lichtenstein, 2003).

Only one study reported on views towards legislation for chlamydia control and police enforcement of sexual contacts to attend testing for chlamydia (Tydén and Ramstedt, 2000). The majority of participants felt that legislation for chlamydia would normalise notification and some were willing to provide names of their partners to health care providers. However, participants were not in favour of use of police enforcement against contacts who did not attend the clinic.

### **Discussion**

Although studies using open-ended questions provided some information, their approach to analysing open-ended data was largely quantitative. A few studies addressed partner notification among MSM and none among HIV positive MSM. Only one study addressed disclosure and notification of chronic STI (Nack, 2000). The majority of studies focused on notification for STI like chlamydia, gonorrhoea, syphilis, NSU, and trichomoniasis. Since 2000, there has been a steady increase in the studies of novel partner notification strategies focusing on timely treatment of sexual partners like PDPT in the USA, or the APT model in the UK. However, these methods are useful only for selected curable STI like chlamydia and gonorrhoea and increasing drug resistance for gonorrhoea, especially among MSM can be a challenge. Most studies focused on participants aged 18-40 years. Given the increase in life expectancy in many developed countries, there is a need to examine the prevalence of STI among people aged 40 and above who are sexually active, and their views towards partner notification. Rates of sex partner acquisition remain higher and for longer in MSM than in heterosexual population (Johnson et al., 2001).

Several studies were conducted from a psychological perspective with an individualistic focus around STI management and partner notification choices,

especially in the UK. The sociological and ethnographic studies that examined partner notification in the context of the broader socio-economic, legal, and cultural milieu were mostly conducted in the USA. Contrary to our preliminary assumptions prior to the synthesis, the review revealed that the experience of shame and stigma associated with STI and partner notification is cross-cultural and without continental boundaries, although its manifestations can be different. Thus, the translation of these studies enabled a ‘line of argument’ synthesis described as “enabling inference about the whole based on the selective studies of the part” (Noblit and Hare, 1988) (pp.: 62). Despite the common experience of shame associated with STI diagnosis, the experience and manifestations of stigma varied according to age, gender, race, religion, sexuality and region. This synthesis provides an insight into how people diagnosed with STI view, experience and manage the stigma of STI diagnosis, and cope with their ‘diseased identity’ and how this affects partner notification.

### **STI diagnosis and stigma**

The experience of STI diagnosis and the operationalization of partner notification is influenced not only by the type of infection; but also by gender, socio-cultural, religious, legal and policy framework governing STI control and drug use in the society. A strong sense of immorality, influenced by religious underpinnings and societal norms of monogamy, is associated with STI diagnosis. The shame and immorality associated with STI influences the strategies adopted for (non)disclosure of STI diagnosis to sexual partners. The characteristics of STI, (for example, treatable, symptomatic, or recurrent) also influence participants’ partner notification strategies. MSM, women, and African American heterosexual men were worried about being perceived as ‘vectors of diseases’. MSM and bisexual

men feared double discrimination due to their perceived ‘deviant’ sexuality. African American heterosexual men were wary of their STI diagnosis due to the history of racial discrimination. Women feared the stigma associated with transgressing the gendered boundaries governing their sexuality. IDUs were concerned about the illegality of drug-use and the negative implications of partner notification, especially on their needle-sharing partners.

### **Partner notification strategies to manage the stigma of STI diagnosis**

The legal and moral underpinnings associated with STI diagnosis translate into ‘internalised stigma’ (described as the acceptance of the social stigma associated with STI/HIV diagnoses as valid) (Steward et al., 2008), especially among women. Sexual health programmes should be mindful of these social meanings associated with STI diagnosis, and the index patients’ social positioning in that community. Historically, STI interventions referred to groups with high STI prevalence such as MSM and IDUs, as ‘high risk groups’, thereby reinforcing the societal views towards these groups as ‘vectors of disease’. With regards to partner notification, the decisions to notify partners involve risk-assessment by the index of the impact of notification on their personal wellbeing, relationships with their partners, and social status. People diagnosed with STI/HIV face real fear of societal stigma and discrimination, which motivates them to adopt strategies to protect themselves from this ‘felt normative stigma’ (Steward et al., 2008). Thus index cases are likely to choose non-disclosure or covering, selective disclosure (i.e. informing some but not all partners) or partial disclosure (i.e. lying about the cause of their infection in an attempt to manage the stigma associated with their condition) and stigma transference (Nack, 2000; Lichtenstein, 2003). This need to manage stigma also translates in to a preference for notifying partners themselves.

However, due to the interdependent nature of sexual health with sexual partnerships (i.e. the risk of re-infection), the challenges to hide symptomatic STI from sex partners, the chronic nature of some infections, and the intimate nature of sexual partnerships, especially with main partners, the usefulness of coping strategies like covering, or passing, is limited, explaining the greater willingness to notify main current partners. Given the uncertainty in assessing the direction of transmission, even in situations where notification takes place ‘stigma transference’ (Nack, 2000), to some extent is likely to occur to protect one’s self-esteem and social standing where the social norm is monogamy. However, among MSM a mutual acceptance of non-monogamy can facilitate notification and symbolise trust. Thus, both trust and blame enable partner notification, especially in the context of current main partners. Notifying casual and ex-partners is challenging due to its perceived threat to social standing. Other partner notification methods requiring less interaction may be preferred for such partners. It is in this context that novel methods like pharmacy models or provider referral can be offered.

### **Implications**

These data indicate that the broader context of stigma attached to STI should not be ignored in efforts to improve effectiveness and uptake of partner notification. Partner notification policies and programs need to acknowledge the impact of STI related stigma on both index patients and their contacts and offer them psychological support. Whether perceived or experienced, stigma is a barrier to accessing sexual health services. Efforts to destigmatise and normalise testing and treatment for STI and to make sexual health services non-judgemental and

accessible are needed (Duncan et al., 2001; Darroch et al., 2003; Lichtenstein, 2003; Coleman and Lohan, 2009).

Notifying partners is an emotionally challenging task and different methods of partner notification must be offered for different types of partnerships as ‘no one size fits all’ (Gorbach et al., 2000). Provider support should be offered and a focus on anonymity and confidentiality of the index case is crucial in this context (Gable et al., 2007). The evidence highlights that despite notification, the stigma associated with STI affects healthcare seeking in sexual health clinics, especially among men. Partner notification services should make special efforts to encourage men to seek care, especially for infections widely considered to be ‘women’s diseases’. This may be the reason why a previous review has reported that none of the partner notification methods were effective for trichomonas (Trelle et al., 2007). Similarly, among IDUs, different partner notification methods are needed for needle-sharing and sexual partners. Novel methods of partner notification like STI home sampling and testing kits, PDPT, pharmacy or the telephone model, may provide more choices for STI testing and should be further investigated, particularly among men. Further research is also needed to understand the effects of legislation regulating partner notification on notifying partners. Last but not the least, this synthesis highlights the need to continue health education to tackle misconceptions about STI transmission.

### **Conclusion**

Partner notification is affected not only by partnership level factors and the type of infection, but also by myriad structural, socio-cultural and legal factors. Stigma is a considerable barrier to sexual health care and partner notification. People diagnosed with STI should be offered support to cope with feelings of embodied

shame and address felt normative stigma. The UNAIDS encourages voluntary partner notification and the provision of professional counselling for the index patient and their contacts (UNAIDS/WHO, 2000). Patients should be offered a 'choice' of partner notification methods and should be involved in decision-making to eliminate the risk of stigma and discrimination. Efforts should be made to destigmatise sexual health programmes and these should not perpetuate or enhance stigma associated with STI. This synthesis highlights that there is a need for further research on partner notification for STI among most-at-risk groups like MSM, African-American populations, and partner notification for STI among PLWH.



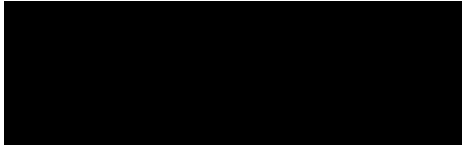
## Appendix 2: Local Research Ethics Committee approval letter

### East London and the City Research Ethics Committee 1

Telephone: [REDACTED]

11 December 2009

Professor Graham Hart



Dear Professor Hart

**Study Title:** Sex, Health, Antiretroviral Treatment and Partner Notification (SHARN) Project  
**REC reference number:** 09/H0703/120  
**Protocol number:** 1

The Research Ethics Committee reviewed the above application at the meeting held on 03 December 2009. Thank you for attending to discuss the study.

#### Ethical opinion

The members of the Committee present gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

#### Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

#### Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

*For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>. Where the only involvement of the NHS organisation is as a Participant Identification*

Centre, management permission for research is not required but the R&D office should be notified of the study. Guidance should be sought from the R&D office where necessary.

Sponsors are not required to notify the Committee of approvals from host organisations. Other conditions specified by the REC. Indicate where final versions of documents should be provided to the committee for information.

- a. Questionnaire: please change ""refused to answer"" to ""declined to answer"".
- b. Any revision of questionnaires should be submitted to the REC for review and opinion prior to use.

**Note**, that some members of the committee were uncomfortable with the terminology used and implied in the questionnaire and remain unconvinced by the explanation of the applicant.

#### Approved documents

The documents reviewed and approved at the meeting were:

| <i>Document</i>   | <i>Version</i> | <i>Date</i>      |
|---|----------------|------------------|
| Covering Letter   |                | 10 November 2009 |
| REC application   |                | 11 November 2009 |
| Protocol  | 1              | 10 November 2009 |
| Applicants' Checklist   |                | 11 November 2009 |
| Participant Information Sheet: Appendix3: PIS_ Questionnaire Pilot Interviews | 2              | 10 November 2009 |
| Participant Information Sheet: Appendix5: PIS_ Questionnaire Survey           | 2              | 10 November 2009 |
| Participant Consent Form: Appendix4: Consent Form_Pilot Interviews            | 1              | 10 November 2009 |
| Participant Consent Form: Appendix6: Consent Form_ Questionnaire Survey       | 1              | 10 November 2009 |
| Figure 1: Overview of proposed SHARP project                                  | 1              | 10 November 2009 |
| Participant Information Sheet: Appendix10: PIS_Focus Group Discussion         | 2              | 10 November 2009 |
| Appendix1: Message for display boards in clinic                               | 1              | 10 November 2009 |
| Appendix2: Flowchart1_Pilot and Questionnaire Survey                          | 1              | 10 November 2009 |
| Appendix7: SHARP Survey Questionnaire   | 1              | 10 November 2009 |
| Appendix8: Email reminder online survey                                       | 1              | 10 November 2009 |
| Appendix9: Flowchart_Focus Group Discussion                                   | 1              | 10 November 2009 |
| Participant Information Sheet: Appendix14: PIS_Indepth Interviews             | 2              | 10 November 2009 |
| Participant Consent Form: Appendix11: Consent Form_Focus Group Discussion     | 1              | 10 November 2009 |
| Participant Consent Form: Appendix15: Consent Form_Indepth                    | 1              | 10 November 2009 |
| Appendix12: Topic guide for focus group and indepth interviews                | 2              | 10 November 2009 |
| Appendix13: Flowchart3_Indepth  | 1              | 10 November 2009 |
| Evidence of insurance or indemnity  |                |                  |
| Appendix16: Email Invitation  | 1              | 10 November 2009 |

|                          |  |                  |
|--------------------------|--|------------------|
| Peer Review - Lisa David |  | 03 November 2009 |
| CV - Prof Graham Hart    |  | 10 November 2009 |
| CV - Ms Sonali Wayal     |  | 10 November 2009 |
| Letter from Funder       |  | 27 October 2009  |

#### **Membership of the Committee**

The members of the Ethics Committee who were present at the meeting are listed on the attached sheet.

#### **Statement of compliance**

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

#### **After ethical review**

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email

████████████████████

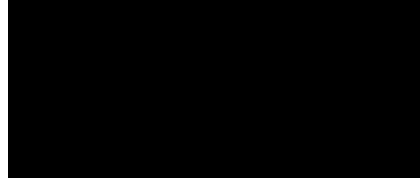
## Appendix 3: Research and Development approval letter



Camden **NHS**

Primary Care Trust

North Central London Research Consortium



19<sup>th</sup> January 2010

Professor Graham Hart



Dear Professor Hart,

**Title: Sex, Health, Antiretroviral Treatment and Partner Notification (SHARPN) Project**

**LREC Ref: 09/H0703/120**

**CSP Reference Number: 28963**

I am pleased to confirm that the above study has now received R&D approval, and you may now start your research in Camden NHS PCT. May I take this opportunity to remind you that during the course of your research you will be expected to ensure the following:

- **Patient contact:** only trained or supervised researchers who hold the appropriate Trust/NHS contract (honorary or full) with each Trust are allowed contact with that Trust's patients. If any researcher on the study does not hold a contract please contact the R&D office as soon as possible.
- **Informed consent:** original signed consent forms must be kept on file. A copy of the consent form must also be placed in the patient's notes. Research projects are subject to random audit by a member of the R&D office who will ask to see all original signed consent forms.
- **Data protection:** measures must be taken to ensure that patient data is kept confidential in accordance with the Data Protection Act 1998.
- **Health & safety:** all local health & safety regulations where the research is being conducted must be adhered to.
- **Adverse events:** adverse events or suspected misconduct should be reported to the R&D office and the Ethics Committee.
- **Project update:** you will be sent a project update form at regular intervals. Please complete the form and return it to the R&D office.
- **Publications:** it is essential that you inform the R&D office about any publications which result from your research.
- **Ethics:** R&D approval is based on the conditions set out in the favourable opinion letter from the Ethics Committee. If during the lifetime of your research project, you wish to make a revision or amendment to your original submission, please contact both the Ethics Committee and R&D Office as soon as possible.

Please ensure that all members of the research team are aware of their responsibilities as researchers. For more details on these responsibilities, please check the R&D handbook or NoCLoR website:  
<http://www.noclor.nhs.uk>

We would like to wish you every success with your project

Yours sincerely,

A solid black rectangular box used to redact the signature of Angela Williams.

Angela Williams  
Research & Development Manager

## Appendix 4: SHARPN survey

### Sex, Health, Antiretroviral Treatment and Partner Notification Project (SHARPN)

*Welcome to the Sex, Health, Anti-Retroviral Treatment and Partner Notification (SHARPN) Survey. Thank you for agreeing to participate in the survey. This survey is being conducted to understand how HIV and HIV treatment is affecting the lives of people living with HIV. Sexually transmitted infections (STIs) are a common problem among HIV positive men who have sex with men. We want to find better ways of treating STIs and contacting sexual partners of a person diagnosed with STIs to inform them of the need to get tested.*

#### COMPUTER ASSISTED INTERVIEW

*-This is an ANONYMOUS computer-assisted survey so you can answer the questions without feeling hesitant about the interviewer's presence. You are not asked for your name anywhere in the survey.*

*-You may find some questions sensitive but please be assured that we would not ask you these questions if they were not important for research and to improve health and well-being of you and the gay community. Since your name will not appear on the survey, no one will be able to link your responses with you.*

*-On an average it takes approximately 35-50 minutes to complete this survey.*

*-When you are finished, please click the FINISH button. From then onwards your answers become a part of the total data collected from all survey participants.*

*-If due to any reason you are not able to complete the survey in one go, then you have the option to complete it later if you have access to computer and internet. If you do, then all you need to do is click the 'SAVE' button and you will be asked to provide your email address. Once you enter your email address, press the 'SEND RETURN TICKET' button. After pressing this button if you see the message 'Please enter a valid return ticket to continue the survey' which asks you for respondent id and password, don't worry, ignore this page and close the survey. You will receive an email with a survey link immediately. You should check your 'JUNK MAIL' in case you do not find the survey email titled "UCL Opinio" in your inbox! Just click on that link and complete the survey. Press the 'FINISH' button when you complete the survey.*

*-You may find it useful to have pen and paper with you to make some notes to help you with your survey but it is not a must.*

#### GIVING YOUR CONSENT

*Your participation in the SHARPN survey is voluntary. The SHARPN survey is anonymous and you provide your consent simply by completing the survey questionnaire. If you decide you do not want to participate we assure you that your care at the Bloomsbury clinic will not be affected in anyway.*

*To start the interview please press the 'Start' button.*

### DEMOGRAPHIC DETAILS

**Q1: Please write the name and position of the person (i.e. doctor, nurse, patient rep etc) who told you about this survey?**

dont know

**Q2: You were told about this survey:**

- When you came for booked appointment (please specify with whom)
- When you came for walk-in appointment (please specify for what purpose)
- Via an email you received from your Doctor
- Via an email you received from Patient Rep
- When you were given a telephone call by a Doctor
- When you were given a telephone call by a NURSE
- In some other way, please specify

**Q3: What was your age at your last birthday?**

years

**Q4: What is your first language, that is the language you understand the best?**

- |  |                              |                                 |  |
|--|------------------------------|---------------------------------|--|
| <input type="radio"/> English              | <input type="radio"/> French | <input type="radio"/> Italian   | <input type="radio"/> Spanish                |
| <input type="radio"/> Portuguese/Brazilian | <input type="radio"/> German | <input type="radio"/> Arabic    | <input type="radio"/> Hindi/Gujarati/Bengali |
| <input type="radio"/> Cantonese/Mandarin   | <input type="radio"/> Other  | <input type="radio"/> Dont know |  |

**Q5: Which of the following ethnic group do you consider you belong?**

- |   |   |
|---|---|
| <input type="radio"/> White British                           | <input type="radio"/> White Irish                     |
| <input type="radio"/> Any Other White (American/European etc) | <input type="radio"/> Mixed White and Black Caribbean |
| <input type="radio"/> Mixed White and Black African           | <input type="radio"/> Mixed White and Asian           |
| <input type="radio"/> Any Other Mixed Background              | <input type="radio"/> Asian British                   |
| <input type="radio"/> Asian Indian                            | <input type="radio"/> Asian Pakistani                 |
| <input type="radio"/> Asian Bangladeshi                       | <input type="radio"/> Any other Asian background      |
| <input type="radio"/> British Black                           | <input type="radio"/> Black Caribbean                 |
| <input type="radio"/> Black African                           | <input type="radio"/> Any other African Background    |
| <input type="radio"/> Chinese                                 | <input type="radio"/> Any other                       |

**Q6: Were you born in the United Kingdom?**

- Yes  No

*Note: if you have answered/chosen item [1] in question 6, skip the following question*

**Q7: Which of the following describes the region where you were born?**

- |   |   |
|---|---|
| <input type="radio"/> Northern Europe                               | <input type="radio"/> Southern Europe                               |
| <input type="radio"/> North America                                 | <input type="radio"/> Central or South America (Includes Carribean) |
| <input type="radio"/> East Asia                                     | <input type="radio"/> Indian Sub-Continent                          |
| <input type="radio"/> Mid-East or North Africa                      | <input type="radio"/> Sub-Saharan Africa                            |
| <input type="radio"/> Australia, New Zealand, or the Pacific Island | <input type="radio"/> Other   |
| <input type="radio"/> Dont know                                     |   |

**Q8: Do you currently live in London?**

- Yes  No

*Note: if you have answered/chosen item [2] in question 8, skip the following question*

*Note: if you have answered/chosen item [2] in question 8, skip the following question*

**Q9: In which year did you begin living in London the first time? i.e. 1982, 1991**

YYYY

**Q10: What is your employment status?**

- Employed  Unemployed  Medically Retired  Other

*Note: if you have answered/chosen item [2, 3] in question 10, skip the following question*

**Q11: Do you normally work.....**

- Part-time  Full-time  Other  Not applicable

*Note: if you have answered/chosen item [2, 3] in question 10, skip the following question*

**Q12: What is your annual income in pounds (£) ?**

- |  |                                     |  |  |
|--|-------------------------------------|--|--|
| <input type="radio"/> Less than 10,000 | <input type="radio"/> 10,000-19,999 | <input type="radio"/> 20,000-29,999    | <input type="radio"/> 30,000-39,999      |
| <input type="radio"/> 40,000-49,999    | <input type="radio"/> 50,000-60,000 | <input type="radio"/> More than 60,000 | <input type="radio"/> Declined to answer |
| <input type="radio"/> Not applicable   |                                     |  |  |



**Q13: Do you receive social welfare benefits?**

- Yes                       No                       Declined to answer

**Q14: What is your highest educational qualification you have completed?**

- I have no educational qualifications                       0-levels/GCSE or equivalent (school age 15/16)  
 A-levels or equivalent (school age 17/18)                       Diploma or NVQ or BTEC  
 University Degree (eg. B.A, BSc.)                       Postgraduate Qualification  
 Other

**Q15: Do you own or rent the place where you live currently?**

- Own-outright or with a mortgage/loan                       Rent-from council  
 Rent-from housing association                       Rent-from private landlord  
 Tied to your job (include rent free accommodation)                       Squat  
 Other                       Declined to answer

**Q16: Which of the following best describes your living arrangements?**

- Homeless/live in temporary accommodation  
 Live alone  
 Live with partner(s)  
 Live with partner(s) and/or others (eg children, friends, tenants)  
 Living with others (eg children, friends)  
 None of the above  
 Declined to answer

**Q17: What is the first half of your home postcode? (eg: WC1, NW5)**

## GENERAL HEALTH AND HIV DIAGNOSIS

**Q18: THE FOLLOWING QUESTIONS ARE ABOUT HEALTH AND HIV:**

How would you describe your overall health, in general, in the last 6 months? Please select the appropriate rating:

- 1 (Very Good)     2     3     4     5 (Very Poor)

**Q19: In which year were you first told that you have HIV? (1987, 1997, 2004??.) (Dont worry if you dont remember the exact year. Try to write an approximate year):**

YYYY

**Q20: Where were you told that you have HIV?**

- |  |   |
|--|---|
| <input type="radio"/> Sexual health clinic in London | <input type="radio"/> Sexual health clinic outside London |
| <input type="radio"/> GP                             | <input type="radio"/> Hospital when you were in-patient   |
| <input type="radio"/> Hospital as an out-patient     | <input type="radio"/> Outside the UK                      |
| <input type="radio"/> Other/None of the above        | <input type="radio"/> Dont know/dont remember             |

**Q21: Who have you told about your HIV Status (tick ALL that apply)?**

- |   |  |
|---|--|
| <input type="checkbox"/> No one               | <input type="checkbox"/> Primary Partner/spouse/Lover          |
| <input type="checkbox"/> HIV Positive friends | <input type="checkbox"/> Close friends                         |
| <input type="checkbox"/> Other friends        | <input type="checkbox"/> Son(s)/daughters                      |
| <input type="checkbox"/> Parents              | <input type="checkbox"/> Brothers/sisters                      |
| <input type="checkbox"/> Neighbours           | <input type="checkbox"/> People from my ethnic community/group |
| <input type="checkbox"/> Work colleagues      | <input type="checkbox"/> Your GP                               |

*Note: if you have answered/chosen at least one of the following items: [1] in question 21, skip the following question*

*Note: if you have answered/chosen at least one of the following items: [1] in question 21, skip the following question*

**Q22: Did telling these people about your HIV status have a negative effect on you? (i.e. they changed their behaviour/attitudes towards you in a bad way)**

- Yes     No     Not Sure

## SEXUALITY AND SEXUAL PRACTICES WITH REGULAR AND NEW PARTNERS

**Q23: The Following Questions Are About Sexuality And Your Sexual Life. Definitions Are Attached With The Questions And Some Of These Definitions May Seem Funny, But They Help Make The Questions Clear.**

**How would you describe your sexual orientation?**

**Q24: How old were you the FIRST TIME you had ANY sexual contact with a boy/man? (Sexual contact means mutual masturbation (wanking), oral sex (sucking), anal intercourse (fucking) or any type of physical contact involving the genital area that you felt was sexual).**

years

**Q25: Have you EVER had anal intercourse with a man? (Anal intercourse, means anal sexual intercourse or fucking - a boy's /man's penis entering a partner's arse/anus).**

- Yes                       No                       Declined to answer

*Note: if you have answered/chosen item [2, 3] in question 25, skip the following question*

**Q26: How old were you the FIRST TIME you EVER had anal intercourse (fucking) with a boy/man? Don't worry if you don't remember exact age, please give approximate age.**

years

**Q27: Do you currently have a boyfriend?**

- Yes     No

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

**Q28: What is the age of your boyfriend? Don't worry if you don't know exact age. Write approximately how old he is.**

years

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

**Q29: Which of the following ethnic group do you think your boyfriend belongs?**

- |   |   |
|---|---|
| <input type="radio"/> White British                           | <input type="radio"/> White Irish                     |
| <input type="radio"/> Any Other White (American/European etc) | <input type="radio"/> Mixed White and Black Caribbean |
| <input type="radio"/> Mixed White and Black African           | <input type="radio"/> Mixed White and Asian           |
| <input type="radio"/> Mixed Any Other Background              | <input type="radio"/> Asian British                   |
| <input type="radio"/> Asian Indian                            | <input type="radio"/> Asian Pakistani                 |
| <input type="radio"/> Asian Bangladeshi                       | <input type="radio"/> Any Other Asian Background      |
| <input type="radio"/> British Black                           | <input type="radio"/> Black Caribbean                 |
| <input type="radio"/> Black African                           | <input type="radio"/> Any Other African Background    |
| <input type="radio"/> Chinese                                 | <input type="radio"/> Any other ethnic group          |



*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 35, skip the following question*

**Q36: In which year was YOUR boyfriend diagnosed HIV positive? Dont worry if you dont remember the exact year.  
Please write approximate year:**

YYYY

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 35, skip the following question*

**Q37: In the last 6 months, what was the viral load of your boyfriend? Write an approximate if you don't remember the exact details:**

- Less than 50       Between 50 and 10,000       10,000 to 100,000       More than 100,000  
 Don't know       Declined to answer       Not applicable

## SEXUAL ACTIVITY WITH BOYFRIEND IN THE LAST 6 MONTHS

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

**Q38: Now I would like to ask you about your sexual activity in the LAST 6 MONTHS with your BOYFRIEND. Please be assured that we would not ask you these questions if they were not important. For questions where we ask you to record the number of times you practiced particular types of sexual activity, do not worry if you do not remember the exact number. Please give your best estimate.**

**In the LAST 6 MONTHS, have you had receptive and/or insertive anal intercourse (fucking) with your BOYFRIEND?**

- Yes       No       Declined to answer       Not applicable

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

**Q39: In the LAST 6 MONTHS, did YOU fuck your boyfriend (i.e. you were the one doing the fucking)?**

- Yes       No

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 39, skip the following question*

**Q40: The following questions are about YOU fucking your boyfriend (i.e. you were the one doing the fucking):**

**In the LAST 6 MONTHS, how often did YOU fuck your boyfriend WITH a condom and CUM INSIDE HIM (i.e. you came/ejaculated inside your boyfriend but you were wearing a condom)?**

- Never       Occassionally       Always       Don't know  
 Declined to answer       Not applicable

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 39, skip the following question*

*Note: if you have answered/chosen item [1, 4, 5, 6] in question 40, skip the following question*

**Q41: In the LAST 6 MONTHS, approximately How Many times did YOU fuck your boyfriend WITH a condom and CUM INSIDE HIM (i.e. you came/ejaculated inside your boyfriend but you were wearing a condom)?**

Record actual number

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 39, skip the following question*

**Q42: In the LAST 6 MONTHS, how often did YOU fuck your boyfriend WITHOUT a condom and CUM INSIDE HIM? (i.e. you were NOT wearing a condom and you ejaculated/came inside your boyfriend)**

- Never                       Occasionally                       Always                       Dont know  
 Declined to answer                       Not applicable

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 39, skip the following question*

*Note: if you have answered/chosen item [1, 5, 6] in question 42, skip the following question*

**Q43: In the LAST 6 MONTHS, approximately How Many times did YOU fuck your boyfriend WITHOUT a condom and cum inside him (i.e. you were NOT wearing a condom and you ejaculated/cum inside your boyfriend):**

Record actual number

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 39, skip the following question*

**Q44: In the LAST 6 MONTHS, how often did YOU fuck your boyfriend WITH a condom but you PULLED OUT before cumming inside him? (i.e. you were wearing a condom but you also pulled out (withdrew) before you came/ejaculated):**

- Never                       Occasionally                       Always                       Dont know  
 Declined to answer                       Not applicable

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 39, skip the following question*

*Note: if you have answered/chosen item [1, 5, 6] in question 44, skip the following question*

**Q45: In the LAST 6 MONTHS, approximately How Many times did YOU fuck your boyfriend WITH a condom and PULLED out before cumming /ejaculating? (i.e. you were wearing a condom but you also pulled out (withdrew) before you came/ejaculated):**

Record actual number

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 39, skip the following question*

**Q46: In the LAST 6 MONTHS, how often did YOU fuck your boyfriend WITHOUT a condom and PULLED OUT before cumming/ejaculation? (i.e. you were NOT wearing a condom but you pulled out (withdrew) and did NOT cum inside your boyfriend):**

- Never                       Occasionally                       Always                       Dont know  
 Declined to answer                       Not applicable

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 39, skip the following question*

*Note: if you have answered/chosen item [1, 5, 6] in question 46, skip the following question*

**Q47: In the LAST 6 MONTHS, approximately How Many times did YOU fuck your boyfriend WITHOUT a condom and you PULLED OUT before cumming? (i.e. you were NOT wearing a condom but you pulled out (withdrew) and did NOT cum inside your boyfriend):**

Record actual number

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

**Q48: In the LAST 6 MONTHS, did Your boyfriend fuck you? (i.e. your BOYFRIEND was doing the fucking)**

- Yes     No

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 48, skip the following question*

**Q49: In the LAST 6 MONTHS, how often did your BOYFRIEND fuck you WITH a condom and CUM INSIDE YOU? (i.e. your boyfriend came/ejaculated inside you but he was wearing a condom)**

- Never                       Occasionally                       Always                       Dont know  
 Declined to answer                       Not applicable

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 48, skip the following question*

*Note: if you have answered/chosen item [1, 5, 6] in question 49, skip the following question*

**Q50: In the LAST 6 MONTHS, approximately How Many times did your BOYFRIEND fuck you WITH a condom and CUM INSIDE YOU? (i.e. your boyfriend came/ejaculated inside you but he was wearing a condom)**

Record actual number

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 48, skip the following question*

**Q51: In the LAST 6 MONTHS, how often did your BOYFRIEND fuck you WITHOUT a condom and CUM INSIDE YOU? (i.e. he came/ejaculated inside you and he was NOT wearing a condom)**

- Never                       Occasionally                       Always                       Dont know  
 Declined to answer                       Not applicable

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 48, skip the following question*

*Note: if you have answered/chosen item [1, 5, 6] in question 51, skip the following question*

**Q52: In the LAST 6 MONTHS, approximately How Many times did your BOYFRIEND fuck you WITHOUT a condom and CUM INSIDE YOU? (i.e. he came/ejaculated inside you and he was NOT wearing a condom)**

Record actual number

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 48, skip the following question*

**Q53: In the LAST 6 MONTHS, how often did your BOYFRIEND fuck you WITH a condom and he PULLED OUT before cumming/ejaculation? (i.e. he was wearing a condom but he also pulled out (withdrew) before he came)**

- Never                       Occasionally                       Always                       Dont know  
 Declined to answer                       Not applicable

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 48, skip the following question*

*Note: if you have answered/chosen item [1, 5, 6] in question 53, skip the following question*

**Q54: In the LAST 6 MONTHS, approximately How Many times did your BOYFRIEND fuck you WITH a condom and he PULLED OUT before cumming/ejaculation? (i.e. he was wearing a condom but he also pulled out (withdrew) before he came)**

Record actual number

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 48, skip the following question*

**Q55: In the LAST 6 MONTHS, how often did your BOYFRIEND fuck you WITHOUT a condom but he PULLED OUT of you before ejaculating/cumming? (i.e. he was NOT wearing a condom but he pulled out (withdrew) to avoid cumming inside you)**

- Never                       Occasionally                       Always                       Dont know  
 Declined to answer                       Not applicable



*Note: if you have answered/chosen item [2] in question 27, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 38, skip the following question*

*Note: if you have answered/chosen item [2] in question 48, skip the following question*

*Note: if you have answered/chosen item [1, 5, 6] in question 55, skip the following question*

**Q56: In the LAST 6 MONTHS, approximately How Many times did your BOYFRIEND fuck you WITHOUT a condom but he PULLED OUT before cumming inside you? (i.e. he was NOT wearing a condom but he pulled out (withdrew) to avoid cumming inside you)**

Record actual number

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

**Q57: In the LAST 6 MONTHS, which other type of sex did you have with your Boyfriend? (tick ALL that apply)**

- I sucked his cock but he did NOT come in my mouth
- He sucked my cock but I did NOT come in his mouth
- I sucked his cock and he came in my mouth
- He sucked my cock and I came in his mouth
- I and my partner together had sex with other men
- I fisted him (fisting means putting part or all of a hand into a partner's arse/anus)
- He fisted me
- I put a dildo/other sex toy into my partner's arse/anus
- He put a dildo/other sex toy into my arse/anus
- We both had watersports (sex that involves urine/piss)
- We both had scat (sex that involves shit/faeces)
- We both had piercing/other activities that involve blood
- We both used recreational drugs for sex
- We did NOT have sex in the last 6 months

*Note: if you have answered/chosen item [2] in question 27, skip the following question*

**Q58: In the LAST 6 MONTHS, do you think your boyfriend had other sex partners?**

- Yes
- No
- Probably
- Probably Not
- Don't know
- Declined to answer
- Not applicable

**Q59: In the LAST 6 MONTHS, which of the following other types of sexual partner(s) have you had? (Tick ALL that apply)**

- I had sex with casual sexual partners
- I had sex with my primary partner
- I had sex with regular partners (not casual and not your primary partner)
- I had sex with paid sexual partners
- None of the above describes my sexual partners
- I did not have sex in the last 6 months
- Dont know
- Declined to answer

Not applicable

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

**Q60: In the LAST 6 MONTHS, where have you met your male sexual partner(s)? (Tick ALL that apply)**

- Internet
- Bar/club
- Backroom
- Cottage (public toilet)
- College/Work
- Sauna
- Private Party
- Gym
- Dating agency/lonely hearts
- Telephone chatline
- Gay sex clubs (where you can have sex on premises)
- Cruising ground (eg Hampstead Heath)
- Leather clubs/leather scenes/leather events
- Patient group/event
- Through friends
- In London
- Outside London
- Dont remember
- Declined to answer
- Not applicable
- I had sex ONLY with my boyfriend in the last 6 months

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

**Q61: In the LAST 6 MONTHS, how often did you have GROUP SEX involving at least two other men (apart from your boyfriend)?**

- Never                       1-5 times                       6-10 times                       11-15 times  
 More than 15 times                       Declined to answer

### Sexual Activity in the LAST MONTH

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

**Q62: The following questions are about your sexual activity in the LAST MONTH in general. In questions where we have asked for a number, please give your best estimate if you can't provide exact figures.**

**In the LAST MONTH, did you have ANY sexual contact with men (sexual contact means mutual masturbation (wanking), oral sex, anal intercourse (fucking) or any other physical contact involving the genital area):**

Yes  No

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

*Note: if you have answered/chosen item [2] in question 62, skip the following question*

**Q63: In the LAST MONTH, with How Many men did you have ANY sexual contact? This could have been your boyfriend or other regular sex partners or casual partners. Don't worry if you do not remember the exact number. Please provide an estimate:**

number of men

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

*Note: if you have answered/chosen item [2] in question 62, skip the following question*

**Q64: In the LAST MONTH, were any of the men you had sexual contact your 'NEW' partners (i.e. men with whom you had sex with for the FIRST time during the last month)?**

Yes  No

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

*Note: if you have answered/chosen item [2] in question 62, skip the following question*

*Note: if you have answered/chosen item [2] in question 64, skip the following question*

**Q65: In the LAST MONTH, HOW MANY of your sex partners were NEW partners (i.e. men with whom you had sex for the first time)?**

number of new partners

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

*Note: if you have answered/chosen item [2] in question 62, skip the following question*

*Note: if you have answered/chosen item [2] in question 64, skip the following question*

**Q66: In the LAST MONTH, did you have insertive or receptive anal sex (FUCKING) with your NEW sexual partners (i.e. men with whom you had sex for the first time)?**

Yes  No

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

*Note: if you have answered/chosen item [2] in question 62, skip the following question*

*Note: if you have answered/chosen item [2] in question 64, skip the following question*

*Note: if you have answered/chosen item [2] in question 66, skip the following question*

**Q67: In the LAST MONTH, with HOW MANY of the 'NEW' partners did you have insertive or receptive anal intercourse (fucking)?**

number of men



*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

*Note: if you have answered/chosen item [2] in question 62, skip the following question*

*Note: if you have answered/chosen item [2] in question 64, skip the following question*

*Note: if you have answered/chosen item [2] in question 66, skip the following question*

**Q69: In the LAST MONTH, about HOW MANY of the ?NEW partners? who fucked you (i.e..THEY were the one doing the fucking):**

You knew were HIV Positive

You assumed were HIV Positive

You knew were HIV Negative

You assumed were HIV Negative

You knew have HEPATITIS C

You did NOT know the HIV status of your New Partner

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

*Note: if you have answered/chosen item [2] in question 62, skip the following question*

*Note: if you have answered/chosen item [2] in question 64, skip the following question*

*Note: if you have answered/chosen item [2] in question 66, skip the following question*

**Q70: In the LAST MONTH, about How Many of the 'NEW partners? whom you fucked (i.e. YOU were doing the fucking)::**

You knew were HIV Positive

You assumed were HIV Positive

You knew were HIV Negative

You assumed were HIV Negative

You knew have HEPATITIS C

You did NOT know the HIV status of your New Partner

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

*Note: if you have answered/chosen item [2] in question 62, skip the following question*

*Note: if you have answered/chosen item [2] in question 64, skip the following question*

*Note: if you have answered/chosen item [2] in question 66, skip the following question*

**Q71: In the LAST MONTH, about how many of your 'NEW partners? with whom you had anal intercourse (fucking) were ANONYMOUS (i.e. you will not be able to contact them again because you do not have their contact details)?**

Number of New Anonymous Partners

None of your new partners were anonymous

Don't remember

*Note: if you have answered/chosen at least one of the following items: [6, 9] in question 59, skip the following question*

*Note: if you have answered/chosen item [2] in question 62, skip the following question*

**Q72: In the LAST MONTH, with how many of your 'OTHER PARTNERS'? did YOU fuck (i.e. you were doing the fucking)? Other partners are everyone else you had sexual contact with in the last month, Excluding your new partners and your boyfriend.**

Number of Other Partners

Did not have sex with Other partners in the last month

Don't remember

## SEXUAL ACTIVITY IN THE LAST 12 MONTH

**Q73: You are doing great! In the previous section, we asked you about your sexual partners in last month. The following section is about your sexual activity in the LAST 12 MONTHS. For questions where you are asked to provide numbers, please give your best estimate if you can't provide exact figures.**

**In the LAST 12 MONTHS, did you have ANY sexual contact with men? This could have been your current or your ex-boyfriend or other sex partners. (Sexual contact means mutual masturbation (wanking), oral sex (sucking), anal intercourse (fucking) or any type of physical contact involving the genital area that you felt was sexual).**

Yes  No

*Note: if you have answered/chosen item [2] in question 73, skip the following question*

**Q74: In the LAST 12 MONTHS, with How Many men have you had Any sexual contact? You'll remember sexual contact means mutual masturbation (wanking), oral sex (sucking), anal intercourse (fucking) or any type of physical contact involving the genital area that you felt was sexual).**

number of men

*Note: if you have answered/chosen item [2] in question 73, skip the following question*

**Q75: In the LAST 12 MONTHS, did you have insertive or receptive Anal intercourse (fucking) with any male sexual partners?**

Yes  No

*Note: if you have answered/chosen item [2] in question 73, skip the following question*

*Note: if you have answered/chosen item [2] in question 75, skip the following question*

**Q76: In the LAST 12 MONTHS, how many men you had anal sex (fucking) were/or still are your boyfriend OR your 'regular sex partner' (i.e. someone who is not your boyfriend but with whom you had regular sexual relationship):**

number of men

tick this box if none of your anal sex partners in the last year were your Regular sex partners or your boyfriend

*Note: if you have answered/chosen item [2] in question 73, skip the following question*

**Q77: In the LAST 12 MONTHS, did you have ANY sexual contact with 'NEW' partners (i.e. men with whom you had sex with for the FIRST TIME during the last 12 months)? (Sexual contact means mutual masturbation (wanking), oral sex (sucking), anal intercourse (fucking) or any type of physical contact involving the genital area that you felt was sexual).**

Yes  No

*Note: if you have answered/chosen item [2] in question 73, skip the following question*

*Note: if you have answered/chosen item [2] in question 77, skip the following question*

**Q78: In the LAST 12 MONTHS, HOW MANY of your sex partners were your 'New' sexual partners (i.e. men you had sex with the first time in the LAST 12 MONTHS)?**

number of men





|   |                       |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| He fucked me with a condom  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I fucked him WITHOUT a condom but pulled out (WITHDREW) before I came/ejaculated  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| He fucked me WITHOUT a condom but pulled out (WITHDREW) before he came/ejaculated | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I fucked him without a condom and came/ejaculated inside him                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| He fucked me without a condom and came/ejaculated inside me                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*Note: if you have answered/chosen item [2] in question 73, skip the following question*

*Note: if you have answered/chosen item [2] in question 77, skip the following question*

*Note: if you have answered/chosen item [2] in question 79, skip the following question*

**Q83: In the LAST 12 MONTHS, about HOW MANY of the ?new partners? who fucked you (i.e. THEY were the one doing the fucking):**

You knew were HIV positive

You assumed to be HIV positive

You knew were HIV negative

You assumed to be HIV negative

You knew have HEPATITIS C

You did NOT know the HIV status of your partners

*Note: if you have answered/chosen item [2] in question 73, skip the following question*

*Note: if you have answered/chosen item [2] in question 77, skip the following question*

*Note: if you have answered/chosen item [2] in question 79, skip the following question*

**Q84: In the LAST 12 MONTHS, about HOW MANY of the ?new partners? you had insertive anal sex with (i.e. YOU were doing the fucking):**

You knew were HIV positive

You assumed to be HIV positive

You knew were HIV negative

You assumed to be HIV negative

You knew have HEPATITIS C

You did NOT know the HIV status of your new partners

*Note: if you have answered/chosen item [2] in question 73, skip the following question*

**Q85: In the LAST 12 MONTHS, with HOW MANY of your ?OTHER PARTNERS' did you have insertive anal intercourse (i.e. you were the one doing the fucking)? (Other partners are everyone else you had sexual contact with in the last 12 months, excluding your new partners and your boyfriend).**

Number of other partners

Did not have sex with other partners

Don't know



*Note: if you have answered/chosen item [2, 3] in question 92, skip the following question*

*Note: if you have answered/chosen item [2, 3] in question 93, skip the following question*

**Q94: In the LAST 5 YEARS, with how many women did you have sexual contact?**

Number of women

Don't remember

*Note: if you have answered/chosen item [2, 3] in question 92, skip the following question*

*Note: if you have answered/chosen item [2, 3] in question 93, skip the following question*

**Q95: In the LAST 5 YEARS, what types of sex did you have with your female sexual partner? Tick ALL that apply**

- |   |   |
|---|---|
| <input type="checkbox"/> We had vaginal sex and used a condom       | <input type="checkbox"/> We had vaginal sex Without a condom                |
| <input type="checkbox"/> We had anal sex and used a condom          | <input type="checkbox"/> We had anal sex Without a condom                   |
| <input type="checkbox"/> She sucked my cock and I came in her mouth | <input type="checkbox"/> She sucked my cock but I did NOT come in her mouth |
| <input type="checkbox"/> We had some other type of sex              |   |

*Note: if you have answered/chosen item [2, 3] in question 92, skip the following question*

*Note: if you have answered/chosen item [2, 3] in question 93, skip the following question*

**Q96: In the LAST 5 YEARS, the women you had sex with, how many:**

You knew were HIV positive

You assumed to be HIV positive

You knew were HIV negative

You assumed to be HIV negative

You did NOT know their HIV status

## PARTNER NOTIFICATION

**Q97: The following questions are about screening for sexually transmitted infections. In this section by sexually transmitted infections we mean infections like Gonorrhoea, Chlamydia, Syphilis, Hepatitis C or A, LGV, Herpes (not HIV) unless we specify that we are asking about HIV. We use the acronym STIs for sexually transmitted infections. We would like to ask you about your opinion and preferences for contacting your sexual partner(s) following your diagnosis with stis to inform them that they may have been exposed to STIs and advise them to test for STIs. This process is called Partner Notification.**

**Did the clinic staff EVER advise you to inform your sexual partners to test for STIs following your diagnosis with STIs or HIV?**

Yes  No

*Note: if you have answered/chosen item [2] in question 97, skip the following question*

**Q98: Which of the following clinic staff has EVER discussed with you about contacting your sexual partner(s) following your diagnosis with STIs or HIV (tick ALL that apply)?**

Health Advisor       Nurse       Doctor       Other (please specify)  
 Not applicable

**Q99: Have you heard of Post-Exposure Prophylaxis for sexual exposure, also known as PEPSE?**

Yes  No

*Note: if you have answered/chosen item [2] in question 99, skip the following question*

**Q100: Since your diagnosis with HIV, has any of your sexual partner(s) ever consulted the clinic for a Post-Exposure Prophylaxis (PEPSE) for HIV after having sex with you?**

Yes  No

*Note: if you have answered/chosen item [2] in question 99, skip the following question*

*Note: if you have answered/chosen item [2] in question 100, skip the following question*

**Q101: Why did your sexual partner consult the clinic to have a Post-Exposure Prophylaxis (PEPSE) for HIV? (tick ALL that apply)**

We had unprotected anal sex  
 Condom breakage/slippage  
 We were under the influence of alcohol and/or drugs  
 You did not know your partner was HIV negative  
 Your sexual partner was advised by the clinic to have PEP by the clinic staff  
 Your partner decided to take PEPSE as a precautionary measure

Other (please specify)

*Note: if you have answered/chosen item [2] in question 99, skip the following question*

*Note: if you have answered/chosen item [2] in question 100, skip the following question*

**Q102: Since your diagnosis with HIV how many of your sexual partners, after consulting the clinic for PEPSE for HIV, actually took PEPSE and/or how many decided NOT to take it?**

**Number of partners took PEPSE**

**Number of partners did NOT take PEPSE**

*Note: if you have answered/chosen item [2] in question 99, skip the following question*

*Note: if you have answered/chosen item [2] in question 100, skip the following question*

**Q103: What were the reasons your partners decided NOT to take PEPSE?**

- Not applicable (choose this option if your partner took PEPSE)
- Worried about side-effects
- My partner was too late in approaching the clinic for PEPSE
- Your partner felt it was no longer important to take PEPSE
- The clinic advised that it was not important to have PEPSE
- Other, please specify

**Q104: Have you heard of Hepatitis C?**

Yes  No



*Note: if you have answered/chosen item [2] in question 108, skip the following question*

**Q111: Have you EVER experienced a break-up of your relationship as a result of contacting your sexual partner(s) following your diagnosis with STIs or HIV?**

- Yes
                 
  No
                 
  Not applicable

**Q112: Have you ever worried that either you or clinic staff contacting your sexual partner(s) to ask them to test for STIs can breach your HIV confidentiality?**

- Yes
                 
  No
                 
  Not applicable

**Q113: Since being told that you have HIV, have you tested for STIs like Gonorrhoea, Syphilis, Hepatitis C etc?**

- Yes
                 
  No
                 
  Dont Know
                 
  Not applicable

**Q114: When do you usually get tested for STIs (tick ALL that apply)?**

- If I have symptoms  
 If my doctor asks me to test for STIs  
 If my sexual partner is diagnosed with STIs  
 When I come to the clinic  
 If I have unprotected anal sex with new partner  
 After having group sex (i.e. sex with more than one partner)  
 Never test for other STIs  
 Don't know  
 Other (please specify)  
 Not applicable

*Note: if you have answered/chosen at least one of the following items: [7] in question 114, skip the following question*

**Q115: When was the MOST RECENT occasion you tested for any STIs?**

- Today
   
  Between yesterday and last month  
 In the last 12 months
   
  Between 1 and 2 years  
 More than 2 years ago
   
  Don't remember  
 Declined to answer
   
  Not applicable



*Note: if you have answered/chosen at least one of the following items: [7] in question 114, skip the following question*

**Q116: Where did you get tested for STIs on that most recent occasion?**

- HIV clinic
- Sexual health clinic/GUM clinic
- GP surgery
- Sauna
- Accident & Emergency Department
- Other community testing center (e.g. Terrence Higgins Trust)
- Other (home sampling kit etc)
- Don't remember
- Not applicable

**Q117: When was the last time you were diagnosed with any STIs?**

- Today
- Between 1 and 2 years
- Don't remember
- Between today and last month
- More than 2 years ago
- Declined to answer
- In the last 12 months
- Never had STIs

*Note: if you have answered/chosen item [6, 7, 8] in question 117, skip the following question*

**Q118: At that time, which of the following STIs did you test positive (tick ALL that apply)?**

- |   |  |
|---|--|
| <input type="checkbox"/> Urethral Gonorrhoea (Gonorrhoea in penis)        | <input type="checkbox"/> Rectal Gonorrhoea (Gonorrhoea in anus/arse)     |
| <input type="checkbox"/> Pharyngeal Gonorrhoea (Gonorrhoea in the throat) | <input type="checkbox"/> Urethral Chlamydia (Chlamydia in penis)         |
| <input type="checkbox"/> Rectal Chlamydia (Chlamydia in anus/arse)        | <input type="checkbox"/> Pharyngeal Chlamydia (Chlamydia in the throat)  |
| <input type="checkbox"/> Rectal herpes (Herpes in/around your arse)       | <input type="checkbox"/> Genital Herpes (Herpes on/in/around your penis) |
| <input type="checkbox"/> Genital Warts (Human Papilloma Virus HPV)        | <input type="checkbox"/> Syphilis  |
| <input type="checkbox"/> LGV  | <input type="checkbox"/> Hepatitis A                                     |
| <input type="checkbox"/> Hepatitis B                                      | <input type="checkbox"/> Hepatitis C                                     |
| <input type="checkbox"/> Declined to answer                               | <input type="checkbox"/> Don't remember                                  |
| <input type="checkbox"/> Not applicable                                   |  |

*Note: if you have answered/chosen item [6, 7, 8] in question 117, skip the following question*

**Q119: At that time, did the clinic staff advise you about the need to inform your sexual partner(s) to test for STIs?**

- Yes
- No
- Declined to answer
- Not applicable

*Note: if you have answered/chosen item [6, 7, 8] in question 117, skip the following question*

*Note: if you have answered/chosen item [2, 3] in question 119, skip the following question*

**Q120: Were you given any of the following to assist you in notifying your partners that you had an STIs (tick ALL that apply)?**

- Referral slips (small forms given by clinic to be given to your partners to bring with them to clinic)
- Written information about the STIs you were diagnosed with
- Written information for your partners about where to obtain a test
- Something else (please specify)
- Dont remember/dont know
- No I was not given any of these above mentioned items
- Not applicable

*Note: if you have answered/chosen item [6, 7, 8] in question 117, skip the following question*

**Q121: At that time, were any of your sexual partners contacted to advise them to test for STIs?**

- Yes                       No                       Declined to answer                       Not applicable  
 Don't remember

*Note: if you have answered/chosen item [6, 7, 8] in question 117, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 121, skip the following question*

**Q122: At that time, which of the following types of sexual partner(s) were contacted (tick ALL that apply):**

- Boyfriend
- Other regular sex partner(s) (not your boyfriend but someone you have sex regularly)
- Casual partner(s)
- Ex-partner(s)
- Did not have a regular partner at that time
- Did not have other sex partner(s) at that time
- Did not have casual partner(s) at that time
- Don't remember
- Declined to answer
- Not applicable
- Other partner(s) please specify



**Q127: When you were diagnosed with HIV, were any of your sexual partner(s) contacted to ask them to test for HIV?**

- Yes                       No                       Dont remember                       Declined to answer  
 Not applicable

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 127, skip the following question*

**Q128: After you were diagnosed with HIV, which of your sexual partner(s) were contacted to ask them to test for HIV (tick ALL that apply)?**

- Boyfriend  
 Other regular sex partner(s) (not your boyfriend but someone you have sex regularly)  
 Casual partner(s)  
 Ex-partner(s)  
 Did not have a regular partner at that time  
 Did not have other sex partner(s) at that time  
 Did not have casual partner(s) at that time  
 Don't remember  
 Declined to answer  
 Not applicable  
 Other partner(s) please specify

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 127, skip the following question*

**Q129: After you were diagnosed with HIV, how were your sexual partners contacted to ask them to test for HIV?**

- Via clinic staff/health advisor                       Face-to-face/in-person by you                       Via text message by you  
 Via telephone/mobile by you                       Via email by you                       Via a friend  
 Via chatline/website by you                       Other (please specify)                       Dont remember  
 Declined to answer

**Q130: In general, how do you feel about discussing your sexual contacts with a health care professional/clinic staff?**

- 1 (Extremely comfortable)       2       3  
 4       5 (Extremely uncomfortable)

**Q131: The following questions are about your views towards notifying your sexual partners in the FUTURE:**

**Assume that in the future you are sexually active. If you are diagnosed with sexually transmitted infections, how likely are you to advise your sexual partner(s) YOURSELF to get tested?**

- 1 (Very Likely)       2       3       4  
 5 (Very Unlikely)

**Q132: Assume that in the future you are sexually active and if you are diagnosed with sexually transmitted infections, will you ask clinic staff to contact your sexual partner(s) on your behalf?**

- Yes       No       Dont Know

*Note: if you have answered/chosen item [2] in question 132, skip the following question*

**Q133: Assume that in the future you are sexually active and you are diagnosed with sexually transmitted infections, will you be willing to give the name(s) and contact details of your sexual partner(s) to the clinic health advisor to contact your sexual partners?**

- Yes       No       Dont Know       Not applicable

**Q134: In the following section let us know your opinion about the practice of contacting sexual partner(s) when a person is diagnosed with curable/treatable STIs like Gonorrhoea, Chlamydia, Syphilis etc. Let us know your opinion about EACH of the following statements:**





|   |                       |                       |                       |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| It should be legally binding (compulsory) for newly diagnosed HIV patients, to themselves or with the help of clinic, to inform all their sexual partner(s) to test for HIV | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|   |                       |                       |                       |                       |                       |                       |                       |                       |

**Q136: Now we would like to know your preferences for contacting your different TYPES of sexual partners:**

**Assume that you have regular partner/boyfriend, some regular fuck buddies or casual partners and you are diagnosed with sexually transmitted infections. Which partners are you most likely to contact to ask them to get tested for STIs ( tick ALL that apply):**

- None of the partners
- Boyfriend
- Regular fuck buddies
- Casual partner(s)/someone you had sex with only once or twice
- Other partners, please specify

*Note: if you have answered/chosen at least one of the following items: [1] in question 136, skip the following question*

**Q137: Assume that you are diagnosed with sexually transmitted infections and you have a Boyfriend. Please read the following options for contacting your Boyfriend to inform him that he should get tested for STIs. Let us know how likely are you to use EACH of the following options:**

|                          | Very Likely           | Somewhat likely       | Not sure              | Unlikely              | Very unlikely         |
|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Not contact my boyfriend | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |



|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I would inform him face-to-face   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would email him from my personal account  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would call him  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would text him  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would ask a clinic staff/health advisor to contact him Without giving my name                                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would ask a clinic staff/health advisor to contact him and give my name   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would send him an anonymous e-card (if such a service of e-cards without giving name is provided by the clinic) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I would take a home sampling kit (if the clinic provides home sampling kit so my partner can take his samples at home and return samples to the clinic for testing) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would ask clinic staff to do a telephone assessment of my partners while I am at the clinic and take his medication with me                                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*Note: if you have answered/chosen at least one of the following items: [1] in question 136, skip the following question*

**Q138: Assume that you are diagnosed with STIs and you have some Regular Sex Partners (i.e. not your boyfriend but someone you have sex with regularly). Please read the following options for contacting them to inform that they should get tested for STIs. Let us know how likely are you to use EACH of the following options:**

|   | Very Likely           | Likely                | Not sure              | Unlikely              | Very unlikely         |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Not contact my regular sex partners         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would inform them face-to-face            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would email them from my personal account | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would call them                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I would text them   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would ask a clinic staff to contact them Without giving my name   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would ask a clinic staff to contact them and give my name   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would send anonymous e-card (if such a service of e-cards without giving name is provided by the clinic)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would take a home sampling kit (if the clinic provides home sampling kit so they can take samples at home and return samples to the clinic for testing) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would ask clinic staff to do a telephone assessment of them while I am at the clinic and take their medication with me                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*Note: if you have answered/chosen at least one of the following items: [1] in question 136, skip the following question*

**Q139: Assume that you are diagnosed with sexually transmitted infections and you have some contactable Casual Partner(s) (i.e. men you have had sex only once or twice). Please read the following options for contacting them to inform that they should get tested for STIs. Let us know how likely are you to use EACH of the following options:**

|  |             |        |          |          |               |
|--|-------------|--------|----------|----------|---------------|
|  |             |        |          |          |               |
|  | Very Likely | Likely | Not sure | Unlikely | Very Unlikely |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Not contact them at all  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would inform them face-to-face   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would email them from my personal account  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would call them  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would text them  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would ask a clinic staff/health advisor to contact them Without giving my name                                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would ask a clinic staff/health advisor to contact them and give my name   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would send them an anonymous e-card (if such a service of e-cards without giving name is provided by the clinic) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I would take a home sampling kit (if the clinic provides home sampling kit so they can take samples at home and return samples to the clinic for testing) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would ask clinic staff to do a telephone assessment of them while I am at the clinic and take their medication with me                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Q140: In recent years, there have been outbreaks of STIs like LGV, Syphilis, Hepatitis C in London and other regions in UK and Europe. In the future, if there is an outbreak of any of these STIs, would you be willing to help the clinic reduce the level of undiagnosed STIs by referring your SEX PARTNERS who may be at risk of these STIs to the clinic?**

Yes       No       Don't Know       Not applicable

**Q141: In the future, if there is an outbreak of STIs like LGV, Syphilis etc, will you be willing to help the clinic reduce the level of undiagnosed STIs by referring to the clinic other gay men from your SOCIAL NETWORK (i.e. men you may not necessarily have sex with but you think may be at risk of these STIs or practice risky sex)?**

Yes       No       Don't Know       Not applicable

**Q142: If there is an outbreak of STIs like Syphilis, LGV or other STIs, can the clinic contact YOU to advise you about the outbreak and to get tested for these infections? If yes, please write in the TEXT BOX what is your preferred method of being contacted by the clinic:**

Yes       No       Not applicable

**Q143: The following questions are about how you would like your sexual partner to contact you if he is diagnosed with STIs after the last time you both had sex:**

**Assume that you have a sexual partner and in the future if your sexual partner is diagnosed with STIs, how important is it that he contacts you to inform you to get tested?**



**Q147: What was your MOST RECENT T-Cell (CD4) count?**

- 0-49                       50-99                       100-199  
 200-499                       Above 500                       Don't remember/don't know

**Q148: When did you receive your MOST RECENT T-cell (CD4 count) test result?**

/  MM/YYYY

**Q149: In the last 12 months, has your T-cell count:**

- Stayed same                       Increased                       Gone up and down  
 Decreased                       Dont Know/don't remember

**Q150: What your MOST RECENT viral load blood test result?**

- Less than 50                       Between 50 and 10,000                       10,000 to 100,000  
 More than 100,000                       Don't remember/don't know

**Q151: When did you receive your MOST RECENT viral load blood test result?**

/  MM/YYYY

**Q152: Do you think the result of your MOST RECENT viral load blood test was.....**

- Undetectable                       Low                       Medium  
 High                       Dont know/don't remember

**Q153: In the LAST 12 MONTHS, has your viral load blood test result:**

- Stayed same                       Increased                       Gone up and down                       Decreased  
 Dont know

**Q154: Undetectable viral load means having a blood viral load of**

- Equal to 0                       Between 1 and 50                       Between 50 and 50,000                       More than 50,000  
 Dont know

**Q155: THE NEXT FEW QUESTIONS ARE ABOUT ANTI-HIV MEDICINES:****Have you EVER taken HIV medication i.e. Antiretroviral treatment (ARV)?** Yes  No*Note: if you have answered/chosen item [2] in question 155, skip the following question***Q156: When did you first start taking HIV medication? (1996, 2001..)** YYYY*Note: if you have answered/chosen item [2] in question 155, skip the following question***Q157: Are you taking HIV medication now?** Yes  No*Note: if you have answered/chosen item [2] in question 155, skip the following question**Note: if you have answered/chosen item [2] in question 157, skip the following question***Q158: What HIV medication are you taking now? (tick ALL that apply)**

- I dont know
- I choose not to know my drug combination
- Nucleoside Analogues (AZT, Truvada, Kivexa, Combivir, DDL, 3TC, Abacavir, FTC, Tenofovir)
- Protease Inhibitors (Indinavir, Ritonavir, Saquinavir, Iopinavir, Fosamprenavir, Atazanavir, Darunavir, Tipranavir, Nelfinavir, Kaletra)
- Non-Nucleosides (Efavirenz, Nevirapine, Etravirine)
- Fixed dose Non Nucleosides (Atripla)
- Triple Nukes (Trizivir)
- Entry Inhibitors (T-20, Maraviroc)
- Integrase Inhibitors (Raltegravir)
- Any other drug not mentioned above
- Alternative medication with anti-HIV effects
- Not applicable



*Note: if you have answered/chosen item [2] in question 155, skip the following question*

*Note: if you have answered/chosen item [2] in question 157, skip the following question*

**Q159: When did you first start the drug combination that you are on NOW? Don't worry if you do not remember the exact month.**

/  MM/YYYY

*Note: if you have answered/chosen item [2] in question 155, skip the following question*

**Q160: Have you EVER had a viral resistance test?**

Yes       No       Dont know

*Note: if you have answered/chosen item [2] in question 155, skip the following question*

*Note: if you have answered/chosen item [2, 3] in question 160, skip the following question*

**Q161: When was your MOST RECENT viral resistance test?**

/  MM/YYYY

*Note: if you have answered/chosen item [2] in question 155, skip the following question*

*Note: if you have answered/chosen item [2, 3] in question 160, skip the following question*

**Q162: Did the test find resistance to any Antiretroviral medicines?**

Yes       No       Dont know

*Note: if you have answered/chosen item [2] in question 155, skip the following question*

*Note: if you have answered/chosen item [2, 3] in question 160, skip the following question*

*Note: if you have answered/chosen item [2, 3] in question 162, skip the following question*

**Q163: Did your doctor change your antiretroviral medicines as a result of the viral resistance test being positive?**

Yes       No       Dont know

*Note: if you have answered/chosen item [2] in question 155, skip the following question*

**Q164: In the LAST 12 MONTHS, have you experienced any of the following: (tick ALL that apply)**

- Loss of sexual urge/libido
- Difficulty in getting an erection
- Difficulty in sustaining an erection
- Unable to come to climax (cum, ejaculate)
- Came to climax (ejaculated) too quickly
- Felt anxious just before having sex about your ability to perform sexually
- Loss of erection when you tried to put on a condom

- Did not experience any of these problems
- Declined to answer
- Not applicable

*Note: if you have answered/chosen item [2] in question 155, skip the following question*

*Note: if you have answered/chosen at least one of the following items: [8, 9] in question 164, skip the following question*

**Q165: Did you do any of the following to deal with these problems (tick ALL that apply):**

- |  |   |
|--|---|
| <input type="checkbox"/> Did NOT do anything                           | <input type="checkbox"/> Talk to your GP                                |
| <input type="checkbox"/> Talk to your HIV clinic doctor                | <input type="checkbox"/> Talk to other health care professional         |
| <input type="checkbox"/> Talk to a counselor                           | <input type="checkbox"/> Took prescribed medication to improve erection |
| <input type="checkbox"/> Took drugs to improve erection (e.g. Ciablis) | <input type="checkbox"/> Stopped taking HIV medication                  |
| <input type="checkbox"/> Did something else to improve erection        | <input type="checkbox"/> Not applicable                                 |

*Note: if you have answered/chosen item [2] in question 155, skip the following question*

**Q166: In the LAST 12 MONTHS, did you take a break from your HIV medicines (had a drug holiday)?**

- Yes  No

*Note: if you have answered/chosen item [2] in question 155, skip the following question*

*Note: if you have answered/chosen item [2] in question 166, skip the following question*

**Q167: How long was the break/drug holiday for?**

number of days

*Note: if you have answered/chosen item [2] in question 155, skip the following question*

*Note: if you have answered/chosen item [2] in question 166, skip the following question*

**Q168: What were the reasons for the drug holiday? tick ALL that apply**

- |   |   |
|---|---|
| <input type="checkbox"/> Developed drug resistance                | <input type="checkbox"/> Side effects became too severe |
| <input type="checkbox"/> Changing regimens                        | <input type="checkbox"/> Complications with Hepatitis C |
| <input type="checkbox"/> Taking part in clinical trial            | <input type="checkbox"/> Recommended by my doctor       |
| <input type="checkbox"/> Recommended by other health professional | <input type="checkbox"/> Liver toxicity problems        |
| <input type="checkbox"/> Other (please specify)                   |   |



|   |                       |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I worry that in future anti-HIV drugs/ARVs will be less effective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|

## SEXUAL PRACTICES WITH YOUR MOST RECENT MALE 3 PARTNERS

**Q172: YOU ARE DOING REALLY WELL. YOU ARE MORE THAN HALFWAY THROUGH THE SURVEY! THE NEXT SECTION IS ABOUT YOUR 'LAST 3 MALE SEXUAL PARTNERS'.**

**FOR THE FOLLOWING QUESTIONS THINK ABOUT YOUR MOST RECENT MALE SEXUAL PARTNER (I.E. THINK OF THE NAME OF THE 'LAST PERSON' YOU HAD SEX WITH BEFORE THIS SURVEY).**

**When was the most recent occasion you had sex with your most recent male sexual partner i.e. the last person you had sex with? (This occasion could have been today, a month ago or some years ago. It could have been with your boyfriend or some other sex partner. This could also have been group sex. Try to remember the name of your partner or your main sex partner (in case your last sex was group sex), to help you answer the following questions):**

- |  |   |
|--|---|
| <input type="radio"/> In the last 7 days               | <input type="radio"/> Between 7 days and 4 weeks ago  |
| <input type="radio"/> Between 4 weeks and 6 months ago | <input type="radio"/> Between 6 months and a year ago |
| <input type="radio"/> Between 1 year and 5 years ago   | <input type="radio"/> More than 5 years ago           |
| <input type="radio"/> Declined to answer               |   |

**Q173: On that most recent occasion, did you have sex with more than one partner?**

- Yes                       No                       Declined to answer                       Not applicable

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1] in question 173, skip the following question*

**Q174: Which of the following best describes your most recent male sexual partner?**

- My boyfriend/lover
- My Ex-boyfriend/lover
- A regular sexual partner (not your boyfriend but someone with whom you have an ongoing sexual relationship)
- A known sexual partner (not your boyfriend or a regular partner but this was not the first occasion that you had sex with him)
- A casual sexual partner (someone you had sex with for the first time on that occasion and you have his contact information)
- A casual sexual partner (someone you had sex with for the first time on that occasion but you do not have his contact details i.e. anonymous)
- A commercial sex partner (some one whom you paid or who paid you to have sex)
- Other

Declined to answer

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1] in question 173, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

**Q175: What was the age of your most recent male sexual partner with whom you had sex with on that occasion? If you don't know the exact age, don't worry, please write down an estimate.**

years

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1] in question 173, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

**Q176: When was the FIRST TIME you had sex with your most recent male sexual partner ? (If this was the first time you were having sex with him write what was the MM/YYYY):**

/  MM/YYYY

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1] in question 173, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

**Q177: What do you think was the ethnic background of your most recent sexual partner you had sex with on that occasion?**

- |   |   |
|---|---|
| <input type="radio"/> White British                           | <input type="radio"/> White Irish                     |
| <input type="radio"/> Any Other White (American/European etc) | <input type="radio"/> Mixed White and Black Caribbean |
| <input type="radio"/> Mixed White and Black African           | <input type="radio"/> Mixed White and Asian           |
| <input type="radio"/> Mixed Any Other Background              | <input type="radio"/> Asian British                   |
| <input type="radio"/> Asian Indian                            | <input type="radio"/> Asian Pakistani                 |
| <input type="radio"/> Asian Bangladeshi                       | <input type="radio"/> Any other Asian background      |
| <input type="radio"/> British Black                           | <input type="radio"/> Black Caribbean                 |
| <input type="radio"/> Black African                           | <input type="radio"/> Any other African Background    |
| <input type="radio"/> Chinese                                 | <input type="radio"/> Any other ethnic group          |

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 177, skip the following question*

**Q178: Which of the following best describes your most recent Main sexual partner on that most recent occasion you had group sex? Your main sexual partner is the person with whom you had the most sexual contact on that occasion of group sex.**

- My boyfriend/lover
- My Ex-boyfriend/lover
- A regular sexual partner (not your boyfriend but someone with whom you have an ongoing sexual relationship)
- A known sexual partner (not your boyfriend or a regular partner but this was not the first occasion that you had sex with him)
- A casual sexual partner (someone you had sex with for the first time on that occasion and you have his contact information)
- A casual sexual partner (someone you had sex with for the first time on that occasion but you do not have his contact details i.e. anonymous)
- A commercial sex partner (some one whom you paid or who paid you to have sex)
- Other
- Don't know
- Declined to answer
- Not applicable

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 177, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q179: What was the age of your most recent Main sexual partner with whom you had sex with on that occasion? If you don't know the exact age, don't worry, please write down an estimate.**

years

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 177, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q180: What do you think was the ethnic background of your most recent Main sexual partner with whom you had sex with on that occasion?**

- |   |   |
|---|---|
| <input type="radio"/> White British                           | <input type="radio"/> White Irish                     |
| <input type="radio"/> Any Other White (American/European etc) | <input type="radio"/> Mixed White and Black Caribbean |
| <input type="radio"/> Mixed White and Black African           | <input type="radio"/> Mixed White and Asian           |
| <input type="radio"/> Any Other Mixed Background              | <input type="radio"/> Asian British                   |
| <input type="radio"/> Asian Indian                            | <input type="radio"/> Asian Pakistani                 |
| <input type="radio"/> Asian Bangladeshi                       | <input type="radio"/> Any other Asian background      |
| <input type="radio"/> British Black                           | <input type="radio"/> Black Caribbean                 |
| <input type="radio"/> Black African                           | <input type="radio"/> Any Other African Background    |
| <input type="radio"/> Chinese                                 | <input type="radio"/> Any other ethnic group          |

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 177, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q181: When was the FIRST TIME you had sex with your most recent sexual partner? (Even if this was the first time you**

**were having sex with him write what was the MM/YYYY):**

/  MM/YYYY

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q182: On that occasion when you had sex with your most recent male sexual partner:**

- You told your sexual partner that you were HIV positive ON THAT occasion
- You told your sexual partner that you were HIV positive BEFORE that occasion
- You assumed that he knew you were HIV positive
- You were confident that he knew you were HIV positive
- You felt it was not important to tell him you were HIV positive
- Don't remember
- Declined to answer
- Not applicable/I was NOT HIV positive at that time

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q183: On that most recent occasion when you had sex what was your viral load? (Don't worry if you don't remember the exact figure, please tick the best estimate)**

- Less than 50
- More than 10,000
- Between 51 and 500
- Dont remember/dont know
- Between 501 to 10,000
- Declined to answer

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q184: On that most recent occasion, did you know if your partner has Hepatitis C?**

- Yes
- No
- Did not know if he has Hepatitis C

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q185: On that most recent occasion, your sexual partner was:**

- HIV positive       HIV negative       HIV untested       Dont know  
 Declined to answer       Not applicable

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 185, skip the following question*

**Q186: On that most recent occasion you knew your most recent male sexual partner(s) was HIV positive because your sexual partner:**

- Told you on or before that occasion that he was HIV positive  
 Someone else had told you his HIV positive status  
 You could tell by the people he was with  
 You could tell by the sort of sex he wanted  
 You could tell by his physical appearance  
 You could tell by the bar/venue where you met  
 You had seen him in the Bloomsbury Clinic or some other HIV clinic  
 You had seen him at a place for positive men (eg support group)  
 You had met through an advertisement for HIV positive people in the press/internet/chatline  
 Other  
 Declined to answer

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 185, skip the following question*

**Q187: On that most recent occasion when you had sex, what was the viral load of your partner?**

- Less than 50       Between 51 and 500       Between 501 to 10,000  
 More than 10,000       Dont remember/dont know       Declined to answer

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6] in question 187, skip the following question*

**Q188: On that most recent occasion, you knew your most recent male sexual partner was HIV negative/untested because:**

- I did not know the HIV status of my partner  
 He told you on or before that occasion that he was HIV negative/untested  
 Someone else had told you he was HIV negative/untested  
 You could tell by the people he was with



- You could tell by the sort of sex he wanted
- You could tell by his physical appearance
- You could tell by the bar/venue where you met
- Other
- Declined to answer

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q189: Where had you met your most recent male sexual partner? (Tick ALL that apply)**

- |   |   |
|---|---|
| <input type="checkbox"/> Internet   | <input type="checkbox"/> Bar/club                             |
| <input type="checkbox"/> Backroom/adult video parlour                       | <input type="checkbox"/> Cottage (public toilet)              |
| <input type="checkbox"/> College/Work                                       | <input type="checkbox"/> Sauna                                |
| <input type="checkbox"/> Private Party                                      | <input type="checkbox"/> Gym                                  |
| <input type="checkbox"/> Dating agency/lonely hearts                        | <input type="checkbox"/> Telephone chatline                   |
| <input type="checkbox"/> Gay sex clubs (where you can have sex on premises) | <input type="checkbox"/> Cruising ground (eg Hampstead Heath) |
| <input type="checkbox"/> Leather clubs/leather scenes/leather events        | <input type="checkbox"/> Patient group/event                  |
| <input type="checkbox"/> Through friends                                    | <input type="checkbox"/> In London                            |
| <input type="checkbox"/> Outside London                                     | <input type="checkbox"/> Dont remember                        |
| <input type="checkbox"/> Declined to answer                                 | <input type="checkbox"/> Not applicable                       |

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q190: Which of the following places describes best where you had sex your most recent male sexual partner? (choose one)**

- |   |  |
|---|--|
| <input type="checkbox"/> Your home          | <input type="checkbox"/> Partner's home                          |
| <input type="checkbox"/> Pub/Club (toilets) | <input type="checkbox"/> Backroom/sex club/sex on premises venue |
| <input type="checkbox"/> Gym                | <input type="checkbox"/> Sauna                                   |
| <input type="checkbox"/> Cruising ground    | <input type="checkbox"/> Cottage (public toilet)                 |
| <input type="checkbox"/> Private party      | <input type="checkbox"/> Declined to answer                      |
| <input type="checkbox"/> Dont remember      |  |

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q191: Which of the following types of sex did you have with your most recent male sex partner on that occasion? (tick ALL that apply):**

- Kissing
- Masturbation
- I fucked him without a condom and came/ejaculated inside him
- He fucked me without a condom and came/ejaculated inside me
- I fucked him and I used a condom
- He fucked me and used a condom

- I fucked him WITHOUT a condom but I pulled out (withdrew) before I ejaculated/came
- He fucked me WITHOUT a condom but he pulled out (withdrew) before he ejaculated/came
- I sucked him but he did NOT ejaculate/cum in my mouth
- He sucked me but I did NOT ejaculate/cum in his mouth
- I sucked him and he came/ejaculated in my mouth
- He sucked me and I came/ejaculated in his mouth
- I finger fucked him
- He finger fucked me
- I fisted him
- He fisted me
- I rimmed him
- He rimmed me
- I put a dildo/sex toy into his arse/anus
- He put a dildo/sex toy into my arse/anus
- We both had watersports (sex that involves urine/piss)
- We both had scat (sex that involves shit/faeces)
- We both had piercing/sex involving blood

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

**Q192: On the most recent occasion when you had sex, did you use recreational drugs? (includes alcohol, poppers, cannabis)**

- Yes
  No
  Declined to answer
  Not applicable

*Note: if you have answered/chosen item [7] in question 172, skip the following question*

*Note: if you have answered/chosen item [1, 9] in question 174, skip the following question*

*Note: if you have answered/chosen item [1, 10] in question 178, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 192, skip the following question*

**Q193: Which drugs did you use? (Tick ALL that apply)**

- |   |   |
|---|---|
| <input type="checkbox"/> Alcohol                                  | <input type="checkbox"/> Poppers (amyl or other nitrite inhalants)    |
| <input type="checkbox"/> Viagra/Cialis                            | <input type="checkbox"/> Liquid Ecstasy/Liquid X/Liquid G/Fantasy/GHB |
| <input type="checkbox"/> Cannabis (marijuana, hash, pot)          | <input type="checkbox"/> Amphetamine (speed)                          |
| <input type="checkbox"/> Cocaine (coke)                           | <input type="checkbox"/> Downers (Valium, Temazepam, Rohypnol)        |
| <input type="checkbox"/> LSD (Acid, Trips)                        | <input type="checkbox"/> Ketamine (Special K)                         |
| <input type="checkbox"/> Meth Amphetamine (Crystal meth, crystal) | <input type="checkbox"/> Heroin (smack)                               |
| <input type="checkbox"/> Crack                                    | <input type="checkbox"/> Mushrooms (Magic mushrooms)                  |
| <input type="checkbox"/> Ecstasy                                  | <input type="checkbox"/> Others                                       |
| <input type="checkbox"/> Declined to answer                       |   |

## SECOND MOST RECENT MALE SEXUAL PARTNER

**Q194: Now think about your SECOND MOST RECENT MALE SEXUAL PARTNER (i.e. think of the SECOND LAST MALE PARTNER you had sex with before completing this survey). You can try to remember the name of this partner or your main sex partner (in case your last sex was group sex) to help you answer the following questions.**

**When was the most recent occasion you had sex with your SECOND MOST RECENT male sex partner? (This could have been this week, this month, few months or years ago. It could also have been sex with more than one partner i.e. group sex or one-to-one sex with your boyfriend or your other sex partners):**

- |  |   |
|--|---|
| <input type="radio"/> In the last 7 days               | <input type="radio"/> Between 7 days and 4 weeks ago  |
| <input type="radio"/> Between 4 weeks and 6 months ago | <input type="radio"/> Between 6 months and a year ago |
| <input type="radio"/> Between 1 year and 5 years ago   | <input type="radio"/> More than 5 years ago           |
| <input type="radio"/> Declined to answer               | <input type="radio"/> Not applicable                  |

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

**Q195: On that second most recent occasion did you have sex with more than one partner?**

- Yes                       No                       Declined to answer                       Not applicable

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 195, skip the following question*

**Q196: Which of the following best describes your SECOND MOST RECENT male sex partner on that most recent occasion?**

- My boyfriend/lover
- My Ex-boyfriend/lover
- A regular sexual partner (not your boyfriend but someone with whom you have an ongoing sexual relationship)
- A known sexual partner (not your boyfriend or a regular partner but this was not the first occasion that you had sex with him)
- A casual sexual partner (someone you had sex with for the first time on that occasion and you have his contact information)
- A casual sexual partner (someone you had sex with for the first time on that occasion but you do not have his contact details i.e. anonymous)
- A commercial sex partner (some one whom you paid or who paid you to have sex)
- Other
- Declined to answer

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 195, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

**Q197: What was the age of your SECOND MOST RECENT male sex partner with whom you had sex with on that occasion? If you don't know the exact age, don't worry, please write down an estimate.**

years

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 195, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

**Q198: When was the first time you had sex with your SECOND MOST RECENT male sex partner? (Even If that was the first time you were having sex with him write what was the MM/YYYY):**

/  MM/YYYY

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 195, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

**Q199: What do you think was the ethnic background of your SECOND MOST RECENT male sex partner you had sex with on that occasion?**

- |   |   |
|---|---|
| <input type="radio"/> White British                           | <input type="radio"/> White Irish                     |
| <input type="radio"/> Any Other White (American/European etc) | <input type="radio"/> Mixed White and Black Caribbean |
| <input type="radio"/> Mixed White and Black African           | <input type="radio"/> Mixed White and Asian           |
| <input type="radio"/> Any Other Mixed Background              | <input type="radio"/> Asian British                   |
| <input type="radio"/> Asian Indian                            | <input type="radio"/> Asian Pakistani                 |
| <input type="radio"/> Asian Bangladeshi                       | <input type="radio"/> Any other Asian background      |
| <input type="radio"/> British Black                           | <input type="radio"/> Black Caribbean                 |
| <input type="radio"/> Black African                           | <input type="radio"/> Any Other African Background    |
| <input type="radio"/> Chinese                                 | <input type="radio"/> Any other ethnic group          |

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 199, skip the following question*

**Q200: Which of the following best describes your SECOND most recent Main sexual partner on that most recent occasion? Your main sexual partner is the person with whom you had the most sexual contact on that occasion of group sex.**

- My primary partner (boyfriend, lover)
- My Ex-boyfriend/lover
- A regular sexual partner (not your boyfriend but someone with whom you have an ongoing sexual relationship)

- A known sexual partner (not your boyfriend or a regular partner but this was not the first occasion that you had sex with him)
- A casual sexual partner (someone you had sex with for the first time on that occasion and you have his contact information)
- A casual sexual partner (someone you had sex with for the first time on that occasion but you do not have his contact details i.e. anonymous)
- A commercial sex partner (some one whom you paid or who paid you to have sex)
- Other
- Declined to answer
- Not applicable

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 199, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q201: What was the age of your most SECOND recent Main sexual partner with whom you had sex with on that occasion? If you dont know the exact age, don't worry, please write down an estimate.**

years

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 199, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q202: What do you think was the ethnic background of your SECOND MOST RECENT male sex partner with whom you had sex with on that occasion?**

- |   |   |
|---|---|
| <input type="radio"/> White British                           | <input type="radio"/> White Irish                     |
| <input type="radio"/> Any Other White (American/European etc) | <input type="radio"/> Mixed White and Black Caribbean |
| <input type="radio"/> Mixed White and Black African           | <input type="radio"/> Mixed White and Asian           |
| <input type="radio"/> Any Other Mixed Background              | <input type="radio"/> Asian British                   |
| <input type="radio"/> Asian Indian                            | <input type="radio"/> Asian Pakistani                 |
| <input type="radio"/> Asian Bangladeshi                       | <input type="radio"/> Any other Asian background      |
| <input type="radio"/> British Black                           | <input type="radio"/> Black Caribbean                 |
| <input type="radio"/> Black African                           | <input type="radio"/> Any Other African Background    |
| <input type="radio"/> Chinese                                 | <input type="radio"/> Any other ethnic group          |

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 199, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q203: When was the first time you had sex with your SECOND MOST RECENT male sex partner? (If that was the first time you were having sex with him, write what was the MM/YYYY):**

/  MM/YYYY

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q204: On that occasion when you had sex with your SECOND MOST RECENT male sex partner:**

- You told your sexual partner that you were HIV positive on that occasion
- You told your sexual partner that you were HIV positive BEFORE that occasion
- You assumed that he knew you were HIV positive
- You were confident that he knew you were HIV positive
- You felt it was not important to tell him you were HIV positive
- Declined to answer
- Not applicable/ I was not HIV positive at that time

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q205: On that most recent occasion when you had sex with your SECOND MOST RECENT male sex partner what was your viral load? (Don't worry if you don't remember the exact figure, please tick the best estimate):**

- Less than 50
- More than 10,000
- Between 51 and 500
- Dont remember/dont know
- Between 501 to 10,000
- Declined to answer

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q206: On that second most recent occasion, did you know if your SECOND MOST RECENT partner has Hepatitis C?**

- Yes
- No
- Did not know if he has Hepatitis C

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q207: On that occasion, your SECOND MOST RECENT male sex partner was:**

- HIV positive
- Declined to answer
- HIV negative
- Not applicable
- HIV Untested
- Dont Know

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 207, skip the following question*

**Q208: On that occasion when you had sex with your SECOND MOST RECENT male sex partner, you knew your sexual partner(s) was HIV positive because:**

- Your sexual partner told you on or before that occasion that he was HIV positive
- Someone else had told you his HIV positive status
- You could tell by the people he was with
- You could tell by the sort of sex he wanted
- You could tell by his physical appearance
- You could tell by the bar/venue where you met
- You had seen him in the Bloomsbury Clinic or some other HIV clinic
- You had seen him at a place for positive men (eg support group)
- You had met through a contact ad for HIV positive people in the press/internet/chatline
- Other
- Declined to answer

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 207, skip the following question*

**Q209: When you had sex with your SECOND MOST RECENT male sex partner, what was the viral load of your partner?**

- Less than 50
- More than 10,000
- Between 51 and 500
- Dont remember/dont know
- Between 501 to 10,000
- Declined to answer

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6] in question 209, skip the following question*

**Q210: On that occasion, you knew your SECOND MOST RECENT male sex partner was HIV negative/untested because:**

- I did not know the HIV status of my partner
- He told you on or before that occasion that he was HIV negative/untested
- Someone else had told you he was HIV negative/untested
- You could tell by the people he was with
- You could tell by the sort of sex he wanted
- You could tell by his physical appearance
- You could tell by the bar/venue where you met
- Other
- Declined to answer

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q211: Where had you met your SECOND MOST RECENT male sex partner? (Tick ALL that apply)**

- |   |   |
|---|---|
| <input type="checkbox"/> Internet   | <input type="checkbox"/> Bar/club                             |
| <input type="checkbox"/> Backroom/adult video parlour                       | <input type="checkbox"/> Cottage (public toilet)              |
| <input type="checkbox"/> College/Work                                       | <input type="checkbox"/> Sauna                                |
| <input type="checkbox"/> Private Party                                      | <input type="checkbox"/> Gym                                  |
| <input type="checkbox"/> Dating agency/lonely hearts                        | <input type="checkbox"/> Telephone chatline                   |
| <input type="checkbox"/> Gay sex clubs (where you can have sex on premises) | <input type="checkbox"/> Cruising ground (eg Hampstead Heath) |
| <input type="checkbox"/> Leather clubs/leather scenes/leather events        | <input type="checkbox"/> Patient group/event                  |
| <input type="checkbox"/> Through friends                                    | <input type="checkbox"/> In London                            |
| <input type="checkbox"/> Outside London                                     | <input type="checkbox"/> Dont remember                        |
| <input type="checkbox"/> Declined to answer                                 | <input type="checkbox"/> Not applicable                       |

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q212: Which of the following places describes best where you had sex with your SECOND MOST RECENT male sex partner? (choose one)**

- |   |  |
|---|--|
| <input type="checkbox"/> Your home          | <input type="checkbox"/> Partner's home                          |
| <input type="checkbox"/> Pub/Club (toilets) | <input type="checkbox"/> Backroom/sex club/sex on premises venue |
| <input type="checkbox"/> Gym                | <input type="checkbox"/> Sauna                                   |
| <input type="checkbox"/> Cruising ground    | <input type="checkbox"/> Cottage (public toilet)                 |
| <input type="checkbox"/> Private party      | <input type="checkbox"/> Declined to answer                      |

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q213: Which of the following types of sex did you have with your SECOND RECENT male sex partner on that occasion? tick ALL that apply**

- Kissing
- Masturbation
- I fucked him without a condom and came/ejaculated inside him
- He fucked me without a condom and came/ejaculated inside me
- I fucked him and I used a condom
- He fucked me and used a condom
- I fucked him WITHOUT a condom but I pulled out (withdrew) before I ejaculated/came
- He fucked me WITHOUT a condom but he pulled out (withdrew) before he ejaculated/came
- I sucked him but he did NOT ejaculate/cum in my mouth
- He sucked me but I did NOT ejaculate/cum in his mouth
- I sucked him and he came/ejaculated in my mouth
- He sucked me and I came/ejaculated in his mouth



- I finger fucked him
- He finger fucked me
- I fisted him
- He fisted me
- I rimmed him
- He rimmed me
- I put a dildo/sex toy into his arse/anus
- He put a dildo/sex toy into my arse/anus
- We both had watersports (sex that involves urine/piss)
- We both had scat (sex that involves shit/faeces)
- We both had piercing/sex involving blood

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

**Q214: On that occasion when you had sex your SECOND MOST RECENT male sex partner, did you use recreational drugs? (includes alcohol, poppers, cannabis)**

- Yes
                 
  No
                 
  Declined to answer
                 
  Not applicable

*Note: if you have answered/chosen item [6, 8] in question 194, skip the following question*

*Note: if you have answered/chosen item [1] in question 196, skip the following question*

*Note: if you have answered/chosen item [1] in question 200, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 214, skip the following question*

**Q215: Which drugs did you use? (Tick ALL that apply)**

- |   |   |
|---|---|
| <input type="checkbox"/> Alcohol                                  | <input type="checkbox"/> Poppers (amyl or other nitrite inhalants)    |
| <input type="checkbox"/> Viagra/Cialis                            | <input type="checkbox"/> Liquid Ecstasy/Liquid X/Liquid G/Fantasy/GHB |
| <input type="checkbox"/> Cannabis (marijuana, hash, pot)          | <input type="checkbox"/> Amphetamine (speed)                          |
| <input type="checkbox"/> Cocaine (coke)                           | <input type="checkbox"/> Downers (Valium, Temazepam, Rohypnol)        |
| <input type="checkbox"/> LSD (Acid, Trips)                        | <input type="checkbox"/> Ketamine (Special K)                         |
| <input type="checkbox"/> Meth Amphetamine (Crystal meth, crystal) | <input type="checkbox"/> Heroin (smack)                               |
| <input type="checkbox"/> Crack                                    | <input type="checkbox"/> Mushrooms (Magic mushrooms)                  |
| <input type="checkbox"/> Ecstasy                                  | <input type="checkbox"/> Others                                       |
| <input type="checkbox"/> Declined to answer                       | <input type="checkbox"/> Not applicable                               |

### THIRD MOST RECENT MALE SEXUAL PARTNER

**Q216: This is the last section of the questions on 3 most recent sex partners! For answering the next section, please think about your THIRD MOST RECENT MALE SEXUAL PARTNER(s). (i.e. think of the THIRD LAST PERSON you had sex with before completing this survey).**

**When was the most recent occasion you had sex with your THIRD MOST RECENT male sexual partner? (This occasion could have been recently or some time ago. You can try to remember the name of this partner or your main sex partner (in case your last sex was group sex), to help you answer the following questions):**

- |  |   |
|--|---|
| <input type="radio"/> In the last 7 days               | <input type="radio"/> Between 7 days and 4 weeks ago  |
| <input type="radio"/> Between 4 weeks and 6 months ago | <input type="radio"/> Between 6 months and a year ago |
| <input type="radio"/> Between 1 year and 5 years ago   | <input type="radio"/> More than 5 years ago           |
| <input type="radio"/> Declined to answer               | <input type="radio"/> Not applicable                  |

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

**Q217: On that most recent occasion, did you have sex with more than one partner?**

- Yes                       No                       Declined to answer                       Not applicable

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 217, skip the following question*

**Q218: Which of the following best describes your THIRD MOST RECENT male sexual partner on that most recent occasion?**

- My boyfriend/lover
- My Ex-boyfriend/lover
- A regular sexual partner (not your boyfriend but someone with whom you have an ongoing sexual relationship)
- A known sexual partner (not your boyfriend or a regular partner but this was not the first occasion that you had sex with him)
- A casual sexual partner (someone you had sex with for the first time on that occasion and you have his contact information)
- A casual sexual partner (someone you had sex with for the first time on that occasion but you do not have his contact details i.e. anonymous)
- A commercial sex partner (some one whom you paid or who paid you to have sex)
- Other
- Declined to answer
- Not applicable

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 217, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

**Q219: What was the age of your THIRD MOST RECENT male sexual partner with whom you had sex with on that occasion? If you dont know the exact age, dont worry, please write down an estimate.**

years

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 217, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

**Q220: When was the first time you had sex with your THIRD MOST RECENT male sexual partner? (IEven if this was the first time you were having sex with him, write what was the MM/YYYY):**

/  MM/YYYY

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 217, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

**Q221: What do you think was the ethnic background of your THIRD MOST RECENT male sexual partner you had sex with on that occasion?**

- |   |   |
|---|---|
| <input type="radio"/> White British                           | <input type="radio"/> White Irish                     |
| <input type="radio"/> Any Other White (American/European etc) | <input type="radio"/> Mixed White and Black Caribbean |
| <input type="radio"/> Mixed White and Black African           | <input type="radio"/> Mixed White and Asian           |
| <input type="radio"/> Any Other Mixed Background              | <input type="radio"/> Asian British                   |
| <input type="radio"/> Asian Indian                            | <input type="radio"/> Asian Pakistani                 |
| <input type="radio"/> Asian Bangladeshi                       | <input type="radio"/> Any other Asian background      |
| <input type="radio"/> British Black                           | <input type="radio"/> Black Caribbean                 |
| <input type="radio"/> Black African                           | <input type="radio"/> Any Other African Background    |
| <input type="radio"/> Chinese                                 | <input type="radio"/> Any other ethnic group          |

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 221, skip the following question*

**Q222: Which of the following best describes your THIRD most recent Main sexual partner on that most recent occasion? Your main sexual partner is the person with whom you had the most sexual contact on that occasion of group sex.**

- My boyfriend/lover
- My Ex-boyfriend/lover
- A regular sexual partner (not your boyfriend but someone with whom you have an ongoing sexual relationship)
- A known sexual partner (not your boyfriend or a regular partner but this was not the first occasion that you had sex with him)
- A casual sexual partner (someone you had sex with for the first time on that occasion and you have his contact information)
- A casual sexual partner (someone you had sex with for the first time on that occasion but you do not have his contact details i.e. anonymous)
- A commercial sex partner (some one whom you paid or who paid you to have sex)
- Other
- Declined to answer

Not applicable

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 221, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q223: What was the age of your most recent Main sexual partner with whom you had sex with on that occasion? If you dont know the exact age, dont worry, please write down an estimate.**

years

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 221, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q224: What do you think was the ethnic background of your THIRD MOST RECENT male sexual partner with whom you had sex with on that occasion?**

- |   |   |
|---|---|
| <input type="radio"/> White British                           | <input type="radio"/> White Irish                     |
| <input type="radio"/> Any Other White (American/European etc) | <input type="radio"/> Mixed White and Black Caribbean |
| <input type="radio"/> Mixed White and Black African           | <input type="radio"/> Mixed White and Asian           |
| <input type="radio"/> Any Other Mixed Background              | <input type="radio"/> Asian British                   |
| <input type="radio"/> Asian Indian                            | <input type="radio"/> Asian Pakistani                 |
| <input type="radio"/> Asian Bangladeshi                       | <input type="radio"/> Any other Asian background      |
| <input type="radio"/> British Black                           | <input type="radio"/> Black Caribbean                 |
| <input type="radio"/> Black African                           | <input type="radio"/> Any Other African Background    |
| <input type="radio"/> Chinese                                 | <input type="radio"/> Any other ethnic group          |
| <input type="radio"/> Declined to answer                      | <input type="radio"/> Not applicable                  |

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18] in question 221, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q225: When was the first time you had sex with your THIRD MOST RECENT male sexual partner? (Even if this was the first time you were having sex with this partner, write what was the MM/YYYY):**

/  MM/YYYY

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q226: On that occasion when you had sex with your THIRD MOST RECENT male sexual partner:**

- You told your sexual partner that you were HIV positive on that occasion
- You told your sexual partner that you were HIV positive BEFORE that occasion
- You assumed that he knew you were HIV positive
- You were confident that he knew you were HIV positive
- You felt it was not important to tell him you were HIV positive
- Dont remember
- Declined to answer
- Not applicable/I was not HIV positive at that time

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q227: On that most recent occasion when you had sex with your THIRD MOST RECENT male sexual partner what was your viral load? (Dont worry if you dont remember the exact figure, please tick the best estimate)**

- Less than 50
- More than 10,000
- Not applicable
- Between 51 and 500
- Dont remember/dont know
- Between 501 to 10,000
- Declined to answer

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q228: On that occasion, did you know if your THIRD MOST RECENT male sex partner has Hepatitis C?**

- Yes
- No
- Did not know if he has Hepatitis C

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q229: On that occasion your THIRD MOST RECENT male sex partner was:**

- HIV positive
- HIV negative
- HIV untested
- Dont Know
- Declined to answer
- Not applicable

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 229, skip the following question*

**Q230: On that occasion you knew that your THIRD MOST RECENT male sex partner was HIV positive because your sexual partner:**

- Told you on or before that occasion that he was HIV positive
- Someone else had told you his HIV positive status
- You could tell by the people he was with
- You could tell by the sort of sex he wanted

- You could tell by his physical appearance
- You could tell by the bar/venue where you met
- You had seen him in the Bloomsbury Clinic or some other HIV clinic
- You had seen him at a place for positive men (eg support group)
- You had met through a contact ad for HIV positive people in the press/internet/chatline
- Other
- Declined to answer

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4, 5] in question 229, skip the following question*

**Q231: On that most THIRD MOST RECENT male sex partner when you had sex, what was the viral load of your partner?**

- Less than 50
- More than 10,000
- Not applicable
- Between 51 and 500
- Dont remember/dont know
- Between 501 to 10,000
- Declined to answer

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

*Note: if you have answered/chosen item [1, 2, 3, 4, 5, 6, 7] in question 231, skip the following question*

**Q232: On that occasion, you knew your THIRD MOST RECENT male sex partner was HIV negative because:**

- I did not know the HIV status of my partner
- He told you on or before that occasion that he was HIV negative/untested
- Someone else had told you he was HIV negative/untested
- You could tell by the people he was with
- You could tell by the sort of sex he wanted
- You could tell by his physical appearance
- You could tell by the bar/venue where you met
- Other
- Declined to answer
- Not applicable

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q233: Where had you met your THIRD MOST RECENT male sex partner? (Tick ALL that apply)**

- |   |   |
|---|---|
| <input type="checkbox"/> Internet   | <input type="checkbox"/> Bar/club                             |
| <input type="checkbox"/> Backroom/adult video parlour                       | <input type="checkbox"/> Cottage (public toilet)              |
| <input type="checkbox"/> College/Work                                       | <input type="checkbox"/> Sauna                                |
| <input type="checkbox"/> Private Party                                      | <input type="checkbox"/> Gym                                  |
| <input type="checkbox"/> Dating agency/lonely hearts                        | <input type="checkbox"/> Telephone chatline                   |
| <input type="checkbox"/> Gay sex clubs (where you can have sex on premises) | <input type="checkbox"/> Cruising ground (eg Hampstead Heath) |

- |  |  |
|--|--|
| <input type="checkbox"/> Leather clubs/leather scenes/leather events | <input type="checkbox"/> Patient group/event |
| <input type="checkbox"/> Through friends                             | <input type="checkbox"/> In London           |
| <input type="checkbox"/> Outside London                              | <input type="checkbox"/> Dont remember       |
| <input type="checkbox"/> Declined to answer                          | <input type="checkbox"/> Not applicable      |

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q234: Which of the following places describes best where you had sex with your THIRD MOST RECENT male sex partner?**

- |   |  |
|---|--|
| <input type="checkbox"/> Your home          | <input type="checkbox"/> Partner's home                          |
| <input type="checkbox"/> Pub/Club (toilets) | <input type="checkbox"/> Backroom/sex club/sex on premises venue |
| <input type="checkbox"/> Gym                | <input type="checkbox"/> Sauna                                   |
| <input type="checkbox"/> Cruising ground    | <input type="checkbox"/> Cottage (public toilet)                 |
| <input type="checkbox"/> Private party      | <input type="checkbox"/> Declined to answer                      |

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q235: Which types of sex did you have with your THIRD MOST RECENT male sex partner? Tick ALL that apply:**

- Kissing
- Masturbation
- I fucked him without a condom and came/ejaculated inside him
- He fucked me without a condom and came/ejaculated inside me
- I fucked him and I used a condom
- He fucked me and used a condom
- I fucked him WITHOUT a condom but I pulled out (withdrew) before I ejaculated/came
- He fucked me WITHOUT a condom but he pulled out (withdrew) before he ejaculated/came
- I sucked him but he did NOT ejaculate/cum in my mouth
- He sucked me but I did NOT ejaculate/cum in his mouth
- I sucked him and he came/ejaculated in my mouth
- He sucked me and I came/ejaculated in his mouth
- I finger fucked him
- He finger fucked me
- I fisted him
- He fisted me
- I rimmed him
- He rimmed me
- I put a dildo/sex toy into his arse/anus
- He put a dildo/sex toy into my arse/anus
- We both had watersports (sex that involves urine/piss)
- We both had scat (sex that involves shit/faeces)
- We both had piercing/sex involving blood

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

**Q236: On that occasion when you had sex with your THIRD MOST RECENT male sex partner did you use recreational drugs? (includes alcohol, poppers, cannabis)**

- Yes
                 
  No
                 
  Declined to answer
                 
  Not applicable

*Note: if you have answered/chosen item [6, 8] in question 216, skip the following question*

*Note: if you have answered/chosen item [1] in question 218, skip the following question*

*Note: if you have answered/chosen item [1] in question 222, skip the following question*

*Note: if you have answered/chosen item [2, 3, 4] in question 236, skip the following question*

**Q237: Which drugs did you use? (Tick ALL that apply)**

- |   |   |
|---|---|
| <input type="checkbox"/> Alcohol                                  | <input type="checkbox"/> Poppers (amyl or other nitrite inhalants)    |
| <input type="checkbox"/> Viagra/Cialis                            | <input type="checkbox"/> Liquid Ecstasy/Liquid X/Liquid G/Fantasy/GHB |
| <input type="checkbox"/> Cannabis (marijuana, hash, pot)          | <input type="checkbox"/> Amphetamine (speed)                          |
| <input type="checkbox"/> Cocaine (coke)                           | <input type="checkbox"/> Downers (Valium, Temazepam, Rohypnol)        |
| <input type="checkbox"/> LSD (Acid, Trips)                        | <input type="checkbox"/> Ketamine (Special K)                         |
| <input type="checkbox"/> Meth Amphetamine (Crystal meth, crystal) | <input type="checkbox"/> Heroin (smack)                               |
| <input type="checkbox"/> Crack                                    | <input type="checkbox"/> Mushrooms (Magic mushrooms)                  |
| <input type="checkbox"/> Ecstasy                                  | <input type="checkbox"/> Others                                       |
| <input type="checkbox"/> Declined to answer                       | <input type="checkbox"/> Not applicable                               |

## PEER AND COMMUNITY

**Q238: You are nearing the end of this survey! The following few questions are about gay community:**

**With whom are you most likely to talk about sex and relationship issues? (Tick the 3 main):**

- My boyfriend  
 My regular partner (a sexual partner, not your boyfriend)  
 HIV positive friends  
 Other friends  
 Health care professional or counselor  
 I dont like to talk about sex and relationship issues  
 Anyone who cares to listen  
 Internet/chatline  
 Advice/helplines  
 Other  
 Declined to answer



**Q239: How many of your gay friends are HIV positive?**

- All                       Most                       About half                       Few  
 None                       Dont know                       Declined to answer

**Q240: In the LAST 12 MONTHS, have you used any of the following services for HIV positive gay men? [tick ALL that apply]**

- |   |   |
|---|---|
| <input type="checkbox"/> Support group for HIV positive MSM         | <input type="checkbox"/> Gay men's group at Body Positive |
| <input type="checkbox"/> Seminars/workshops on HIV treatments (NAM) | <input type="checkbox"/> Individual counseling            |
| <input type="checkbox"/> Couple counseling                          | <input type="checkbox"/> Another service                  |
| <input type="checkbox"/> No I did not use any of these services     | <input type="checkbox"/> Declined to answer               |

**Q241: Do you think your sexual behaviour is safer than your HIV positive gay friends?**

- Yes, safer than my HIV positive gay friends  
 No, less safe than my HIV positive gay friends  
 About the same  
 Not sure  
 Declined to answer  
 Not applicable/I am not sexually active since a long time

**Q242: Are you a member of any gay political, sports or social organizations?**

- Yes  No

**Q243: Is being part of a gay community important to you?**

- Yes  No

**Q244: If your gay friends knew details of your sexual encounters, how do you think they would react?**

- |  |  |
|--|--|
| <input type="radio"/> They would be envious                | <input type="radio"/> They would disapprove    |
| <input type="radio"/> It would be no big deal              | <input type="radio"/> They would be supportive |
| <input type="radio"/> They would not want to talk about it | <input type="radio"/> Not sure                 |
| <input type="radio"/> Declined to answer                   | <input type="radio"/> Not applicable           |



|  |                       |                       |                       |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I am concerned about being infected with another strain of HIV                             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Hepatitis C has made it difficult for HIV positive men to have unprotected anal sex (fuck) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| HIV has negatively affected my libido/sexual urge  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I have stopped having sex because of my HIV status   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| People with HIV should start using HIV medication as soon as they are diagnosed with HIV   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Q246: THE FOLLOWING SECTION IS ABOUT THE EFFECTS THAT HIV MEDICATION LIKE ANTIRETORVIRAL TREATMENT CAN HAVE ON SEXUAL BEHAVIOUR AND PRACTICES. PLEASE READ EACH OF THE FOLLOWING STATEMENTS CAREFULLY AND TICK THE OPTION THAT BEST DESCRIBES YOUR OPINION:**

|  |                |       |                            |          |                   |           |                    |                |
|--|----------------|-------|----------------------------|----------|-------------------|-----------|--------------------|----------------|
|  |                |       |                            |          |                   |           |                    |                |
|  | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree | Dont know | Declined to answer | Not applicable |



|  |                       |                       |                       |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Getting another strain of HIV could reduce my treatment options in the future  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| During anal sex withdrawing (pulling out) before ejaculation (cumming) can reduce the risk of passing on HIV to sexual partner(s)                                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| HIV is unlikely to be transmitted if a HIV negative person has insertive anal intercourse (He is doing the fucking) without a condom with a HIV positive partner | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| HIV is unlikely to be transmitted if HIV positive sexual partner ejaculates inside the mouth of a HIV negative sexual partner during oral sex                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Q247: THE FOLLOWING STATEMENTS ARE ABOUT MEDICAL TREATMENTS FOR HIV. PLEASE READ EACH OF THE FOLLOWING STATEMENTS CAREFULLY AND TICK THE OPTION THAT BEST DESCRIBES YOUR OPINION:**









|  |                       |                       |                       |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| HIV positive man should not have insertive anal sex (means he does the fucking) without a condom with a HIV negative men | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| HIV positive men should only have sex with other HIV positive men  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Q249: THIS IS THE LAST QUESTION OF THE SURVEY! PLEASE PRESS THE 'FINISH' BUTTON AFTER COMPLETING THIS QUESTION:**

**The SHARPN survey started on 1st May 2010. Had you already participated/completed this survey in the last 6 months?**

Yes  No

**Appendix 5: SHARPN display board write-up**

HAVE YOUR SAY! We want to know your views on how to contact sexual partners following diagnosis. We also want to know about your experiences of taking HIV medication. Ask any nurse in the Bloomsbury clinic for further information about the SHARPN study. Your views can help us improve your health care.

## **Appendix 6: Participant information sheet for cognitive interviews**



### **Sex, Health, Antiretroviral Treatment and Partner Notification (SHARPN) Project**

#### **Participant Information Sheet Questionnaire Pilot**

**Version: 2**

**Date: 10 November 2009**

You are being invited to take part in Sex, Health, Antiretroviral Treatment, and Partner Notification (SHARPN) Project. Please read this information sheet carefully. Please feel free to ask questions if any part of the information is unclear to you.

#### **Who is conducting this study?**

This study is being conducted by Centre for Sexual Health and HIV Research, University College London in collaboration with the Department of Primary Care and Public Health, Brighton and Sussex Medical School, Falmer, Brighton. The study has been reviewed and approved by an independent NHS Research Ethics Committee and the Camden PCT Research & Development department.

#### **What is the purpose of the study?**

We are conducting this study to understand views and experiences of people living with HIV. We want to know if and how HIV has affected sexual behaviour and practices of people living with HIV and their experiences of using anti-retroviral treatment and using partner notification services i.e. contacting sex partners to get tested following diagnosis with sexually transmitted infections. We will be conducting a questionnaire survey to understand the impact of these factors on the lives of people living with HIV. We want you to read this questionnaire and let us know if you understand the questions and how you derived your answers. We also want to know if there are any questions in the questionnaire that you did not understand and how we can change them.

#### **Why have you been invited?**

All men who identify themselves as men who have sex with men and are accessing the HIV clinic at Mortimer Market Centre are invited to participate in the study.

**Do you have to take part in the study?**

It is entirely your choice whether you want to take part in the study. If you have any questions or concerns about participating in the study, please ask the researcher. You can also discuss about your study participation with the representatives of clinic's patient network. If you decide to take part in the study, you are free to withdraw at any time without giving any reason. If you decide not to participate in the study, it will not affect the standard of health care you receive from this clinic.

**What will you have to do if you take part in the study?**

If you decide to participate you will be requested to sign a consent form indicating that you have voluntarily agreed to participate in the study. We will then ask you to complete a questionnaire survey either online or using a pen and paper in a separate quiet room in the clinic. These questions will be about your sexual behaviour and practices, HIV medication and your sexual partnerships, and/or your preferences towards various partner notification methods. You are not obliged to answer any questions that make you feel uncomfortable. We will ask you to answer one section of the questionnaire or ten questions at a time. The researcher will ask you if you understood the questions and how you arrived at the response for that question. If you do not understand the questions then it will be helpful for us to know that and to hear your suggestions about how to improve the question. These discussions will be audio-recorded. There will be no reference on the audio-recording or the questionnaire to your name or information that will link your survey responses to you. These audio files will be destroyed after analysis of the discussion. All the information you provide in the survey will be anonymous and confidential. We anticipate that you will take approximately 35-45 minutes to complete this interview.

**Who will know you are taking part in the study?**

The clinic staff that provides you with medical care will not have access to your interview responses or audio-recording. The audio-recorded files will be kept on a secure password protected computer in the researcher's office. Your doctor will not be paid for your participation in the study. Nor will your GP be notified about your study participation. The research team will manage the interview responses and analyse the data.

**Are there any disadvantages of you participating in the study?**

There are no disadvantages of you participating in the study. You may find some questions sensitive and personal. You are not obliged to answer those questions that make you feel uncomfortable.

**What are the possible benefits of you participating in the study?**

There will be no direct benefit to you for participating in the study. It is anticipated that the wider men who have sex with men (MSM) community will benefit in future from the study results. Findings from the interviews will help us improve the survey questionnaire that will be conducted to help inform, modify, and develop partner notification and other health care services that are responsive to the needs and preferences of patients.

**What will happen to the study results?**

Results of the interview will be used to revise the survey questionnaire for the study that is planned to be conducted in the Bloomsbury clinic once. This survey will be conducted after we finalise the questionnaire with your feedback. If you would like to be informed of the study findings, please do let us know and we are happy to share the publication with you when the study will be completed. We will also put a poster of the study findings in the Bloomsbury. The study results will be disseminated through interim report, posters, and articles in journals and magazines like NAM, HIV Treatment Update.

**What if there is a problem?**

If you have concerns or are unhappy with any aspect of this study, you can discuss these with the researchers whose details are mentioned below. They will do their best to answer your questions. If you remain unsatisfied and wish to complain formally, you can do this with the help of the hospital's patient support service:

**Tel:** [REDACTED] **Email:** [REDACTED] More information is available at [REDACTED]

**If you have any questions or concerns please contact the researchers:**

Ms Sonali Wayal

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Professor Graham Hart

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

## Appendix 7: Consent form for cognitive interviews



Study R&D Number: □□□□□□□□

**CONFIDENTIAL**

**Consent Form \_Questionnaire pilot**

**Version: 1**

**Date: 10<sup>th</sup> November 2009**

**Sex, Health, Antiretroviral Treatment and Partner Notification (SHARPN) Project**

**An interview to explore if patients understand the questions of the survey on sexual behaviour, ART and partner notification**

**Study Investigators:** Ms Sonali Wayal, Professor Graham Hart, Professor Jackie Cassell

**Please initial the box**

I confirm that I have read and understood the participant information sheet dated 10<sup>th</sup> November 2009\_version 2 for the above mentioned study.

I have had the opportunity to ask questions and discuss the study. I have received satisfactory answers to all my questions.

I understand that my participation is voluntary and I am free to withdraw at any time, without giving any reason.

I understand that refusal to participate in the study will not affect my medical care or legal rights.

I understand the interview will be audio-recorded and I give my consent for the same.

I understand that the information provided by me will be kept confidential and anonymous.

I agree to take part in the above-mentioned study.

\_\_\_\_\_  
Name of Patient

\_\_\_\_\_  
Signature and Date

\_\_\_\_\_  
Name of Person taking consent

\_\_\_\_\_  
Signature and Date

## **Appendix 8: Patient information sheet for SHARPN survey**



### **Sex, Health, Anti-retroviral Treatment and Partner Notification (SHARPN) Project**

#### **Participant Information Sheet\_ Questionnaire Survey**

**Version: 2**

**Date: 10 November 2009**

You are being invited to take part in Sex, Health, Anti-retroviral Treatment, and Partner Notification (SHARPN) Project. Please read this information sheet carefully. Please feel free to ask questions if any part of the information is unclear to you.

#### **Who is conducting this study?**

This study is being conducted by Centre for Sexual Health and HIV Research, University College London, London in collaboration with Department of Primary Care and Public Health, Brighton and Sussex Medical School, Falmer, Brighton. The study has been reviewed and approved by an independent NHS Research Ethics Committee and the Camden PCT Research & Development department.

#### **What is the purpose of the study?**

We are conducting a questionnaire survey to understand views and experiences of people living with HIV. We want to know if and how HIV has affected your sexual behaviour and practices. We also want to know about your experiences of using anti-retroviral treatment and using partner notification services i.e. contacting sex partners to get tested following diagnosis with sexually transmitted infections. This survey is about your views towards partner notification and aims to understand which methods of partner notification are acceptable to you. Information from this survey will help us modify and develop effective health interventions for the care and treatment of people living with HIV. We will also be conducting individual in-depth interviews with some chosen participants. These face-to-face interviews will allow us to talk to you in detail about your experiences of the effect of HIV on your sexual life and health in general, about using antiretroviral treatment and your views about new methods of partner notification.

**Why have you been invited?**

All men who identify themselves as men who have sex with men and are accessing the HIV clinic at Mortimer Market Centre are being invited to participate in the study.

**Do you have to take part in the study?**

It is entirely your choice whether you want to take part in the study. If you have any questions or concerns about participating in the study, please ask the researcher. You can discuss the study with the clinic's patient representatives. If you decide to take part in the study, you are free to withdraw at any time without giving any reason. If you decide not to participate in the study, it will not affect the standard of health care you receive from this clinic.

**What will you have to do if you take part in the study?**

If you decide to participate, you will be requested to sign a consent form indicating that you have voluntarily agreed to participate in the questionnaire survey. We will then request you to complete a questionnaire survey online in a separate quiet room in the clinic. You will be asked questions about your sexual behaviour and practices, HIV medication and your sexual partnerships, and your preferences towards various partner notification methods. There will be no reference on the survey questionnaire to your name or information that will link your survey responses to you. All the information you provide in the survey will be anonymous and confidential.

Some men participating in the questionnaire survey will also be invited to participate in a face-to-face interview. If you would like to participate in a face-to-face interview and share your experiences about HIV, antiretroviral treatments and partner notification then we will document your contact details i.e. email address and phone number and some basic information i.e. your age and if you are taking antiretroviral treatment. We will contact you at a later stage to arrange a face-to-face interview in the clinic on a day and time convenient for you. All the information collected during face-to-face interviews will be treated with confidentiality.

**Who will know you are taking part in the study?**

The clinic staff that provides you with medical care will not have access to your survey responses. Your doctor will not be paid for your participation in the study. Nor will your GP be notified about your study participation. The research team will manage the questionnaire responses.



**How much time is involved?**

We would like you to complete an online questionnaire survey. We request you to complete all the questions. We anticipate that you will take approximately 25-45 minutes to complete this survey. You can complete the survey online in your own time if you have access to computer and internet. We will document your email address and send you the questionnaire web link.

**Are there any disadvantages of you participating in the study?**

There are no disadvantages of you participating in the study. You may find some questions sensitive and personal. You are not obliged to answer those questions that make you feel uncomfortable.

**What are the possible benefits of you participating in the study?**

There will be no direct benefit to you for participating in the study. It is anticipated that the wider men who have sex with men (MSM) community will benefit in future from the study results. Findings from our survey can help inform, modify, and develop health care services that are responsive to the needs and preferences of patients.

**What will happen to the study results?**

Results of the questionnaire survey will be analysed as an aggregate of participants' responses and published as reports, posters, and articles in journals and magazines like NAM, HIV Treatment Update. If you would like to be informed of the study findings, please do let us know and we are happy to share the publication with you when the study will be completed.

**What if there is a problem?**

If you have concerns or are unhappy with any aspects of this study, you can contact the researcher whose details are mentioned below. They will do their best to answer your questions. If you remain unsatisfied and wish to complain formally, you can do this with the help of the hospital's patient support service: **Tel:** [REDACTED]; **Email:** [REDACTED] More information is available at [REDACTED]

**If you have any questions or concerns please contact the researchers:**

Ms Sonali Wayal

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Professor Graham Hart

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

## Appendix 9: Consent form for the SHARPN survey



Study R&D Number:

**CONFIDENTIAL**

**Consent Form\_questionnaire survey**

**Version: 1**

**Date: 10th November 2009**

**Sex, Health, Antiretroviral Treatment and Partner Notification (SHARPN)  
Project**

**A study to understand patients views towards HIV and Antiretroviral treatments, sexual behaviour, and acceptability and preferences regarding partner notification methods.**

**Study Investigators:** Ms Sonali Wayal, Professor Graham Hart, Professor Jackie Cassell

**Please initial in the box**

I confirm that I have read and understood the participant information sheet dated 10<sup>th</sup> November 2009 version 2 for the above mentioned study.

I have had the opportunity to ask questions and discuss the study. I have received satisfactory answers to all my questions.

I understand that my participation in the survey is voluntary and I am free to withdraw at any time, without giving any reason.

I understand that refusal to participate in the study will not affect my medical care or legal rights.

I understand that the information provided by me will be kept confidential and anonymous.

I agree to take part in the above-mentioned study.

\_\_\_\_\_  
Name of Patient

\_\_\_\_\_  
Signature and Date

\_\_\_\_\_  
Name of Person taking consent

\_\_\_\_\_  
Signature and Date

I agree to be contacted at a later stage by a researcher to take part in a one-to-one interview (Please leave blank if you do not wish to be contacted)

If you have agreed to participate in a face-to-face interview, please provide the following information:

Age:.....years

Are you currently taking antiretroviral treatments: Yes / No

Please let us know how you would prefer to be contacted:

- Via phone.....

(Please give your telephone number and your preferred time for being contacted)

- Via email address: .....

.

## **Appendix 10: Modified patient information sheet (following pilot for survey)**



### **Sex, Health, Anti-retroviral Treatment and Partner Notification (SHARPEN) Project**

#### **Participant Information Sheet\_ Questionnaire Survey**

**Version: 3**

**Date: 19<sup>th</sup> March 2010**

You are being invited to take part in Sex, Health, Anti-retroviral Treatment, and Partner Notification (SHARPEN) Project. Please read this information sheet carefully. Please feel free to ask questions if any part of the information is unclear to you.

#### **Who is conducting this study?**

This study is being conducted by Centre for Sexual Health and HIV Research, University College London, London in collaboration with Department of Primary Care and Public Health, Brighton and Sussex Medical School, Falmer, Brighton. The study has been reviewed and approved by an independent NHS Research Ethics Committee and the Camden PCT Research & Development department.

#### **What is the purpose of the study?**

We are conducting a questionnaire survey to understand views and experiences of people living with HIV. We want to know if and how HIV has affected your sexual behaviour and practices. We also want to know about your experiences of using anti-retroviral treatment and using partner notification services i.e. contacting sex partners to get tested following diagnosis with sexually transmitted infections. This survey is about your views towards partner notification and aims to understand which methods of partner notification are acceptable to you. Information from this survey will help us modify and develop effective health interventions for the care and treatment of people living with HIV. We will also be conducting individual in-depth interviews with some chosen participants. These face-to-face interviews will allow us to talk to you in detail about your experiences of the effect of HIV on your sexual life and health in general, about using antiretroviral treatment and your views about new methods of partner notification.

**Why have you been invited?**

All men who identify themselves as men who have sex with men and are accessing the HIV clinic at Mortimer Market Centre are being invited to participate in the study.

**Do you have to take part in the study?**

It is entirely your choice whether you want to take part in the study. If you have any questions or concerns about participating in the study, please ask the researcher. You can discuss the study with the clinic's patient representatives. If you decide to take part in the study, you are free to withdraw at any time without giving any reason. If you decide not to participate in the study, it will not affect the standard of health care you receive from this clinic.

**What will you have to do if you take part in the study?**

If you decide to participate, we will ask you to complete a questionnaire survey online in a separate quiet room in the clinic. **By completing the questionnaire survey you are implicitly giving your consent to participate in the study.** In the survey, you will be asked questions about your sexual behaviour and practices, HIV medication and your sexual partnerships, and your preferences towards various partner notification methods. There will be no reference on the survey questionnaire to your name or information that will link your survey responses to you. All the information you provide in the survey will be anonymous and confidential.

**Who will know you are taking part in the study?**

The clinic staff that provides you with medical care will not have access to your survey responses. Your doctor will not be paid for your participation in the study. Nor will your GP be notified about your study participation. The research team will manage the questionnaire responses.

**How much time is involved?**

We would like you to complete an online questionnaire survey. We request you to complete all the questions. We anticipate that you will take approximately 25-45 minutes to complete this survey. You can complete the survey online in your own time if you have access to computer and internet. We will document your email address and send you the questionnaire web link.

**Are there any disadvantages of you participating in the study?**

There are no disadvantages of you participating in the study. You may find some questions sensitive and personal. You are not obliged to answer those questions that make you feel uncomfortable.

**What are the possible benefits of you participating in the study?**

There will be no direct benefit to you for participating in the study. It is anticipated that the wider men who have sex with men (MSM) community will benefit in future from the study results. Findings from our survey can help inform, modify, and develop health care services that are responsive to the needs and preferences of patients.

**What will happen to the study results?**

Results of the questionnaire survey will be analysed as an aggregate of participants' responses and published as reports, posters, and articles in journals and magazines like NAM, HIV Treatment Update. If you would like to be informed of the study findings, please do let us know and we are happy to share the publication with you when the study will be completed.

**What if there is a problem?**

If you have concerns or are unhappy with any aspects of this study, you can contact the researcher whose details are mentioned below. They will do their best to answer your questions. If you remain unsatisfied and wish to complain formally, you can do this with the help of the hospital's patient support service: **Tel:** [REDACTED]; **Email:** [REDACTED] More information is available at [REDACTED]

**If you have any questions or concerns please contact the researchers:**

Ms Sonali Wayal

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Professor Graham Hart

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

## Appendix 11: SHARPN survey study sheet

Dear Doctors/Nurses/Phlebotomy Staff/Health Advisors (Bloomsbury Clinic),

### Sex, Health, Antiretroviral Project and Partner Notification (SHARPN) Project

This patient is ELIGIBLE for the SHARPN survey. Eligibility criteria are:

- HIV positive
- Age 18 or above
- Men who have sex with men (MSM)

It will be helpful if you can please do the following:

- Inform the patient the SHARPN survey is about attitudes towards Antiretroviral treatment, sexual behaviour, and their views towards partner notification for other STI.
- Give the patient the attached study information sheet (copies are kept in every consulting room on the table and near the nurses station on ground floor).
- If the patient agrees, please refer them to the nurses station on the ground floor and ask them to look for Sonali Woyal (██████████) or Nurses: Are Isaksen, Taras Flynn, Brian George or Nina Panahmand
- Patients can complete the survey at home in their own time if they have access to computers and internet.

Did you ask the patient to participate in the survey? (Please tick)

|                          |                          |                          |
|--------------------------|--------------------------|--------------------------|
| Yes                      | No                       | Did not ask              |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Did the patient agree to participate? (Please tick)

|                          |                          |
|--------------------------|--------------------------|
| Yes                      | No                       |
| <input type="checkbox"/> | <input type="checkbox"/> |

If the patient agrees to participate, please ask them to write their EMAIL ADDRESS in capital letters and keep this sheet in the SHARPN study folder: .....

Thank you for your co-operation

## **Appendix 12: Topic guide for qualitative interviews**

### **Meanings of implications of HIV diagnosis on health and sexual behaviour:**

- HIV diagnosis: year of diagnosis; impact of diagnosis and how contracted HIV (perceptions to risk)
- Attitude towards HIV: manageable condition/treatment optimism/stigma/gay community
- Meaning and knowledge of HIV: effect of HIV on viral load, CD4 count, implications
- Advice given by clinicians/nurse about sexual practices and behaviour
- Source of information for sexual behaviour and medical advice

### **Hepatitis C Diagnosis:**

- Why tested (symptoms or other reasons)?
- How do you think you got infected with Hep C (risk perceptions)?
- Impact of diagnosis (on health, (treatment and sex) and partner notification / Any other STI equally stigmatised

### **HIV Medication**

- Knowledge and attitudes towards cART
- Currently taking cART: self or friends/since when/experience of taking cART/effects on sexual behaviour and practices
- Sexual dysfunction/loss of sexual libido

### **Disclosure, sexual behaviour, and Swiss statement**

- Are you currently in a relationship? Nature of relationship and type of partners
- How do you meet your partners?
- Do you inform sexual partners about your HIV status? When do you disclose to sex partners? If does not disclose HIV status, then why so?
- Condom less sex with HIV positive men
- Sexual strategies used instead of disclosure of HIV status
- Views about transmitting HIV to sexual partners and strategies: negative experiences and fear of transmission occurring, strategies used for prevention
- Views towards ART and HIV transmission: Knowledge of Swiss Statement

### **Recent STI diagnosis, Partner notification (PN), sexual episode**

- Recent STI diagnosis: which/why tested/ any co-infections [Hep C]
- Experience of interaction with Health Advisors on recent occasion
- Experience of PN for past episode: who/how/barriers/reasons



- PN for HIV when diagnosed

### **Attitudes towards PN, and towards PN by type of sexual partnership**

- Views towards partner notification per se and towards provider referral and patient referral
- Views towards notifying regular partner vs. other partners: is there any difference and why?
- Preferred methods for PN (scenario 5) and partnership type
- Monogamy with HIV positive partner and Hepatitis C diagnosis
- PN for Syphilis when sexual partner is not aware of HIV status
- Views about being notified by partner for Syphilis and Hep C
- Website bareback party, Group sex, Syphilis
- LGV outbreak and extended PN
- HSK and APT for CT and NG

### **Views towards PN and Law**

- PN for newly diagnosed HIV
- PN for other STI (curable and non-curable)
- Legal obligation for PN for HIV and other STI
- Criminalisation of HIV transmission

### **Views towards Female researcher**

- How are you feeling after the interview? Anonymity/other issues/Views towards researcher
- How are you feeling after the discussion?

### **Vignettes on partner notification used during in-depth interviews and FGD**

#### **SCENARIO 1:**

#### **Preferences for Partner notification (please tick 3 most preferred methods)**

1. Not contact any sexual partner
2. Contact sexual partner face-to-face and tell them
3. Contact sexual partner face-to-face and give them clinic referral slip
4. Contact via email from personal account
5. Contact via anonymous e-card (assuming such a service of anonymous e-card is provided by the clinic)
6. Contact via personal telephone/mobile
7. Contact via text message from personal mobile
8. Contact via online chat
9. Ask the health advisor/clinic staff to contact your partners (anonymously)

**SCENARIO 2:**

Assume that you have a boyfriend who is HIV positive. You both have agreed to have a monogamous relationship and practice unprotected anal sex. You went to a party with your friends where you met 'Y' and had sex with him only that one time. Unfortunately, you were diagnosed with Hepatitis C a few weeks later. Your doctor tells you that Hepatitis C is not curable but tells you about the treatment for Hepatitis C. He asks you to send your boyfriend to test for Hepatitis C. What are you most likely to do?

**SCENARIO 3:**

Assume that you are diagnosed with Chlamydia and Gonorrhoea and are treated for these infections in the clinic. You have a boyfriend who lives with you. The doctor offers you two options:

-One is to take a home sampling kit, which contains a pot to collect urine, swabs to collect specimens from rectum and tube to put that swab. It also contains instruction sheet on how to collect the specimens and pre-addressed package to post the specimens to the clinic.

-The second option is to call your boyfriend while you are in the clinic so the doctor can assess your partner on the phone and if needed give you medication for your partner for Chlamydia and Gonorrhoea.

Do you think you may use any of these two options?

**SCENARIO 4:**

Assume that you have a regular fuck buddy and 2 other casual partners. Your regular fuck buddy has been diagnosed with Syphilis and Hepatitis C. Do you think he should contact you to tell you that you should get tested for these infections?

**SCENARIO 5:**

Assume you have your profile on Gaydar.com (a website of social/sexual networking for gay men). On this website, you read information about a party where only HIV positive men who have sex with men are invited to have anal sex without condom. The rule is if you express interest to attend the party and are invited, you must attend the party. If you don't attend, you will be excluded from future events. You express interest and are invited for the party. You go to the party and have group sex. Within days, you develop symptoms and are diagnosed with Syphilis and treated for it. Your doctor asks you to contact your sexual partners so they can test for Syphilis.

Do you think you will contact the group sex members to tell them that maybe Syphilis was transmitted during that party?

**SCENARIO 6:**

Assume that there is an outbreak of Lymphogranuloma Venerum (LGV) in London. LGV is a sexually transmitted infection. Your sexual partner is diagnosed with LGV. So you also go to the clinic and get tested for LGV but you are not infected. The doctor informs you about the outbreak and mentions that many people with LGV do not have symptoms i.e. are asymptomatic. Your doctor asks you to refer your gay friends who, you know, practice unprotected sex to test for LGV. They may or may not be your sex partners.

Will you ask your gay friends to test for LGV if there is an outbreak?

## **Appendix 13: Patient information sheet for focus group discussion**



### **Sex, Health, Antiretroviral Treatment and Partner Notification (SHARPN) Project**

#### **Participant Information Sheet\_Focus group discussion**

**Version: 2**

**Date: 10th November 2009**

You are being invited to take part in Sex, Health, Antiretroviral Treatment, and Partner Notification (SHARPN) Project. Please read this information sheet carefully. Please feel free to ask questions if any part of the information is unclear to you.

#### **Who is conducting this study?**

This study is being conducted by Centre for Sexual Health and HIV Research, University College London, London in collaboration with Department of Primary Care and Public Health, Brighton and Sussex Medical School, Falmer, Brighton. The study has been reviewed and approved by an independent NHS Research Ethics Committee and the Camden PCT Research & Development department.

#### **What is the purpose of the study?**

We are conducting this study to understand views and experiences of people living with HIV. We want to know about your experiences of using partner notification (PN) services i.e. contacting sex partners to get tested following diagnosis with sexually transmitted infections. This study is about your views towards partner notification and aims to understand which methods of partner notification are acceptable to you. Information from this study will help us modify and develop effective health interventions for care and treatment of people living with HIV.

#### **Why have you been invited?**

We want to conduct a group discussion with members of the Bloomsbury Clinic Patient Network to understand their views about partner notification services. We will present you with different scenarios to understand your preferences and acceptability of various PN methods.

**Do you have to take part in the study?**

It is entirely your choice whether you want to take part in the study. If you have any questions or concerns about participating in the study, please ask the researcher for further information. You can also discuss with the representative of the clinic's patients network. If you decide to take part in the study, you are free to withdraw at any time without giving any reason. If you decide not to participate in the study, it will not affect the standard of health care you receive from this clinic.

**What will you have to do if you take part in the study?**

If you decide to participate you will be requested to sign a consent form indicating that you have voluntarily agreed to participate in the study. We will then request you to participate in a group discussion with 6-8 other members of the clinic's patient network in a separate quiet room in the clinic. We anticipate that the discussion will last for approximately an hour. The discussion will be around issues related to screening for sexually transmitted infections, sexual partners and your preferences towards various partner notification methods. The discussion will be audio-recorded with your permission. We will not audio-record your name or identifiable data.

**Who will know you are taking part in the study?**

The clinic staff that provides you with medical care will not have access to the discussion details or audio-recording. The audio-recorded files will be stored in the researcher's office on a secure password protected. These audio files will be destroyed immediately after transcription. Your doctor will not be paid for your participation in the study. Nor will your GP be notified about your study participation. The research team will manage the responses and analyse the data. The discussion will be analysed and no references to the names of participants will be made in the study publications. During the group discussion if there is a disclosure of information that indicates the possibility of self-harm or harm to others, we will be obliged to report this information to appropriate clinic staff to ensure your safety. Due to the discussion of sensitive issues if you feel the need to talk to a counselor, the researcher can refer you to an appropriate counseling service.

**Are there any disadvantages of you participating in the study?**

There are no disadvantages of you participating in the study. You may find some questions sensitive and personal. You are not obliged to answer those questions that make you feel uncomfortable.

**What are the possible benefits of you participating in the study?**

There will be no direct benefit to you for participating in the study. It is anticipated that the wider community will benefit in future from the study results. Findings

from the discussion will help us understand your views and suggestions about the issues explored in the discussion.

**What will happen to the study results?**

The study findings can help inform, modify, and develop partner notification services that are responsive to the needs and preferences of patients. Direct quotes from the discussion may be used for journal articles and posters but identifiable data or your name will not be disclosed. Results of the discussion will also be used to revise the topic guide of in-depth interviews that will be conducted in the patients in the Bloomsbury clinic. If you would like to be informed of the study findings, please do let us know and we are happy to share the study summary with you on completion of the study. We will also put a poster of the study findings in the Bloomsbury clinic.

**What if there is a problem?**

If you have concerns or are unhappy with any aspect of this study, you can discuss these with the researchers whose details are mentioned below. They will do their best to answer your questions. If you remain unsatisfied and wish to complain formally, you can do this with the help of the hospital's patient support service: **Tel:** [REDACTED]; **Email:** [REDACTED] More information is available at [REDACTED]

**If you have any questions or concerns please contact the researchers:**

Ms Sonali Wayal

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Professor Graham Hart

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

## Appendix 14: Consent form for focus group discussions



Study R&D Number:

Consent Form\_Focus group discussion

Version: 1

Date: 10 November 2009

### Sex, Health, Antiretroviral Treatment and Partner Notification (SHARPN) Project

A study to understand patients views towards HIV, Antiretroviral treatments, sexual behaviour, and acceptability and preferences regarding partner notification methods

**Study Investigators:** Ms Sonali Wayal, Professor Graham Hart, Professor Jackie Cassell

#### Please initial the box

I confirm that I have read and understood the participant information sheet dated 10th November 2009\_version 2 for the above mentioned study.

I have had the opportunity to ask questions and discuss the study. I have received satisfactory answers to all my questions.

I understand that my participation in the group discussion is voluntary and I am free to withdraw at any time, without giving any reason.

Refusal to participate in the study will not affect my medical care or legal rights.

I understand that the group discussion will be audio-recorded and I agree for the same.

I understand that if I disclose information during the discussion that indicates that I am at risk of serious self-harm or harm to others, the researcher may have to disclose this information to an appropriate clinic staff

I understand that if due to the discussion I feel distressed, the researcher can help me meet a counsellor

I understand that the information provided by me will be kept confidential and anonymous

I understand that direct quotes from group discussion will be used for journal articles and posters but identifiable data or my name will not be disclosed

I agree to take part in the above-mentioned study.

\_\_\_\_\_  
Name of Patient

\_\_\_\_\_  
Signature and Date

\_\_\_\_\_  
Name of Person taking consent

\_\_\_\_\_  
Signature and Date



## **Appendix 15: Study information sheet for in-depth interviews**



### **Sex, Health, Antiretroviral Treatment and Partner Notification (SHARPN) Project**

#### **Participant Information Sheet\_In-depth interviews**

**Version: 2**

**Date: 10 November 2009**

You are being invited to take part in Sex, Health, Antiretroviral Treatment, and Partner Notification (SHARPN) Project. Please read this information sheet carefully. Please feel free to ask questions if any part of the information is unclear to you.

#### **Who is conducting this study?**

The SHARPN project is being conducted by Centre for Sexual Health and HIV Research, University College London, London in collaboration with Department of Primary Care and Public Health, Brighton and Sussex Medical School, Falmer, Brighton. The study has been reviewed and approved by an independent NHS Research Ethics Committee and the Camden PCT Research & Development department.

#### **What is the purpose of the study?**

We will be conducting face-to-face individual interviews with some participants. These interviews will allow us to talk to you in detail about your experiences and the effect of HIV on your sexual life and health in general. We want to know about your experiences of using antiretroviral treatment and partner notification services i.e. contacting sexual partners following diagnosis with sexually transmitted infections (STI) to advise them to test for the infections. Talking to you face-to-face will help us understand your views and opinion towards new methods of contacting sexual partners after being diagnosed with STI and if you have used any of these methods in the past.

#### **Why have you been invited?**

All men who identify themselves as men who have sex with men and are accessing the Mortimer Market Centre HIV clinic are being invited to participate in the study.

#### **Do you have to take part in the interview?**

It is entirely your choice whether you want to take part in the interview. Your participation is voluntary. If at any point, you feel that you do not want to participate in the interview, you are free to withdraw from the study. If you decide not to participate in the study, it will not affect the standard of health care you receive from this clinic.

**What will happen if you decide to take part in the study?**

If you agree to participate in the study, you will be invited to talk to a trained researcher in a quiet room in the clinic on a day and time convenient for you. You will be requested to give your written consent to participate in the interview and to audio-record the interview. We will not audio-record your name or identifiable data. You can refuse for the interview to be recorded. However, we assure you that recording is done for purposes of convenience and audio-recorded data will be stored on password-protected computer. We will not maintain a link your name and the audio-files. The audio-recorded file will be transferred to the computer and given a study number e.g. IDI\_1001. These files will be destroyed immediately after transcription.

**How much time is involved?**

The interview is likely to last for approximately 60-70 minutes. The researcher will talk to you about your sexual experiences and practices since being diagnosed with HIV, antiretroviral treatment and your sexual partnerships, and your preferences towards various partner notification methods.

**Are there any disadvantages of you participating in the study?**

There are no disadvantages of you participating in the study. You may find some questions sensitive and personal. You are not obliged to answer those questions that make you feel uncomfortable.

**What are the benefits of you participating in the study?**

There will be no direct benefit to you for participating in the study. It is anticipated that the wider community will benefit in future from the study results. Findings from the discussion will help us understand your views and suggestions about the issues explored in the discussion.

**What will happen to the study results?**

All the information provided by you during the interview will be treated with confidentiality. During the interview if there is disclosure of information that indicates possibility of self-harm or harm to others, we will be obliged to report this information to appropriate clinic staff. Due to the discussion of sensitive issues if you feel the need to talk to a counselor the researcher can refer you to an appropriate service. All the interviews will be analysed by the researcher. We will use direct quotes from your interview in the reports and articles but we will not refer to your name or identifiable data. If you would like to be informed of the study findings, please do let us know and we are happy to share the results summary with you when the study will be completed. We will also publish articles in journals and magazines like NAM, HIV Treatment Update.

**What if there is a problem?**

If you have concerns or are unhappy with any aspects of this study, you can contact the researcher whose details are mentioned below. They will do their best to answer your questions. If you remain unsatisfied and wish to complain formally, you can do this with the help of the hospital's patient support service: **Tel:** [REDACTED]; **Email:** [REDACTED] More information is available at [REDACTED]

**If you have any queries, please do not hesitate to contact the researchers:**

Ms Sonali Wayal

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Professor Graham Hart

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

## Appendix 16: Consent form for in-depth interviews



Study R&D Number:

### Consent Form\_In-depth interviews

Version: 1

Date: 10th November 2009

### Sex, Health, Antiretroviral Treatment and Partner Notification (SHARPN) Project

A study to understand patients views towards HIV, Antiretroviral treatments, sexual behaviour, and acceptability and preferences regarding partner notification methods.

**Study Investigators:** Ms Sonali Wayal, Professor Graham Hart, Professor Jackie Cassell

#### Please initial in the box

I confirm that I have read and understood the participant information sheet dated 10th November 2009 \_version 2 for the above mentioned study.

I have had the opportunity to ask questions and discuss the study. I have received satisfactory answers to all my questions.

I understand that my participation in the survey is voluntary and I am free to withdraw at any time, without giving any reason.

Refusal to participate in the study will not affect my medical care or legal rights.

I understand that the interview will be audio-recorded and I agree for the same.

I understand that if I disclose information during the interview that indicates that I am at risk of serious self-harm or harm to others, the researcher may have to disclose this information to an appropriate clinic staff.

I understand that if due to the interview I feel distressed then the researcher can help to meet a counsellor.

I understand that the information provided by me will be kept confidential and anonymous.

I understand that direct quotes from my interview will be used for journal articles and posters but identifiable data or my name will not be disclosed.

I agree to take part in the above-mentioned study.

\_\_\_\_\_  
Name of Patient

\_\_\_\_\_  
Signature and Date

\_\_\_\_\_  
Name of Person taking consent

\_\_\_\_\_  
Signature and Date

## **Appendix 17: Broad tree nodes (broad themes) identified during coding of qualitative data**

The process of analysing qualitative data started with identifying broad tree nodes. The following broad tree nodes of interest were identified during the process of coding. The transcripts were coded using these tree nodes and the description of these nodes was documented to maintain consistency in coding. New tree nodes were added to this list as the process of coding transcripts progressed. The data in each tree node was further analysed to identify emerging themes:

### **Added on 6<sup>th</sup> August when coding IDI\_001**

1. Age and sex: change in sexual behaviour and attitudes due to age
2. Age at HIV diagnosis
3. Views towards anonymous e-card
4. cART and sex behaviour: views about cART and sexual behaviour
5. cART medication: views towards cART c and experience of starting cART
6. Attitudes to HIV: change over time and current attitudes towards HIV as an illness
7. Being gay and stigma: experiences as a gay man
8. CD4 count: perceptions/meaning of CD4 cell count and its relevance
9. Change in gay sex over time
10. Criminalisation of HIV transmission
11. Disclosure about HIV status: attitudes towards and experience of HIV disclosure on relationships in general and if the person has told anyone about his status, why etc.
12. Disclosure of HIV status to sex partners: views and attitudes towards disclosure of HIV status for sex purposes and what methods does the person use.
13. Serodiscordant primary partnership
14. Recreational drug use
15. Expanded partner notification: views towards referring social network people in event of outbreak of STI
16. Experience as a contact: participants experience as a contact of an index patient and views about it
17. Experience of HIV diagnosis: psychological and other experiences of being diagnosed with HIV
18. Experience of notifying for STI: participants experience of notifying sex partners after being diagnosed with STI (not HIV)

19. Experience of HIV partner notification Female interviewer: experience of the participant of being interviewed by me
20. Group sex and partner notification: views about scenario for group sex and partner notification Group sex: experience of engaging in group sex and reasons for the same
21. Health advisor for partner notification: experience of interaction with health advisors/other professionals for partner notification
22. HCV diagnosis: Participants sexual practices and behaviour and reasons for them
23. HIV and sex: Participants sexual practices and behaviour and reasons for them
24. HIV and stigma: views and perceptions towards HIV and stigma, participants own views towards HIV and internalised shame
25. Home sampling and APT
26. How infected with HIV: perceptions about how the participant thinks he got infected with HIV
27. Internet and sex: use of internet for sex partners, profile types etc.
28. Internet PN: views towards contact or being contacted via email, online chat, anonymous e-card (any internet related tool) or ways of contacting partners met online.
29. London
30. Mandatory partner notification
31. Medical advice: Is the participant given any medical advice about sex behaviour, medication, HIV etc. or does the participant ask for it.
32. mental health
33. Migration: is the participant a non-UK citizen, when migrated, why
34. Partnership type and partner notification methods: what are the preferred methods of contacting different types of sex partners? are there any differences in preferred methods of notifying different types of partners
35. Preference as a contact: what are participants views and preferences about being a contact and method of being notified
36. Provider referral
37. risk perceptions: perceptions about the risk of acquisition or transmission of STI and HIV
38. Risk reduction strategies: knowledge, understanding and use of strategies or practices to minimise transmission of HIV or lack of awareness of such strategies
39. Sex partner at the time of HIV diagnosis
40. Sexual partnerships: views towards sexual partners' status of HIV. hep c etc. and current type of partners
41. Sexual preference: does the participant have sexual position preference i.e. does he like to be only top or bottom or both? Why? Is it for risk reduction or personal preference?
42. Sexual problems

43. Social support
44. SOPV: sex on premises venues and experience of meeting sex partners in such venues, frequency of visit , disclosure
45. STI screening and diagnosis: does the participant screen for STI, when and experience of diagnosis with recent STI
46. Swiss statement: views towards having undetectable viral load and sexual behaviour
47. Syphilis diagnosis and unaware HIV partner: scenario where the partner is unaware that the participant has HIV and then participant is diagnosed with syphilis and may want to notify the partner
48. Testing for HIV: why tested for HIV, experience of HIV testing, reasons for not testing etc.
49. Unprotected sex: experiences of unprotected sex and bare backing
50. Views towards HIV partner notification: what are participants views towards HIV PN and why
51. Views towards partner notification (overall)
52. Viral load
53. Year HIV diagnosed

**Additional themes included on 8<sup>th</sup> August when coding IDI\_002**

54. Other health problems
55. HIV and employment
56. Vignettes and challenges
57. Sexual pleasure

**Additional themes included on 10th August when coding IDI\_003**

58. Shared stigma: feelings towards other HIV positive people and feelings of community/commonness

**Additional themes included on 12th August when coding IDI\_004**

59. ART immediately at diagnosis
60. Cure for HIV
61. Need for health promotion: participants views about the kind of information they need, advice they would like etc.
62. Sexual behaviour of gay men in general
63. PEP

**Additional themes included on 8th August when coding IDI\_005**

64. HSK for HIV



## Appendix 18: Charting of qualitative data using excel data

| Participant details   | HIV and sex  | Risk perceptions  | Disclosure to sex partners   | Internet and sex  |
|---|--|---|--|---|
| <b>IDI_0001, White British man in mid-fifties living with HIV since 2 years, on cART and has a boyfriend, educated till NVQ level</b> | He was completely put off sex after HIV diagnosis, didn't have sex for 2 months; he loves his current partner; continues to have penetrative sex with boyfriend but 'of course' uses condoms.  | Being passive during UAI and IDU are risky for HIV trans; thinks there are "grey areas" for HIV transmission.   | Does not disclose HIV status in saunas; norm is to assume men are HIV positive in these venues; thinks its sex partners responsibility to protect him and he should protect himself.   | He doesn't have a computer but thinks of getting one and things may change for dating.  |
| <b>IDI_002, Black British man in mid-twenties living with HIV since 4 years, not on cART, educated till NVQ level</b>                 | He didn't have sex for a year post-diagnosis because he was depressed; but later said he got drunk and had UAI; after a year when started dating again felt things were new and didn't know how to handle sex, disclosure to partners of HIV status; was surprised when he disclosed and sex partner was fine with it. | Thinks HIV transmits through contact with blood so was worried when he had nose bleed at work; HIV can be prevented by safe sex, being careful with ejaculation i.e. cum shouldn't go near anal or mouth areas. | He has decided to be honest because earlier he lied and thinks he got HIV because of his situation full of lies; men appreciated him informing them of HIV diagnosis but in some cases it meant end of relationship; never asks sex partners their status unless they volunteer. | He has online profile but has not disclosed his HIV status; doesn't feel the need as he always discloses his status to person before sex or has safe sex. |