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Chlamydia testing and treatment in community pharmacies: findings and lessons learned from setting out to evaluate an unexpectedly short lived service in Lothian, Scotland

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DECLARATION

I hereby declare that this thesis is written by me and based on my own work. In carrying out this study, I was fully engaged in the whole research process i.e. proposal writing, field work, analyses and writing the thesis. Although I have received invaluable advice and feedback while preparing this thesis, I wrote it myself and take full responsibility of its content.

This work has not been submitted for any other degree or professional qualification.

Signature:

Date: March 2013

ABSTRACT

Introduction

Genital chlamydia is the most commonly diagnosed sexually transmitted infection. In August 2008, the Scottish government directed its health boards to involve community pharmacies in providing chlamydia testing and treatment for young people. Lothian Health Board envisaged a pharmacy-based chlamydia testing and treatment (CT&T) service to be able to reach deprived population. This research project set out to evaluate the implementation of the CT&T in Lothian, Scotland. However, the Lothian CT&T service suffered from setbacks such as; implementation delays, minimal advertising of the service, low uptake, withdrawal by central government of specific funding to support the service costs, and subsequent termination of the service in Lothian by March 2011. As it turned out, the CT&T service ran in Lothian for only 10 months. As events unfolded, the aims of the PhD research were successively revised so as to undertake an integrated set of studies that provide important insights and generalizable knowledge about the rationale for such a service, the process of implementation, including barriers and facilitators, and the potential to utilise routine data to assess the impact of a new service. An additional component was added, in that I undertook an analysis of an anonymous routine data on chlamydia testing obtained from the microbiology reference laboratory of Lothian to describe the epidemiology of chlamydia in Lothian (2006-2010) and to report an impact of recent policy changes (2008-2009) on chlamydia surveillance activity.

Methods

The Centre for Disease Control (CDC) framework for programme evaluation was used to guide design the evaluation of the CT&T service, and a subset of 'strategic' stakeholders for the service was involved throughout. Four studies were undertaken towards the evaluation, and these employed diverse methods, as follows: (i) A training need survey of pharmacists and their support staff was undertaken in 166 community pharmacies in Lothian, to inform the training session held prior to the CT&T service launch. (ii) A survey of 33 strategic stakeholders in Lothian was undertaken to provide input to the evaluation objectives and to identify their perceptions and concerns in relation to the CT&T initiative and its evaluation. (iii) A

survey of potential service users, young people aged 15-24 years, was carried out at the Genito-Urinary Medicine (GUM) clinic and two other sexual health drop-in clinics in Lothian. The survey ascertain their preferences regarding specific aspects of the CT&T service, and their views on issues identified in previous literature as facilitators or barriers with regard to utilising of such a service. (iv) In order to understand the service provider's perspective on setting up and delivering of the CT&T service, in-depth interviews were undertaken with participating and non-participating pharmacists. Eleven pharmacists were purposively sampled from 66 pharmacies invited by NHS Lothian to pilot the service roll-out.

Finally, after the Lothian CT&T service had been terminated, 3 strategic stakeholders for Lothian, and a Scottish Government representative were contacted by email, to elicit their views on factors contributing to policy decisions regarding pharmacy-based CT&T services.

Results

The analysis of disaggregated (individual) routine laboratory data showed that age, gender, year of testing and deprivation were associated with the chlamydia testing outcome measures. The before-and-after analysis, with respect to recent major policy/guidance changes (that is, publication of the sexual health service standards for Scotland in 2008, and of SIGN guidelines for chlamydia in 2009), showed that surveillance activity for chlamydia increased only transiently (i.e. in 2009 only). The annual surveillance target for women aged 15-24 years, of 300 tests / 1000 population, was achieved in 2009 only, but targets for males aged 15-24 years (of 100 tests / 1000 population) were not achieved.

With respect to the evaluation studies, the training needs survey (i) had a 53% pharmacy response rate from the pharmacies comprised 41% pharmacists, 32% technicians and 26% counter assistants. The survey showed differences in self-assessed training needs between pharmacy staff groups (pharmacists/ technicians/ counter staff). With regard to pharmacist-only competencies, the highest rates of substantial training needs were for clarity regarding the medico-legal aspects (Fraser guidelines), taking a sexual history, criteria for referral and reviewing own and staff competencies for the CT&T service (83% to 77%). With respect to all staff

competencies, the greatest self-reported training need was for inter-communicative aspects of providing the service – for respondents overall, 56% to 83% across competencies within this domain.

For the stakeholder survey (ii), the response rate was 52% (n=17). Sixteen stakeholders indicated their strong or moderate concern regarding young peoples' knowledge about the service. The stakeholders also acknowledged the difficulty inherent in promoting the service to those who might benefit from using it. A view commonly expressed by respondents was that sexual health counselling concomitant with testing would be difficult to deliver through the CT&T service, due to: the difficulty in achieving privacy; a busy retail environment; and pharmacists tending not to have the necessary skills. However, they also acknowledged that chlamydia service delivery is problematic everywhere and not just in pharmacies. The key benefits of the service suggested for young people included increase accessibility, normalization of chlamydia testing and its ability of provision of sexual health service to hard-to-reach population. Such a service was perceived to enhance the role of pharmacist in public health provision. The survey also sought input of strategic stakeholders to ensure that the evaluation questions of most importance to them were included. All the proposed evaluation questions were marked as important. Some suggested questions such as client's satisfaction with the service or related to the service logistical planning could not be incorporated in the later components of the intended evaluation as the service uptake was too low to answer those questions.

The survey of potential service users (iii) had an overall response rate of 20% (n=78). Young people who responded indicated that they felt confident that a pharmacy would offer complete confidentiality for testing, provide reliable test results and have knowledgeable staff to provide the service (90% to 93%). That said, these respondents indicated a preference to be tested in GUM clinic (32%) or drop-in clinics (34%), with only 11% indicating a preference for being tested in a pharmacy. Those who had not previously been tested for chlamydia placed more importance on a toilet facility in a pharmacy they would chose for chlamydia testing, whereas younger respondents (≤ 19 years) placed more importance on a less busy pharmacy.

Analysis of in-depth interviews with pharmacists (iv) comprising interviews with 11 lead pharmacists (4 respondents from pilot pharmacies and 7 from non-pilot pharmacies) found that pharmacists were enthusiastic about their newly developed public health role. The respondents foresee a shift to pharmacies for being a first port of call for clients. They were also generally positive about the anticipated attitude of general practitioners and pharmacy support staff towards their provision of chlamydia service. From a pharmacist's perspective, barriers to delivering the CT&T service were identified as workload and lack of adequate physical infrastructure within a pharmacy such as a consultation room and a toilet facility. On the other hand, the assurance of financial incentives for providing the service was a facilitator. Given the poor uptake of service, the pilot service interviewees did not have enough experience of service delivery to reflect on different aspects of the service. The key explanation proposed by pharmacists for the low uptake of the service was inadequate advertising, and it was felt that the service had been withdrawn too soon to judge its effect. This study also revealed that miscommunication between Lothian Health Board and pharmacies had been a common reason why many invited pharmacies did not take part in the pilot service.

Conclusion

The Lothian CT&T service had been designed to improve access to chlamydia services for young people living in deprived areas in Lothian, which generally are more geographically distant from existing (non-GP) chlamydia services that are available in Lothian. The enthusiasm found among pharmacists to deliver the CT&T service, and the acceptability to potential service users of the various characteristics of the service, suggests that as part of a multi-faceted approach to chlamydia service, a pharmacy-based testing and treatment would be a useful additional choice for young people to such a service.

Despite this, the uptake of the service was very low. It is possible that this is due to the virtual absence of advertising for the service. Furthermore, the service was short lived, being cancelled after 10 months. Both these circumstances might reflect the fact that the initial impetus for the service was at Government level, not within Lothian Health Board, and the service being supported by special central government

funding that ceased after 10 months. This highlights the importance of robust commitment to any new service initiative that is being considered, in particular among key policy-makers / budget-holders.

Nevertheless the research findings of this thesis are useful to inform planning of future initiatives in provision of chlamydia testing to young people in community pharmacies, and as such will enhance the chances of successful outcomes. Furthermore, many of the findings will be of considerable utility in developing chlamydia services in other health care settings, and even for other public health programmes in pharmacies.

DEDICATION

I dedicate this thesis to

my husband Ziauddin Ahmed Kapadia, my children Hamnah and Bilal and to my parents Asadullah and Najma Farid for their constant support and unconditional love.

I love you all dearly.

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Publications

Chlamydia screening in community pharmacies - a systematic literature review of the characteristics of service users and meta-analysis of chlamydia prevalence. Sexual Health *2013, 10(1): 1-8*

Assessment of pharmacy staff competence and training needs to deliver chlamydia screening in community pharmacies. Journal of Pharmaceutical Health Service Research *2012, 3(4): 221-228*

Conferences attended, to present findings from this PhD research, are listed in Appendix 40.

ABBREVIATIONS & ACRONYMS

CA	Counter Assistant
CDC	Centre for Disease Control
CT&T	Chlamydia Testing and Treatment. *Note: In this thesis CT&T refers to the service in Lothian only*
CY	Caledonia Youth
df	degrees of freedom
EC	Emergency Contraception
FP	Family Planning
GP	General Practitioner
GROS	General Register Office for Scotland
GUM	Genito-Urinary Medicine
HPA	Health Protection Agency
HPS	Health Protection Scotland
ISD	Information Services Division
MI	Multiple Imputation
MYPAS	**M**id-Lothian **Y**oung **P**eople's **A**dvice **S**ervice
NAAT	Nucleic Acid Amplification Test
NCSP	National Chlamydia Screening Programme
NHS	National Health Service

PDPT	Patient Delivered Partner Therapy
PID	Pelvic Inflammatory Disease
PN	Partner Notification
PTK	Postal Testing Kit
QIS	Quality Improvement Scotland
SIGN	Scottish Intercollegiate Guidelines Network
SIMD	Scottish Index of Multiple Deprivation
STI	Sexually Transmitted Infection
TNA	Training Needs Assessment
TPB	Theory of Planned Behaviour
UK	United Kingdom
VSI	Vital Sign Indicator
YP	Young People

CHAPTER 1: INTRODUCTION TO THE THESIS

1.1 Introduction

Community pharmacy is now being recognized as a mainstream contributor to the provision of public health services in the United Kingdom (UK) (Silcock *et al.*, 2004, Richardson and Pollock, 2010). The new NHS pharmacy contract and current legislative changes provide a basis for community pharmacy to become fully integrated into NHS public health and long-term care programmes. Sexual health service delivery (including chlamydia testing and treatment, and emergency contraception (EC)) is a component of public health services to be provided through community pharmacies in Scotland (NHS Circular PCA(P)(2008)17).

In 2008, a Scottish government directive stated that all health boards should implement a pharmacy based chlamydia testing and treatment service for young people (aged 15-24 years) so that they can access chlamydia testing kits directly from the community pharmacies, and so that anyone with a positive test result can access treatment from a pharmacist, without requiring consultation with a medical doctor. Partner notifications could also be provided through the same route.

This thesis reports a set of studies around the implementation of a pharmacy-based chlamydia service in Lothian, Scotland. This introductory chapter provides an overview of the research undertaken for this PhD and a brief overview of the thesis, chapter by chapter.

1.2 Overview of the research

For my PhD research studies, I set out to undertake an evaluation of the pharmacy-based Chlamydia Testing and Treatment service (CT&T) service[1] that was shortly to be implemented in Lothian. However, as is explained more fully in chapter 5, unforeseen circumstances affected the CT&T service launch and delivery - implementation delays, minimal advertising of the service, low uptake, withdrawal by central government of specific funding to support the service costs, and shortly

[1] In this thesis, CT&T refers only to the chlamydia testing and treatment service in Lothian Health Board. Similar services in other parts of the Scotland, and elsewhere, are referred to as "pharmacy-based chlamydia service".

thereafter withdrawal of the service by Lothian Health Board. As the initial delays made it more and more apparent that formal evaluation of the CT&T service would not be possible as originally intended, within the timescale of my PhD studies, the evaluation studies that had been planned were reconsidered and revised so that they could still offer some formative evaluation of the service. In particular, it became apparent that it would not be possible to undertake the outcome analysis that I would have wished to, if service uptake and time were not issues. Therefore, in place of an outcome analysis, an analysis of routine laboratory data was undertaken to describes the recent epidemiology of chlamydia infection in Lothian (2006-2010) and also analyse an impact of recent policy changes (2008-2009) on chlamydia surveillance changes.

When, ultimately, it became clear that the service was to be withdrawn, it was realised that there was thus no utility even in formative evaluation, in terms of feeding back to the CT&T service stakeholders in Lothian. The challenge then arose as to how to present the research undertaken as a PhD research thesis. Reflection on the research undertaken shows that it comprises a set of related studies that, both tell the story of the interrupted evaluation and, describe efforts to nevertheless undertake useful and informative research. Considered as a whole, the evaluation research and laboratory data analysis provides important insights and generalisable knowledge about the rationale for such a service, the process of implementation, including barriers and facilitators, and the potential to utilise routine data to assess the impact of a new service.

This thesis therefore presents an integrated set of studies that describe the initial work undertaken to plan the evaluation and the studies ultimately completed. The studies included provide an epidemiology of chlamydia in Lothian from 2006 to 2010 and investigates the impact of policy changes in 2008-2009 on chlamydia surveillance activity, and investigate different aspects of the implementation of the service from the perspective of strategic stakeholders, service providers (pharmacists and their support staff) and potential clients.

The objectives of the PhD research reported in this thesis are detailed in section 6.5.

1.3 Thesis outline

The chapters that comprise the remainder of the thesis are outlined below:

Chapter 2 reports a literature review of the epidemiology of chlamydia, chlamydia screening services and policies related to chlamydia testing, more specifically in UK.

Chapter 3 reports analyses of routinely collected chlamydia data in Lothian from 2006 to 2010, addressing chlamydia testing activity and diagnosis trends. This provides a description of the epidemiology of chlamydia in Lothian, Scotland and hence provides a background to the development of a pharmacy-based chlamydia service in Lothian. However the study also aimed to 'pilot' how an outcome analysis of the CT&T service evaluation might have looked albeit, clearly, execution of such was going to be impossible time-wise. The analysis undertaken is with respect to an (earlier) 'natural experiment' that occurred, the introduction of sexual health service standards in 2008 and revised SIGN guidelines for chlamydia in 2009. The analysis undertaken was a comparison of changes in chlamydia testing activity in Lothian, from before to after these policy changes. This also allowed me to examine the feasibility of using routine data to evaluating the impact of a similar natural experiment, a change in sexual health service delivery such as introduction of pharmacy-based chlamydia testing and treatment.

Chapter 4 provides a structured review of the literature on community pharmacy provision of a chlamydia service. It concludes by providing a conceptual framework for pharmacy-based chlamydia service and, suggests issues that should be addressed in future evaluations of such a service.

Chapter 5 describes in detail the specifications of the Lothian CT&T service, and its timeline.

Chapter 6 provides an overview of research methods used in this thesis. I detail the methods used for programme evaluation and the rationale for the questions chosen for the evaluation. This chapter also describes how the delays in service implementations, and later limited uptake of the service, required modifications to the methods initially proposed. The final objectives of my PhD research are outlined

here, together with a brief overview of the methods chosen to address these objectives.

Chapters 7 to 10 in turn report each of the studies that contribute towards an evaluation of the short-lived CT&T service in Lothian. Each chapter gives further detail of study-specific methods (not covered in the more general methods of chapter 6), reports results and provide some discussion specific to that study. The rationale for including discussion within the relevant study chapters are to ensure some immediate interpretation and discussion of results reported, and to prevent the final discussion chapter from becoming too cumbersome, allowing it to focus on integrative discussion.

Chapter 7 describes a training needs assessment (TNA) survey undertaken with the community pharmacy staff in Lothian with respect to pharmacy delivery of CT&T service. This survey informed the development of a training programme for community pharmacy staff in Lothian prior to launch of CT&T.

Chapters 8 describes a strategic stakeholder survey which aimed to ascertain whether the proposed evaluation questions were what the strategic stakeholders judged important to answer, and to invite suggestions as to any other questions that should be addressed. In addition it also aimed to elicit their views on various challenges that such a service would face and their views on likely success of the service.

Chapter 9 describes a survey of potential service users, to explore acceptability to them of various aspects of the planned pharmacy chlamydia service.

Chapter 10 presents results for an in-depth interview study with both pharmacists who piloted the CT&T service in their respective pharmacies, and also with pharmacists who were invited by NHS Lothian to provide the CT&T service but declined to do so. The purpose of this study was to elicit facilitators of and barriers to the provision of CT&T service as perceived by pharmacists, and to draw on their views to suggest a chlamydia service model that is feasible from the perspective of pharmacists.

A brief **chapter 11** presents the responses from a small subset of key stakeholders when contacted after the CT&T service had terminated in Lothian, about the reasons for its termination after running for only a short period of 10 months. It also reports viewpoints of the stakeholders with respect to the obstacles in the implementation of the CT&T service.

The concluding chapter (**chapter 12),** draws together the main findings of the thesis with an integrated discussion. I also discuss the unforeseen circumstances that impacted on the implementation and sustainability of the CT&T service in Lothian, in specific, but also in Scotland overall. The implications for specific issues in programme planning and implementation are highlighted and recommendations for further research are discussed.

1.4 Audience for this thesis

This thesis makes a meaningful contribution to the literature on chlamydia screening and pharmacy services, and increases our knowledge about the feasibility of a pharmacy-based chlamydia testing and treatment service. However, the thesis has additional relevance and would be useful to a number of different audiences. A key audience would be the policymakers, both at a pharmacy level, in the NHS and within government. Findings of some of the studies that contributed towards the formative evaluation of the CT&T service - such as the stakeholder survey, TNA and some components of the in-depth interviews with pharmacists – would be useful to programme stakeholders (including practitioners) wishing in future to develop or implement a similar service. In addition, the methods employed in evaluating this service, and the difficulties encountered during the evaluation, would add considerable knowledge to the literature on evaluation of public health programmes. In this regard, these studies would be useful to the methodologists and researchers working in the field of programme evaluation.

1.5 Looking ahead

When setting out on my evaluation of the proposed CT&T service, I was aware that it would require me to develop a much broader set of research skills than my training so far. However, I was excited at the prospect, and pleased that I would be doing this in the context of sexual health services, my particular public health interest. When

the various unforeseen circumstances began to become apparent it was disconcerting and disappointing. However my supervisors reassured me that all research suffers setbacks, and that I should think creatively about how to revise the studies planned, so as to nevertheless complete useful research and produce new knowledge. In the event I have experienced even broader research training than I had anticipated, and the chapters ahead give an account of this, and of my findings and reflections.

CHAPTER 2: BACKGROUND TO CHLAMYDIA – EPIDEMIOLOGY AND HEALTH POLICIES IN THE UNITED KINGDOM

2.1 Introduction

This chapter reviews the literature on the epidemiology and burden of chlamydia, with a focus on the prevalence of chlamydia in the United Kingdom (UK) in general and Scotland in particular. It then explores the government's health services strategies, policies and targets for chlamydia in Scotland. The policy developments detailed within this chapter provide an indication of the opportunities available for community pharmacies in Scotland, and although similar developments are occurring within England, Wales and Northern Ireland, they are not addressed within this thesis.

For reporting chlamydia diagnosis, the terms 'prevalence' and 'positivity' have been used interchangeably in the literature. However in this chapter, the term *prevalence* is used, if a study reported results from population screening and *positivity* if the study reported results from testing in health care settings. The diagnostic rate describes the number of the population that tested positive for chlamydia / 100, 000 population.

Sexually transmitted Infections (STIs) have been recognized as a major public health problem. Among all STIs, genital chlamydia is the most commonly diagnosed infection (Health Protection Agency, 2010). It is caused by the bacterium Chlamydia trachomatis. It is readily treatable by antibiotics and its transmission can be controlled by also treating partners of infected persons. However approximately 70% of women and 50% of men infected with chlamydia remain asymptomatic, resulting in a large pool of cases that remain undiagnosed and untreated. The recommended test for chlamydia diagnosis is nucleic acid amplification technique (NAAT). Taking compliance with therapy into account, the recommended treatment for uncomplicated chlamydia infection is with the antibiotic Azithromycin 1 g, given as a single oral dose. Alternative antibiotic regimes are recommended where patients are unable to take Azithromycin. Abstinence during and one week after the treatment and partner notification are also recommended (Scottish Intercollegiate Network

(SIGN), 2009). Partner notification involves informing the sexual partners of the index patient infected with chlamydia that one of their sexual partners has been found to be infected so they might be too, and so should have a test or at least a treatment.

2.2 Epidemiology of chlamydia

2.2.1 Global Evidence

Accurate epidemiological information about the occurrence of chlamydia is imperative for prevention and control programmes, in particular for targeted screening. Estimates of chlamydia prevalence vary according to the methods used in the study, such as the study settings, type of population targeted, age and gender (Adams *et al.*, 2004).

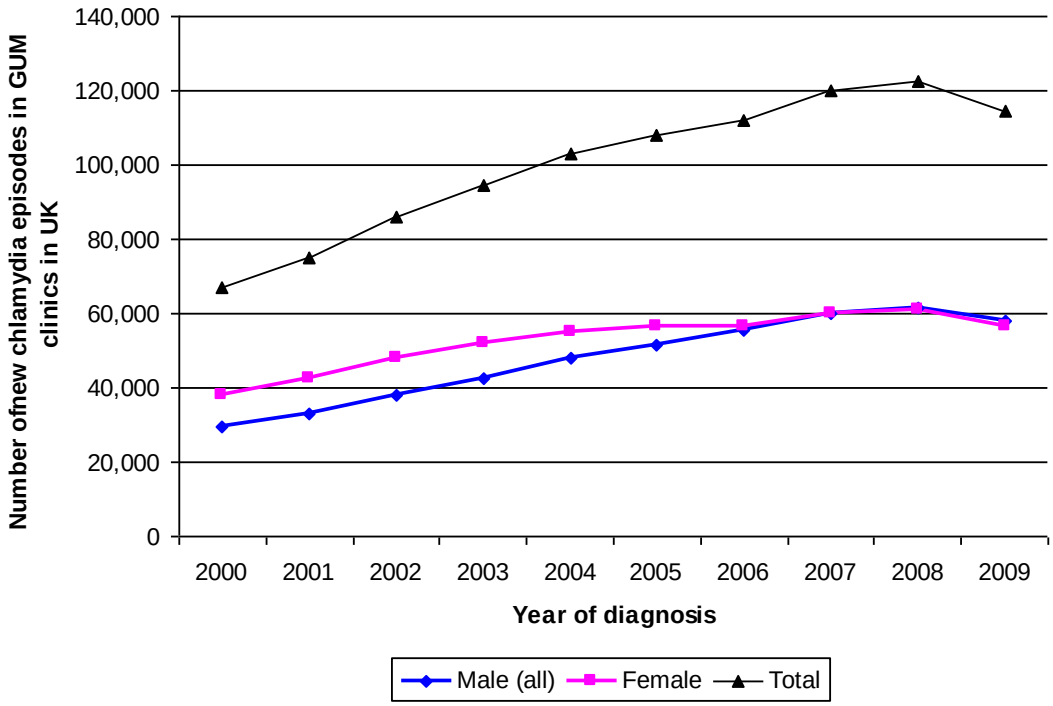
The European Centre for Disease Prevention and Control (ECDC) published its first comprehensive report of STI surveillance data in June 2011 (European Centre for Disease Prevention and Control, 2011). This report is based on case report and/or aggregate data from 23 countries in the European Union, with 88% of all the cases being reported by four countries (United Kingdom, Sweden, Denmark and Norway). The overall diagnostic rate increased from 143 per 100, 000 population in 2000 to 332 per 100, 000 in 2009. In 2009, the highest rates were observed in Iceland (711 per 100 000 population), Denmark (541), Norway (474), Sweden (408), UK (348) and Finland (250). The lowest rates were observed in eight countries (Cyprus, Greece, Lithuania, Luxembourg, Poland, Romania, Slovakia and Slovenia) with rates less than 10 per 100, 000 population. It was however cautioned that the interpretation of the overall trend is difficult as it is highly influenced by changes in testing and screening practices and the development of surveillance systems over time and across countries. Three quarters (75%) of all chlamydia cases were diagnosed in young people aged between 15 and 24 years; male to female ratio was 0.68 in 2009 meaning that almost 50% more cases were reported in women than in men.

2.2.2 Evidence from the United Kingdom

For the UK specifically, data have been collected routinely from GUM clinics throughout the UK. The Health Protection Agency (HPA) collates a UK dataset annually from England, Wales, Northern Ireland and Scotland. The number of

chlamydia diagnoses in the past decade in UK has increased from 67,173 (males 29,390; females 37,783) in the year 2000 to 114,686 (58,042; 56,530) (Figure 2-1). Thus there is an overall 100% increase in chlamydia diagnoses among males and 50% increase among females, in the year 2009 as compared to the year 2000.

Figure 2-1: United Kingdom - number of new diagnoses of chlamydia made in GUM clinics, by year of testing and gender



Data Source: Health Protection Agency

The number of chlamydia diagnoses rose more rapidly in the first six years of the decade and then stabilised. The difference between the number of female and male diagnoses narrowed from 2004 onwards, becoming negligible from 2007 onwards.

The most commonly cited population based studies on chlamydia include 'National Survey of Attitude and Lifestyle' (NATSAL) and the 'Chlamydia Screening Study' (ClaSS). The NATSAL was a probability sample survey of men and women aged 16–44 years from Britain (Fenton *et al.*, 2001). In this survey, 11, 161 respondents (4762 men and 6399 women) were recruited for computer assisted self interviews (CASI) about their sexual behaviour and lifestyle. Half of all the sexually experienced respondents (n=5026) aged 18-44 years were also invited to provide, through a postal testing kit (PTK), a urine sample for testing for Chlamydia

trachomatis infection. Of these, 71% agreed and provided the urine sample. This study found the prevalence of chlamydia infection to be 3% (95% C.I. 1.7% to 5.0%) among women aged 18-24 years. In men the prevalence in the same age group was 2.7% (95% C.I. 1.2% to 5.8%). Among men the prevalence was highest in the 25-34 year age group (3%; 95% C.I. 1.7% to 5.1%). Non-married status, age, and reporting partner concurrency of two or more sexual partners in the past year were independently associated with chlamydia infection.

In ClaSS study, 19, 773 eligible men and women aged 16-39 years from GP registers in Bristol and Birmingham were invited for chlamydia screening (Low, 2007). The screening uptake rate was 32%. Prevalence of chlamydia infection in 16-24 years old was 6.2% (95% C.I 4.9% to 7.8%) among women and 5.3% (95% C.I. 4.4% to 6.3%) among men.

A systematic review of studies from UK found a strong association of age group and study setting with the prevalence of chlamydia among females (Adams *et al.*, 2004). Table 2-1 is adopted from the Adam (et at. 2004) study indicates that the positivity is highest among individuals younger than 20 years of age and higher in studies conducted in health care settings compared to population-based studies. For example, among those under 20 years of age, estimates for chlamydia positivity were 17% in genitourinary medicine clinics, 14% in antenatal clinics, 14% in termination of pregnancy (TOP) clinics, 12% in youth clinics, 10% in family planning clinics, and 9% in general practice, compared to 4% in population based studies (Adams *et al.*, 2004).

Table 2-1: Among females, percentage chlamydia positivity (with 95% CI), overall, and separately by age group and setting.

Setting	Age group (in years)				Overall positivity by setting	N**
	<20	20–24	25–29	≥ 30		
Population-based	3.8 (1.0 - 8.3)	2.7 (1.1 - 5.0)	2.2 (0.9 to 4.1)	0.9 (0.4 to 1.5)	1.6 (1.0 to 2.3)	1725
GP Surgery	8.6 (6.6 - 0.9)	5.9 (4.7 - 7.2)	2.9 (1.2 to 5.2)	1.1 (0.2 to 2.7)	7.1 (6.7 to 7.6)	13,207
Family planning clinic	10.0 (9.1 - 0.9)	7.4 (5.7 - 9.4)	3.8 (2.2 to 6.0)	1.5 (0.5 to 2.8)	8.1 (7.6 to 8.7)	9,512
Youth clinic	12.3 (10.0 - 4.9)	10.1 (7.0 - 13.6)	-	-	12.2 (10.8 to 13.7)	1,996
Antenatal clinic	13.5 (9.5 to 9.1)	6.5 (3.5 - 10.4)	7.2 (2.4 to 14.2)	0.0 (1.2 to 1.2)	8.5 (6.6 to 10.6)	803
***TOP clinic**	13.6 (10.6 - 6.8)	9.7 (6.5 - 13.3)	2.0 (0.3 to 5.1)	1.2 (0.2 to 2.9)	8.5 (7.4 to 9.8)	2,114
GUM clinic	17.3 (13.6 - 21.3)	12.4 (10.3 - 14.7)	4.9 (2.6 to 8.0)	5.1 (2.7 to 8.3)	12.7 (11.5 to 14.0)	2,831

* TOP=Termination of Pregnancy **N Number of individuals in the model

Adopted from (Adams et al., 2004) systematic review and meta-analysis

2.2.2.1 National Chlamydia Screening Programme in England

In England, the phased implementation of the National Chlamydia Screening Programme (NCSP) began in September 2002 (National Chlamydia Screening Programme, 2008). It offers opportunistic screening for chlamydia to sexually active individuals aged 15-24 years. In the first year, the majority of young men were being screened in Community Contraceptive Services (CCS) (43 per cent) and educational settings (26 per cent). Young women were screened predominantly in CCS (63 per cent) and youth settings (15 per cent). Progressively, the screening venue was diversified into a wider range of settings for both young men and women including outreach, prisons, pharmacies and by postal testing kits (PTK). Five years on, educational settings (22 per cent), youth settings (15 per cent), and CCS (13 per cent) remain the most commonly used screening venues for young men. For young women, CCS (31 per cent), youth settings (19 per cent) and also general practice (14 per cent) were the most commonly used screening settings. The community pharmacies undertook nearly 3% of all screening tests among men and women.

Differences in positivity across screening venues in NCSP are in line with the previous findings of a meta-analysis by Adam et al. The highest positivity was reported among young people tested in contraceptive services (10.4 per cent), using PTK (10.3 per cent) and in youth settings (10.3 per cent), while people tested in educational settings had a much lower positivity (4.3 per cent). The higher positivity reported in the NCSP compared to the prevalence from population based studies (such as NATSAL) is a result of the high risk population targeted in the screening programme, such as those displaying high risk sexual behaviours or those from the black ethnic minority (Riha *et al.*, 2011).

The national screening targets set out by the Department of Health in England are called chlamydia 'Vital Signs Indicator' (VSI) and it measures the proportion of the 15-24 year old total population tested for chlamydia outside of GUM clinics. The target set by the Department of Health in England was 17% of the eligible population to be tested during the year 2008-9, 25% during 2009-10 and 35% during 2010-11. It is however debatable how the success of the chlamydia screening programme should be measured - by number of people tested (as would be reflected by the VSI),

number of infection treated or by the reduction in the prevalence or incidence of the infection. Modelling by the Health Protection Agency (HPA) estimated that reduction in the prevalence of chlamydia could be achieved by screening of 26-43% of the 16-24 year old population per year, in addition to robust arrangement for contact tracing and treatment of sexual partners of index patients. The national audit report on chlamydia screening has shown that 22% of the 15-24 year old population have been tested for chlamydia in 2008/09 (National Audit Office, 2009). Of those who tested positive for chlamydia, 12% were not traced to be treated. Moreover 72% of the primary care trusts in England failed to meet the standards of tracing and treating partners of infected patients. This mean that the effect of screening would be diminished by the high levels of repeated infection due to lack of treatment of existing sex partners, exposure to infected new sex partners or treatment failure (Heijne *et al.*, 2011). The report concluded that the programme was unlikely to produce a significant reduction in prevalence and provided poor value for money.

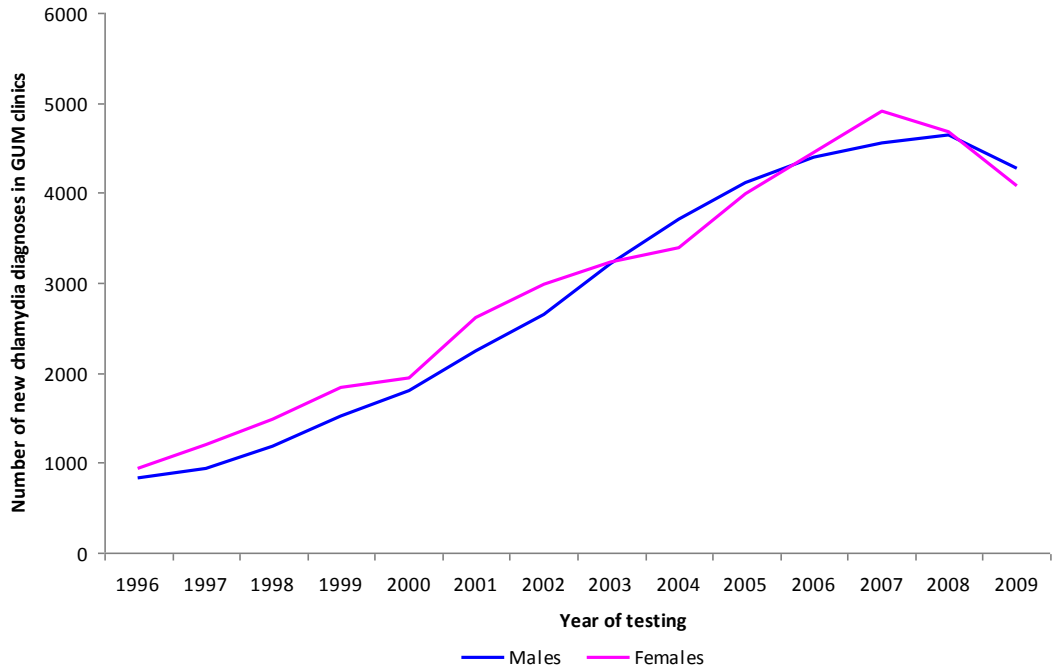
2.2.2.2 Prevalence of chlamydia infection in Scotland

In Scotland, the trends in chlamydia diagnoses have been similar to the rest of the UK and Europe. Scotland does not currently have a national screening programme for chlamydia. Chlamydia screening in the general population has not yet been made widely available and currently patients have to visit their GP or sexual health clinics, such as GUM or FP clinics, to be tested. Many patients accessing these services for emergency contraceptive (EC) consultation, abortion or other sexual health problems are opportunistically offered chlamydia testing. A survey conducted in family planning clinics in Scotland reported that women aged under 20 or over 30 years were significantly more likely to decline to be tested than women aged 20 to 30 (Kettle *et al.*, 2002).

Figure 2-2 shows the rising trends of diagnoses of chlamydia among men and women in the GUM clinic setting in Scotland from 1996-2009. The largest (year on year) absolute increase among males was observed in 2003 (565 more diagnoses than the preceding year) and then in 2004 (490 more diagnoses). Among females the largest increase was observed in 2001 (679 more diagnoses) and then in 2005 (598 more

diagnoses). The absolute number of diagnoses decreased in 2008 and 2009 in females and in 2009 in males.

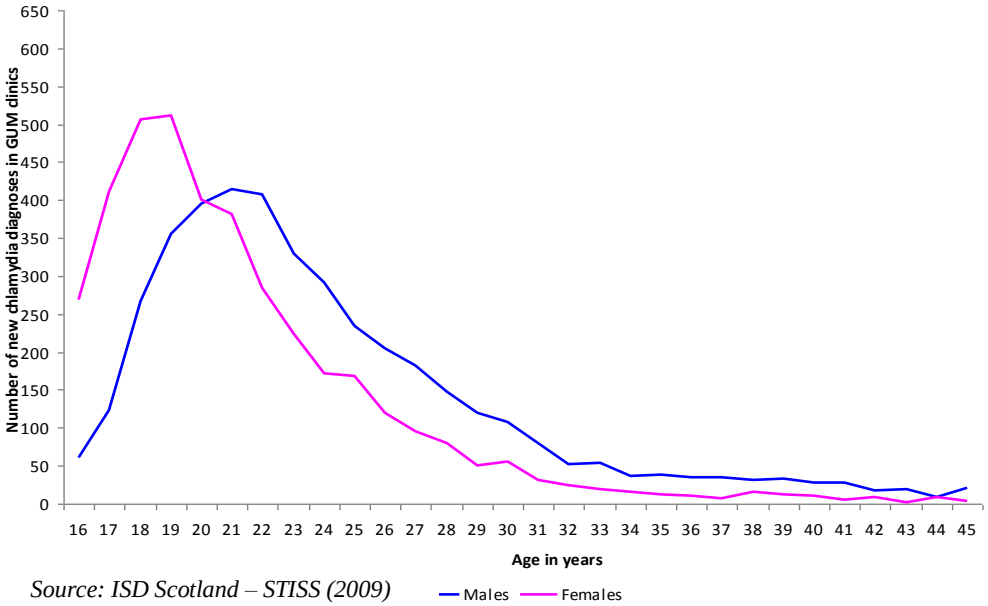
Figure 2-2: Scotland - number of new diagnoses of chlamydia made in GUM clinics, by year of testing and gender



Source: ISD Scotland – STISS

Similar to the trends in the rest of the UK and Europe, chlamydia infection is found predominately in young people - in 2009, 63% and 79% of all male and female diagnoses respectively, were made in persons aged less than 24 years (Figure 2-3).

Figure 2-3: Scotland - number of new diagnoses of chlamydia made in GUM clinics, by age and gender

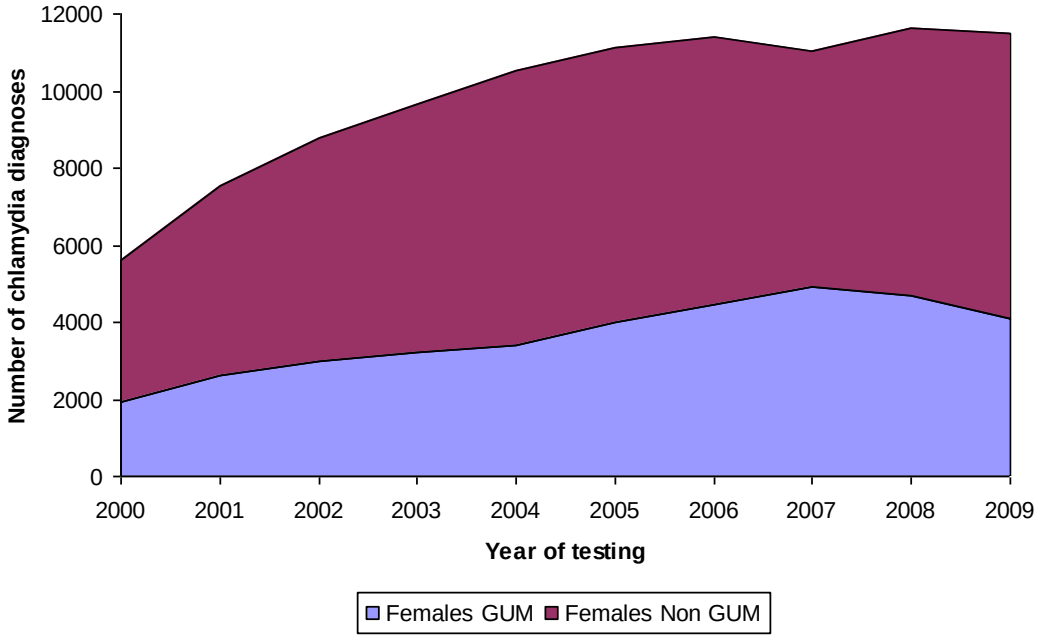


Source: ISD Scotland – STISS (2009)

The graphs in figure 2-2 and 2-3 comprise diagnoses made in GUM clinics only. However, nearly half of all chlamydia diagnoses are made in settings other than sexual health clinics i.e. mostly in general practices. Thus Health Protection Agency of Scotland (HPS) collects aggregated laboratory data for chlamydia and reports a more comprehensive picture of chlamydia diagnoses made in different health boards in Scotland.

Figure 2-4 and 2-5 are the stacked area graphs indicating time trends of contribution of GUM and non-GUM settings in chlamydia diagnoses, separately for females and males. Over half to two thirds of women were diagnosed in clinical settings other than the GUM and this trend has been consistent throughout the last decade (Figure 2-4). In contrast to women, men were more commonly diagnosed at GUM clinics (Figure 2-5). However this trend is gradually declining with more men being diagnosed in non-GUM settings. For example, in the year 2000, 89% of the men were diagnosed in a GUM setting. This trend gradually declined over the last decade, so that in the year 2009, 65% of the men were diagnosed in the GUM clinics.

Figure 2-4: Females - diagnoses of chlamydia made in GUM clinic & non-GUM settings in Scotland, by year of testing.



Data source: Health protection Scotland (2008)

Figure 2-5: Males - diagnoses of chlamydia made in GUM clinic & non-GUM settings in Scotland, by year of testing.

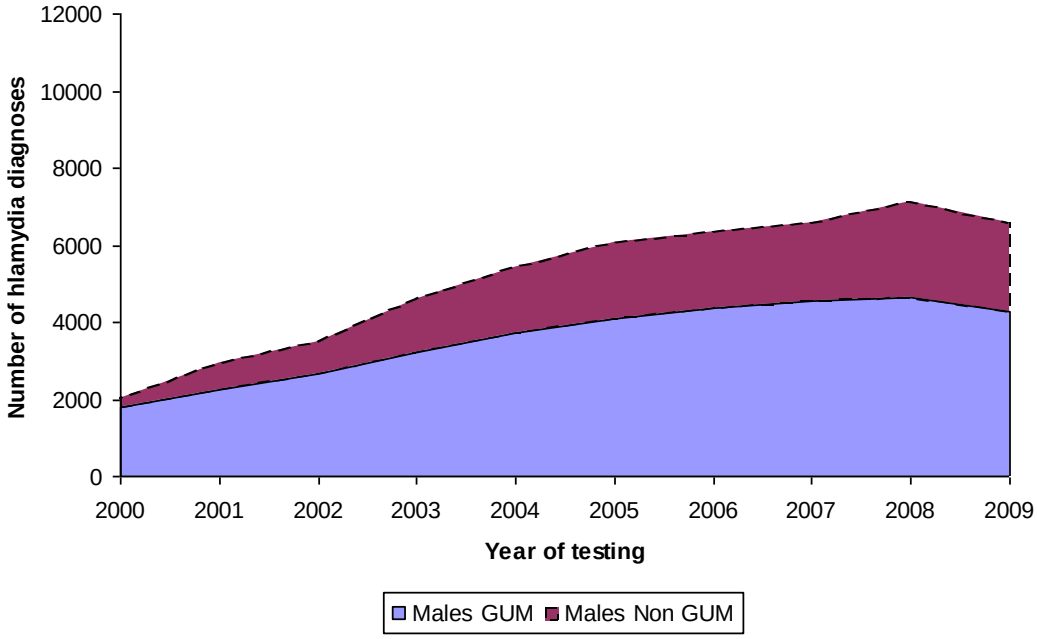
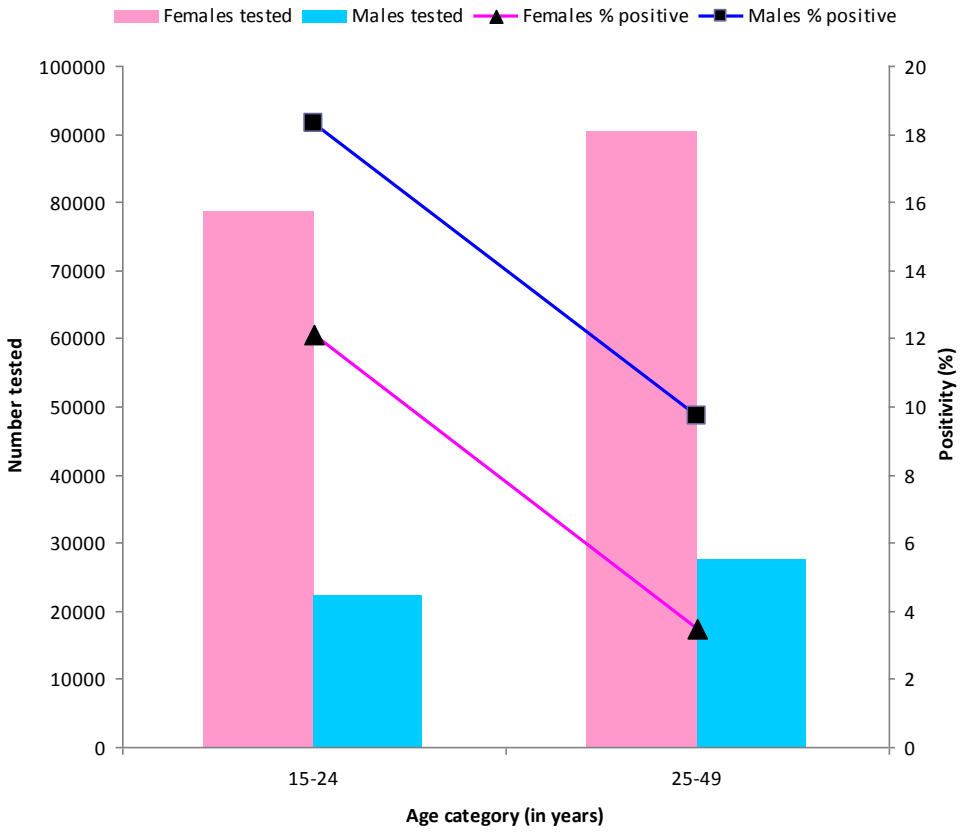


Figure 2-6 shows the comparison of chlamydia testing and positivity for men and women across two age bands – 15-24 years and 25-49 years. Within each age band, the majority of chlamydia testing (~76%) is performed on women, but a higher positivity was observed in men than women. Across the two age bands, three times as many positive diagnoses were made in women younger than 25 years of age than in the older age group. Similarly twice as many diagnoses were made in men younger than 25 years, than in the older age group.

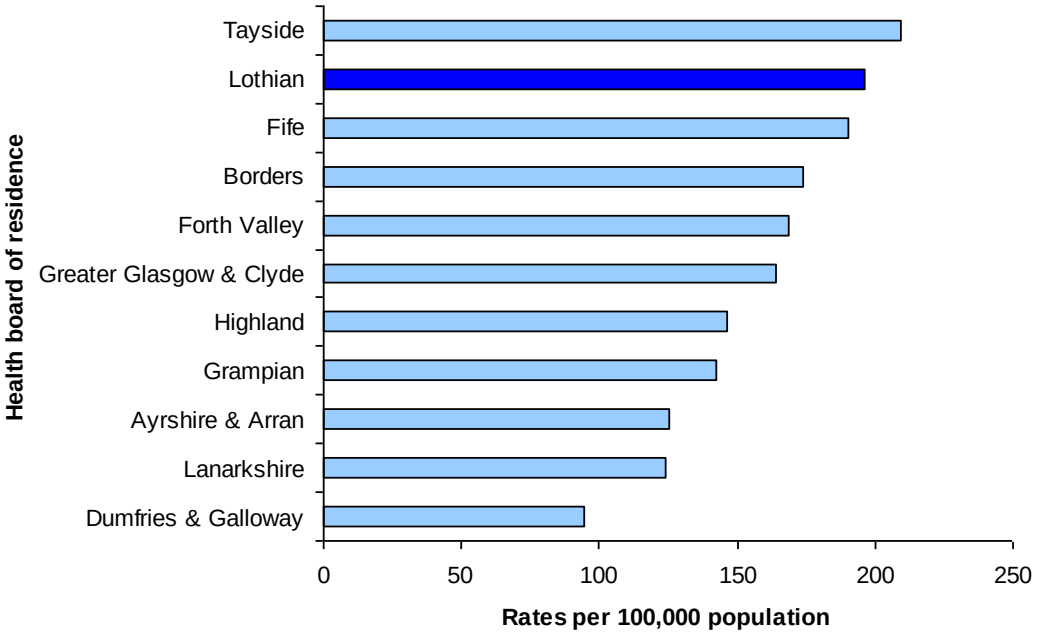
Figure 2-6: Scotland - number tested and chlamydia positivity, by age group and gender



Data Source: Scotland's sexual health information 2007. (Health protection Scotland & ISD)

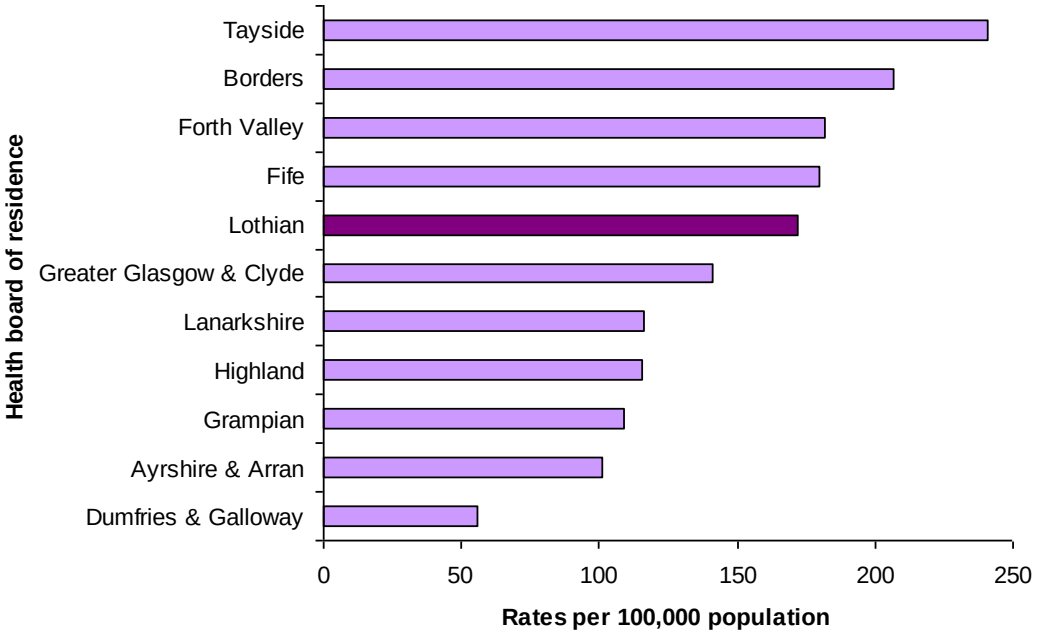
Figures 2-7 and 2-8 shows the rates of diagnoses of chlamydia made in GUM clinic setting in 2009, by NHS board of residence in Scotland, separately for males and females. Among men, the highest diagnostic rate was observed in Tayside, followed by Lothian and Fife. Among women, the highest diagnostic rate was in Tayside, followed by Borders and Forth valley.

Figure 2-7: Males in Scotland - rates of diagnoses of chlamydia made in GUM clinic setting, by NHS health board area of residence



Source: ISD Scotland – STISS (2009)

Figure 2-8: Females in Scotland - rates of diagnoses of chlamydia made in GUM clinic setting, by NHS health board area of residence



Source: ISD Scotland – STISS (2009)

2.2.3 Cost effectiveness of chlamydia screening

The cost effectiveness of chlamydia screening is demonstrated using empirical estimates of screening uptake and incidence of complications of chlamydia infection. A number of mathematical models have been generated to consider the cost effectiveness of different screening/testing strategies for chlamydia at various levels of prevalence. One study which used a dynamic model of chlamydia screening taking into account the transmission of chlamydia and the complication rate, suggested that chlamydia screening would be cost saving after 4-5 years of screening programmes (Welte *et al.*, 2000). One model considered three different probabilities of chlamydia progression to pelvic inflammatory disease (PID) at 1%, 10% and 30%. This study found that annual screening is only cost effective in those with the highest prevalence of infection i.e. men and women aged under 20; or if the PID progression is 10% or higher (Adams *et al.*, 2007).

It has been argued that in the evaluation of cost effectiveness of chlamydia screening programmes, the rates of complications have been over estimated (van Valkengoed *et al.*, 2004). The rationale for recommending a screening programme for chlamydia infection was based on two earlier randomised control trials (RCTs) of screening versus normal care conducted in 1990s, which demonstrated a greater than 50% decrease in the incidence of PID (Ostergaard *et al.*, 2000, Scholes *et al.*, 1996). However these studies were criticized for methodological limitations – for example for measuring outcome in only a small proportion of women randomised, ascertainment of outcome based on case notes (rather than utilising laparoscopic diagnosis), and a large loss to follow up in both the screening and control groups. Moreover neither of the trials evaluated opportunistic chlamydia screening as it is currently practised. The most recent evidence from Uppsala women's population-based cohort study from Sweden (Low *et al.*, 2006) estimated the population cumulative incidence of PID, ectopic pregnancy and infertility by the age of 35 years, stratified by their prior chlamydia test status. The cumulative incidence of PID was estimated at 3.9% (95% CI 3.7% to 4.0%) overall: 5.6% (4.7% to 6.7%) in women who ever tested positive for chlamydia, 4.0% (3.7% to 4.4%) in those with negative tests, and 2.9% (2.7% to 3.2%) in those who were never screened. Similarly, the study identified considerably lower estimates for ectopic pregnancy

and infertility than previously estimated. A subsequent systematic review of the economic evaluations of chlamydia screening undertaken by the same group of authors (Low *et al.*, 2007) failed to offer any firm recommendations about the cost effectiveness of chlamydia screening, because of the lack of a reliable natural history data. Similarly a more recent systematic review of the evidence of infertility following chlamydia infection demonstrates the absence of such evidence and an overall lack of research on the natural history of chlamydia infection in women (Wallace *et al.*, 2008).

A recent evaluation of cost, cost effectiveness and sex equity with the national chlamydia screening programme showed that increasing male screening coverage from 8% (baseline value for 2008-9) to 24% (to match female coverage) would cost over six times as much as increasing partner notification efficacy from 0.4 partners per index case (baseline value for 2008-9) to 0.8 (Turner *et al.*, 2010). The study concluded that increasing the effectiveness of partner notification would not only be more cost effective than increasing male coverage, but at the same time would equalise the ratio of women to men diagnosed.

2.2.4 Rising trends of chlamydia diagnoses - an epidemic or an artifact of surveillance

The sharp rising trend in chlamydia diagnoses, observed particularly in first 5 years of the last decade, has been hypothesised to be due to improved testing coverage, diagnostic techniques, widespread change in the riskiness of sexual practices, antimicrobial resistance and arrested immunity (Vickers and Osgood, 2010).

Improved case finding due to increased testing volume or coverage are identified as the most important factors responsible for an observed increase in the annual incidence rate of chlamydia infection (Miller, 2008, Vickers and Osgood, 2010, Hughes *et al.*, 2007). Coverage reflects the proportion of the population that is reached by testing / screening activities. Due to the relatively constant population denominator, increases in coverage which will generally lead to more cases being identified will in turn lead to a higher calculated incidence of chlamydia against that constant population. These observed increases may occur in the face of an

unchanging, increasing or even declining true incidence rate (Miller, 2008, Burckhardt *et al.*, 2006).

The rate of chlamydia diagnoses made had also been shown to be affected by the diagnostic test accuracy. The diagnostic tests examined for detection of Chlamydia trachomatis were nucleic acid amplification techniques (NAAT), culture techniques such as gene probes (GP), enzyme immuno-assay (EIA) and direct immuno-fluorescence (DFA). A systematic review examined 30 studies on the diagnostic probability of the different testing techniques for chlamydia and demonstrated that NAAT used on non-invasive samples such as urine were more effective at detecting asymptomatic chlamydia infection than other tests (Watson *et al.*, 2002). In Scottish laboratories, from January 1992 there was a gradual shift of laboratories to more sensitive NAAT diagnostics, which were comprehensively provided by all laboratories by September 1998. A Scottish study reporting trends in chlamydia diagnoses on routine GUM clinic surveillance data demonstrated an overall 55% increase in diagnoses following a gradual shift of laboratories to more sensitive NAAT diagnostics (Burckhardt *et al.*, 2006). However in Sweden, the incidence of chlamydia infection began to rise before the introduction of NAAT testing.

There is also some evidence that a screening programme based on early case detection and treatment results in an early reduction in prevalence, but is then followed by a rebound in prevalence (Brunham *et al.*, 2005). A control strategy based on shortening the average duration of infection interferes with the effects of immunity on population susceptibility to infection and that, in the absence of strategies to alter sexual behaviour, results in a later increase in prevalence.

2.3 Sexual health policy & guidelines for Scotland

The policy developments in Scotland, in relation to sexual health in general and chlamydia in particular, are described in this section.

2.3.1 Respect and Responsibility – a strategy and action plan

In January 2005, the Scottish Government launched a national strategy for improving sexual health in Scotland, *'Respect and Responsibility: A Strategy and Action Plan for Improving Sexual Health'* against a background of rising teenage pregnancies and STIs (The Scottish Government, 2005). The strategy was based on the principles of self respect, respect for others, on strong relationships and on recognising the diversity of needs and lifestyles of people in Scotland.

The strategy seeks to improve access to information and services related to sexual health whilst allowing flexibility for local services to respond to local needs. To support the implementation of *Respect and Responsibility*, a National Sexual Health Advisory Committee (NSHAC) was formed. This committee set up a number of groups to look at particular issues such as national data collection, rural issues and staff training as well as engaging with stakeholders within, as well as out of, the NHS to address wider societal issues related to sexual health.

2.3.2 National databases on sexual health

'Respect and Responsibility' advocated the development of a national sexual health information system to support service planning. Hence the Information Service Division Scotland (ISD) and Health Protection Scotland (HPS) collaborated to create DASH (Data Augmentation for Sexual Health). Its purpose was to focus on sexual health data development to support service planning and redesign. A new clinical management system was also developed, called National Sexual Health System (NaSH), to support sexual health services throughout Scotland. The NaSH system is initially intended for use in the GUM and sexual and reproductive health clinics. However, the intention is that it can be used wherever these specialised services are provided, for example in acute HIV care, community pharmacy or general practice settings. The system is currently being rolled out throughout Scotland in GUM clinics and family planning clinics. In addition to providing an electronic patient

record for sexual health, the system will also provide secondary data for national reporting.

2.3.3 Quality Improvement Scotland sexual health services standards

One of the key recommendations within 'Respect and Responsibility' was the development of clinical standards to evaluate and improve the quality of provision of sexual health services in Scotland. The sexual health services standards were published in April 2008 by Quality Improvement Scotland (QIS) (NHS Quality Improvement Scotland, 2008). Three standards are pertinent to the provision of STI services, and are described below:

i. **Standard statement 1: A comprehensive range of specialist sexual health services is provided locally and individuals with the greatest need are treated as a priority.**

   Under this standard, 80% of individuals with priority sexual health conditions should be seen by the specialist sexual health service. Moreover, there should be a minimum of 2 full working days per week of specialist sexual health service available within 30 minutes travel time from each settlement of over 10,000 people.

ii. **Standard Statement 3: NHS boards ensure the development and delivery of integrated approaches to sexual health improvement, particularly in relation to young people.**

   This standard focused on the provision of chlamydia testing. Its following three components are particularly relevant:

   - Standard 3.1: 60% of chlamydia tests per year are taken from males and females aged under 25 years.
   - Standard 3.2: For males aged 15-24 years, the annual rate of chlamydia tests performed in the NHS board area is greater than 100 per 1000 population.
   - Standard 3.3: For females aged 15-24 years, the annual rate of chlamydia tests performed in the NHS board area is greater than 300 per 1000 population

iii. **Standard statement 4: Individuals who are diagnosed with a sexually transmitted infection see an appropriately trained member of staff to organise partner notification.**

According to this standard, partner notification should be offered in all settings delivering sexual health care, including primary care, youth services and community pharmacies. To meet this standard, an essential criterion is that for every 100 individuals diagnosed with chlamydia in a specialist sexual health setting, 64 contacts are verified as having attended within 90 days of first partner notification interview.

Quality Improvement Scotland has also developed a self assessment framework to support NHS boards in providing information to monitor their performance against the standards. The performance of each health board will be monitored against these standards and recommendations on improvements will be made.

2.3.4 SIGN guideline for chlamydia

The Scottish Intercollegiate Guidelines Network (SIGN) was formed in 1993 to improve the quality of health care for patients in Scotland by reducing variation in practice and outcome, through the development of evidence based clinical guidelines containing recommendations for effective practice. The revised SIGN guidelines (Number 109) on the management of genital chlamydia infection were issued in March 2009 with the intention of advising on policy for the most cost effective testing strategy at a population level and to consolidate best practice in the management of individual cases of diagnosed infection (Scottish Intercollegiate Network (SIGN), 2009). The guideline updated SIGN 42, published in 2000, to reflect the most recent evidence. The following recommendations are worth noting:

i. Resources for chlamydia testing in women should be targeted where prevalence is known to be highest, i.e. first those aged 15-19 and then those aged 20-24

ii. Resources for chlamydia testing in men should be targeted where prevalence is known to be highest, i.e. those aged under 25

iii. Postal testing kits should be used to increase chlamydia testing among young men

iv. All patients attending GUM clinics should be tested for chlamydia

v. In health care settings other than GUM, testing should be most strongly advised for those who have had two or more partners in the past 12 months

vi. Patient diagnosed with chlamydia must receive partner notification either by trained practice nurses within general practice or health advisers in GUM

vii. Those who have been diagnosed with chlamydia in the previous 12 months should be tested

viii. Test for re-infection is recommended at 3-12 months or sooner if there is a change of partner

ix. Uncomplicated chlamydia should be treated with Azithromycin 1g as a single dose, including for pregnant women

2.3.5 Healthy Respect programme

Healthy Respect is a Scottish government funded national health demonstration project established in Lothian following the recommendation in the Government's White paper 'Towards a Healthier Scotland' published in year 1999 (Healthy Respect, 2010). It was implemented in two phases from 2001 to 2008. It aimed to help young people in Lothian to develop a positive attitude to their own sexuality and that of others and a healthy respect for their partners, with the aim of reducing unintended teenage pregnancies and STIs. It provides free and confidential information and advice about sexual health and relationships through youth friendly, Healthy Respect accredited drop-in clinics, website, advertising campaigns, schools and youth clubs. It also connects with hard to reach groups through community education, social work, voluntary organisations and the NHS. Healthy Respect staff and partners come from a variety of areas including education, the voluntary sector, youth work, community learning and development, medical and nursing, social marketing and health promotion.

The evaluation of phase 2 of Healthy Respect indicated that it is able to improve the knowledge of sexual health more among boys than girls. It had a significant effect in the improvement of use of condoms by boys but no change was seen in the intention of girls to use condoms. Moreover, all these changes were more evident among those

from more affluent areas. During the Healthy Respect demonstration period, the trends for chlamydia positivity and teenage pregnancy in Lothian did not differ from the rest of the Scotland. However it was acknowledged in the evaluation report that it is difficult to determine what impact Healthy Respect had had on teenage pregnancy or chlamydia infection rates in Lothian. Healthy Respect is now integrated into NHS Lothian and will continue to work in partnership with other agencies.

2.3.6 The Sexual Health and Blood Borne Virus Framework 2011-2015

Most recently, the Scottish Government published 'the Sexual Health and Blood Borne Virus framework' in August 2011. This framework for the first time brings together four policies in relation to sexual health, HIV, hepatitis B and hepatitis C, into a single integrated strategy. It was based on the premise that these health problems do not occur in isolation, hence needing an integrated approach. It adopted an outcome based approach where the progress against the outcomes will be monitored nationally through a small set of indicators. It also advocated a multi agency approach where the NHS, Local Authority, Scottish Prison Service and Third Sector should all work in an integrated way to achieve the outcomes. The target outcomes set out in this framework are as follows:

i. Fewer STIs and unintended pregnancies
ii. A reduction in the health inequalities gap in sexual health
iii. People affected by blood borne viruses leading longer, healthier lives
iv. Sexual relationships are free from coercion and harm
v. A society and culture whereby the attitudes of individuals, the public, professionals and the media in Scotland towards sexual health are positive, non-stigmatising and supportive

It was emphasised that any sexual health improvement interventions developed to achieve these outcomes, should have a sound or promising evidence base and should be monitored and evaluated. The progress towards these outcomes will be monitored nationally as well as across health boards. In terms of provision of the service for young people it was particularly emphasised to provide accessible sexual health

services to young people, for example, through drop-in services for young people in, or close to, schools, particularly in areas of greatest need (for example, areas of high prevalence, remote/rural areas where there are fewer specialised sexual health services).

2.3.7 Changes in pharmacy regulations to enable the provision of pharmacy-based sexual health service

In February 2002, the health minister launched the strategy for pharmaceutical care in Scotland 'The Right Medicine' (Scottish Executive, 2002). It outlined the way in which community pharmacies could play their role in promoting public health and providing better access to quality service to patients. Following on this, a new NHS community pharmacy contract in Scotland was developed after consultation of the Scottish government with the professional bodies and its phased implementation was started in April 2006 (Scottish Executive, 2003). As part of this new contract, the health boards were instructed to plan and secure the provision of pharmaceutical care services (PCS) in their respective areas through community pharmacies. A range of public health services were negotiated locally between NHS Boards and local pharmacy contractors, but from an agreed framework.

The sexual health services commissioned through community pharmacies included pharmacy-based chlamydia service and EC service. However chlamydia testing by pharmacies required legislative changes, particularly in terms of over the counter provision of Azithromycin through pharmacies for the full implementation of a pharmacy-based chlamydia service. EC already had over-the-counter status in Scottish pharmacies (legislated in 2001). In August 2008, in Scotland, Azithromycin for the treatment of chlamydia infection was made available through community pharmacies using a Patient Group Direction.

The chronology of a pharmacy-based chlamydia service in Scotland, in general, and the CT&T service in Lothian Health Board, in particular, have been described in more detail in chapter 5.

2.4 Summary of findings and discussion

The diagnoses of chlamydia infection have been on the rise in the past decade. It is speculated that most of the rise in diagnoses is a result of increased testing and better detection techniques. However reaching those individuals at greatest risk remains problematic. The various policies and guidelines developed in the last decade were intended to improve the sexual health outcomes and inequalities in outcomes.

The NCSP was rolled out in England in 2002, supported by funding of £150m by the health department. In Scotland, there is no national screening programme, but the SIGN guidelines recommends to opportunistically target young people for chlamydia testing. The substantial investment for the chlamydia screening in NCSP and the recommendations in the SIGN guidelines are based on the premise that untreated asymptomatic chlamydia infection is associated with long term complications such as ectopic pregnancy and infertility. However as discussed in section 2.2.3, much of this assumption is either based on observational studies or on RCTs published in the 1990s that have been criticized for considerable selection and measurement bias. If the success of the current screening programme is to be measured by the reduction in the prevalence of infection, then this has yet not been demonstrated in the NCSP, which has been implemented since 2002. Hence it is uncertain whether opportunistic screening of young people can control the chlamydia epidemic. For a screening programme to be effective in the long term, a sufficiently high proportion of the target population needs to be screened at the defined screening interval. By definition, opportunistic screening does not achieve a high coverage. Taken together with the lack of evidence of the effectiveness of an opportunistic chlamydia screening programme, the appropriateness of chlamydia screening programmes has now being questioned widely in literature (Low, 2007, Mayor, 2009).

Regardless of the debate of the cost effectiveness of chlamydia screening, it might also be important to analyse whether such services are able to achieve its desired objectives of improving accessibility for young people. It would therefore be useful to see whether the sexual health policies and guidelines for chlamydia testing in Scotland have produced any change in testing practice in GUM and non-GUM settings. New chlamydia testing venues such as community pharmacies were added

to provide wider choice and access of testing to young people, particularly those living in deprived areas. Hence the comparison of the provision of testing in different health service locations and whether the testing is able to detect cases in deprived areas needs to be further investigated.

CHAPTER 3: ANALYSES OF ROUTINE DATA FOR CHLAMYDIA IN LOTHIAN, SCOTLAND - 2006 TO 2010

3.1 Introduction

In Chapter 2, I have provided a detailed literature review of the epidemiology of chlamydia in UK as well in other parts of Europe. As described in section 2.2.2, the number of chlamydia diagnoses has increased tremendously in the last decade. For example the number of chlamydia diagnoses in the past decade in UK has increased from year 2000 to year 2009 by 71%, from 67,173 to 114,686 overall. This comprises a 100% increase in chlamydia diagnoses among males (29,390 to 58,042) and a 50% increase among females (37,783 to 56,530) (Figure 2-1). As further discussed in chapter 2 (section 2.2.4), the sharp rising trend in chlamydia diagnoses has been hypothesised to be due to improved testing coverage, diagnostic techniques, widespread change in the risky behaviour related to sexual practices, antimicrobial resistance and arrested immunity (Vickers and Osgood, 2010).

Accurate epidemiological information about the occurrence and distribution of chlamydia is necessary for the prevention and control programmes, in particular for targeted screening. This chapter focuses in detail on chlamydia testing and diagnostic activities in Lothian across a five year period from 2006 to 2010. This time period was chosen to allow the comparison of trends pre and post implementation of the CT&T service. The analysis of routinely collected laboratory data for chlamydia provides a descriptive epidemiology for Lothian of three chlamydia outcomes; namely surveillance rate, diagnostic rate and positivity rate.

The CDC framework of programme evaluation emphasized the importance and utility of the surveillance systems for performance measurement and program evaluation (Centre for Disease Control and Prevention and U.S. Department of Health and Human Services, 2005). These routine dataset are suggested by the CDC as a useful resource in programme planning and formative evaluation by serving two purposes; firstly, it identifies the key burden and risk factors - the descriptive and analytic epidemiology of the public health problem. Secondly, these are useful in measuring long term and population based outcomes. Although it was not possible to

examine the impact of CT&T service in terms of standard chlamydia outcomes, an 'equivalent' analysis has been undertaken of the changes in chlamydia testing activity after the publication of the Quality Improvement Scotland (QIS) sexual health service standards (in 2008) and the SIGN guidelines for chlamydia (in 2009). These two documents have been described in detail in chapter 2 (section 2.3).

Apart from examining the impact of these publications, the analysis also enables a consideration of the feasibility of using routine laboratory data (as currently collected) for investigating changing trends in chlamydia testing and outcomes, such as might be expected to occur after a change in service provision, such as an introduction of CT&T. Recent studies in England had demonstrated the feasibility of collecting data directly from laboratories to monitor testing trends against the recently developed vital sign indicators for chlamydia (Jennison et al., 2010, Slater et al., 2007).

3.2 Aims and Objectives

The primary aim of this chapter is to describe the epidemiology of chlamydia testing and diagnostic outcomes, and to explore the association of these outcomes with key socio-demographic variables.

The specific objectives are:

- to analyse anonymous disaggregate data for chlamydia testing and diagnoses trends in Lothian across the 5 year period from January 2006 to December 2010.
- to investigate the changes in chlamydia testing trends before and after the introduction of policy guidelines relevant to chlamydia testing; i.e. QIS sexual health services standards in 2008 and SIGN guidelines for chlamydia in 2009

A secondary aim of this study is to examine the feasibility of using routine data to assess the impact of introducing some new service or policy, on the outcomes of chlamydia surveillance activities. This issue is addressed in the discussion section of this chapter.

3.3 Methods

3.3.1 Possible sources of routinely collected chlamydia data

Routine data are defined as data that have regular and continuing collection, use standard definitions, include some degree of obligation to collect the data completely and regularly, and are collected at the national or regional level (Stevens *et al.*, 2005). Data on STIs diagnosed in Scottish GUM clinics have been continuously collected since 1922 (Information Service Division Scotland). The information service division (ISD) Scotland, reports national and local statistics for chlamydia based on aggregate data from GUM clinic. Following on from the recommendations of a national sexual strategy for Scotland, 'Respect and Responsibility'(The Scottish Government, 2005) to develop high quality data for sexual health, a phased transition from recording data on STIs in *STISS* (Sexually Transmitted Infections Surveillance System) to *NaSH* (National Sexual Health System) took place in 2009. NaSH is implemented as one national database to record all clinic details, events and episodes of care for each patient coming to the specialist sexual health service in Scotland. The biggest limitation of the NaSH system, as well as the previous STISS is that it does not include diagnoses made in settings other than GUM or FP clinic. Hence a comprehensive picture of chlamydia testing activity cannot be obtained from NaSH databases alone.

Nearly half of all chlamydia diagnoses are made in settings other than sexual health clinics i.e. mostly in general practices. Health Protection Agency (HPA) Scotland collects aggregated laboratory data for chlamydia and reports a more comprehensive picture of chlamydia diagnoses made in different health boards in Scotland. However existing surveillance undertaken by HPA, Scotland, collects only positive results in aggregate form (and not the overall level of testing) (Mackenzia *et al.*). Thus it is neither possible to use these data to assess population coverage of chlamydia testing; nor whether testing is being targeted at those at highest risk of infection, as per Scottish sexual health policy. Moreover, the aggregate data reported from laboratories across Scotland as well for GUM clinic did not accounted for duplicate records, equivocal or inhibitory results.

As described earlier, an annual sexual health report has been produced by ISD and HPS since 2005. The reporting of chlamydia data by both ISD and HPS is undertaken based on 'NHS boards of testing' rather than by 'NHS board of residence'. There are two issues that could affect the estimates of aggregate data based on NHS board of testing:

1. People may /do cross NHS board boundaries to access services
2. Sometimes chlamydia testing for one health board is performed in the laboratories within another health board (for example, some tests for Scottish Borders, Falkirk and Motherwell are performed in Lothian Health Board).

The ASSIST study in England demonstrated the feasibility and importance of collecting chlamydia testing disaggregate data from laboratories (Slater *et al.*, 2007). It was proposed that if a disaggregate data on chlamydia testing were collected from laboratories; the reporting of chlamydia testing activity would be enhanced in the following ways:

i. A more comprehensive means to monitoring chlamydia testing activity would be possible.
ii. A unified dataset would eliminate the need to combine data from disparate sources to report testing activity for chlamydia. In general it would be more representative for the source population.
iii. Data linkage with other relevant datasets would be possible, for example, with SIMD based on a common variable such as residential postcode.

Given the comprehensiveness of laboratory data, I decided to use routine laboratory data for exploring chlamydia testing trends in Lothian over the span of last 5 years. Choosing this 5 year period allowed me to undertake analysis of chlamydia testing activity over a reasonable time span in Lothian. It also allowed description of any changes in the testing activity resulting from the emergence of relevant chlamydia policy / guidance in 2008 and 2009.

3.3.2 Variables available for analysis

The following variables were available and requested from the Chlamydia trachomatis laboratory dataset;

1. Test identifier
2. Specimen date
3. Specimen type
4. Age in years
5. Gender
6. Test result
7. Test location

3.3.3 Deprivation variable used for analyses

As has been pointed out in section 5.2, one rationale for the CT&T service in Lothian was to improve access, and implicit in this rationale was a wish to improve testing rates in young people from lower socio-economic areas. This was built into the design of Lothian CT&T service, by selecting pilot pharmacies in areas of higher deprivation (Section 5.4.1.2). Therefore any analysis of changes in testing activity and outcome would benefit from having a measure of socio-economic status as a potential stratification variable.

Socio-economic status is a multi-dimensional concept reflecting a person's income, employment status, levels of education, home ownership, wealth and number/type of assets. The individual level information on socio-economic status needed was not available in the laboratory dataset. Such data is very time-consuming to collect at the individual level, but there are area based indicators of average socio-economic status for small geographical areas – labelled deprivation variable. Initial work in United Kingdom on obtaining an area based measures of deprivation was undertaken by Carstair and Morris (Carstairs and Morris, 1991). The Carstair's index is now out of date, but the SIMD now provides a most updated measure of multiple deprivations at a data-zone level (The Scottish Government, 2009). Previous studies have employed data linkage techniques, of linking postcode information of patient's data with SIMD

dataset, to obtain corresponding area measure of deprivation of the patients (Hutchinson *et al.*, 2004, MacLeod *et al.*, 1999, Hanlon *et al.*, 2005, Challier *et al.*, 2000, Yu *et al.*, 2011). For the current study, I had retrieved SIMD dataset at data-zones level for Lothian and provided this dataset to the statistician at the microbiology laboratory for linkage with records with those tested for chlamydia. The record linkage is described in detail in the next section.

The average size of a data-zone in SIMD 2009 is approximately 1500 people. Data-zones have a specified minimum population to avoid the risk of data disclosure, and are not subject to frequent boundary change hence more suitable for comparison over time. The SIMD 2009 is a composite area-based measure of 38 indicators within the following seven domains (the percentages show the weights attributed to each domain):

- Current income (28%)
- Employment (28%)
- Health (14%)
- Education (14%)
- Geographic access (9%)
- Crime (5%)
- Housing (2%)

The weights reflect both the robustness of the domain and the relative importance afforded to the domain in terms of its contribution to the concept of multiple deprivation. Each LSOA in Scotland has been assigned an overall SIMD 2009 score and also a rank (1=most deprived LSOA to 6, 505=least deprived LSOA in Scotland). The SIMD ranks are also categorised to provide SIMD quintiles, with quintile 1 specifying most deprived and quintile 5 least deprived. SIMD 2009 data and guidance on the methodology used as well as the variables used to construct the domains to derive the index is available from the Scottish Government website http://www.scotland.gov.uk/Topics/Statistics/SIMD.

An SIMD linked data set therefore provided two further variables for analysis:

1. Deprivation quintile
2. Urban-Rural (U-R) classification

3.3.4 Data processing

The processing of chlamydia data took place at two stages, firstly by the laboratory based statistical analyst prior to the extraction of data as per my request, and next, by me, once I had the anonymised data in my possession.

3.3.4.1 Data processing at the laboratory

The lab undertook a special processing of the raw dataset before it was handed over to me, to accommodate my intended research. Lab data retrieval and linkage with the SIMD dataset was undertaken by the scientific officer at the Bacteriology Reference Laboratory of Royal Infirmary, Edinburgh. Hence I received the processed data after removal of all personal identifications. The processing of the row dataset undertaken in the laboratory was as follows:

i. A new variable called 'Unique cluster code' was created based on name, soundex code, gender, DOB and the Community Health Index (CHI) number *(CHI is a population register, which is used in Scotland for health care purposes. The CHI number uniquely identifies a person on the index)*. I later used this variable, in the absence of CHI number, for de-duplication purpose (see section 3.3.4.2.1).

ii. Age in years was calculated by subtracting the date of birth from the date of specimen submission. This enabled exclusion of exact DOB from the dataset to further ensure anonymity.

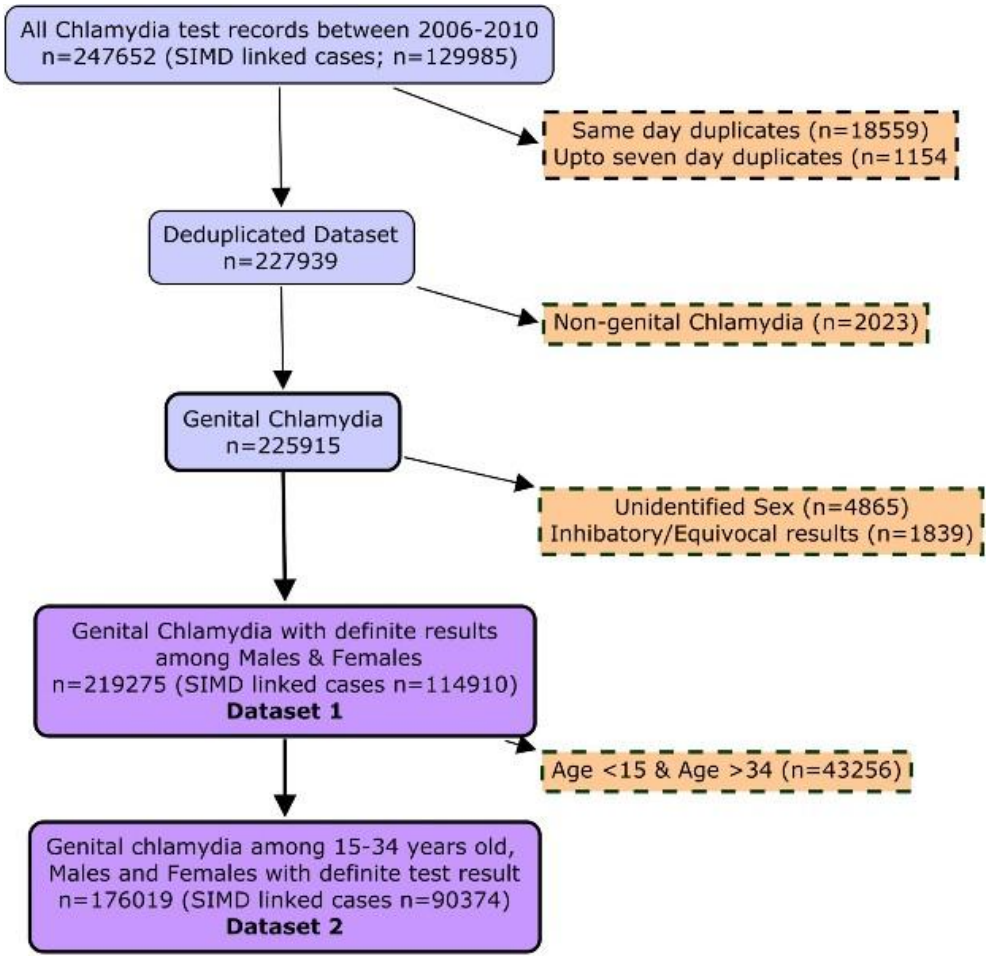
iii. **Record linkage:** The Scottish government website provides information on SIMD deprivation score and its quintiles and other relevant variables (such as urban-rural classification) for each full postcode in Scotland. Hence for the Lothian postcodes (a total of 21, 796 full postcodes in Lothian), I retrieved variables on deprivation quintile and urban-rural classification from SIMD and, provided this dataset to the laboratory for data linkage. The laboratory dataset for which the postcode information was available (52.5% of the original lab database), it was linked with the SIMD dataset. The linked dataset

therefore provided these two additional geographical variables, only for cases with full postcode information. The full postcode information was later removed, for the confidentiality purpose, before the laboratory processed dataset was handed over to me.

3.3.4.2 Further data processing once the data was received

Data was received by me in a protected hard disk in CVS format. Upon receipt of the lab data, it was imported to SPSS version 17. It undertook the following processing to make the data ready for analysis. Figure 3-1 is a flow diagram showing the steps of data processing undertaken by me and the final datasets used for the analysis.

Figure 3-1: Flow diagram showing data processing for analysis



Note: One record may fulfil several exclusion criteria.

3.3.4.2.1 De-duplication

It was estimated that approximately 5-20% of chlamydia tests in a calendar year are repeat ones on the same individual due to repeat sample taken at a single consultation

or sample taken at a different consultations for the same clinical episode (Information Service Division Scotland and National Service Scotland, 2008). Hence multiple samples should be identified and de-duplicated systematically within the dataset.

For preparation of the dataset a de-duplication algorithm (Figure 3-2) was adapted to prevent multiple samples from the same episode being counted as proposed in the CTAS study (Health Protection Agency, 2008). A duplicate is defined as the latter of two samples which had been taken from an individual within a seven day continuous period. Duplicates were removed and single test records were retained.

Figure 3-2: De-duplication algorithm

Matched Unique cluster code –*Yes* → Matched specimen dates –*Yes* → Remove duplicates

OR

Matched Unique cluster code –*Yes* → Specimen dates within 7 days –*Yes* → Remove duplicates

Where test results from duplicates detected chlamydia (i.e. one is positive and a second record is negative) and the date of specimen are within seven days, the positive result was retained. If the test result does not detect chlamydia (i.e. negative or equivocal), then negative is retained in preference to equivocal result. If the test results of the duplicates are same but are from different sample sites, then the order of preference of retaining the sample record were: genital, urine sample, rectal, pharyngeal or other sample. A total of 19, 713 records (8%) were removed by this process.

3.3.4.2.2 Data inconsistencies and completeness

Analysis of the dataset for completeness of individual data fields and inconsistencies was conducted to assess data quality. As described earlier, a full extract of all chlamydia testing data was requested. As well as minimising the workload on data provider, this also allowed me to identify data error and completeness of lab dataset. The following inconsistencies in the data were identified:

i. For 169 records, specimen site did not match with gender. For example, for 130 records, cervical specimen was recorded for male.

ii. For 4865 records, gender was coded as 'unidentified'. A higher proportion of reporting of unidentified gender (64% of all unidentified gender reported in 5 years) occurred in year 2007 (n=1640) and 2008 (n=1812). Moreover 61% (n=2985) of these were reported in PTK tests with highest numbers reported in 2007 (n=1110) & 2008 (n=1635). These two years also represent the highest testing activity for PTK.

iii. For 143 records, no age was recorded. It is possible to cross check patients DOB and gender with patients CHI number. CHI number is the unique patient identifier for health care services within Scotland and consists of a 10-character code. The first 6-digits of the CHI correspond to the date of birth (DDMMYY), two digits, a 9th digit which is always even for females and odd for males and an arithmetical check digit. However as I did not have access to CHI number and full DOB for confidentiality reasons, this cross checking was not possible. Therefore 4865 records for unidentified gender and 143 records for age need to be removed in dataset 1 (used for gender and age analyses).

3.3.4.2.3 Recoding

Variables such as specimen type, location and test result have multiple codes. These variables were re-categorised as follows:

i. **Specimen Type:** This variable had 42 codes. It was re-coded into 5 categories: 1='genital swab', 2= 'urine sample', 3= 'rectal swab', 4= 'pharyngeal swab' and 5= 'other' (This category primarily includes conjuctival samples). SIGN guidelines covers chlamydia infection of genital tract, rectum or pharynx. Records with chlamydia tests from other sites, for example, ocular chlamydia infections were excluded from the analysis since they were unlikely to be transmitted sexually. Hence specimen indicated for genital chlamydia testing were specimen obtained by swabbing the cervix, vagina, urethra, rectum or pharynx, as well as urine samples.

ii. **Test Result:** This variable had 18 codes. It was re-coded into 3 categories: 1= Positive, 2= Negative, 3= Inhibitory/ Equivocal.

iii. **Test Location:** This variable had 572 codes. It was recoded into 5 categories: 1= GP surgery and community midwives, 2= GUM clinic, 3= Family planning

clinic, 4= Healthy Respect and outreach, 5= Others. The 'other' category primarily included test requests from hospital wards. Whereas Health Respect and outreach primarily represent tests undertaken through PTK.

iv. **Age:** The age was categorised as: ≤14yrs, 15-19yrs, 20-24yrs, 25-29yrs, 30-34yrs & ≥ 35. The categories ≤14yrs & ≥ 35yrs were only used for initial description of the sample. The calculation of diagnostic, surveillance and positivity rates and for the logistic regression analyses, the ≤14yrs and ≥ 35 were excluded.

v. **Years of testing** was retained as a discrete variable for 5 years from 2006 to 2010 separately. For the logistic regression analyses, the first two years (i.e. 2006 and 2007) were merged to create a category ≤2007, to examine the impact of sexual health policies on chlamydia testing activity which were published in 2008 and onwards.

At this stage, two datasets were created as shown in figure 3-1. Dataset 1 includes all tested genital samples with definitive results. Dataset 1 was used for an overall description of chlamydia testing in Lothian and for part one of the policy analysis. Dataset 2 is a subset of dataset 1, where the individuals tested were 15-34 years of age and was used for the later part of the policy analysis and for the description and analysis of the three outcome measures.

3.3.5 Outcome Measures

Three outcome measures have been selected for the analysis of chlamydia testing activity trends in Lothian. These outcome measures are:

3.3.5.1 Population surveillance rate (Coverage)

Population surveillance rate reflects the coverage of chlamydia testing activity achieved in a population, and is calculated as follows:

$$Population\ \ Surveillance Rate = \frac{Number\ of\ \ person tested\ \ for\ chlamydia}{Midyear\ Population} \times 1000$$

Population surveillance rate is a process measure and is used as a 'standard' measure for chlamydia testing activity in health care settings in Scotland (Standards 3.2 &

3.3), as proposed in 2008. Up until 2010 / 11, it has also been used by NCSP to monitor its programme performance.

3.3.5.2 Population diagnostic rate (Prevalence)

This measure reflects both coverage and positivity of testing at all health care services, and is calculated as follows:

$$Population\ \ Diagnosis Rate = \frac{Positive\ Tests}{Midyear\ Population} \times 100{,}000$$

3.3.5.3 Positivity rate

Positivity is calculated as follows:

$$Positivity\ Rate = \frac{Positive\ Tests}{Total\ Tests} \times 100$$

Positivity is an important element of surveillance since it gives an indication as to whether testing is being targeted at those most in need, those who are chlamydia positive. NCSP have proposed to replacing population surveillance rate, with population diagnostic rate and positivity rate, from 2011 / 12. It is judged that these measures will better reflect chlamydia control activity, among those aged 15-24 years old, in both NCSP and non-NCSP settings, including GUM clinics.

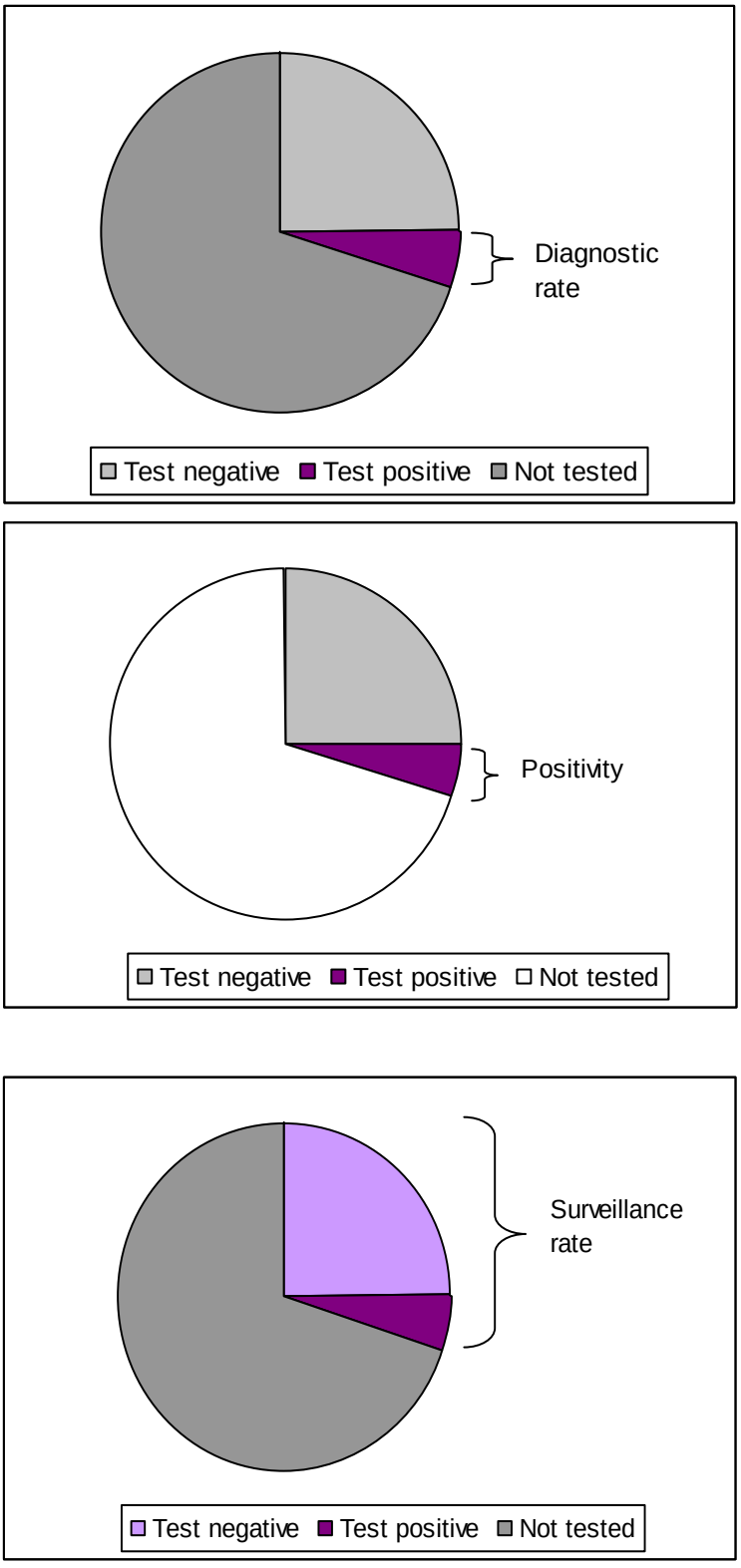
3.3.5.4 Comparison of the three outcome measures / definitions

Figure 3-3 overleaf is a diagrammatic representation of the three outcome measures. In each diagram the entire 'area' population is hypothetically split into (the same) three subsets – not tested, tested but negative, and tested positive. In each diagram, the mauve slice (or in the bottom diagram, slices) indicate(s) the numerator for the outcome measure, whereas the grey slices (or in the bottom diagram, slice) represent(s) the remainder of the denominator (because the entire denominator of course *includes* the numerator as well). The diagram therefore aids understanding of how the three outcome measures differ in what they encapsulate.

It can be seen that positivity rate is a testing activity outcome measure, and requires only the laboratory dataset provided to undertake analysis. However surveillance rate and diagnostic rate are population-based measures and, in order to calculate these

outcomes, it is required to obtain the relevant Lothian population estimates over the relevant years.

Figure 3-3: Diagrammatic representation of outcome measures for chlamydia testing



3.3.5.5 Other outcomes relevant to the analysis of sexual health policy & guidelines for Scotland

Age focused testing outcomes are used in the analysis of QIS sexual health service standards and SIGN guideline for chlamydia. These standards and guideline have been discussed in detail in section 2.3. The key points relevant to the analyses of routine data for chlamydia are described below:

The sexual health services standards were published in April 2008 by Quality Improvement Scotland (NHS Quality Improvement Scotland, 2008). Standard statement 3 is about the provision of chlamydia testing. Its following three components are particularly relevant:

i. Standard 3.1: 60% of chlamydia tests per year are taken from males and females aged under 25 years.

ii. Standard 3.2: For males aged 15-24 years, the annual rate of chlamydia tests performed in the NHS board area is greater than 100 per 1000 population.

iii. Standard 3.3: For females aged 15-24 years, the annual rate of chlamydia tests performed in the NHS board area is greater than 300 per 1000 population.

While standards 3.2 and 3.3 use population surveillance rate as an outcome measure, as already described (section 3.3.5.1), the appropriate outcome measure for standard 3.1 is an age targeted proportion of all testing (i.e. number of tests among those <25 years old / total number of tests).

The revised SIGN guidelines (Number 109) on the management of genital chlamydia infection then followed the next year in March 2009 (Dhar *et al.*, 2010). Its key recommendations relevant to my current analyses of data are as follows:

i. Resources for chlamydia testing in women should be targeted where prevalence is known to be highest, i.e. first those aged 15-19 and then those aged 20-24.

ii. Resources for chlamydia testing in men should be targeted where prevalence is known to be highest, i.e. those aged under 25.

iii. Postal testing kits should be used to increase chlamydia testing among young men

Although the above SIGN guideline recommendations does not provide measurable targeted outcomes, these recommendations are also evaluated while presenting the analysis of QIS sexual health service standards in terms of any increase in testing activity in the defined age group as well as the use of PTK among men.

3.3.6 Obtaining population denominators needed for analyses of surveillance rate and diagnostic rates

The *denominator* for population surveillance rate and for population diagnostic rate is a midyear population, so these outcomes required accessing GROS population figures for Lothian for the relevant years. The laboratory dataset would provide *numerator* counts of tests undertaken (for surveillance rate) or of positive test results (for diagnostic rate). However, it was also wished to be able to include gender and age group in the analysis. Therefore the population counts were obtained for 32 cells (corresponding to the 32 unique combinations of the three explanatory variables: age category (4 categories i.e. 15-19 years, 20-24 years, 25-29 years & 30-34 years); gender (2 categories i.e. male & female); and year of testing (4 categories i.e. 2006-07, 2008, 2009 and 2010) (Table 3-1). For the analysis by SPSS, however, what needs to be input is not numerator and denominator, but numerator and remainder of denominator (for example, for population surveillance rate, tested (t) and not tested (N-t), where 'not tested' = denominator - numerator). An outcome variable was therefore created, where '1' refers to the unique combination count of 'tested' and '0' refers to the unique combination counts of 'not tested'. The final step prior to analysis was to declare the variable containing t and N-t as a weight variable in SPSS to simulate the current frequencies of the unique combination of the explanatory variables in the population.

Table 3-1: Development of aggregated data set for analysis of population surveillance rate – two rows created for each of the 32 population x year combinations

Explanatory variables - Combination codes			**Outcome**	**Counts**
Age category 1 = 15-19 2=20-24 3=25-29 4=30-34	**Gender** 1=Male 2=Female	**Year of testing** 1=2006-07 2=2008 3=2009 4=2010	**Tested** Yes =1 No = 0	**Aggregate number tested (t) or *not* tested (N-t)**
x	y	z	1	t
			0	N-t

A similar exercise was undertaken for the analysis of population diagnostic rate (Table 3-2). However, the numerator counts for each 32 unique aggregates is obtained from the laboratory dataset for the number of positive tests (p), and N-p is obtained by subtracting p from the midyear Lothian population estimate for each unique combination of age, sex and year population (N). A variable containing p and N-p is then declared as a weight variable in SPSS for the analysis of population diagnostic rate.

Table 3-2: Development of aggregated data set for analysis of population diagnostic rate – two rows created for each of the 32 population x year combinations

Explanatory variables - Combination codes			**Outcome**	**Counts**
Age category 1 = 15-19 2=20-24 3=25-29 4=30-34	**Gender** 1=Male 2=Female	**Year of testing** 1=2006-07 2=2008 3=2009 4=2010	**Positive** Yes =1 No = 0	**Aggregate number of positive (p) or not positive (N-p)**
x	y	z	1	p
			0	N-p

3.3.7 Statistical analysis

3.3.7.1 Descriptive statistics

Descriptive statistics were produced. Proportions of chlamydia testing activity across different health care settings, age categories, gender and years were plotted in graphs.

3.3.7.2 Logistic regression analyses

Logistic regression analyses are performed separately for surveillance rate, positivity rate and diagnostic rate (see section 3.3.5, for the definition of the three outcome measures). The multivariate modelling was used to describe the associations of these outcome measures with available epidemiological variables, not to construct a predictive model. The regression coefficient (β), standard error of β (S.E.), a Wald test ($\chi^2 = B^2/S.E.^2$), significance level for the Wald test and its degrees of freedom, OR and C.I. for each explanatory variable are presented in the final model.

3.3.7.3 Multiple imputations of missing values

For the analysis of positivity rate was performed on the SIMD-linked dataset which provided two additional SIMD variables (deprivation quintile and urban-rural classification) were available as potential explanatory variables. As discussed in section 3.3.4.1, data linkage for the two SIMD-linked variables could only be achieved for 53% of the full laboratory dataset. Performing multivariate logistic regression would result in list-wise deletion of cases with any missing value on any covariate. Thus the high proportion of missing values for deprivation and urban-rural would lead to the exclusion of a substantial proportion of the tested population, which in turn leads to substantial loss of precision and power and would introduce bias (Sterne et al., 2009a).

In SPSS, missing value analysis can be performed to assesses whether the data is missing completely at random (MCAR) - when subjects with missing data form a random subset of study sample; or missing not at random (MNAR) - when the probability that an observation is missing depends upon unobserved subject information. Moreover, when the (missing) value of the variable depends on characteristics that are observed, missing values are called MAR (missing at random) and need complicated statistical modelling. Complete case analysis on MCAR data would give an unbiased, though less precise estimates. However, when the data is

MAR, multiple imputations **(MI)** have been recommended as a means of dealing with the missing data. In MI, each missing value is replaced by a set of *'m'* > 1 plausible values drawn from their predictive distribution, based on all other information available in the data set. This results in *'m'* complete datasets, each of which can be analyzed by complete-data methods (Schafer and Olsen, 1998, Sterne et al., 2009a).

Missing value analysis performed on the SIMD-linked dataset confirmed that the dataset is MAR. The missing values for deprivation quintile and urban-rural classification differ across gender and age categories, because the variable is mainly missing in GUM clinic testing data, and it is GUM where most of the tests for males are performed and where there is more testing of the younger age category. Missing data were therefore imputed in SPSS, using multiple imputation command to generate 5 'complete' sets of data. It has been recommended that any imputation procedure should include explanatory variables involved in the planned analysis, the outcome variable (Moons et al., 2006, Sterne et al., 2009a), and any variables not used in the analysis which nevertheless have strong correlations with incomplete variables (He, 2010). The variables identified for the current MI procedure include age category, gender, year of testing, SIMD quintile, urban-rural classification, result category and test location. The test location is not used in modelling, but missing SIMD values were far less common for non-GUM cases, so test location was included in the MI procedure.

Analytical procedures in SPSS, which work with MI datasets, first produce output for each complete imputed dataset, and then provide pooled estimates from those outputs. The logistic regression models for positivity rate are reported and compared both for pooled estimates obtained after running analysis of MI datasets, as well as estimates obtained after list-wise deletion of cases with missing values in the original dataset.

For the analysis of population diagnostic and surveillance rate, multiple imputations would have been required at aggregate level, but this was beyond the scope of this research.

3.3.8 Ethical approval

Studies involving access to routine data from the NHS laboratory require Caldicott Guardian approval, which was later sought from the NHS Lothian board (Reference number: JMS/JI/10175) (Appendix 1).

3.3.9 Presentation of results

The results are presented in six sections as follows:

- Overall description of dataset (for both complete dataset and SIMD linked dataset), for various demographic and descriptive variables (section 3.4.1).
- Description of population surveillance rate stratified for age, gender and year of testing; and the association of these explanatory variables with the *population surveillance rate* (section 3.4.2).
- Description of population diagnostic rate stratified for age, gender and year of testing; and the association of these explanatory variables with the *population diagnostic rate* (section 3.4.3).
- Description of positivity rate stratified for age, gender and year of testing; and the association of these explanatory variables with the *positivity rate* (section 3.4.4.1).
- Description of positivity rate with additional SIMD linked variables i.e. deprivation quintile and urban-rural classification (section 3.4.4.2). This section present results that estimate the association of positivity rate with age, gender, year of testing as well as deprivation quintile and urban-rural classification. Logistic regression analysis was performed on the original dataset to allow list-wise deletion of cases with missing values (i.e. missing values for deprivation quintile and urban-rural classification); and on multiple imputed (MI) datasets. Pooled estimates from multiple imputed datasets are reported.
- Analyses of chlamydia testing activities before and after the introduction of the QIS sexual health service standards (2008) and the SIGN guideline (2009) are presented in section 3.4.5

3.4 Results

3.4.1 Description of Lothian laboratory dataset

Table 3-3 gives the basic description of chlamydia testing activity in Lothian. The tests were evenly distributed across the five years. Genital samples accounted for nearly half of all the chlamydia samples taken. Further analysis of specimen type by gender (data not shown) suggests that genital samples were predominantly (97.8%) taken from female, whereas, urine samples were more evenly distributed among males (45.6%) and females (51%).

Of all the tests performed, 49% were on ≤ 24 year olds. The largest proportion of tests were performed in GP surgeries (37.3%), followed by GUM clinic (34.4%). The overall positivity rate for the five years was 7.8%.

Since SIMD linkage was achieved for nearly half of the dataset (53.4%), missing value analysis was undertaken to identify any variations in missing values for SIMD linked variables across the available laboratory database variables (Table 3-4). The SIMD-linked variables were primarily missing in tests undertaken in GUM clinics (99.9%), Healthy Respects drop-ins (99.9%) and FP & WW clinics (60.3%). Furthermore, these variables are more commonly missing among tests undertaken for males (77%). This disparity in missing SIMD variables for males was primarily because males were more commonly tested in sexual health clinics and these clinics do not record postcode information of the patients.

Table 3-3: Descriptive statistics for genital chlamydia laboratory data

Variable*	n	(%)
Year of testing		
2006	42614	19.4
2007	40710	18.6
2008	44759	20.4
2009	46823	21.4
2010	44369	20.2
Specimen Type		
Genital Swab	102014	46.5
Urine	115702	52.8
Rectal	1524	0.7
Pharyngeal	35	0.0
Gender		
Female	161070	73.5
Male	58205	26.5
Age (in years)		
≤ 14	1684	0.8
15-19	36635	16.7
20-24	67643	30.9
25-29	45171	20.6
30-34	26570	12.1
≥ 35	41530	18.9
Test Result		
Positive	17042	7.8
Negative	202233	92.2
Test Location		
GP Surgery	81821	37.3
GUM	75350	34.4
FP & WW	18993	8.7
HR & Outreach	8425	3.8
Others	34686	15.8

Dataset 1 (N=219275), see Figure 3-1

Table 3-4: Number (%) missing values for SIMD deprivation and urban-rural explanatory variables, by categories of key routine data variables

Variable	Missing values in each category*	
	n	%
Total missing values	**104365**	**47.6**
Age in years		
≤ 14	218691	65.3
15-19	202260	53.6
20-24	185109	49.5
25-29	195459	47.3
30-34	203899	42.1
≥ 35	195325	42.3
Gender		
Female	117640	36.9
Male	206000	77.2
Test Location		
GP Surgery	142250	5.9
GUM	219217	99.9
FP & WW	211740	60.3
HR & Outreach	219267	99.9
Others	188991	12.7
Year of testing		
2006	195204	43.5
2007	196698	44.5
2008	196037	48.1
2009	196125	50.6
2010	197401	50.7

*Dataset 1 (N=219275), see Figure 3-1

Table 3-5 shows the distribution of SIMD linked variables in the laboratory dataset and for the Lothian population. The first three deprivation quintiles are more frequently represented in the SIMD-linked laboratory data subset as compared to the Lothian data-zone population. For example, the most deprived quintiles represent 15.9% of the laboratory data subset compared to 12.6% of the Lothian data-zone population categorised as most deprived. Similarly, testing from the urban areas is slightly more represented (95%) in the laboratory data subset than that for Lothian data-zone population (92%).

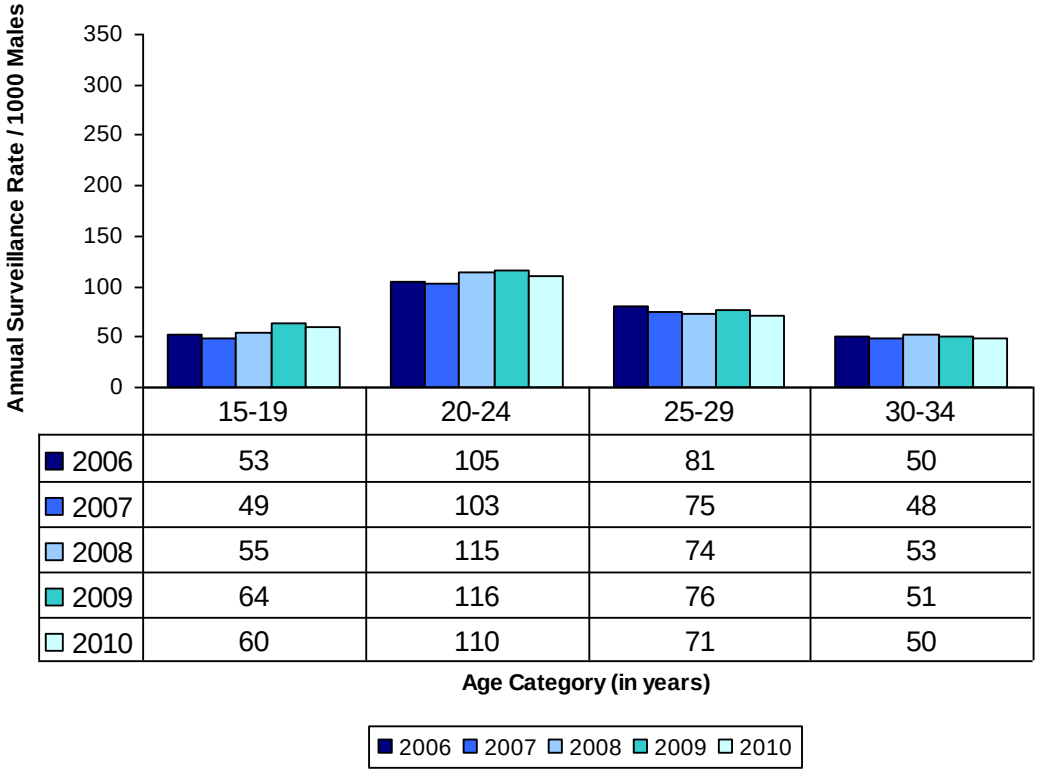
Table 3-5: Distributions for deprivation and urban-rural variables separately for the SIMD linked laboratory dataset and for the Lothian population

	SIMD linked laboratory dataset		Data-zones for Lothian
SIMD linked variables	**n**	**%**	**%**
Deprivation Quintile			
1 (Most Deprived)	18261	15.9	12.6
2	24225	21.1	19.5
3	21028	18.3	16.8
4	19550	17.0	17.7
5 (Least Deprived)	31846	27.7	33.4
Urban-Rural Classification			
Urban	108976	94.8	92.1
Rural	5943	5.2	7.9

3.4.2 Population surveillance rate

The population surveillance rate (see 3.3.5.1 for definition) in men by year for different age categories is shown in Figure 3-4. In order to make it easier for visual comparisons of rates in the male and female graph, the y-axis of the graph for males is on the same scale as that for females. Across different age categories, the rates were highest among 20-24 year old males and then among those 25-29 years old. Across five years, the surveillance activity was only slightly increased in 2009.

Figure 3-4: Males – population surveillance rate / 1000 males (mid-year population) in the 15 to 34 year olds Lothian population



	15-19	20-24	25-29	30-34
2006	53	105	81	50
2007	49	103	75	48
2008	55	115	74	53
2009	64	116	76	51
2010	60	110	71	50

In a similar way, the population surveillance rates among women by year and age categories are shown in Figure 3-5. Overall population surveillance rate for females was approximately three times as high as for males. The rates were highest among 20-24 year old females and then 15-19 years old. Across the five years, rates have tended to increase among 15-19 years old and 20-24 years old but remained more stable among the later age categories.

Figure 3-5: Females – population surveillance rate / 1000 females (mid-year population) in the 15 to 34 year olds Lothian population

	15-19	20-24	25-29	30-34
2006	239	297	201	131
2007	207	276	193	128
2008	244	317	200	136
2009	269	325	205	140
2010	254	302	181	128

A multivariate logistic regression analysis of population surveillance rate with three independent explanatory variables (age category, year of testing and gender) shows a statistically significant association with each variable (p-value of <0.001). Table 3-6 shows the adjusted OR and 95% C.I, regression coefficients (log odds) and its S.E. and Wald statistics p-value for each of the three variables. Appendix 2 shows crude OR and 95% C.I. for the association of population surveillance rate. Refer to figure 3-3 for understanding odds ratio for surveillance rate.

Table 3-6: Population surveillance rate – multivariate logistic regression analysis of its association with age, gender and year of testing

Variables in the main effect model	Log Odds	S.E.	Sig.	Adjusted OR	95% C.I. for OR	
					Lower	Upper
Age Category (in Yrs)			<0.001*			
15-19	0.569	0.009		1.77	1.74	1.80
20-24	0.992	0.008		2.70	2.65	2.74
25-29	0.458	0.008		1.58	1.56	1.61
30-34	0			1.00		
Gender			<0.001**			
Female	1.258	0.006		3.52	3.48	3.56
Male	0			1.00		
Year of Test			<0.001***			
2008	0.081	0.007		1.08	1.07	1.10
2009	0.125	0.007		1.13	1.12	1.15
2010	0.031	0.007		1.03	1.02	1.05
2006-07	0			1.00		
Constant	-3.139	0.009	<0.001	0.043		

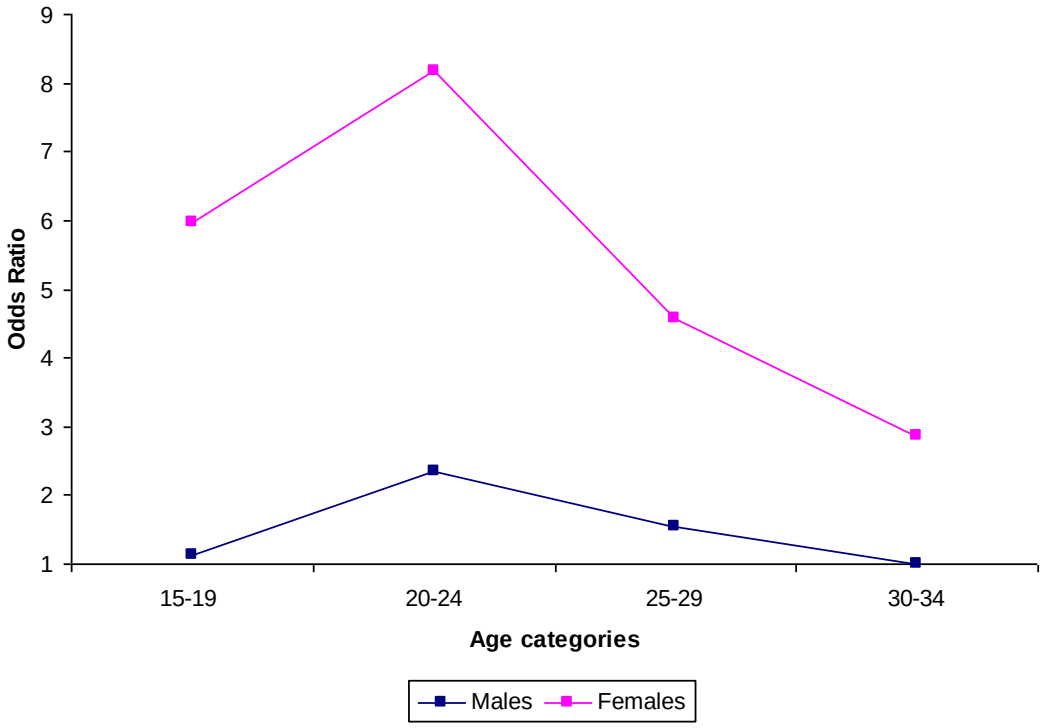
Wald statistics (df): * 16969.73(3), **45676.09(1), ***338.01(3)

According to the Wald criteria, all the three variables are significantly associated with having a chlamydia test. In the model, after adjusting for all the three explanatory variables, odds of being tested in a population among those aged 20-24 years old were 2.7 times (95% CI: 2.65 to 2.74) more as compared to 30-34 years

old. For females, the odds of being tested in a population were 3.52 times (95% CI: 3.48 to 3.56) as compared to males. Compared to 2006-07, the odds of being tested in a population were 8% more likely in 2008 and 13% more likely in 2009, but falls to 3% in 2010.

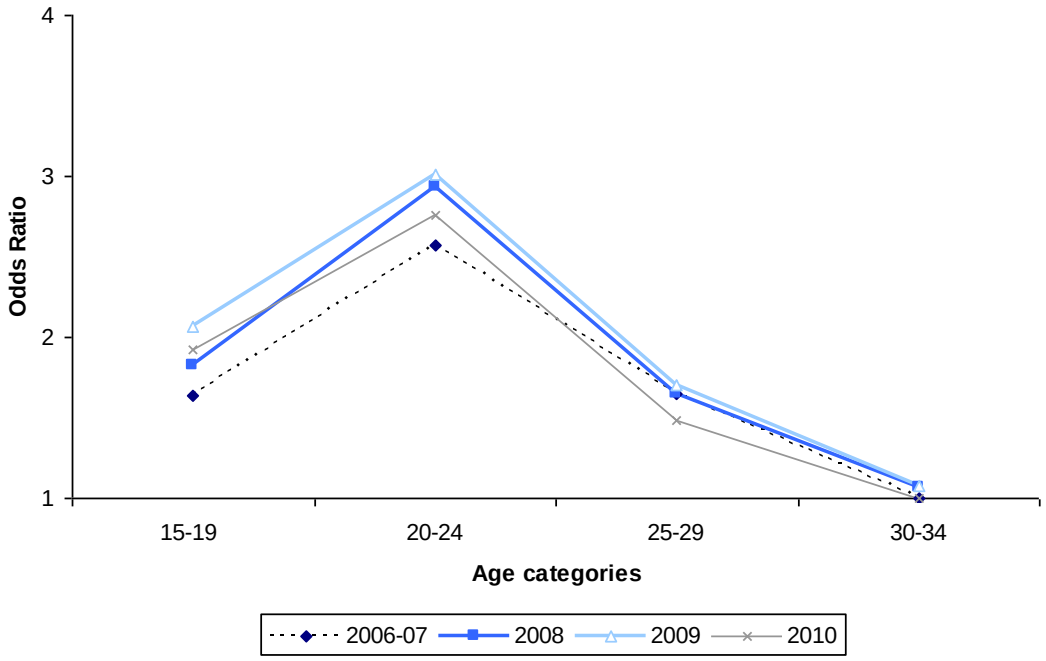
Next, an interaction term 'age category by gender' was entered in the main effect model. Appendix 3 presents the results of this analysis with three explanatory variables and the interaction term 'age category by gender' added in the main effect model. Figure 3-6 is a simple graphical representation of the odds ratio of population surveillance rate for age categories and gender, calculated by multiplying the odds ratio of each combination of age and gender categories in Appendix 3. The reference category is 30-34 years old males. As can be seen in figure 3-6, across all age categories, the odds of being tested in a population was higher among females compared to males. As compared to the reference group, the OR in the 15-19 year olds was more than 5 times as higher among females (OR =5.97) than males in the same age category (OR=1.13). Further examination of the interaction term in Appendix 3 suggests that the highest log odds for interaction category (which represent the largest interaction effect) is 0.612 for '15-19 year olds by female'. The Wald statistics for the interaction term was statistically significant (Wald statistics (df) = 1289.2 (3); p-value <0.001).

Figure 3-6: Association of population surveillance rate with gender and age, including an interaction term in the model



Next, an interaction term 'age category by year of testing' was entered in the main effect model. Appendix 4 presents the results of this analysis with three explanatory variables and the interaction term 'age category by year of testing' added in the main effect model. Figure 3-7 is the graphical presentation of OR for population surveillance rate with different combinations of age categories and year of testing, when an interaction term (age category by year of testing) is included in the model. The reference category is 30-34 year old for the year 2006-07. Within each age category, the odds of being tested in a population were progressively higher in 2008 and 2009 as compared to 2006-07. In 2010, the odds of being tested though higher among 15-19 and 20-24 year old compared to same categories in 2006-07, but decreased for older age categories as compared to 2006-07. Within each year, the odds of being tested in a population were highest for the 20-24 year old age category. The Wald statistics for the interaction term was statistically significant (Wald statistics (df) = 232.75(3); p-value <0.001).

Figure 3-7: Association of population surveillance rate with year of testing and age, including an interaction term in the model

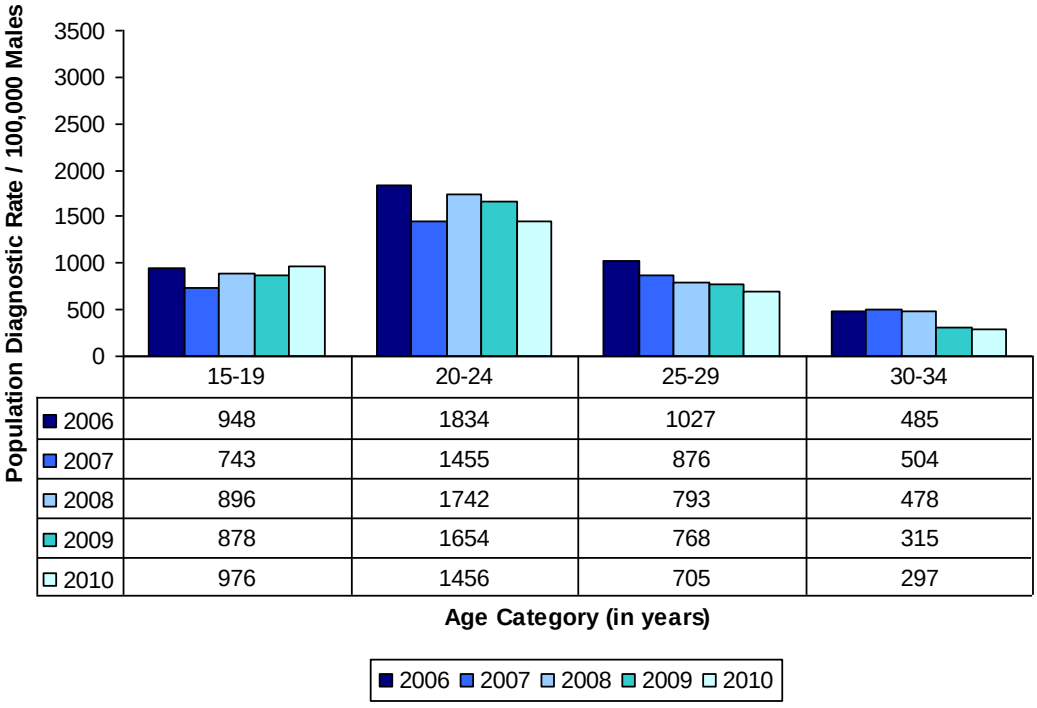


If the sample size is large, almost any difference between models is likely to be reliable (statistically significant) (Tabachnick and Fidell, 2007). In the current scenario, the addition of interaction terms only adds little extra meaning to the main effect model at the cost of a more complex model. Hence it was decided to keep a more parsimonious model by not including an interaction term in the model. Therefore the main effect model was retained for final discussion and comparison with other outcome measures.

3.4.3 Population diagnostic rate

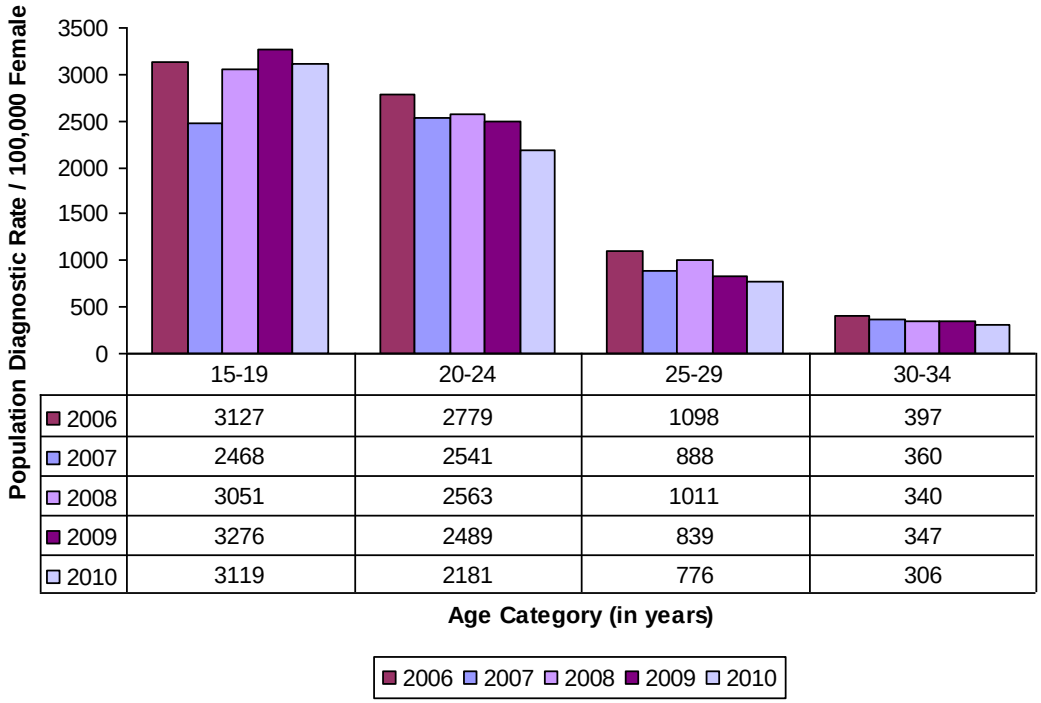
Figures 3-8 and 3-9 compares the population diagnostic rates for males and females in different age categories across five years. Among the different age categories in males, the highest rates were observed among 20-24 years old at 1834/100,000 in 2006 and declining to 1456/100,000 in 2010. Within each age category, the rates from 2006 to 2010 remained relatively stable among 15-19 year olds, but tended to decrease in the older age categories.

Figure 3-8: Males - population diagnostic rate / 100, 000 males (mid-year population) in the 15 to 34 year olds Lothian population



	15-19	20-24	25-29	30-34
2006	948	1834	1027	485
2007	743	1455	876	504
2008	896	1742	793	478
2009	878	1654	768	315
2010	976	1456	705	297

Figure 3-9: Females - population diagnostic rate / 100, 000 females (mid-year population) in the 15 to 34 year olds Lothian population



	15-19	20-24	25-29	30-34
2006	3127	2779	1098	397
2007	2468	2541	888	360
2008	3051	2563	1011	340
2009	3276	2489	839	347
2010	3119	2181	776	306

The diagnostic rates among females (Figure 3-9) have a decreasing trend across the four age categories with the highest rates observed among 15-19 years old (3276/100,000 in 2009). Across five years, the rates remained similar in 15-19 year old age category, but tended to decrease in the later age categories.

Table 3-7 shows the main effect model of a multivariate logistic regression analysis performed on diagnostic rate as an outcome and three explanatory variables: age category, year of testing and gender. Univariate analysis indicated that all the three variables were statistically significant with a p-value of <0.001, see Appendix 2). Refer to figure 3-1 for understanding odds ratio for diagnostic rate.

In the model, after adjusting for all the three explanatory variables, the odds of diagnoses among 15-19 year olds and 20-24 year olds were five times more likely (95% CI 4.86 to 5.54 among 15-19 year olds; and 5.19 to 5.90 among 20-24 year olds) than 30-34 year olds in the population. The odds of diagnosis were 74% more likely in females as compared to males. The odds of diagnosis do not vary with the

year of testing, except for the year 2010, where the odds of diagnosis in a population was 11% less likely than early years i.e. 2006-07.

Table 3-7: Population diagnostic rate – multivariate logistic regression analysis of its association with age, gender and year of testing

Variables in the main effect model	Log Odds	S.E.	Sig.	Adjusted OR	95% C.I. for OR	
					Lower	Upper
Age Category (in Yrs)			<0.001*			
15-19	1.65	0.033		5.19	4.86	5.54
20-24	1.71	0.032		5.53	5.19	5.90
25-29	0.83	0.035		2.30	2.15	2.47
30-34	0			1.00		
Gender						
Female	0.55	0.017	<0.001**	1.74	1.69	1.80
Male	0			1.00		
Year of Test			<0.001***			
2008	0.006	0.022		1.01	0.96	1.05
2009	-0.03	0.022		0.97	0.93	1.01
2010	-0.11	0.023		0.89	0.86	0.93
2006-07	0			1.00		
Constant	-5.86	0.033	<0.001	0.003		

Wald Statistics(df): *4016.65(3), **1093.25(1), ***29.24(3)

Two interaction terms, age category by gender and age category by year of test, were separately entered in the main effect model (analysis not shown here). The Wald statistics for each interaction term were statistically significant (p-value <0.001). However, as noted in section 3.4.2, given the large sample size, statistical significance would be expected even for a fairly modest absolute effect. Here the value of Wald statistics was even lower than the corresponding Wald statistics values for interaction terms in the logistic regression model for the population surveillance rate (Wald statistics (df) for: age category by year of testing =71.21(9); age category

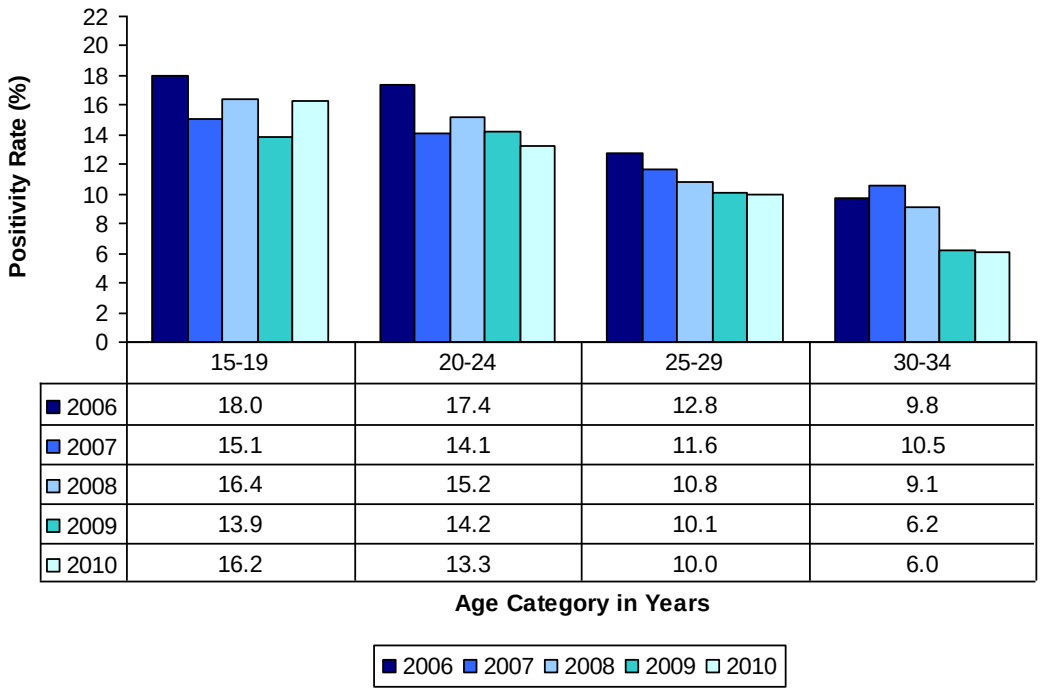
by gender = 709.67 (3). Hence it was decided that there was no need to retain the interaction term in the model.

3.4.4 Positivity rate

3.4.4.1 Association with age, gender and year of testing

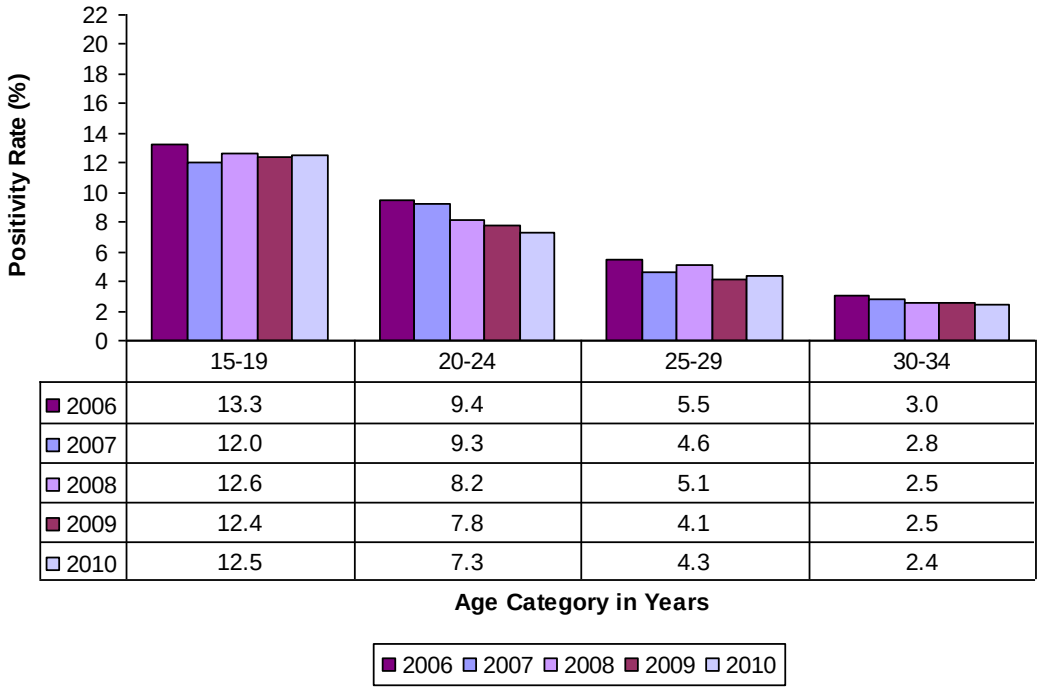
Figure 3-10 and 3-11 indicate the positivity rate among males and females for the different age categories across the five years. Overall, the positivity tended to decrease with increasing age-band, both among males and females. The highest positivity was observed in 2006 among 15-19 year old males (18%) and females (13%). Positivity rate remained relatively stable between 2007-2010 among 15-19 year old males and females. For the later age categories, among males and females, the positivity decreased in successive years.

Figure 3-10: Males - positivity rate across years 2006 to 2010, among 15 to 34 year olds tested for chlamydia



	15-19	20-24	25-29	30-34
2006	18.0	17.4	12.8	9.8
2007	15.1	14.1	11.6	10.5
2008	16.4	15.2	10.8	9.1
2009	13.9	14.2	10.1	6.2
2010	16.2	13.3	10.0	6.0

Figure 3-11: Females - positivity rate across years 2006 to 2010, among 15 to 34 year olds tested for chlamydia



	15-19	20-24	25-29	30-34
2006	13.3	9.4	5.5	3.0
2007	12.0	9.3	4.6	2.8
2008	12.6	8.2	5.1	2.5
2009	12.4	7.8	4.1	2.5
2010	12.5	7.3	4.3	2.4

As can be seen in Appendix 5, the population diagnostic rate was consistently higher for females as compared to males at each age year, however the reverse was true for the positivity rate i.e. the positivity rate was higher among males as compared to females.

Univariate analysis indicated that all the three variables were statistically significant with a p-value of <0.001 (Appendix 2). Table 3-8 shows the main effect model of a multivariate logistic regression analysis performed on positivity rate as an outcome and three explanatory variables: age category, year of testing and gender. The odds of being tested positive was highest among 15-19 years olds (OR 3.75; 95% CI; 3.50 to 4.01) then among 31-34 year olds. The odds of a positive test were 0.52 times lower among females (95% C.I. 0.50 to 0.54) as compared to males. Compared to the years 2006-07, the odds of positive test significantly decreased in successive years.

Table 3-8: Positivity rate – multivariate logistic regression analysis of its association of with age, gender and year of testing

Variables in the main effect model	Log Odds	S.E.	Sig.	Adjusted OR	95% C.I. for OR	
					Lower	Upper
Age Category (in Yrs)			<0.001*			
15-19	1.32	0.03		3.75	3.50	4.01
20-24	0.95	0.03		2.60	2.43	2.77
25-29	0.46	0.04		1.58	1.47	1.70
30-34	0.00			1.00		
Gender			<0.001**			
Female	-0.66	0.02		0.52	0.50	0.54
Male	0.00			1.00		
Year of Test			<0.001***			
2008	-0.08	0.02		0.93	0.89	0.97
2009	-0.17	0.02		0.85	0.81	0.89
2010	-0.18	0.02		0.84	0.80	0.88
2006-07	0.00			1.00		
Constant	-2.61	0.03	<0.001	.073		

Wald Statistics (df): * 2122.78(3), **1346.28(1), ***82.07(3)

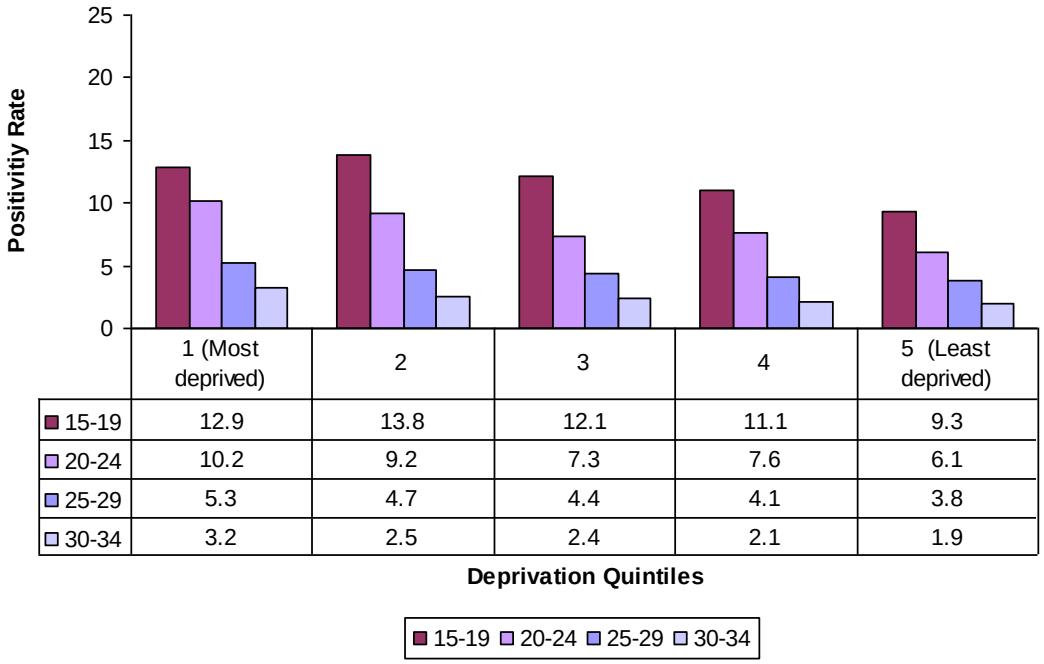
Two interaction terms, age category by gender and age category by year of testing, were separately entered in the main effect model. The Wald statistics for the interaction terms were statistically significant (p-value <0.01). The Wald statistics and corresponding p-values for the interaction terms were even lower than for those in the hierarchical model for population surveillance rate and population diagnostic rates, indicating an even less strong relationship between these categories. Hence it was decided to retain the main effect model for the discussion purpose.

3.4.4.2 Further analysis of positivity rate by deprivation

Figures 3-12 and 3-13 show the positivity rate for the age categories across the deprivation quintiles for females and males respectively. Within each deprivation quintile among females, the chlamydia positivity was highest among 15-19 year age

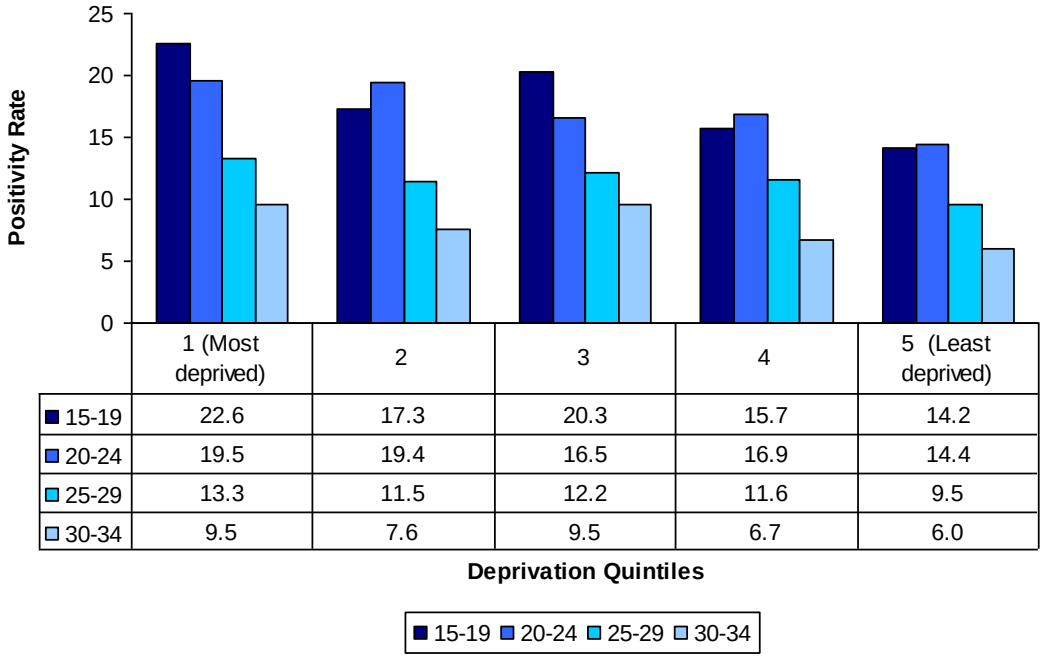
category and decreased with the increasing age category. Across the deprivation quintiles, positivity was highest in the most deprived quintile and then decreased successively in the lesser deprived quintiles. The only exception is the 15-19 year old age category among females where the positivity was similar in the two most deprived quintiles (13% and 14% respectively). Among males, the pattern was similar but less regular in that in deprivation quintiles 2 and 4, 15-19 years old have positivity rate lower than 20-24 year old. The highest positivity was seen among 15-19 year old males in the most deprived quintile (23%).

Figure 3-12: Females - positivity rate across deprivation quintiles, among 15 to 34 year olds tested for chlamydia



	1 (Most deprived)	2	3	4	5 (Least deprived)
15-19	12.9	13.8	12.1	11.1	9.3
20-24	10.2	9.2	7.3	7.6	6.1
25-29	5.3	4.7	4.4	4.1	3.8
30-34	3.2	2.5	2.4	2.1	1.9

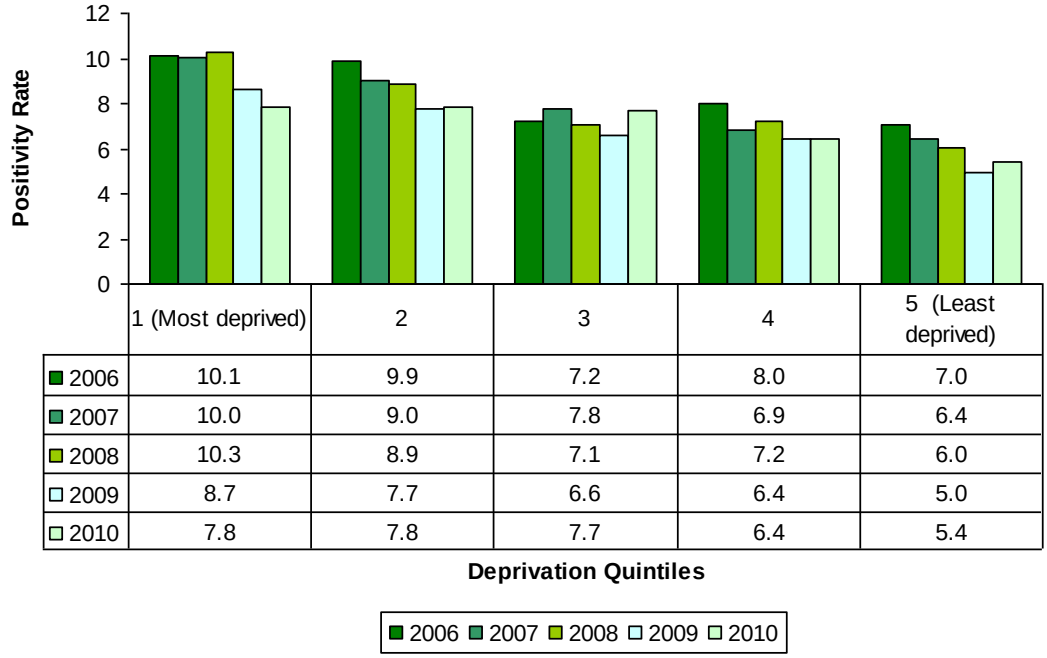
Figure 3-13: Males - positivity rates across deprivation quintiles, among 15 to 34 year olds tested for chlamydia



	1 (Most deprived)	2	3	4	5 (Least deprived)
15-19	22.6	17.3	20.3	15.7	14.2
20-24	19.5	19.4	16.5	16.9	14.4
25-29	13.3	11.5	12.2	11.6	9.5
30-34	9.5	7.6	9.5	6.7	6.0

Figure 3-14 shows the distribution of positivity across the deprivation quintiles, separately for each year. Across the deprivation quintiles, positivity tended to be highest in the most deprived quintile for each year and decreased successively in the lesser deprived quintiles. Within each quintile, other than middle quintile, the positivity showed an overall trend of decreasing across the five years.

Figure 3-14: For each year - positivity rate across deprivation quintiles, among 15 to 34 year olds tested for chlamydia



	1 (Most deprived)	2	3	4	5 (Least deprived)
2006	10.1	9.9	7.2	8.0	7.0
2007	10.0	9.0	7.8	6.9	6.4
2008	10.3	8.9	7.1	7.2	6.0
2009	8.7	7.7	6.6	6.4	5.0
2010	7.8	7.8	7.7	6.4	5.4

Chlamydia positivity among those tested in the urban population was 7.5%, whereas for those tested in the rural population, it was 9.1% (data not shown).

Table 3-9 shows three models of logistic regression analyses with explanatory variables. In order to make comparison with the second and third models where SIMD-linked variables were added, model 1 shows the adjusted OR and 95% CI, from Table 3-8, for three independent variables age category, year of testing and gender. In model 2, deprivation quintile and 2-fold urban-rural classification were added along with age category, gender and year of testing in a full dataset to allow for list-wise deletion of cases with missing values. Finally in model 3, pooled results of logistic regression analyses on five (imputed) complete datasets are presented (also see Appendix 6 for β co-efficient and S.E of model 3).

In model 2, based on list-wise deletions of cases with missing values, the odds ratios for age category and gender had similar but stronger trends as compared to model 1. To check whether the alteration in the strength of association with age category and gender are due to the reduced dataset (bias) or due to the effect of the addition of SIMD-linked variables (confounding), the analysis (with age, gender and year as predictor variables) was rerun on the reduced dataset, which include only cases with values for SIMD-linked variables. This showed that the stronger association of age and gender persisted and hence were not a consequence of the addition of the SIMD-linked variables (analysis not shown here). This suggests that the addition of deprivation quintile and urban-rural classification variables do not explain the change in estimates for association with age category and gender. In model 2, the odds of being tested positive, relative to the least deprived testees, was highest among the most deprived quintile (OR 1.59; 95% CI; 1.47 to 1.72) and decreased with decreasing deprivation quintile. Relative to those tested in the urban areas, the odds of being tested positive was 16% higher (95% CI; 1.04 to 1.30) in those from rural areas.

In model 3, after multiple imputations, the pooled OR for age category and gender are closer to those in model 1 but with a narrower 95% C.I, due to smaller standard errors. The ORs for deprivation quintile had a decreasing trend, but the strength of association was similar to what was seen in model 2. However, the ORs for urban-

rural classification became non significant. The ORs for year categories remained similar in all the three models.

Table 3-9: Positivity rate and deprivation - multivariate logistic regression analysis by age, gender, deprivation and year of testing

	Model 1			Model 2			Model 3*		
Variables in the main effect model	**Adjusted OR**	**95% C.I**		**Adjusted OR**	**95% C.I**		**Adjusted Pooled OR**	**95% C.I**	
		Lower	**Upper**		**Lower**	**Upper**		**Lower**	**Upper**
Age Category									
15-19	3.75	3.50	4.01	4.62	4.16	5.12	3.62	3.55	3.69
20-24	2.60	2.43	2.77	3.23	2.92	3.57	2.59	2.53	2.66
25-29	1.58	1.47	1.70	1.78	1.59	1.98	1.57	1.50	1.64
30-34	1.00			1.00			1.00		
Gender									
Female	0.52	0.50	0.54	0.43	0.40	0.46	0.52	0.48	0.57
Male				1.00			1.00		
Year of testing									
2008	0.93	0.89	0.97	0.92	0.86	0.98	0.92	0.87	0.96
2009	0.85	0.81	0.89	0.79	0.74	0.85	0.84	0.80	0.89
2010	0.84	0.80	0.88	0.81	0.75	0.86	0.83	0.78	0.88
2006-07				1.00			1.00		
Deprivation Quintiles									
1 (Most deprived)				1.59	1.47	1.72	1.58	1.49	1.67
2				1.47	1.36	1.58	1.45	1.38	1.52
3				1.27	1.17	1.37	1.29	1.17	1.42
4				1.19	1.10	1.30	1.20	1.09	1.31
5 (Least Deprived)				1.00			1.00		
2 fold Urban Rural classification									
Rural				1.16	1.04	1.30	1.15	0.97	1.34
Urban				1.00			1.00		
Constant	0.073			0.054			0.057		

Based on model 3, the odds of positivity among 15-19 year olds were 3.6 times (95% CI 3.55 to 3.69) more likely compared to 30-34 year olds. The odds ratio had a decreasing but positive trend with increasing age category. The odds of positivity among females were 0.52 times (95% C.I 0.48 to 0.57) less likely than males. As compared to the year 2006-07, the odds of being tested positive decreased in successive years. The odds of being tested positive was highest among the most deprived quintile (OR 1.58; 95% C.I 1.49 to 1.67) compared to the least deprived quintile. There was a decreasing but positive trend in the successive deprivation quintiles compared to the least deprived quintile.

Three interaction terms; 'deprivation quintile by year of testing', 'deprivation quintile by age category' and 'deprivation quintile by gender' were separately entered in the main effect model in the MI datasets. Pooled estimates of OR for all the three interaction terms were non significant, hence the main effect model was retained.

3.4.5 Chlamydia testing activity before and after the introduction of Scottish national policy and guidelines

This section presents the analyses to address the QIS sexual health service standards. Some references are also made to the SIGN guideline recommendations which are considered relevant or implicit in the discussed standards.

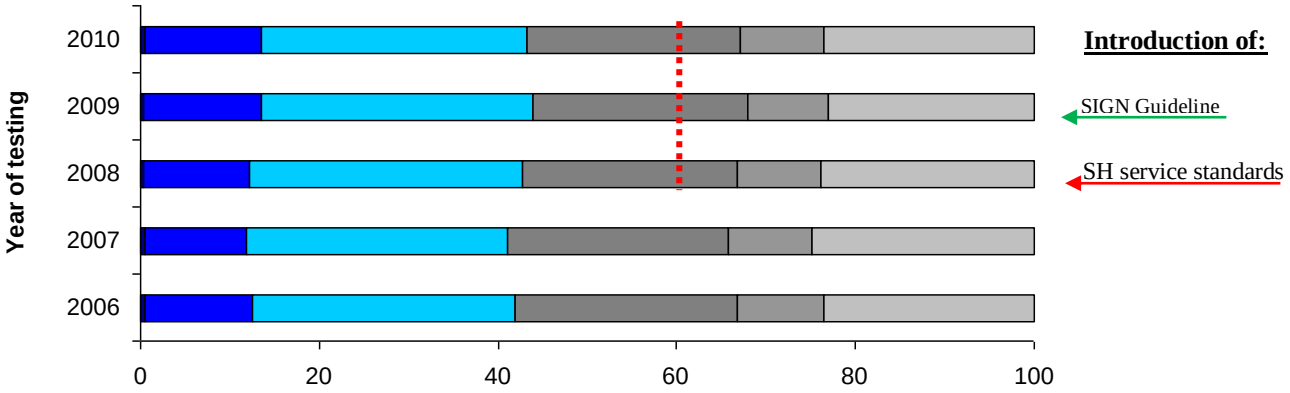
For both males and females, 60% of all tests per year are taken from <25 year old (including <15 years) (Standard 3.1)

The distribution of chlamydia tests across age-bands among males and females are shown in figures 3-15 and 3-16 respectively. For males the two shades of blue slices within each bar show the proportion of tests performed in the two youngest age categories (under 25 years old). For females this age group is represented by the two shades of mauve slices. The largest proportion of tests were performed among those aged 20-24 years old (~30% among males and ~31% among females), followed by among 25-29 year olds (~24% among males, ~24% females respectively).

With respect to examining whether activity reflected policy and guidelines, red and green arrows indicate the timing of (i) introduction of SH service standards (2008) and (ii) publishing of the SIGN guidelines (2009) respectively and red dotted line across the bars for 2008 onwards indicates the 60% SH service standards target.

It can be seen that the proportion of tests performed among <25 years old males increased from 41% in 2007 to 44% in 2009. The increase in chlamydia testing activity observed during same period among women aged <25 years was from 49% to 51%. However in neither gender was the threshold target achieved.

Figure 3-15: Males - distribution by age-band of genital chlamydia tests performed, separately for the years 2006 to 2010



	2006	2007	2008	2009	2010
>=35	23.5	24.9	23.9	23.0	23.6
30-34	9.8	9.2	9.2	9.1	9.3
25-29	24.8	24.8	24.1	24.0	23.9
20-24	29.4	29.1	30.7	30.4	29.8
15-19	12.0	11.4	11.8	13.1	13.0
<=14	0.6	0.5	0.3	0.4	0.5

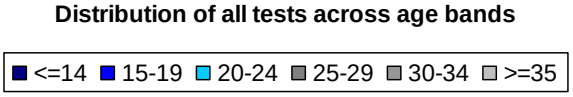
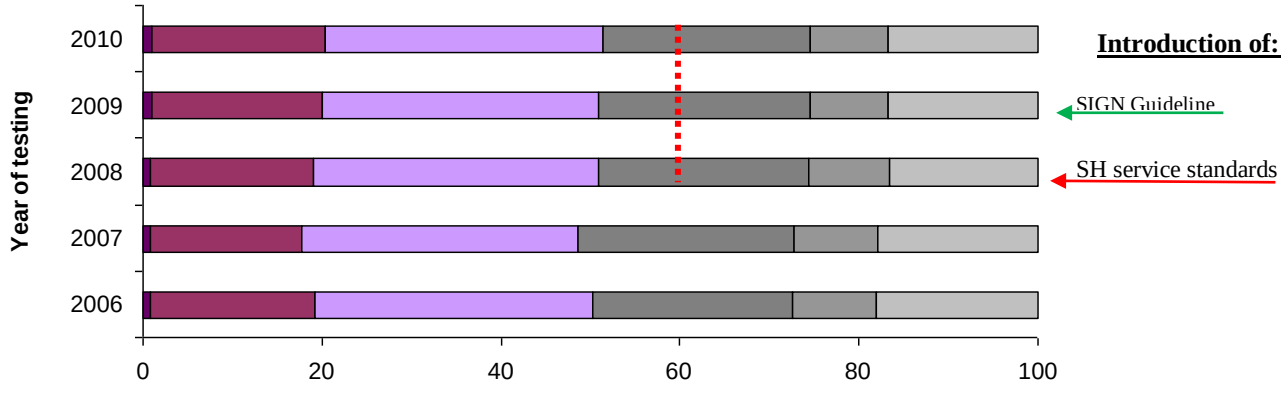
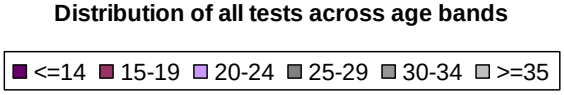


Figure 3-16: Females - distribution by age-band of genital chlamydia tests performed, separately for the years 2006 to 2010

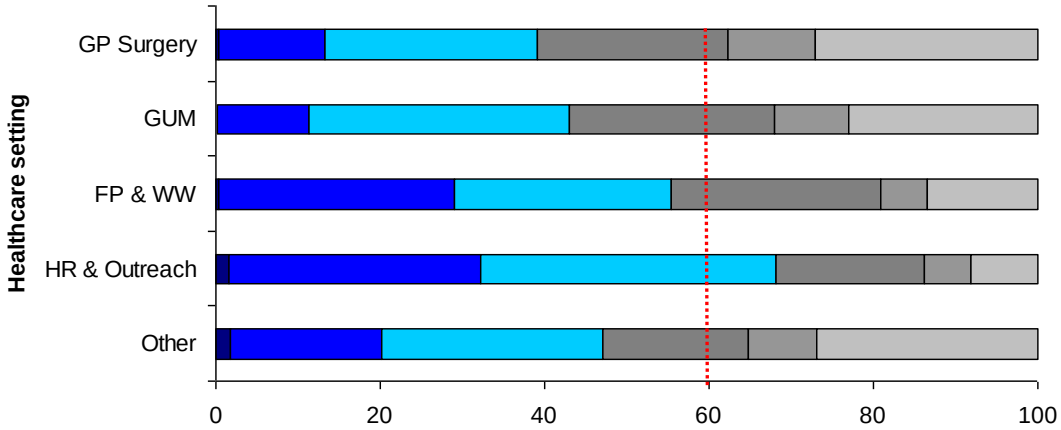


	2006	2007	2008	2009	2010
>=35	18.1	17.9	16.6	16.8	16.7
30-34	9.4	9.3	9.0	8.7	8.6
25-29	22.3	24.1	23.5	23.6	23.3
20-24	31.1	30.9	31.9	30.9	31.0
15-19	18.3	17.0	18.2	19.0	19.3
<=14	0.9	0.8	0.8	0.9	1.0



Figures 3-17 and 3-18 shows that between 2008 to 2010, the 60% testing target for <25 years old had only been achieved in HR & outreach among males; and in GUM clinics and HR & outreach among females. However note that Healthy Respect venues were primarily meant to serve young people under 25 years.

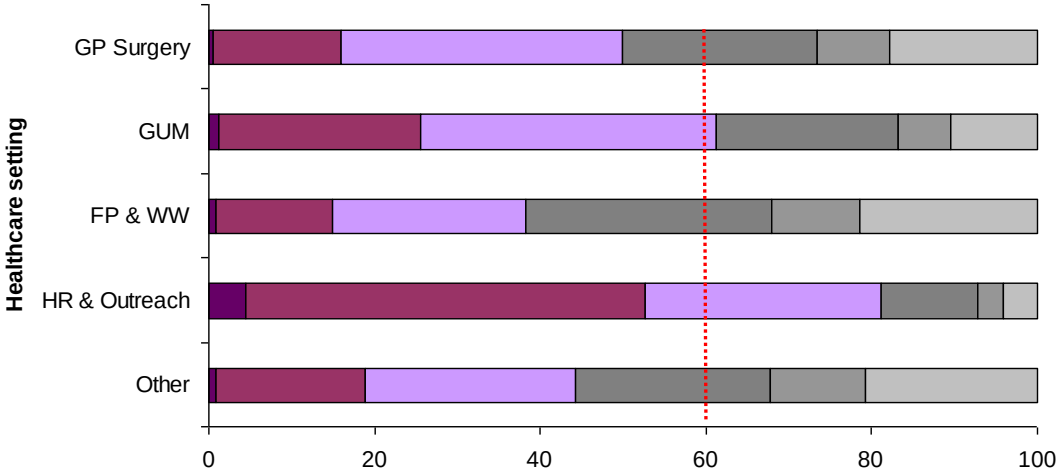
Figure 3-17: Males - distribution by age-band of genital chlamydia tests performed, separately by health care setting for the years 2008 to 2010 combined



	Other	HR & Outreach	FP & WW	GUM	GP Surgery
>=35	27.0	8.1	13.4	23.0	27.1
30-34	8.3	5.7	5.8	9.0	10.6
25-29	17.7	18.0	25.4	24.9	23.1
20-24	26.8	36.0	26.4	31.8	25.8
15-19	18.4	30.6	28.6	11.0	12.9
<=14	1.8	1.6	0.4	0.2	0.4

Distribution of all tests across age bands

Figure 3-18: Females - distribution by age-band of genital chlamydia tests performed, separately by health care setting <u>for the years 2008 to 2010</u> combined



	Other	HR & Outreach	FP & WW	GUM	GP Surgery
>=35	20.8	4.1	21.4	10.5	17.8
30-34	11.5	3.1	10.7	6.3	8.8
25-29	23.4	11.7	29.6	21.9	23.6
20-24	25.4	28.5	23.4	35.7	34.0
15-19	18.0	48.2	14.0	24.4	15.3
<=14	0.9	4.5	0.9	1.1	0.6

Distribution of all tests across age bands

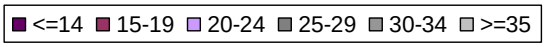
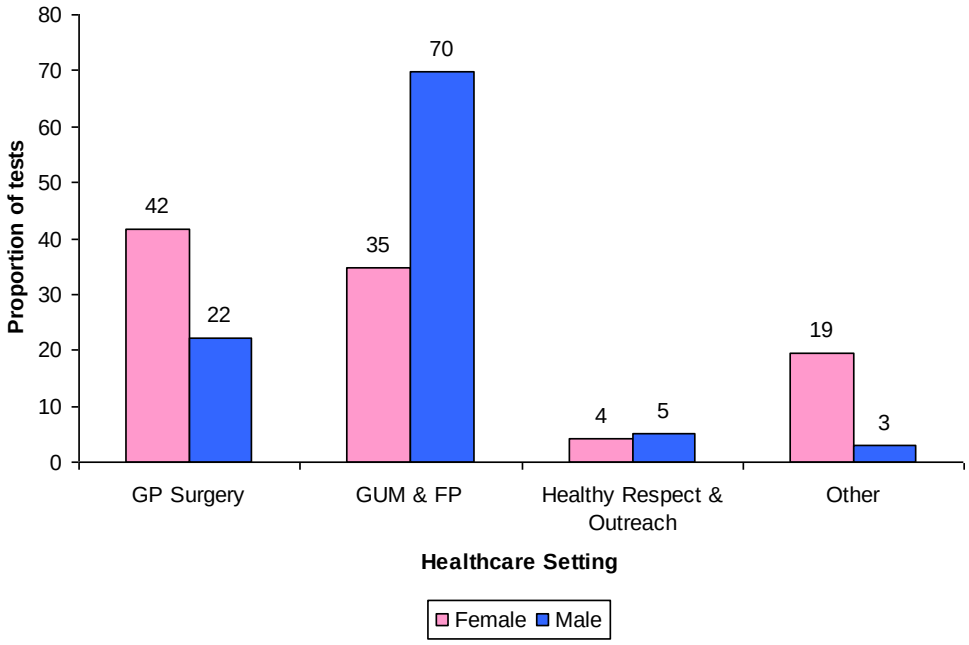


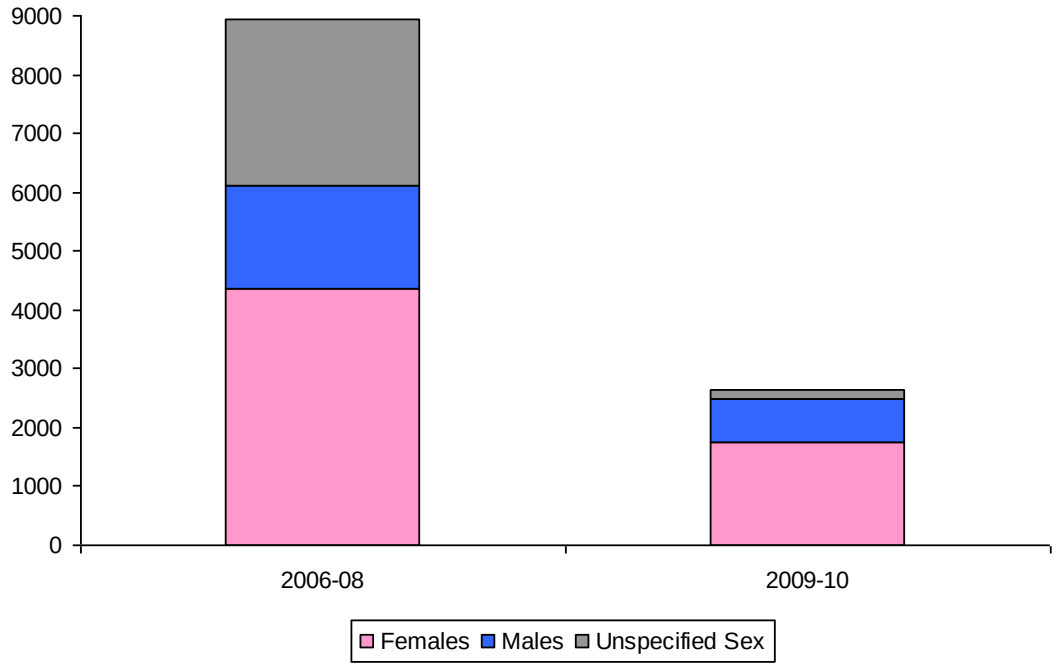
Figure 3-19 shows the relative proportion of tests undertaken among males and females in different health care settings. Among males, tests were predominantly (70%) performed in GUM & FP clinics. However among females nearly 42% of the tests were performed in a GP surgery and another 35% were performed in the GUM & FP clinics. The Healthy Respect and outreach accounted for only 4% and 5% of all the tests among females and males respectively.

Figure 3-19: Distribution by service provider of chlamydia tests undertaken among males and females for the years 2006 to 2010 combined



As described earlier, the Healthy Respect and outreach mainly represents testing undertaken through PTK. Testing activity through PTK decreased by half in 2009 despite the SIGN guideline recommendation to increase PTK testing activity for males (Figure 3-20). While it would be good to be able to explain proportion of males and females using PTK, this would be unreliable since a quarter of the PTK tests had unspecified gender, particularly more in 2006-08 periods.

Figure 3-20: Testing through Healthy Respect programme and outreach (PTK) - distribution by year of testing and gender

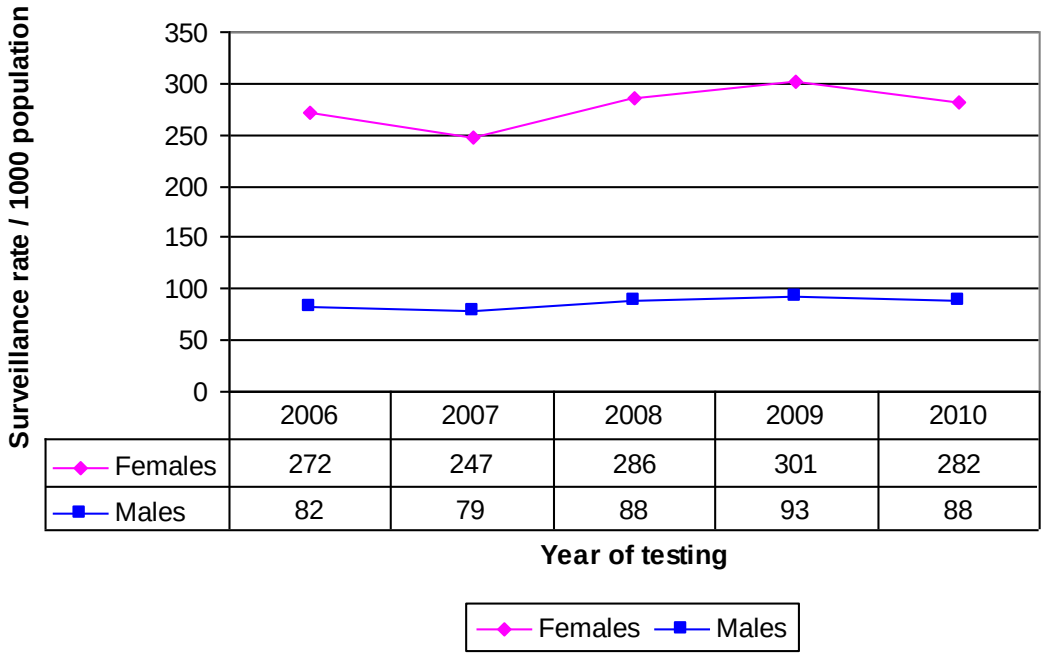


Population Surveillance rate in males aged 15-24 years: 100/1000 population (SH standard 3.2)

Population Surveillance rate in females aged 15-24 years: 300/1000 population (SH standard 3.3)

Figure 3-21 compares the surveillance rate among males and females, across the five year period from 2006-2010. Overall, the peak of surveillance activity, both among males and females, was noticed in 2009 and than declined in 2010. The surveillance rates among 15-24 year old males reached 93/1000 males in 2009 but declined to 88/1000 males in 2010. The overall rates among 15-24 years old females indicate that criterion for this standard was just met in 2009 but declined again in 2010 to 282/1000 females. This indicates a short-lived higher surveillance activity targeted for 15-24 year olds in 2009 following SH standards and SIGN guideline recommendations to focus the resources for chlamydia testing among those aged under 25 years.

Figure 3-21: Population surveillance rate among 15 to 24 year old males and females across years 2006 to 2010



3.5 Discussion

The analysis of laboratory data for chlamydia testing activity in Lothian shows that nearly three years after the launch of QIS sexual health service standards, the Lothian Health Board has not yet been able to achieve a testing target of 60%, both in males and females. The surveillance activity particularly increased in 2009 but declined again in 2010. The annual surveillance target of 300 tests / 1000 population was barely achieved for women in 2009, whereas among males the highest rates achieved were 93 tests/ 1000 population in the same year (in contrast to the target rates of 100/1000 males). A large proportion of males were being tested in GUM and FP clinics (70%), in contrast to females which were primarily being tested in GP clinics (42%) followed by GUM and FP clinics (35%). Surveillance rate (testing coverage) was highest among 20-24 year age category both among males and females, followed by 15-19 year old females, but 25-29 year old males. The diagnostic rate was highest among 15-19 years old females with a decreasing trend. In males the diagnostic rate is highest among 20-24 year olds for all five years, followed by 15-19 year olds in 2008 onwards. The positivity rate was highest in 15-19 years old, both among males and females and had a decreasing trend in the later age categories. The positivity was three times higher among males compared to females in contrast to the diagnostic rate which was 1.7 times higher among females compared to males. The positivity rate was highest in the most deprived quintile (with a decreasing trend) and higher in a rural than in an urban population.

This chapter described chlamydia testing activity in the context of existing Scottish policies. This is the first study in Scotland describing the association of positivity rate in relation to deprivation and urban-rural classification, and informs the planning of chlamydia surveillance and/or screening activity in contrasting demographic settings. The availability of disaggregate data allowed record linkage with geographic database (i.e. with SIMD database) and provided additional, but crucial variables for analysis purpose. The value of using disaggregated data to describe geographical inequalities in sexual health has been widely demonstrated before (Shahmanesh *et al.*, 2000, Lacey *et al.*, 1997, Johnson *et al.*, 2010, Kufeji *et al.*, 2003). The importance of collating data from different testing laboratories to provide

disaggregate data for the surveillance activity on chlamydia as well as for other STI have recently been identified and considered feasible (Jennison *et al.*, 2010, Slater *et al.*, 2007). The two outcome measures, namely the positivity rate and diagnostic rate have only recently been proposed by NCSP in 2010/11. This is the first Scottish study that reports analysis of these newly proposed outcome measures against the known risk factors.

The analysis comparing 'before and after' shows that the introduction of revised sexual health standards and guidelines on chlamydia testing led to only a short-lived increase in chlamydia testing activity in Lothian. It was suggested in another study that when the chlamydia testing rates reach an optimal level, further efforts to increase the testing might not be successful due to a ceiling effect (Morgan *et al.*, 2012). However, this is unlikely to be the case among females in Lothian, since the rates in Lothian were lower than many other health boards in Scotland, and these health boards have been able to achieve increased testing since 2008 (Information Service Division Scotland and National Service Scotland, 2011).

The current study suggests that the sexual health service standard for chlamydia testing per 1000 female population (300 tests) was achieved only transiently in 2009 in Lothian (301 tests), but dropped to 282 tests in 2010. The service standards for male testing were not achieved in Lothian. It is intriguing to note that the corresponding ISD figures for chlamydia testing among females in Lothian were 310 tests / 1000 female in 2009 and 298 tests / 1000 females in 2010. For males, the corresponding ISD figures were 102 tests / 1000 males in 2009 and 101 tests / 1000 males in 2010 (Information Service Division Scotland and National Service Scotland, 2011). From the ISD figures, it appears that the testing targets were also achieved for males in 2009 and were sustained in 2010. However, the database on which the ISD report was based includes equivocal, unconfirmed, indeterminate as well as duplicate results. The ISD report has also acknowledged that 5 to 20% of tests in a calendar year were duplicate tests and another 1.1% of tests were equivocal or inhibitory. In my work on the Lothian laboratory database, I found I had to remove 8% of records because they were duplicates and a further 0.7% of records because they were for tests noted as having equivocal or inhibitory results.

Methodologically, duplicate records should be removed since their retention would lead to erroneous inflation of the surveillance rate. However, it is arguable that tests with equivocal/inhibitory results should have been retained for the calculation of surveillance rate, albeit they could not have contributed anything to analyses of positivity or chlamydia prevalence. However, even if these 'equivocal/inhibitory' records had been retained in the dataset, the surveillance rate per year would have been increased among females by only 0.3 percent, and would not have altered at all among males.

It is also notable that the SIGN guideline recommendation for at least 60% testing for under 25 years old was not achieved in Lothian. The proportion of tests performed among males aged under 25 years was reached to only 44% in 2009, a small increase from 2008 (41%). Similarly, among females aged under 25 years, the testing rate reached to 51% in 2009 compared to 49% in 2008. However, among the different health care settings, GUM clinics were able to achieve testing rates of 60% among females. It might be possible that these guideline recommendations were not effectively communicated in the various health care settings, more importantly the GP practices, whereas the guidelines might have been highly salient in the GUM clinics.

The present study identified that age, gender and year of testing are independently associated with chlamydia surveillance, diagnostic and positivity rates. Moreover chlamydia positivity has been demonstrated to be significantly associated with deprivation category; being highest in the most deprived and then decreasing in better off. These results confirm the role of age and gender in the chlamydia testing activity (Hughes *et al.*, 2007, Shahmanesh *et al.*, 2000, Johnson *et al.*, 2010, Kufeji *et al.*, 2003) and additionally of the role of deprivation status in the detection of chlamydia positivity (Shahmanesh *et al.*, 2000, Johnson *et al.*, 2010, Kufeji *et al.*, 2003). Due to the inappropriateness of the linkage of a variable with a large proportion of missing information on postcode, the surveillance rate (coverage) could not be calculated for deprivation quintile or urban-rural classification. For the available SIMD-linked dataset in our study, 28% of all the tests are performed in the least deprived quintile compared to 16% of all the tests in the most deprived quintile.

However the testing in the second most deprived quintile is similar to the least deprived quintile. A similar trend is noticed both among males and females. If we assume that this relationship holds true for all the cases in the dataset (i.e. also for cases for which linkage was not achieved), then it contradicts findings of another study which demonstrated that testing is highest for more deprived areas for females (with a decreasing trend) but not for males (U shaped relationship with the middle categories of deprivation having the lowest coverage) (Johnson *et al.*, 2010). The same study has also demonstrated that the testing coverage is lower in rural areas than in urban centres for males and females.

It is reassuring that in the last 5 years, the positivity and diagnostic rates have decreasing trends for all age categories, both among males and females. However, not all of this decrease can be attributed to the increase in population surveillance rate which was only noted in the immediate post-policy-change years (i.e. in 2008 and 2009 when SH strategy and SIGN guidelines were introduced) and fell back to the pre-policy rates in 2010. This finding would be compatible with two scenarios. Either the population which is being targeted for testing in the more recent years have a lower risk of chlamydia (perhaps being the 'worried well'), or the prevalence of chlamydia is decreasing in the population due to low risk sexual behaviour or due to natural immunity. NCSP has recommended that the English screening programme needs not only to improve coverage but also to identify the high risk people to invite/ encourage to be screened.

In the current study, fewer tests were undertaken in GP practices as compared to GUM clinics; the ratio of chlamydia tests in GP practices compared to GUM clinics was 0.85 (82793 and 96355 tests respectively). The discrepancy in testing between the two health care settings was more noted among males (GP:GUM = 0.34), but the reverse was true for females (GP:GUM =1.27). There could be different explanations for this contrasting scenario of testing among males and females in the two health care settings. Firstly, a higher ratio of female GP principals to female practice population was found associated with higher testing rates in females (Kufeji *et al.*, 2003). However, further linkage with the GP workforce data may be needed for such an analysis in our case. Secondly, a historical emphasis in the UK on GUM clinics in

providing STI testing and partner notification particularly for males might also explain why most chlamydia tests for men are performed in the GUM clinic. Thirdly, gender difference in health seeking behaviour might have resulted in fewer testing opportunities for young men in GP clinics (Galdas *et al.*, 2005), but the annual consultation rates in GP practices in 2007 among males aged 15-19 year olds and 20-24 year olds were 2.11 and 2.16 person-years respectively, suggesting that the opportunistic testing for men in primary care is achievable (The Information Centre for Health and Social Care, 2008).

3.5.1 Feasibility of utilising laboratory data for monitoring surveillance activity

The routinely collected data is often questioned for its completeness and scope (Kane *et al.*, 2000, Stevens *et al.*, 2005). Limited use of routine data by health service managers appeared to relate to problem of accessibility, lack of knowledge about the availability of data, complexity of data provision process, lack of resources to examine and interpret data and perceived poor data quality and relevance (Wilkinson *et al.*, 2007). As the prime purpose of these data is not the provision of indicators for evaluation purposes, not all the relevant variables are always available for analysis purpose. Clinical information and relevant indicators can be added to a dataset by linkage to other databases. However, linkage might not always be possible for all individuals and incomplete linkage has been demonstrated to affect estimates both in terms of bias and precision (Baldi *et al.*, 2010). A secondary aim of this analysis was therefore to examine the feasibility of using routine data to assess the impact of introducing some new service or policy, on the outcomes of chlamydia surveillance activities (Section 3.2).

Routine database from Lothian laboratory has a potential to provide a comprehensive picture of testing activity and diagnosis of chlamydia in Lothian, Scotland. The analysis of routine data helped in detecting changes and time trends, with regard to the diagnostic and surveillance activity. However, this study also point to improvements that need to be made in the collection of data, in order to assess the testing activity in Lothian in future. While the completeness of laboratory data was very good for age, year of testing as well as for test location and specimen type, and

to a lesser extent to gender, there were many missing values for postcode information. This lack of information was predominately in the case of tests requested at GUM clinics and Healthy Respect and outreach (only 0.1% of test requests have postcode information).To a lesser extent, this applied also to the family planning clinic (40%). This is in contrast to 94% and 87% of chlamydia test requests from GP surgeries and 'other' locations (primarily hospitals) which provided postcode information for the patient. In case of GP surgeries, only registered patients can attend a particular GP, hence the availability of patient postcode information in lab request forms is automated unless it is explicitly requested by the patient that such information should not be included in their test request form. In contrast, a patient attending a GUM clinic does not need to be a registered patient and hence in such a case additional information (such as patient's postcode) would needed to be recorded while requesting a lab test. As evident from the current study, this information was not available from the GUM clinic in the Lothian laboratory database. Slater et al. obtained this information from patient-based records of the GUM clinics (Slater *et al.*, 2007). However automated linkage with GUM database was not attempted in this study due to the limitation of time and resources. Information regarding patients seeking care from GUM clinic is also not accessible by their GPs in Scotland. A proposal of such an access by the GP was identified as undesirable by the 64% of the GUM clinic patients (Fernando and Clutterbuck, 2008).

The unavailability of postcode information on nearly half of the dataset limits the value for the analysis to be done in terms of identifying deprivation and urban-rural differences in the outcome measures for chlamydia. I remedy this by undertaking multiple imputations of deprivation quintile and urban-rural classification variables, in order to perform logistic regression analysis of positivity rate on imputed datasets. For the imputation of these variables, outcome variable (i.e. positive or negative result) was also used in the imputation process for predicting the missing values of variables. In such a scenario, each row of dataset provides a single case scenario for the imputation of other variables. Failure to include outcome information has been identified to falsely weaken the association (Sterne et al., 2009b). However applying the same imputation technique to produce data for the regression analysis of

surveillance and diagnostic rates was not possible since, in such a circumstance, the dataset were used at aggregate level and the outcome variable was also available at aggregate level. Other techniques are available to deal with multiple imputations of the aggregate data, but these were not used in the current thesis due to time limitation. The unavailability of postcode information from the GUM clinic deters the possible analysis to identify the equity of distribution of surveillance and diagnostic rate at the population level.

Information on reason-for-test was not available in the laboratory dataset. It is therefore possible that many of these tests are used for diagnosis, such as for the investigation of symptoms of vaginal discharge or for the investigation of infertility, and this may partly explain the large number of tests in the higher age categories. Statistically significant differences in positivity for chlamydia, between screening versus diagnostic tests, have been demonstrated in some clinical settings only (Stephens *et al.*, 2011). The results from this dataset are not comparable to results of other studies reporting on chlamydia screening, since the surveillance laboratory data is based on testing requests from diverse health care settings, which provide opportunistic as well as diagnostic testing to sexually active individuals seeking care for related health problems, and to notified partners.

The collection of minimum risk factor information (such as multiple partners, unprotected sex) is also desired, as the present data conceals variations in respect of these risk factors. Similarly information on ethnicity was not available.

To further examine the feasibility of using routine data for assessing the impact of introducing some new service on outcomes of chlamydia surveillance activities, a scenario analysis is presented in Appendix 7 to find the additional number of tests that would have been required, after the introduction of CT&T, to produce a statistically significant change in the proportion of 15-24 year olds tested. It shows that a total of 675 additional tests / year would have been required to see a statistically significant change in the proportion of young people tested. However, defining a performance measure for the CT&T service is complicated, since the Scottish government aim was to widen access to sexual health services available (The Scottish Government, 2008). Therefore an unchanged number of tests, but a

shift in the proportion of tests undertaken in different health care settings such that a reasonable proportion of tests are obtained through community pharmacies, could be indicative of 'success', to a degree, assuming that this was more convenient for the population. On the other hand, Lothian Health Board selected pharmacies in outlying hard-to-reach (high deprivation) communities, so their implicit aim was to improve access (and hence increase testing) among these groups. It could therefore be argued that even if there was an increase of 675 or more test per year in Lothian, if these were not individuals from the more deprived subsets of the Lothian population, then the new service was not really achieving this 'health equity' objective. This highlights the importance of specification of outputs for evaluation at the same time as specification of a new service. However, as has been discussed earlier, the routine laboratory data would not allow outcome evaluation of CT&T relating to health equity objectives, because information on socio-economic status or geographical areas of residence of those who would be tested through CT&T within Lothian would not be available.

3.6 Chapter overview

This chapter has described the chlamydia testing and diagnostic trends in Lothian across five years from 2006-2010. This time period was chosen to provide a context for chlamydia policies developed in Scotland and to examine their impact on testing activities in Lothian. Logistic regression models were developed to establish how age, gender, year of testing, deprivation and urban-rural location are associated with chlamydia outcome measures.

This analysis has also highlighted the deficiencies in existing surveillance data and demonstrated that, if postcode information is available in the routinely collected dataset, how data linkage could be beneficial in providing additional variables for analyses. Similarly the unavailability of the information on reason-for-test had made it impossible to separate the noise effect of testing for other reasons (such as abortion, infertility or symptoms), from testing encouraged for young people as part of an increased surveillance activity.

Ongoing data analysis to describe the distribution of surveillance, diagnostic and positivity rate by key epidemiological variables (such as age, gender and deprivation)

and across time will be required to provide continuous evaluation and highlight areas where current targeting could be improved. Such analysis should be provided at all local health board levels in Scotland so as to assist health boards in improving their strategy for targeting of testing and improve equity of coverage and detect a greater proportion of chlamydia infection. Information on sexual behaviour, ethnicity, and reasons-for-test would provide more elaborate understanding of the variations in the chlamydia outcome.

CHAPTER 4: COMMUNITY PHARMACY PROVISION OF CHLAMYDIA SERVICES – A STRUCTURED LITERATURE REVIEW OF INTERNATIONAL EVIDENCE

4.1 Introduction

Before planning my evaluation the first requirement was to learn as much as possible about what is known about the chlamydia testing service delivery through community pharmacies. The questions of main interest to me for the review of the literature were:

- What is the feasibility and effectiveness of community pharmacy provision of chlamydia testing and treatment services?
- Among potential clients aged 15 to 24, what are their preferences regarding chlamydia testing services? How do different types of chlamydia testing strategies employed in pharmacies (such as opportunistic testing during EC consultations, specimen collection, result notification and marketing strategies) compare in terms of likelihood of use by such clients?
- Among youth aged 15-24, what are the facilitators of and barriers to *accessing* the chlamydia testing and treatment service in community pharmacies?
- Among the pharmacy staff, what are the facilitators of and barriers to *implementing* the chlamydia testing and treatment service in community pharmacies?

I first looked for previous reviews addressing the above issues, but could not find any published review of evidence relating to pharmacy-based chlamydia testing and treatment service. I therefore commenced a critical review of the source literature, and the following sections describe the methods and report the findings. The chapter concludes with identification of gaps in the available literature and suggestions of future research questions for chlamydia testing in community pharmacies.

4.2 Methods

4.2.1 Search strategies

I searched electronic databases (MEDLINE, EMBASE, Web of Knowledge, PsycINFO and POPLINE). The search combines terms describing pharmacy service (pharmacies, community pharmacies and pharmacist) with chlamydia infection or contact tracing. The search strategy used in OvidSP database is provided in Appendix 8. Additional papers were identified by reviewing the literature quoted by authors discovered within the initial review. Papers not reported in English were excluded from review. Grey literature reports were identified by contacts with relevant organisations and authors. In addition contacts were made with NHS service providers or other relevant persons known to be commissioning / implementing chlamydia service through community pharmacies. Searches were undertaken in June 2009 and updated in June 2010 and 2011.

The results were downloaded into Endnote for sifting at title and abstract level. Following this sifting, studies for potential inclusion were obtained for full paper examination and data extraction. The process is illustrated in the flow chart in Figure 4-1.

4.2.2 Inclusion and exclusion criteria

I selected for inclusion in the review only those studies where chlamydia testing, treatment or partner notification was formally introduced as a programme or intervention in a pharmacy. There are many studies especially those reported from developing countries which evaluated the quality of management of STIs in pharmacies or reported the practice or knowledge of pharmacy workers for STI management, particularly in relation to syndromic management (Ralph *et al.*, 2001, Sihavon *et al.*, 2007, Viberg *et al.*, 2009, Kwena *et al.*, 2008, Jacobs *et al.*, 2004, Adams *et al.*, 2007). Other studies reported antibiotic dispensing practice for STIs in pharmacies (Wachter *et al.*, 1999) or treatment seeking behaviour of patients with symptoms of a STI (Kleinschmidt *et al.*, 2006, Guan *et al.*, 2009, Ngo *et al.*, 2007, Sihavong *et al.*, 2006). Most of these studies are from countries, where there is no formal regulation in terms of drug prescription and those studies only evaluated the competencies of pharmacy staff in adequate management of STIs where there is no

formal programme of STI management. These studies are therefore excluded from the current review of literature. Position and policy papers describing the role of pharmacists in managing STIs were also excluded (Mayhew *et al.*, 2001, McCree *et al.*, 2005, Stergachis *et al.*, 1993).

Therefore, the studies were included if they:

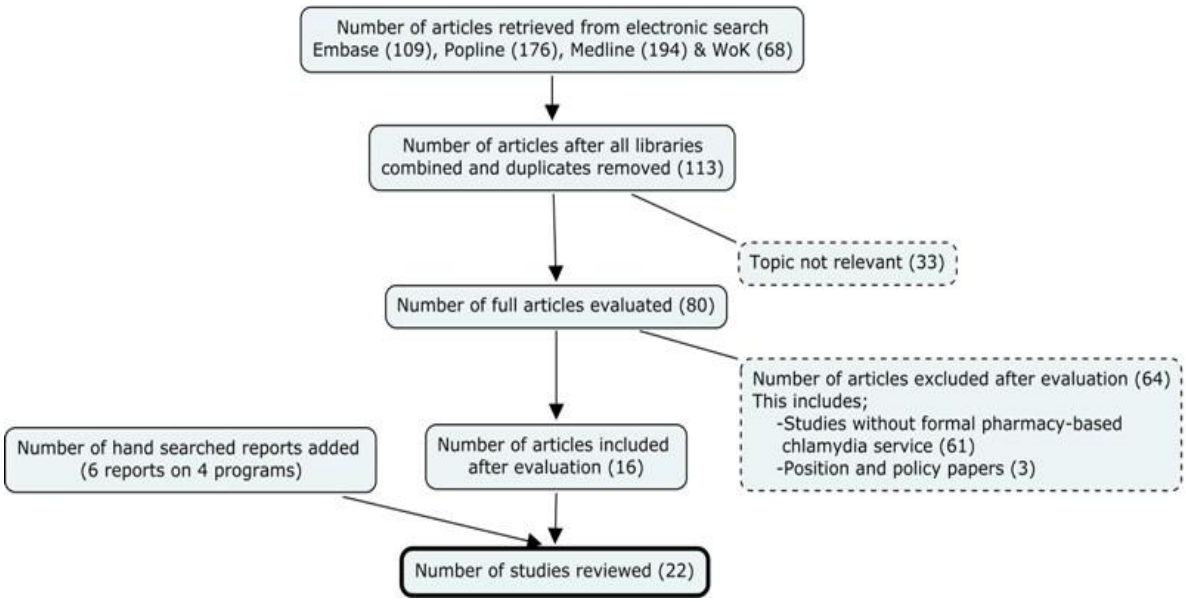
- measure one or more outcomes of pharmacy provision of chlamydia services
- include empirical data on perceptions or attitudes of health care providers or of users of pharmacy chlamydia services

Studies were excluded if they:

- focus on chlamydia services in primary care settings other than pharmacies
- describe service developments without supporting data
- reported the practice or knowledge of pharmacy worker with respect to STI management, particularly in relation to syndromic management but *without* a formal programme in place

To answer the research questions, I considered both quantitative studies (for example, randomized controlled trials (RCTs) and cross-sectional studies), and qualitative studies that explore user or provider experiences with testing and treatment. 22 articles / reports were included in the full review.

Figure 4-1: Flowchart of articles/reports found to include in the systematic review



4.2.3 Consideration of study quality

Quality assessment frameworks for research are generally based on a hierarchy of evidence with RCTs as the 'gold standard'. However RCTs and other quantitative methodologies are not necessarily best suited to research questions involving varied populations with complex needs, nor with regard to assessment of success of service in terms of its uptake and feasibility rather than cure. Longitudinal studies and well conducted qualitative research are therefore equally likely to provide informative evaluation of such interventions. Since most of the studies included here are reports of programme evaluation, descriptive in nature and eliciting views of clients and service providers regarding the service, assessment of the quality of these studies was not straight forward. A traditional systematic review of controlled trials would contain a quality assessment stage with the objective of excluding those studies that do not provide a reliable answer to the question under review. There is much debate and little consensus in the literature regarding how and whether quality should be assessed of the qualitative literature (Hannes, 2011, Dixon-Woods and Fitzpatrick, 2001). I agree with Thomas and Harden (2008) that the quality of the studies should be assessed to avoid drawing unfounded conclusions. However, since there is little agreement on which to base decisions for excluding studies based on quality criteria, I have followed their recommendation that studies should be excluded only if they have substantial flaws. I applied seven quality criteria (of basic methodological standards) as proposed by Harden for studies on views and perceptions (Harden *et al.*, 2004). These criteria are as follows:

1. An explicit theoretical framework underpinning the study and/or literature review
2. Aims and objectives clearly stated
3. A clear description of context of the study
4. A clear description of the sampling and recruitment procedures
5. A clear description of methods used to collect and analyse data
6. Attempts made to establish the reliability or validity of data analysis
7. Inclusion of sufficient original data to arbitrate between evidence and interpretation

Appendix 9 gives the illustration of criteria applied to these studies. The Harden criteria focused on the generic issues of reporting quality (Harden *et al.*, 2004) and all the twenty two included studies were assessed as being of satisfactory quality and hence were not excluded from the review. After my thematic synthesis was complete, I also undertook a degree of sensitivity analysis, as recommended by Thomas and Harden (2008) by examining the relative contributions of studies to the final analytic themes. It was found that the more developed studies contributed comparatively more to the synthesis and contained many unique themes.

4.2.4 Abstraction of data and analysis

Most of the studies included in the review were evaluation studies. The data reported included the service audit as well as qualitative understanding of the barriers and facilitators identified by the service users and providers. Similarly a few studies also explored providers' willingness to provide the service.

I used QSR NVIVO-8 software to manage the data and its categorization according to the themes (QSR International Pty Ltd, 2008). The final selected papers were imported to NVIVO-8. Data for the analysis in this review consisted of either verbatim quotations from the study participants of the reviewed studies or findings reported by authors that were clearly supported by the study data. These data were extracted from the results sections of the publications reviewed.

Structured summaries of each study were developed by extracting details of the study type, objectives and population -age group targeted and geographical location - and also the key study findings.

4.2.4.1 Synthesising qualitative findings

Previous reviews have employed various methods to qualitatively synthesise the systematic review findings (Barnett-Page and Thomas, 2009). Two recently emerged methods in reviewing literature on health policy and practice are framework synthesis and thematic synthesis (Baxter *et al.*, 2011, Carroll *et al.*, 2011, Pavlin *et al.*, 2006, Thomas and Harden, 2008, Oliver *et al.*, 2008). Framework synthesis involves a preliminary identification of *a priori* framework against which to map data from the studies included in the review (Barnett-Page and Thomas, 2009). The a priori framework used to extract and synthesise findings is either informed by

background material and team discussions with the policy people commissioning the review, or is available through a previously developed conceptual models and frameworks. As such, it is largely a deductive approach that is considered useful in addressing urgent policy questions (Carroll *et al.*, 2011, Dixon-Woods, 2011). However, the reliance of the framework synthesis on a pre existing framework or themes raises a question whether the chosen framework would offer a 'conceptual fit' with the review questions. It is also possible that an apparently appropriate a priori framework may be found to accommodate only a small proportion of the review's included studies. In such a case, the framework synthesis has a danger to 'reduce some of the vividness of insight seen in the best qualitative research' (Dixon-Woods, 2011).

In order to integrate the findings of the reviewed studies, I drew on the principles of thematic synthesis (Thomas and Harden, 2007). Thematic synthesis is an inductive approach of data synthesis. The first two stages of a thematic synthesis of reviewed studies are coding text line-by-line according to its meaning and content, and developing descriptive themes. The process of synthesis begins in the descriptive stage when the findings are organised into descriptive themes. The review process then extends further to the analytical stage by comparing and contrasting the descriptive themes and interpreting the relationship between the themes. I used direct and referenced quotes, where required, to avoid the potential for inaccurate paraphrasing or de-contextualisation. The synthesis of the reviewed studies is presented in the results section in two parts. Part one provides a descriptive synthesis of various aspects of pharmacy-based chlamydia screening, including testing, treatment and partner notification as well as the cost effectiveness reported in these studies (sections 3.3.6). Part two of the review presents an analytical synthesis of the facilitators and barriers to access and to implement a pharmacy-based chlamydia service (section 3.3.7). A hierarchy of themes was then developed by inferring the level at which these themes act (i.e. service providers, users and strategic stakeholders), and presented as a conceptual model in section 4.4.2. Any links between the themes that has been identified or discussed in the studies, or that I have inferred during the analytical stage, is shown in the model by means of arrows and connection lines. Finally, noticeable gaps in the evidence base are reported.

4.2.4.2 Synthesising quantitative findings

Proportions are reported, where available, for different socio-demographic characteristics of the client as well as for chlamydia testing uptake and return rates. p-values are reported in the text only if they were available in the reviewed literature. In order to calculate an overall estimate of the positivity (percentage of positive test results) among people tested through this service, a meta-analysis was undertaken. The purpose of this meta-analysis was to report the pooled estimate of chlamydia positivity detected through pharmacy screening services. Estimates were pooled and are reported as a proportion and 95% confidence interval (95% CI). The results of meta-analysis are displayed by *Forest plot*. The Forest plot shows unadjusted prevalence estimates (boxes) with 95% confidence limits (bars). The size of the square is proportional to the precision of the study (or sample size). The aggregated estimate obtained by combining estimates from all the studies is displayed as a diamond.

The inconsistency of results across studies was summarised using I^2 test for heterogeneity. The test describes the percentage of total variation across studies that are due to heterogeneity rather than chance alone (homogeneity) (Higgins *et al.*, 2003). The I^2 values lies between 0% and 100%. A value of 0% indicates no observed heterogeneity, and larger values show increasing heterogeneity. I^2 value also helps to decide between the two types of statistical models that can be used to provide combined estimates. In the *fixed effect model*, it is assumed that the underlying true exposure effect in each study is the same (homogeneity). The overall variation reflects the random variation within each study but not any potential heterogeneity between studies. The *random effect models* incorporate variation (heterogeneity) between the studies. It is assumed that each study has its own true estimate and there is a random distribution of these true estimates around a central effect. If large heterogeneity between the studies is found, a random effect model is used and vice versa. Random effect methods generally yield large variance and confidence interval because a between-study variance component is added to the overall variance (Blettner *et al.*, 1999). A sensitivity analysis was undertaken by excluding a study reporting chlamydia testing activity for pay-to-use service.

The meta-analysis was conducted using Stats-Direct statistical software, version 2.7.8 (http://www.statsdirect.com). The meta-analysis is presented in part one of the result section, where different models of pharmacy-based chlamydia screening and its effectiveness are presented.

4.3 Results

4.3.1 Description of studies included

After full review of 80 papers, 16 met the inclusion criteria (Golden et al., 2001, Bloomfield et al., 2002, van Bergen et al., 2004, Golden et al., 2005, Baraitser et al., 2007, Cameron et al., 2007, Taylor et al., 2007, Brabin et al., 2009b, McNutt et al., 2009, Cameron et al., 2010, Thomas et al., 2010, Anderson and Thornley, 2011, Cameron et al., 2011, Dabrera et al., 2011, Emmerton et al., 2011, Gale and Watson, 2011). An additional 6 reports were included, identified through grey literature or by consulting an expert group (Anthony and Watson, 2008, Gudka *et al.*, 2010, Muir, 2008, Taylor Nelson Sofres Healthcare, 2007, Tinelli *et al.*, 2009, Watson, 2008).

Fourteen of the studies were from the UK, four from the USA, three were from Australia and one was from the Netherlands. However the studies from the USA and the Netherlands are among the pioneer studies, which tested the feasibility of providing chlamydia testing and partner treatment through community pharmacies. The studies included are described briefly below and are presented in tables 4-1 to 4-3 for service feasibility, economic analysis and partner notification strategies respectively. The tables present these studies in order of their publication years.

4.3.2 Evaluation of feasibility and acceptability of a pharmacy-based chlamydia service

Pharmacy Chlamydia Screening Pathfinder was the largest pilot service of its kind which offered chlamydia service, free to users (16-24 year olds) via 200 pharmacies of a large chain across 31 primary care trusts (PCTs) in areas of London (Table 3-1). Taylor Nelson Sofres (TNS) undertook an independent evaluation on behalf of the Department of Health of the first two years of a pilot scheme (Taylor Nelson Sofres Healthcare, 2007). The evaluation looked at service uptake and patients' perceptions of the service. Over the 2 year pilot, 37,461 tests were supplied via community pharmacies. Other small pilots were conducted in London (Baraitser *et al.*, 2007) and Manchester (Brabin et al., 2009a, Thomas et al., 2010) in England, Fife (Muir, 2008) and Grampian (Anthony and Watson, 2008, Thomas *et al.*, 2010, Tinelli *et al.*, 2009) in Scotland, Perth (Gudka *et al.*, 2010) and Queensland (Emmerton *et al.*, 2011) in Australia and San Francisco in the USA (Bloomfield *et al.*, 2002). The number of

pharmacies involved in these pilots ranged from only 1 pharmacy to 44 pharmacies. These pilots mostly targeted women requesting EC. However in some studies, tests were also handed out to men and women on self referral. During these pilot, some of the chain pharmacies also started providing chlamydia testing through the pharmacies as a pay-to-use service. A total of 338 pharmacies from a large chain provided the service and its uptake was evaluated (Anderson and Thornley, 2011). The feasibility and acceptability of the service was tested by means of service audit data, questionnaire survey of client experience, in-depth structured interviews with clients and pharmacists and evaluation reports from professional patients paid to visit the pharmacies.

In addition to the service evaluations, surveys were undertaken among pharmacists (Cameron *et al.*, 2007, Taylor *et al.*, 2007, Gale and Watson, 2011) and potential service users (Taylor *et al.*, 2007) to determine their willingness and acceptability to provide chlamydia testing and treatment service in community pharmacies.

4.3.3 Cost effectiveness of a pharmacy-based chlamydia service

Cost effectiveness analysis of pharmacy provision of chlamydia testing was undertaken in Amsterdam, the Netherlands (van Bergen *et al.*, 2004) and Grampian, Scotland (Tinelli *et al.*, 2009) as well (Table 4-2).

4.3.4 Evaluation of partner notification through pharmacies

Table 4-3 summarises the studies that reported partner notification through pharmacies. Expedited partner therapy through community pharmacies has been among the first strategies of STI care provision tested through community pharmacies in USA. In a randomized controlled trial, women and heterosexual men with gonorrhoea or chlamydia infection were assigned to have their partners receive expedited treatment through pharmacies or standard referral (Golden *et al.*, 2001, Golden *et al.*, 2005). Patients in the expedited-treatment group were offered medication through pharmacies for their partners. Patients assigned to standard partner referral were advised to refer their partners for treatment and were offered assistance in notifying partners. In another study in Lothian, Scotland (Cameron *et al.*, 2010, Cameron *et al.*, 2011), index cases with uncomplicated chlamydia were

given a pharmacy voucher to pass onto sexual partners. Partners could redeem vouchers for free treatment (Azithromycin) at one of 90 pharmacies in the area. To determine pharmacists' perceptions about patient delivered partner therapy (PDPT) and potential barriers that need to be addressed in pharmacies for successful implementation of PDPT, surveys of pharmacists were conducted in Lothian, Scotland (Cameron *et al.*, 2007) and New York state in the USA (McNutt *et al.*, 2009).

Table 4-1: Description of primary papers on a pharmacy-based chlamydia service

Number and Reference	Geographical Location	Study components	Objectives of the study	Number of pharmacies participated in the evaluation	Study population	Age in years of (potential) service users	Key Findings
i) **(Bloomfield *et al.*, 2002)**	San Francisco, USA	Service audit data	to establish the efficacy and acceptability of screening by PTK made available in pharmacies (and other public places)	1	All sexually active individuals, but particularly targeted white gay men.	Not specified	193 test kits were picked up from the pharmacy in 2 weeks and 38% were returned. Chlamydia positivity: 1.3%
ii) **(Baraitser *et al.*, 2007)**	London, UK	A questionnaire survey of clients, in-depth interviews with clients and pharmacists, and a mystery shopper study	Evaluation of the feasibility and acceptability to users and pharmacists of community pharmacy led chlamydia testing	3 independent community pharmacies	Sexually active men and women receiving EC or self requested chlamydia testing from the pharmacist	Not specified	83 tests were taken in 3 months with 8 (9.5%) positive for chlamydia. Of these, 94% were women and 71% from ethnic minorities.
iii) **(Taylor *et al.*, 2007)**	Perth, Australia	Questionnaire based surveys, separately for pharmacists and women	To determine the acceptability to pharmacists and women of a *proposed* community pharmacy based chlamydia screening programme	N/A	Pharmacists from selected community pharmacies (n=25) Women from the community (n=50)	18-29	84% of the pharmacist supported the proposed service. 76% of the women would accept and return the sample. Privacy and confidentiality were identified as major concerns by the women.
iv) **(Taylor Nelson Sofres Healthcare, 2007)**	London, UK	Pre-post pilot surveys, In-depth interviews with clients and service providers and service activity data	The evaluation of the service uptake and perceptions of patients and provider about the service	200 pharmacies of a large chain	Pharmacists proactively offered kits when women attended for EC; otherwise the kits were given when requested	16-24	Over the 2 year pilot, 37, 461 tests were supplied via community pharmacies. The number of kits given out per store varied from between 2 per month to 9 per week. Chlamydia positivity:7.9%

Table 3-1: Continued

Number and Reference	Geographical Location	Study components	Objectives of the study	Number of pharmacies participated in the evaluation	Study population	Age in years of (potential) service users	Key Findings
v) (Watson, 2008)	Grampian, Scotland	Service audit data	To measure and compare the uptake of chlamydia testing in different setting including community pharmacies	10	Men and women requesting chlamydia testing from pharmacies, (and GP, youth centres and SH drop-ins)	16-24	1 year pilot. 68% of the 144 kits supplied from pharmacies were returned. Chlamydia positivity: 16.4%.
vi) (Anthony and Watson, 2008)	Grampian, Scotland	In-depth interviews	To explore service providers' and service users' experiences of the chlamydia study	10	24 service providers and 16 service users	16-24	1 year pilot. Both providers and users had extremely positive experience and were supportive of future pharmacy provision of screening. Autonomy and anonymity were identified as facilitators of the service.
vii) (Muir, 2008)	Fife, Scotland	Service audit data	To explore the feasibility of offering chlamydia testing in pharmacies offering EC	44	Pharmacists proactively offered kits when women attended for EC; or the kits were handed out on self referral	13-25	1.5 year pilot. 10% of the client receiving EC from pharmacies accepted the offer for chlamydia test. Chlamydia positivity: 10.5%
viii) (Brabin et al., 2009b)	Manchester, UK	Service audit data	To assess the uptake of free PTK by women requesting EC at pharmacies	33	Women requesting emergency contraception	≤ 25	25% of the women accessing EC were offered screening. 46% and 18% of the women respectively accepted and returned the kit. Chlamydia positivity: 9.1%

Table 3-1: Continued

Number and Reference	Geographical Location	Study components	Objectives of the study	Number of pharmacies participated in the evaluation	Study population	Age in years of (potential) service users	Key Findings
ix) (Gudka *et al.*, 2010)	Perth, Australia	Service audit data, client satisfaction survey, focus group with pharmacists and clients	To develop a feasible pharmacy based chlamydia screening model	20	Women accessing EC from pharmacies and pharmacist providing the service	Age range not mentioned. Mean age is 24 ± 5 years	6 month pilot. 78% (n=596) of the EC clients were offered screening. 41% agreed to participate. Pharmacists successfully identified 15% of EC consumers to have symptoms of STIs and were referred to specialist clinic. All the 46 clients who returned the kit were tested negative for chlamydia.
x) (Thomas *et al.*, 2010)	Manchester, UK	In-depth interviews	To understand why pharmacist selectively offered screening to EC clients	20	12 pharmacists providing chlamydia screening	N/A	Pharmacists were keen to expand the service but reluctant to offer it to married women and those in long term relationship. To avoid offence, they selected women based on age, education and ethnicity.
xi) (Anderson and Thornley, 2011)	England & Wales, UK	Service audit data	To assess the feasibility of *pay-to-use* chlamydia screening in community pharmacies	338	Men and women accessing pay to use chlamydia testing and treatment from community pharmacies.	≥16	A total of 14, 378 private tests were performed in 2 years. 64% tested were females. Chlamydia positivity: 9.8% in males and 6.8% in females. The positivity is highest among 16-24 yrs age group.

Table 3-1: Continued

Number and Reference	Geographical Location	Study components	Objectives of the study	Number of pharmacies participated in the evaluation	Study population	Age in years of (potential) service users	Key Findings
xii) (Dabrera *et al.*, 2011)	London, UK	In-depth interviews	To understand the issues facing pharmacists in offering chlamydia screening	N/A	10 Pharmacists providing chlamydia screening service	N/A	The majority were supportive of the service, though some were concerned about approaching young people. Offering screening in a non-sexual health context was identified as difficult and pharmacists selectively approached clients accessing EC.
xiii) (Emmerton *et al.*, 2011)	Queensland, Australia	Service audit data, client satisfaction questionnaire, in-depth interviews with pharmacists	To explore, the feasibility of community pharmacies for distribution of screening kit, and association between risk based screening and test results	4	English speaking women presenting for a sexual health related product or consultation with the pharmacists	≥16	4 month pilot. 12% of the 156 kits distributed were returned. Chlamydia positivity: 22%. The association between risk assessment for STI and test result was inconclusive. Pharmacist described barrier related to workload, lack of staff and restriction of advertising to in-store posters and leaflets only.
xiv) (Gale and Watson, 2011)	Grampian, Scotland	A questionnaire survey	To explore community pharmacists activities and attitudes towards the provision of sexual health services	N/A	Lead community pharmacists working in 128 community pharmacies in Grampian	N/A	The response rate was 74% (n=94). 10% were currently providing chlamydia testing, however 86% were willing to provide chlamydia testing in future. 65% were also willing to provide PDPT to the chlamydia positive clients to give to their sexual partners.

Table 4-2: Papers on economic analysis of the pharmacy-based chlamydia service

Number and Reference	Geographical Location	Study components	Objectives of the study	Number of pharmacies participated in the evaluation	Study population	Age in years of (potential) service users	Key Findings
i) **(van Bergen *et al.*, 2004)**	Amsterdam, Netherlands	Service audit data used for economic evaluation and a questionnaire survey of women who were offered the service	to establish the effectiveness and cost effectiveness of a pharmacy based chlamydia screening offered to women accessing EC	1 pharmacy in a health centre	Women who collected their EC from a pharmacy in a health centre were offered PTK	15-29	2 year pilot indicated that the uptake of the service was low (27%). Chlamydia positivity: 9%. Net cost per pelvic inflammatory disease prevented ranged from cost saving upto £ equivalent of £3364.
ii) **(Tinelli *et al.*, 2009)**	Grampian, Scotland	Service audit data	To assess the incremental costs and cases of chlamydia identified	10	Men and women requesting chlamydia testing from pharmacies, (and general practice, youth centres and SH drop-ins)	16-24	Testing would cost an additional £76,225 / year in Grampian, and would identify an additional 145 index cases of chlamydia. GP practices and FP clinics have the most favourable cost effectiveness ratio than pharmacies

Table 4-3: Description of primary papers on partner notification through community pharmacies

Number and Reference	Geographical Location	Study components	Objectives of the study	Number of pharmacies participated in the evaluation	Study population	Age in years	Key Findings
i) (Golden *et al.*, 2001)	Seattle & King county, Washington, USA	Service audit data and telephonic interviews with clients	Feasibility of providing partner treatment from pharmacies	12	Heterosexual English speaking men and women and diagnosed with chlamydia or gonorrhoea	≥14	266/458 randomly selected infected patients chose to obtain medication for partner from the pharmacy. 223/266 (84%) successfully did so.
ii) (Golden *et al.*, 2005)	Seattle & King county, USA	RCT	RCT of expedited partner treatment from pharmacies, STD clinic or direct mailing Vs. Standard referral. Primary outcome was persistent or recurrent infection	12	Heterosexual English speaking men and women and diagnosed with chlamydia or gonorrhoea	≥14	Expedited treatment was effective than standard referral of partners in reducing persistent or recurrent infection among patients with gonorrhoea (3 percent vs. 11 percent, p=0.01) but not in those with chlamydia infection (11 percent vs. 13 percent, p=0.17).
iii) (Cameron *et al.*, 2007)	Lothian, Scotland	A questionnaire survey	Willingness of pharmacists (and other health professionals) to provide partner testing / treatment through pharmacies and (other health care settings)	NA	Community pharmacists attending local meeting	N/A	49/50 pharmacists were willing to provide free PTK and all 50 pharmacists were willing to provide treatment to patient tested positive for chlamydia. 9/50 (18%) were not willing to provide treatment to index patient for their partner.

Table 4-3 continued

Number and Reference	Geographical Location	Study components	Objectives of the study	Number of pharmacies participated in the evaluation	Study population	Age in years	Key Findings
iv) (McNutt *et al.*, 2009)	8 counties of New York state, USA	A questionnaire survey	To determine pharmacists' perceptions about PDPT and potential barriers that need to be addressed in pharmacies for successful implementation of PDPT	N/A	Pharmacists recruited from the pharmacies	N/A	67% of the pharmacists (n=193) responded to the survey. 63% supported PDPT for chlamydia. The potential barrier cited most often for patient counselling was time.
v) (Cameron *et al.*, 2010) & (Cameron *et al.*, 2011)	Lothian, Scotland	Service audit data	To evaluate the feasibility and satisfaction with expedited partner treatment from pharmacies by issuing treatment vouchers to index cases	90	Index patient diagnosed with uncomplicated chlamydia were given a pharmacy treatment voucher to pass on to their partner	15-47	40% of the vouchers were redeemed by the partners of index patients from the pharmacy. 87% of the partners were satisfied with this method of treatment.

4.3.5 Synthesis of findings for a pharmacy-based chlamydia service

This section is divided into two parts. Part I reviews the different aspects of the models of chlamydia services implemented in pharmacies, the economic evaluation undertaken in reviewed studies and also presents the pooled estimates of chlamydia positivity reported in these studies, produced by undertaking the meta-analysis. Part II provides a review of facilitators and barriers to access and to implement a pharmacy-based chlamydia service. The discussion section then follows, which summarises the key findings of these two parts, limitations of the studies reviewed and key recommendations for any future evaluation of a similar service.

4.3.6 Part I: Review of pharmacy-based chlamydia service models

This section addresses the question of how different strategies of pharmacy provision of chlamydia testing compare in terms of their acceptability to young people as well as to the pharmacists.

4.3.6.1 Different methods of engaging young people in testing

The studies reviewed suggest that different strategies were employed to engage young people in a pharmacy-based chlamydia service. The most common strategy used in these studies was offering chlamydia testing during an EC consultation. Although pharmacists were willing to provide EC, they did not consistently offer chlamydia screening to such clients and waited to be asked for a kit by clients (Baraitser *et al.*, 2007). The kit offering rate to EC clients varied from 25% to 78% (Brabin et al., 2009a, Gudka et al., 2010, van Bergen et al., 2004). Pharmacists acknowledged offering selective screening to EC clients who they thought would be more likely to have chlamydia (Brabin et al., 2009a). They were reluctant to offer it to married women and those in long term relationship. To avoid offence, they also selected women based on age, education and ethnicity (Thomas *et al.*, 2010). The other reason given for not offering the kit was either *'forgotten'* or *'too busy'* (van Bergen *et al.*, 2004).

The pharmacists agreed that offering chlamydia screening with EC is an ideal opportunity to screen women because, '*it was not personal, but because they had*

unprotected sex, it was a responsible approach and entirely the right timing' (Gudka *et al.*, 2010). They judged the combination of discussing STIs and chlamydia with EC to be highly realistic, but felt that it may also impose a risk of deterring women from accessing EC, since the offer of screening could be construed as a criticism of a client's sexual partner or sexual morality. Hence some pharmacists recommended that it should be available to everyone, and not just EC consumers.

Moreover by this offering strategy, those women who are sexually active and not using EC would not be reached. Considering all eligible sexually active women aged 15–29 years, Van Bergen (et al. 2004) estimated that community coverage of chlamydia screening by this strategy was only 13%.

The other approaches used were displaying self-test kits in pharmacies in buckets that were labelled as containing male and female testing kits to be picked up by young people (Watson, 2008), offered to clients when presenting for any sexual related product or consultation (Emmerton *et al.*, 2011) or given on self request. Pharmacists were typically less comfortable with the idea of offering the kit to individual customers outside of the sexual health consultation context (Baraitser *et al.*, 2007). Therefore it was suggested that the training of pharmacist for the provision of chlamydia service should emphasise the importance of the benefit of the staff's proactive approach (Taylor Nelson Sofres Healthcare, 2007).

4.3.6.2 Preference for specimen type

With the newer amplification techniques such as nucleic acid amplification tests (NAATs), self-collected specimens such as urine and vaginal swabs have been used with the same diagnostic accuracy as swab samples obtained by health care professionals. In the pharmacy screening studies, self collected samples were provided, either urine (Brabin et al., 2009a, Muir, 2008) and / or self-obtained low vaginal swabs (LVS) kits (Anthony and Watson, 2008, Gudka *et al.*, 2010, Watson, 2008).

A survey of preferences of potential clients for various protocols of chlamydia testing in pharmacies in Australia reported urine testing method as being most preferred by clients (77%), followed by self-obtained low vaginal swab (15%). Swab samples obtained by doctors was preferred by only 8% of the respondents (Taylor *et*

al., 2007). There was a general consensus among consumers that the self-collection of vaginal swab was easy to use, and was not a barrier to them (Gudka *et al.*, 2010).

4.3.6.3 Method of sample submission

In some pilots, participants were asked to post the home collected urine sample to the laboratory in the pre-paid envelope (Brabin et al., 2009a, Thomas et al., 2010, van Bergen et al., 2004, Muir, 2008, Taylor Nelson Sofres Healthcare, 2007). Other options included collecting the sample on-site in a pharmacy toilet and submitting there and then (Muir, 2008), mix of both approaches (Dabrera *et al.*, 2011), or collecting the sample at home but submitting directly to the pharmacy or to the pathology drop-in site (Gudka *et al.*, 2010).

In-store toilets were not rated as an important attribute of service provision, by the clients (Taylor Nelson Sofres Healthcare, 2007), but some pharmacists provided access to an in-store toilet in order to enhance the return rate (Dabrera *et al.*, 2011). However, both the pharmacists and the clients equally preferred returning the sample to the pharmacy (Gudka *et al.*, 2010), even if that meant an extra workload to them (Thomas *et al.*, 2010).

Submitting the sample to the designated pathology drop-ins was described by the clients as a biggest deterrent for completing the test (Gudka *et al.*, 2010). It was demonstrated in the same study, that having to submit the sample to the pathology drop-ins resulted in wastage of kits.

In terms of posting the sample, while 30% of the clients indicated their preference to send the sample back by post (Gudka *et al.*, 2010), in another study, 54% of the participant were concerned about safety of the sample if sent through post (Bloomfield *et al.*, 2002). However it is not clear in this study whether by safety they meant the danger of being *lost* or *spilled* in the post. In another study, clients described their lack of confidence that the sample will reach its destination and therefore, returning the sample to a pharmacy and physically handing the kit to a pharmacy employee, gave a sense of *'security'* (Taylor Nelson Sofres Healthcare, 2007*).*

4.3.6.4 Uptake of chlamydia screening

In the studies reviewed, reported acceptance of and participation in chlamydia testing varied widely. Between 10%-47% of those approached by the pharmacists agreed to be tested. Once successfully recruited by a pharmacy, the proportion who returned home test kits varied widely between 12% and 51% (Baraitser et al., 2007, Bloomfield et al., 2002, Brabin et al., 2009b, Emmerton et al., 2011, Gudka et al., 2010, Muir, 2008, Taylor Nelson Sofres Healthcare, 2007, van Bergen et al., 2004, Watson, 2008).

The Grampian study demonstrated a statistically significant variation in return rates across the different sites that participated in their study, with highest return rates occurring within the pharmacy-sourced kits (67.6%) and lowest rates occurring with kits obtained by self pick from community sites (7.5%). The author discussed the fact that the highest return rate from community pharmacies might have been partly due to clients having an opportunity of consultation with a pharmacist prior to the issue of the kit. This consultation may have provided motivation for the client to return their kit (Watson, 2008).

Different suggestions offered by the clients to improve the uptake of the kits were its availability from all pharmacies, making the submission process easier (by providing the mail option) and packaging EC and chlamydia kit together with charging a fee (Gudka *et al.*, 2010). Pharmacists particularly emphasised the need to increase the advertising of the service if wishing to improve uptake. Some pharmacists noted that a parallel programme of mailing kits to young people had resulted in the reduced number of people asking for screening kit or accepting the offer of screening in the pharmacy (Dabrera *et al.*, 2011).

Though free chlamydia service was considered a strength of the service by the clients (Taylor Nelson Sofres Healthcare, 2007), Bloomfield et al. suggested that charging a nominal fee would increase the return rate (Bloomfield *et al.*, 2002). In another study, 31% of the service user indicated their willingness to pay an average of A$26±9 for the kit (Gudka *et al.*, 2010).

4.3.6.5 Notification of test results

Result notification strategies reported in the reviewed studies included having staff attempt notification by telephone, text, email, postal letter or return visit to the pharmacy as preferred by the client (Anthony and Watson, 2008, Emmerton *et al.*, 2011, Muir, 2008). However, the most common method of notification of result was by telephone by the clinic staff, but only in the case of positive result (Bloomfield et al., 2002, Brabin et al., 2009a, Gudka et al., 2010). Those who tested negative were not generally directly notified, however in some pilots, a telephone number was provided to all participants to enable them to receive their results over the telephone (Bloomfield *et al.*, 2002). While it was appreciated by clients how rapidly *positive* test results were made known to them on the telephone (Anthony and Watson, 2008), in another pilot, it was suggested by the clients that they should be informed *regardless* of the test result (Bloomfield *et al.*, 2002). A telephone conversation, for some service users, was preferred to a face-to-face approach to minimise embarrassment (Taylor Nelson Sofres Healthcare, 2007).

In the Australian pilot, 33% of the clients indicated that obtaining the result through the telephone was *'very difficult'*, primarily because it could be obtained only during working hours. Hence alternative methods of obtaining their results were suggested, such as by post and email (Gudka *et al.*, 2010).

4.3.6.6 Treatment options

Across the various studies, treatment options offered to infected persons were variable, including attending a sexual health clinic (such as GUM), family planning clinic or general practice, having therapy delivered, or picking up medication at their local pharmacy. The key benefits stated for the pharmacy option was the convenience of accessing pharmacies and their preference to collect the test and treatment from the same location (Taylor Nelson Sofres Healthcare, 2007).

The majority of pharmacists and women felt comfortable with the pharmacist's role with respect to counselling on results and provision of antibiotics (Taylor *et al.*, 2007).

4.3.6.7 Approaches used to notify and treat sexual partners

Few studies have described strategies for contacting sexual partners of those who test positive for chlamydia or the effectiveness of contact efforts undertaken through pharmacies. One randomised controlled trial in the USA was amongst the pioneer studies that introduced a novel approach of involving pharmacies in STI testing (Golden *et al.*, 2001, Golden *et al.*, 2005). In this trial, women and heterosexual men with chlamydia or gonorrhoea infection were randomly assigned to receive either expedited partner treatment through pharmacies or standard referral. In the treatment arm, 76% agreed to give treatment to their partner(s) and most of them obtained medication for a partner at a pharmacy (84%). The trial further demonstrated that among patients with gonorrhoea, expedited treatment was more effective than standard referral of partners in reducing persistent or recurrent infection (3 percent vs. 11 percent, p=0.01). However among those with chlamydia infection, the expedited partner treatment was not effective (11 percent vs. 13 percent, p=0.17). However patients assigned to expedited treatment of sexual partners were statistically significantly more likely than those assigned to standard referral of partners to report that all of their partners were treated and statistically significantly less likely to report having sex with an untreated partner.

In another study in Lothian, for uncomplicated chlamydia expedited partner treatment at a pharmacy was reported as a popular choice of chlamydia treatment among partners as demonstrated by the fact that 40% of partner treatment vouchers were redeemed from the pharmacy with a median of 2 days of issuance (Cameron *et al.*, 2010). The Dutch study also reported successful partner notification achieved in 73% of the cases (van Bergen *et al.*, 2004).

In the Grampian study, centralised partner notification was provided by the SHAs for all clients who tested positive for chlamydia infection during this study (Anthony and Watson, 2008). In addition, if clients had not undergone partner notification with the SHAs from the GUM clinic, community pharmacists could issue them partner notification forms for self-completion. Partner notification was successfully achieved, obtaining a rate per index case of 1.58 contacts identified, 0.99 contacts traced and 0.46 contacts identified and treated. This 0.99 partners traced per case

exceeded the standard of 0.64, as set by Quality Improvement Scotland (Quality Improvement Scotland, 2008). It was observed that partner notification was related to the current status of the partner, in that index patients do not usually notify ex partners (Taylor Nelson Sofres Healthcare, 2007).

Surveys in Lothian (Cameron *et al.*, 2007) and New York (McNutt *et al.*, 2009) reported 82% and 63% respectively of the pharmacists were willing to supply patient delivered partner therapy (PDPT) to the index woman to give to her sexual partner(s). Support for the concept of PDPT for chlamydia was highest for pharmacist owners/co-owners, followed by supervisory pharmacists and staff pharmacists (73.7%, 68.4%, 57.0%, respectively, p= 0.046). Some pharmacists felt that PDPT would benefit the health care system in terms of time and money, and that it was a good option for improving sexual health (McNutt *et al.*, 2009). Pharmacists who were negative towards supplying the index woman with treatment for her partner(s), gave reasons such as concern that the partner would receive inadequate information about the medication, that the partner would have contraindications to Azithromycin therapy, that the partner should have a positive test result before being treated, and that the partner should take responsibility for their own health and consult a doctor for testing and treatment (Cameron *et al.*, 2007). The pharmacists also raised the possibility of offering PDPT to *'mature'* women only.

4.3.6.8 Provision of support to pharmacies and referral procedures

A referral procedure was in place in TNS London and Grampian pilots only (Anthony and Watson, 2008, Taylor Nelson Sofres Healthcare, 2007). Pharmacists had direct telephone access to sexual health advisers (SHAs) at the GUM clinic and were also able to access a 48-hour fast-track referral to GUM clinic for clients who were deemed to require a specialist consultation. Participants in the TNS study suggested that if the client has to be referred, it would be better if a referral letter could be provided to the patients to be handed over to their GP rather than the patient having to go and explain the reason for their consultation as '*some people feel uncomfortable starting this conversation with their GP'.*

4.3.6.9 Strategies for advertising testing service

In-store promotion of free chlamydia testing in pharmacies for young people was generated most commonly by pharmacies (either by pharmacists during EC consultation or in-store promotion such as posters) and by local sexual health clinics. Social networks are other common explanation of how service users first hear about the service (Anthony and Watson, 2008, Brabin et al., 2009b, Taylor Nelson Sofres Healthcare, 2007, Watson, 2008). Amongst the 16-24 year old local population, awareness of the in-pharmacy screening service has shown a greater than 25% increase within one year compared before the service launch (Taylor Nelson Sofres Healthcare, 2007). This might suggest that general marketing/communication activity, coupled with a visible presence in pharmacy, had improved the knowledge of local people about the service.

While the Manchester and Queensland pilots did not include any measures to raise awareness of the screening and its availability, other than the pharmacist offering it during EC consultation (Brabin et al., 2009a, Emmerton et al., 2011), the USA and Grampian studies used extensive advertising campaigns such as advertisement in a local newspaper, posting flyers in the neighbourhood where the kits were available and sharing information with several community outreach services and youth centres (Anthony and Watson, 2008, Bloomfield *et al.*, 2002). The pharmacists in the Queensland pilot described the restriction of in-store advertising by posters and leaflets as a major limitation of the service uptake (Emmerton *et al.*, 2011). In the Grampian study, the response from service users with regard to the in-store pharmacy posters was very positive. *'I think it was good, it was eye catching, I don't think it would have put anybody off, it wasn't sort of a turn off, I like the colours of the bins etc, no I think it was, it was very well advertised'* (Anthony and Watson, 2008).

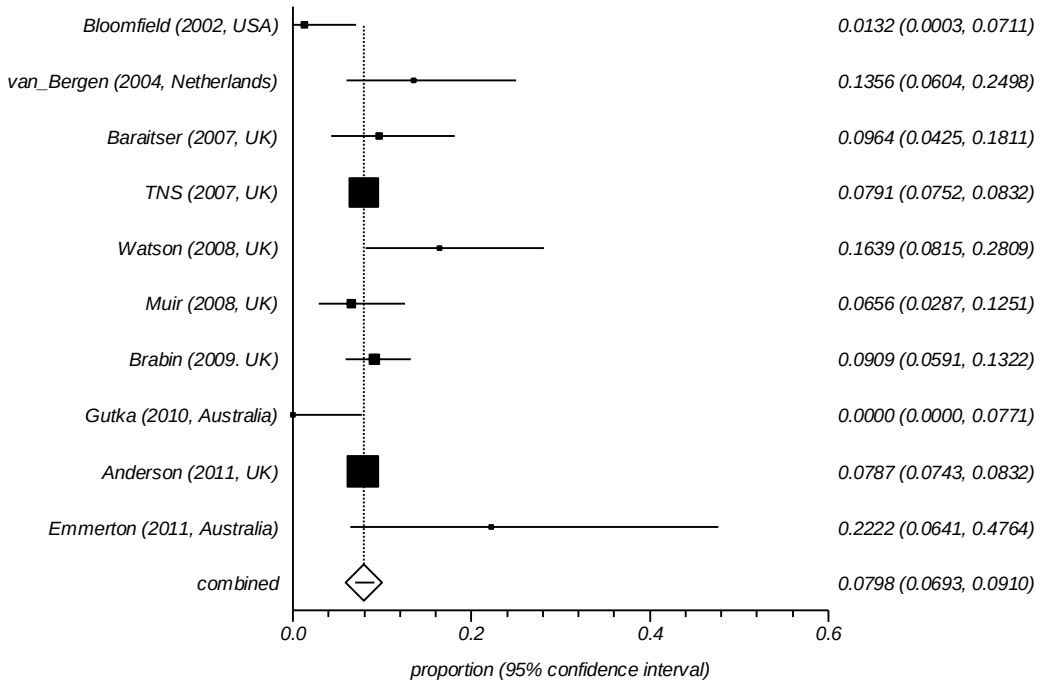
The two most common suggestions made to promote the service, by the clients as well as pharmacists were through television and schools. A number of other suggestions were made: advertising in magazines, radio, billboards, the tube, buses, nightclubs, public toilets, GP surgeries and local community centres, further education and colleges and outside the pharmacy store as well. One

suggestion was to provide leaflets about the service when customers make a related purchase, for example, condoms (Anthony and Watson, 2008, Taylor Nelson Sofres Healthcare, 2007). Respondents wanted it to be simple to pick up information. There was also a belief that word of mouth would play an important part (Taylor Nelson Sofres Healthcare, 2007).

4.3.6.10 Meta analysis of test results from pharmacy-based chlamydia services

This meta-analysis combined prevalence figures from 10 studies with 32, 665 subjects tested for chlamydia in pharmacy chlamydia screening services. The difference between the studies was very large (I^2 = 67% inconsistency; 95% CI 22% to 82%). The high value means that most of the variability across studies is due to heterogeneity rather than chance. Hence a random effect model was followed. Figure 3-2 shows the Forrest plot of meta-analysis of the positivity of chlamydia among those tested in a pharmacy setting. It showed a positivity of 0.08 for chlamydia (95% CI = 0.069 to 0.091).

Figure 4-2: Forest plot and meta-analysis of published proportions (95% C.I) of chlamydia diagnosed in pharmacy testing (random effect)



The Forest plot shows only unadjusted positivity estimates (boxes) and 95% CI (line

across the box). The data were not reported in sufficient detail to enable summary age-specific or gender specific prevalence to be calculated. A sensitivity analysis was undertaken by excluding the only study reporting prevalence of chlamydia among those who used pay-to-use service. The re-calculated proportion of chlamydia was 0.08 (95% CI = 0.06 to 0.11), meaning that it does not markedly change the estimates obtained by including all the studies.

4.3.6.11 Cost-effectiveness of pharmacy-based chlamydia services

The costs for the pharmacy-based chlamydia testing were considered similar to that of other population-based screening programmes (Bloomfield *et al.,* 2002) (Muir, 2008). The total cost of a pharmacy service includes the professional fee, cost of postal kits, lab tests, training and administration. The cost of testing and treatment exists regardless of location of testing and treatment. In effect only the professional fee for the pharmacist and developing an infrastructure for service provision can be considered as an additional cost.

Cost-effectiveness was estimated using a pharmaco-economic model which is based on using risks for complications as estimated in the international literature. The scenarios in which cost savings potentials was found were: using 40% risk of PID; or using 20% risk of PID among 15–24 year old women, with a lower cost for the laboratory tests (van Bergen *et al.*, 2004).

The sensitivity analysis of the cost effectiveness model in the three study sites (i.e. pharmacies, GP clinic and FP clinic) in a Grampian study suggested that for pharmacy sites to be cost-effective, the charges incurred for tests at pharmacy sites would have to be abolished, and that test uptake in 16-24 year olds would have to increase from current ~100 test undertaken in a year to ~800 per year (Tinelli *et al.*, 2009). The study concluded that if testing is to be introduced, distribution of testing kits through GP practices and family planning clinics would likely to provide the most cost effective service, since these sites have the highest return rates.

4.3.7 Part II: Review of performance of pharmacy-based chlamydia service

This section provides the review of literature on the facilitators and barriers of the chlamydia service from the perspective of service users and pharmacists.

4.3.7.1 Facilitators of and barriers to *access* a pharmacy-based chlamydia service - perspective of service users

The following main themes emerged from the thematic analysis of the reviewed studies:

- Perception of risk status and interpretation of STI symptoms
- Embarrassment and stigma
- Socio-demographic factors
- Privacy and confidentiality concerns
- Anonymity
- Convenience and access
- Location of testing service
- Communication
- Trustworthiness

These themes are discussed below.

4.3.7.1.1 Perception of risk status and interpretation of STI symptoms

The decision to seek care was found to be influenced by the individual's perception of their risk status and interpretation of symptoms. Those refusing chlamydia testing cited low perceived risk as one of their reasons for refusing testing. Among those who declined the offer of testing, being married or in a stable relationship or having first time sex were perceived as low risks for chlamydia (Gudka *et al.*, 2010, Muir, 2008). However intercourse without condom with a new or casual partner, or with a partner who tested positive for chlamydia, were acknowledged/realised to confer a higher risk of chlamydia infection (Anthony and Watson, 2008). Similarly, those who were recently tested for chlamydia or were diagnosed with an STI were more likely to accept a screening offer (van Bergen *et al.*, 2004, Emmerton *et al.*, 2011) -

among participating women, 51% had been tested for STIs in the past 12 months and 38% had a history of STIs, compared with 20% and 22% respectively among non-participants.

Individuals accepting screening were also likely to look for symptoms as a sign of disease / infection (Anthony and Watson, 2008). In the TNS study, 16% of the participants undertook screening because they had signs or symptoms that concerned them (Taylor Nelson Sofres Healthcare, 2007). This is a high percentage, given the service was intended to offer an opportunistic health screen to those without symptoms. This suggests that the pharmacy staff health check does not reveal the symptoms, or that some service users chose not to disclose symptoms at that point. However in the Perth pilot, 13% of the clients who were identified as showing symptoms of STI were referred for a full sexual health check (Gudka *et al.*, 2010).

4.3.7.1.2 Embarrassment and stigma

Service users felt that the pharmacy service would help to avoid embarrassment, since it avoided the negative associations or stigma attached to clinic attendance, and saved them having to go to the GP (Anthony and Watson, 2008, Taylor *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007).

However, service users highlighted many facets of embarrassment that are potentially associated with the pharmacy service as well, including knowing someone in the store, knowing the pharmacist, having to ask for the kit and perhaps being overheard doing so by the next person in the queue. Moreover, pharmacists perceived that pharmacist's age and gender also acted as barriers for young people-adolescents were perceived to be reluctant to discuss their chlamydia risk if the pharmacist was a young male (Taylor *et al.*, 2007, Thomas *et al.*, 2010). Pharmacy is also perceived as a public place with a greater chance of being seen by someone the user knows. It was however noted that although embarrassment is a huge barrier, it was not unique to pharmacies. Instead it relates to the general stigma of seeking care for a STI. (Taylor Nelson Sofres Healthcare, 2007)

Reducing spoken communications between the client and pharmacists was proposed as a way to reduce embarrassment, for example, avoiding the need to request the test kit by use of tickets/vouchers, which could be handed over at the counter whilst

making other purchases (Taylor Nelson Sofres Healthcare, 2007). Respondents also suggested that these could be given out during health education classes at school or in youth clubs. They suggested ways of making the process of getting the kit in the pharmacy more discreet; such as a more subtle label for the screening kit, a less distinctive colour for the pack, and always handing over the kit at the counter in a bag. However, users were divided on whether kits should be more or less visible within stores (Taylor Nelson Sofres Healthcare, 2007).

4.3.7.1.3 Socio-demographic profile of clients

The chlamydia service in most pilots was particularly targeted at young people under 24 years of age. While some pilots focused on women receiving EC (Brabin et al., 2009b, Emmerton et al., 2011, Gudka et al., 2010, van Bergen et al., 2004), some particularly targeted high risk males, for example, a USA San-Francisco study was targeted towards gay men (Bloomfield *et al.*, 2002). Still others were targeted to all young people (Baraitser *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007). The London TNS pilot while effectively reached young women (79%); did not reach young men, a group that was considered hard to reach. It might reflect the greater awareness of STIs among females, as demonstrated in the TNS study, however the low numbers of men tested in the other pilot suggest this may also be because most clients heard about the service from a pharmacist during a consultation for EC (Baraitser *et al.*, 2007). Within the targeted age group, women older than 24 years were offered the lowest number of kits, but were significantly more likely to accept the offer of a screening kit (Brabin et al., 2009a).

In terms of education, the majority of participants had received the minimum year 12 or equivalent qualification, were working fulltime (Gudka *et al.*, 2010, Taylor Nelson Sofres Healthcare, 2007) and were from a less deprived area (Watson, 2008). Thomas (et al. 2009) reported that pharmacists perceived that educated women were more likely to accept the offer of the test since less educated women generally do not see the danger of chlamydia.

In the Dutch study, ethnicity of chlamydia service users reflects the practice population (van Bergen *et al.*, 2004), whereas the London pilot predominantly reached the ethnic population (56% of the service users were from black, vs. 26% of

the black population in London) (Baraitser *et al.*, 2007). In contrast, the London TNS pilot was underused by this ethnic minority - of the male users, 9% were black. The reason for differential uptake of the service by ethnic minority in the two pilots undertaken in London might reflect the type and location of pharmacies offering the service. The TNS pilot was undertaken through a high street pharmacy chain, whereas the other London pilot was undertaken through independent pharmacies. This might suggest that ethnic minority clients are more likely to use the service offered through independent pharmacies.

In contrast to the service uptake, the highest proportion of positive screens, 15%, was among the ethnic minority of Surinamese/Antillean in the Dutch study (van Bergen *et al.*, 2004) and, 15%, among black service users in the TNS pilot. However, Asian service users had the lowest positivity rate of 4% only (Taylor Nelson Sofres Healthcare, 2007). This suggests that the service should be offered particularly in the pharmacies that serve high risk ethnic populations.

4.3.7.1.4 Privacy and confidentiality

In many pilots, the majority of service users (87% to 95%) were not concerned about the privacy achieved in a pharmacy consultation (Baraitser *et al.*, 2007, Gudka *et al.*, 2010), but in another study, 56% were 'very concerned' and 29% were 'somewhat concerned' about the privacy while receiving the service in the pharmacy (Bloomfield *et al.*, 2002). A surveys of young people conducted in the TNS evaluation also confirmed that young people perceived that pharmacy chlamydia screening would be as confidential as other screening locations (Taylor Nelson Sofres Healthcare, 2007).

While exploring the difference in responses of the service users about their perception of privacy in a pharmacy, Gutka (et al., 2010) indicated that the response of service users depends upon whether they were asked a closed ended or an open ended question. He supported his argument by indicating that when the service users were asked a polar (yes/no) question to indicate whether they were concerned about privacy, 87% answered that they were not concerned. However, when the same service users were asked an open-ended question, almost 50% indicated that they experienced a lack of privacy. Many service users noted that the need for privacy

during sexual health consultations varies for each individual, but they were clear that a dedicated private consultation area was preferable and that they would not feel comfortable discussing sexual health 'over the counter'. In other studies, service users expressed their reluctance to access any facility that might draw attention to their use of a chlamydia service. They believed that they would feel stigmatised if other clients saw them going into the consultation room to speak to the pharmacist in private, especially in small pharmacies (Anthony and Watson, 2008, Taylor Nelson Sofres Healthcare, 2007). The difficulties in achieving privacy for sexual health consultations were also equally felt by the pharmacists (Dabrera *et al.*, 2011).

Whether or not a pharmacy has a private consultation area does not appear to influence a person's choice of pharmacy, with only 1% stating this to be a reason for choosing one pharmacy over another (Taylor Nelson Sofres Healthcare, 2007). However, in some pilots it was a mandatory requirement in order to provide a chlamydia service in pharmacy (Gudka *et al.*, 2010, Muir, 2008)

McNutt studied the level of confidentiality achieved in pharmacy interactions and observed that, combining customer and staff measures, 53% of all pharmacy staff-client encounters met the criteria for confidential interactions. However, it was noted that in 81% of pharmacies, a conversation in the pharmacy area could be overheard at a distance beyond 6 feet, and in 61% of pharmacies at least 15 feet away (McNutt *et al.*, 2009). The terms privacy, anonymity and confidentiality have been used interchangeably and imprecisely in recent research, so there is a need for more nuanced evaluation studies in the future.

4.3.7.1.5 Anonymity

Another concern of service users was a desire for anonymity. They described different aspects of anonymity. They preferred to use a service distant from home, to avoid running into anyone they knew (Taylor *et al.*, 2007). The TNS pilot demonstrated that more screening was undertaken in stores in large shopping centres and at train and tube stations which may reflects anonymity. Some preferred a pharmacy service over the GP one, due to the fact that the GP often knew them from their childhood and knew their parents as well. Hence it is embarrassing to the service users (Taylor Nelson Sofres Healthcare, 2007).

Service users were also concerned about providing personal details (such as their postcode and date of birth) to the pharmacy staff (Anthony and Watson, 2008, Taylor *et al.*, 2007). The perception that information would be shared between health care professionals was reported by service users as a barrier to accessing treatment. There was uncertainty about the legal guidelines that pharmacists operate under, and whether they would keep records of those who have requested screening kits (Taylor Nelson Sofres Healthcare, 2007).

4.3.7.1.6 Convenience and access

Convenience was the advantage of a service most frequently described by the clients. The aspects of convenience highlighted by the clients were no need for appointment to access the service (Anthony and Watson, 2008, Baraitser *et al.*, 2007, Gudka *et al.*, 2010, Taylor *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007), extended opening hours of the pharmacy and easy access from work or home (Baraitser *et al.*, 2007, Taylor *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007). The pharmacy service was considered to reduce waiting times for testing and for treatment, which were seen as a frustration when trying to arrange appointments with GP surgeries and SH clinics (Anthony and Watson, 2008, Baraitser *et al.*, 2007, Bloomfield *et al.*, 2002, Taylor Nelson Sofres Healthcare, 2007). In a London pilot, where the service was evaluated by simulated clients, they found that they waited less than 2 minutes at the pharmacy counter to get a consultation and test kits were obtained on average within 22 minutes (range 8–35 minutes) (Baraitser *et al.*, 2007).

4.3.7.1.7 Location of the pharmacy

Locality influences a service user's choice of pharmacy; whether it be a considerable distance from home to preserve anonymity or attending the local trusted community pharmacy close to home or work (Taylor *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007). In the TNS pilot, 36% of respondents chose a pharmacy close to home, and 35% chose one close to work. There were mixed feeling about accessing a 'local pharmacy'. It was indicated that people would not go where they recognised store staff or where they themselves might be recognised, and thus tended to prefer a large pharmacy in a shopping area rather than a small local pharmacy. An alternative opinion expressed by *pharmacists* was that local community pharmacists knew their

clients well, had forged a relationship with them, and were ideally placed to help them (Thomas *et al.*, 2010). The accessibility of the service was seen as a particular advantage by many, given the high street availability of the service, and the option of going to a different location if preferred.

In rural areas, transport and the cost of transport was considered as a barrier (Muir, 2008). However this pilot, which was undertaken predominantly in a rural area in Fife, reported that the median travelling distance from a client's home postcode area to the pharmacy was 2.1 miles (range 0.2-30.5miles). However 40% of the clients travelled less than 1 mile for treatment.

4.3.7.1.8 Communication

The excellent communication skills of the pharmacists and counter staff were important to respondents. With regard to the service, all clients felt 'very comfortable' or 'comfortable' discussing sexual health with the pharmacist (Baraitser *et al.*, 2007). Clients felt it was appropriate to discuss sexual health issues with their pharmacist if s/he appeared approachable and was professional in approach (Baraitser *et al.*, 2007, Gudka *et al.*, 2010). They also valued clear and concise information being given to them about the service, thereby making them feel comfortable (Gudka *et al.*, 2010). The majority of service users commented positively on how they had been dealt with by the pharmacy staff and described the staff attitude as friendly, helpful and non-judgemental (Anthony and Watson, 2008, Baraitser *et al.*, 2007, Gudka *et al.*, 2010, Taylor *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007). However in some cases a service user complained that the pharmacy staff member who dealt with his/her request had not been sure of the process and/or was very self-conscious, embarrassed and nervous. It was also felt that if assistants try to be too caring they can appear patronising (Taylor Nelson Sofres Healthcare, 2007).

4.3.7.1.9 Confidence in a pharmacy service

A reason for not judging a pharmacy-based chlamydia screening programme as first choice was that doctor's involvement was preferred (Taylor *et al.*, 2007). Clients also expressed concerns that the advice received from a pharmacist would not be of the same quality as that received from a doctor, and raised questions over test reliability,

and whether the pharmacy test would be of the same standard as those used in other locations (Taylor Nelson Sofres Healthcare, 2007).

4.3.7.2 Facilitators of and barriers to the *provision* of a pharmacy-based chlamydia service - perspective of pharmacists

The themes that emerged from the analysis of the paper reviewed can be grouped into the following facilitators of and barriers to the *provision* of the pharmacy chlamydia service:

- Pharmacists' attitude towards the provision of chlamydia service
- Views regarding the attitude of other stakeholders
- Perception of risk status of the client
- Financial incentives
- Training of pharmacy staff
- Time and workload
- In-pharmacy facilities
- Paperwork

These themes are discussed in detail below.

4.3.7.2.1 Pharmacist's attitude towards the provision of a chlamydia service

Pharmacists believed that screening fulfilled an important educational goal for the pharmacy of bringing sexual health awareness to people (Taylor *et al.*, 2007). Many considered chlamydia screening as a service enhancement which demonstrates a *'progressive'* and *'proactive role'* of pharmacy (Thomas *et al.*, 2010) which leads to greater customer satisfaction (Baraitser *et al.*, 2007, Cameron *et al.*, 2007). Pharmacists described their overall experience in providing the service as very positive (Gudka *et al.*, 2010, Taylor Nelson Sofres Healthcare, 2007).

Pharmacists believed that participation in chlamydia service gave them a chance to exercise their professional reputation as a primary health care provider in the field of sexual health services (Gudka *et al.*, 2010, Taylor Nelson Sofres Healthcare, 2007, Cameron *et al.*, 2007, Baraitser *et al.*, 2007). They also felt that their participation in such a service would help in reducing workload on the GPs (Baraitser *et al.*, 2007), by providing a first line of care to patients (Taylor *et al.*, 2007). Often their participation was motivated by their awareness of the prevalence of chlamydia in the

population served by their site and their desire to address this problem (Anthony and Watson, 2008, Taylor *et al.*, 2007). Others described it as an easy add-on to their ongoing provision of EC (Dabrera *et al.*, 2011). The perceived benefits for pharmacists of providing this service also included greater skills training and job satisfaction (Baraitser *et al.*, 2007), and positive impact on the pharmacy business because of *'greater footfall'* (Anthony and Watson, 2008). However, the pharmacists also noticed hesitation towards proving the sexual health service to young girls. One pharmacist who withdrew from the pilot noted that *"It is a good study, and we can see the benefits of it, but we feel uncomfortable and out of our depth discussing sexual health with young girls. We do not have any female pharmacists. It is just very difficult"* (Gudka *et al.*, 2010). Training was perceived to develop confidence in pharmacist to provide counseling to young people on sexual health matters and is discussed in more detail in the relevant theme entitled 'training of pharmacy staff'

4.3.7.2.2 Pharmacists views regarding attitudes of other stakeholders

Pharmacists reported that their support staff have a positive attitude towards pharmacy involvement in this service. They described that the pharmacy support staff involvement was only limited to promoting the service, whereas for the actual handing out of the test and counseling, they were keen to refer them to the pharmacists. Pharmacist perceived that the GPs were also supportive in their provision of the service (Anthony and Watson, 2008).

Frequent contacts with administrative staff responsible for the chlamydia service was considered positive to ensure that arrangements are satisfactory (Anthony and Watson, 2008). However in the TNS study, the project staff indicated their concern that, in the case of pharmacy chains, their head offices did not involve project staff in the planning/provision of pharmacy staff training (Taylor Nelson Sofres Healthcare, 2007). It was also felt that to enhance the support to pharmacists, the government and pharmacy governing bodies should also be involved in the service (Taylor *et al.*, 2007).

Pharmacists had mixed views about client attitudes to screening (Thomas *et al.*, 2010). The majority of pharmacists indicated that their clients responded positively

to the offer of a kit, however a few pharmacists believed that offering screening could be construed as criticism of a client's sexual morality.

None of the studies explored the attitude of strategic stakeholders responsible for policy making regarding the chlamydia screening.

4.3.7.2.3 Selective offer of service by pharmacists

Pharmacists believed that they offer the service more often to those women who they think were at greater risk (Brabin et al., 2009a, Thomas et al., 2010). Some pharmacists clearly stated that they would assess clients risk for STI and their need for a kit before deciding whether it was appropriate to offer them. Protective factors for chlamydia stated by pharmacists in these studies were aged over twenty, being married, having children, from ethnic minority groups and in a steady and long term relationship. However, despite knowing the risk factors, some pharmacists indicated that they would offer the kits to those who they think are likely to be receptive of the offer, such as educated women or older women, because they felt that the *'less educated generally don't see the danger of chlamydia',* and older women had a more responsible attitude (Thomas *et al.*, 2010).

4.3.7.2.4 Financial incentives

Reimbursement arrangements varied across pilots, with the Manchester study providing no additional financial incentives beyond the payment for EC (Thomas *et al.*, 2010), whereas an Australian pilot provided each participating pharmacy with a $1000 readiness payment to enable their involvement with the chlamydia screening programme, and a further incentive of $15 per chlamydia screening test returned (Gudka *et al.*, 2010). Grampian pilot provided pharmacists a fee of £10 for every consultation that resulted in the issue of a test kit (Anthony and Watson, 2008).

Although most pharmacists indicated the benefits of participating in this scheme in terms of enhancing their professional status, given the retail environment of the pharmacy, they accepted that it is a mix between professionalism and entrepreneurism (Gudka *et al.*, 2010, Thomas *et al.*, 2010). Van-Bergen (et al. 2004) indicated that in order to sustain a programme, appropriate financial incentives were needed, and suggested that a marked decline in the distribution of test kits in the

pharmacy in the second year of the programme might had been a result of the absence of financial incentive offered to the pharmacy.

4.3.7.2.5 Paperwork

Some pharmacists criticised the leaflets they were given to hand out as *'overloaded with information'* and felt that because of this clients lost interest in testing (Brabin et al., 2009a). In addition, some pharmacists (and other providers) considered the laboratory form as complicated for some clients to complete and suggested that such forms be simplified for the clients (Anthony and Watson, 2008). Extensive record keeping required for the service was also described as deterrent to some pharmacists (Taylor Nelson Sofres Healthcare, 2007).

4.3.7.2.6 Time and workload

The barriers to patient counselling in chlamydia screening that were most often cited were workload and time restrictions (Baraitser *et al.*, 2007, Dabrera *et al.*, 2011, Gudka *et al.*, 2010, McNutt *et al.*, 2009, Taylor *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007, Thomas *et al.*, 2010). Pharmacists felt that their increasing involvement in the provision of other services, meant that adding chlamydia screening adds extra well placed pressure on the pharmacy (Taylor *et al.*, 2007). They were concerned that the increase in workload would result in greater chance of prescription errors (McNutt *et al.*, 2009).

Clients also noticed pressure on pharmacists and indicated that it appeared that understaffing meant their consultation was interrupted frequently, since pharmacists had to keep an eye on dispensing activities within the pharmacy (Baraitser *et al.*, 2007). Hence, possible strategies were suggested to free up pharmacists so they could have more time to do public health, such as training other pharmacy staff such as dispensers to take up some of the responsibilities of a pharmacist (such as checking prescriptions) (Thomas *et al.*, 2010). Simplification of paperwork was also advised as one way of dealing with the workload of the pharmacist (Gudka *et al.*, 2010).

4.3.7.2.7 Training of pharmacy staff

Overall, service providers were satisfied with the training provided which was considered comprehensive and detailed. They felt that sexual health training built

their confidence and skills (Anthony and Watson, 2008, Baraitser *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007). Most pharmacists said they felt confident and comfortable talking about EC and chlamydia screening (Baraitser *et al.*, 2007, Gudka *et al.*, 2010, Taylor *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007).

However in terms of availability of trained staff, the professional patients reported difficulty accessing the service because of unavailability of an 'accredited' pharmacist at the time of visiting the pharmacy (Baraitser *et al.*, 2007). Some pharmacies in the Manchester and London pilots ceased recruitment over the study period, mainly because their trained pharmacist left and could not be replaced.

Pharmacists also raised concerns about the process for cascading training that resulted in no training for new joiners, part time staff and locum pharmacists (Taylor Nelson Sofres Healthcare, 2007, Thomas *et al.*, 2010). They also indicated that training was not put into frequent practice due to the low uptake of the service. Hence they advocated frequent refresher training. There were some suggestions that the training should be tailored according to the type of pharmacy staff. Regarding the focus of training, it was suggested to highlight the importance of the benefit of staff's proactive approach, since findings indicate some service users would not have used the service otherwise (Taylor Nelson Sofres Healthcare, 2007) or did not feel comfortable asking for a kit (Taylor *et al.*, 2007).

4.3.7.2.8 In-pharmacy facilities

The lack of a toilet facility was perceived by pharmacists as a barrier to providing a chlamydia testing service in community pharmacies (Cameron *et al.*, 2007, Gudka *et al.*, 2010). Service providers working in stores with toilets were reported to encourage customers to avail themselves of the store toilet to use the kit straightaway. Mixed views were put forward by pharmacists about the advantage offered by in-store toilets. Some felt these would be an advantage, particularly for teenagers who might not want to take the test home. Others viewed in-store toilets less positively, since they thought it would make test use too obvious. However, as reported earlier, potential service users did not consider an in-store toilet to be particularly important (Taylor Nelson Sofres Healthcare, 2007).

The availability of the consultation room was considered part and parcel of achieving *confidentiality and privacy*, so this is discussed in more detail in the relevant theme (section 4.3.7.1.4). However it was evident that pharmacists working in a pharmacy without a consultation room were less motivated to provide sexual health counseling to their clients (McNutt *et al.*, 2009).

4.4 Discussion and recommendations

This chapter provides a comprehensive review of 22 studies found in the published and grey literature. It has examined the models of chlamydia screening in pharmacies. The economic analysis of the implementation of chlamydia screening in community pharmacies is described and the meta-analysis of chlamydia positivity for those tested in pharmacy setting is presented. Facilitators of and barriers to the pharmacy chlamydia service are then discussed in the light of the conceptual model which is developed through the analytical stage of the thematic synthesis.

4.4.1 Major findings

Recent evidence from the UK, the USA, Australian and European studies included in this review indicated that it is feasible to test young people for chlamydia in a community pharmacy setting.

These studies identified that the chlamydia screening service is generally acceptable to the majority of community pharmacists. The uptake of the service was low and pharmacists suggested more promotion strategies to increase awareness of the service among the target group such as campaigns that target young people in high schools, youth clubs, pubs and social networking sites. Most often the participants were offered screening during EC consultation. However, women requesting EC, represent only a subset of the population needing chlamydia screening. The pharmacists were also selective in offering the service to only those EC clients who were perceived to be receptive of the service, for example, those who seemed educated, or in the higher age group.

Urine samples were the preferred method of specimen collection. Completed kits were returned by the clients by either post to the microbiology laboratory, handed in at the pharmacy or at the designated pathology sites. Result notification strategies reported in studies varied from asking participants to call, staff-initiated notification (by telephone, mobile or text), post, or in person (requiring the person to return to the pharmacy). However, clients generally preferred to be notified of the result by phone, irrespective of whether they were tested positive or not. Some studies provided more than one result notification options to their clients. Persons notified of a positive test were counseled and further advised to go to a GUM clinic, GP or pharmacy for

treatment. Partner notification was well received from the pharmacies.

The meta-analysis indicated a pooled proportion of chlamydia infection was 0.08 (95% C.I 0.069 to 0.091). This proportion corresponds to a percentage of 8%, which is very similar to that reported for the meta-analysis of chlamydia positivity from GP surgeries (Table 2-1) (Adams *et al.*, 2004). This might suggest that the population getting tested in general surgeries are similar, in terms of risk of getting chlamydia infection, to those being tested in community pharmacies as well.

Potential for cost saving through pharmacy chlamydia screening/testing was found only in a limited set of scenarios, such as assuming relatively high PID-risks (40%) or if the uptake of service from the pharmacy is very high, at up to 800 kits / year, instead of a current uptake rate of 100 kits / year.

4.4.2 Development of a conceptual model of the facilitators of and barriers to the service provision and access

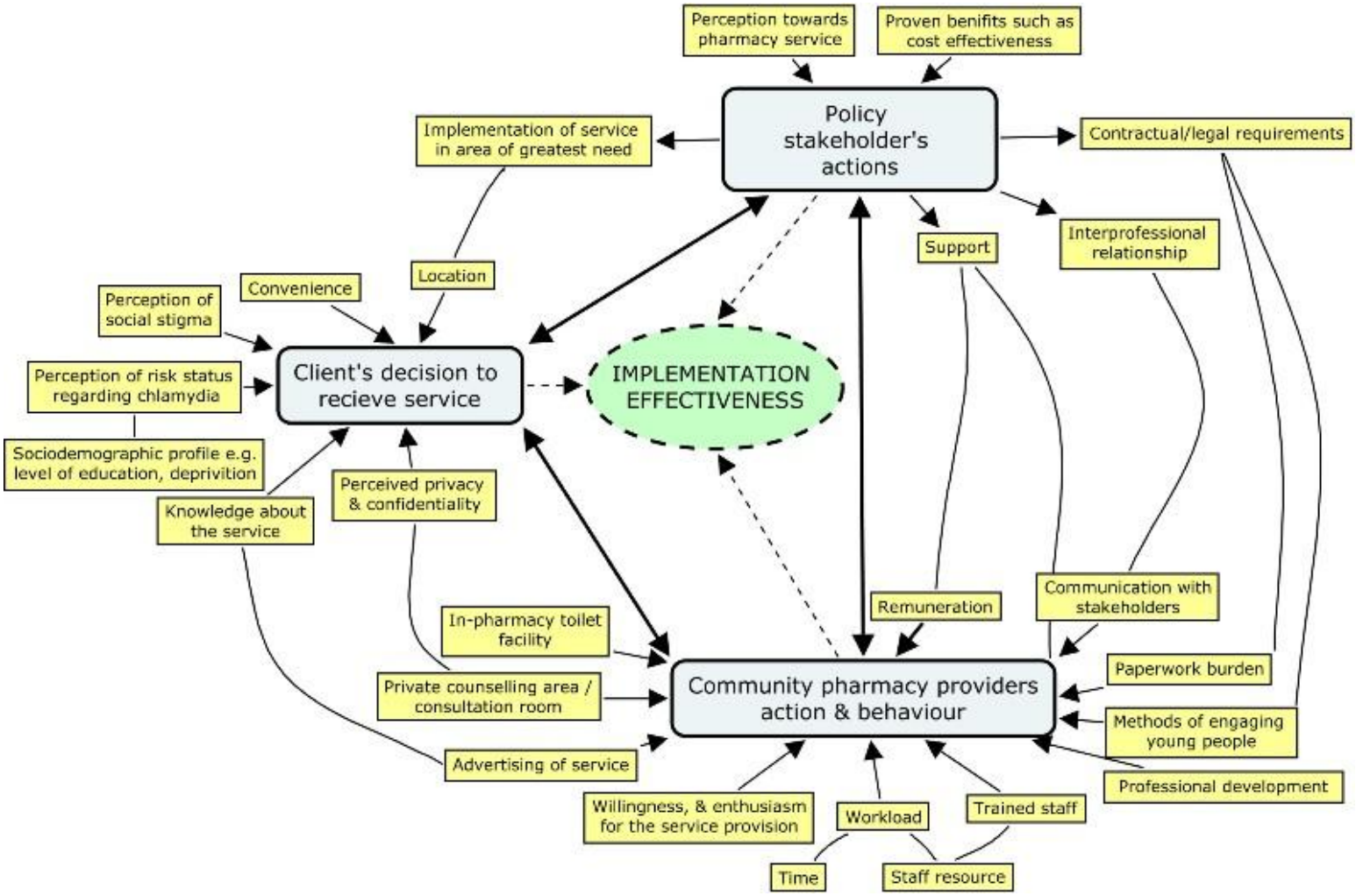
In summary, the studies reviewed point to a number of facilitators of and barriers to chlamydia testing (access or implementation), among service users and providers. The themes and sub-themes identified in this review are summarised in a conceptual model in figure 3-3. This model shows that these factors can be classified based on the level at which they operate; i) Service user i.e. young people aged 16-24 years; ii) Service providers i.e. pharmacists and their support staff; and iii) Stakeholders acting at policy level and in decision making regarding a service.

This review indicates that young people are worried about the maintenance of privacy and confidentiality when accessing these services. There seems to be a need for young people to be given greater reassurances about this aspect, through publicity campaigns. This review also highlighted a diversity of preference among young people regarding accessing the pharmacy chlamydia service. Convenience of access and location appeared as key factors for some young people deciding upon the use of pharmacy service close to their home, study or work place. Other service users indicated their preference for a service which is away from home to ensure anonymity of access. Young people also valued those staff members who have a non-judgmental but a professional approach towards them so that they feel comfortable discussing sexual health issues with them. They also valued clear and

concise information about the service provided to them. This also highlights the importance of well trained staff - a factor also emphasized in reviews of contraceptive service and other public health service delivery to young people and was found to have a positive effect on pharmacists' attitudes (Baxter *et al.*, 2011, Anderson and Blenkinsopp, 2006, Eades *et al.*, 2011).

The current review highlighted the concerns of pharmacists regarding the availability of trained staff and the need for recurrent training to incorporate new joiners, part time and locum staff so that the continuity of service provision could be ensured. However none of the studies in the current review assessed specific areas for future training in the provision of chlamydia service.

Figure 4-3: Conceptual model of facilitators and barriers for the provision of and access to pharmacy-based chlamydia testing and treatment service



The majority of the pharmacists in this review were positive about providing chlamydia service and felt that this was not only an important role of bringing sexual health awareness and its provision to young people but also lead to their professional development. A recurring theme from studies was a concern of increased workload due to the increasing involvement of pharmacists in the provision of public health services and hence time management issues. Under staffing was identified as another reason adding up to the increased work load on pharmacists.

Pharmacists regarded the attitude of other stakeholders as important and highlighted the need for improved connections between different agencies involved in delivering the service. The joint working between different agencies such as; the government, pharmacy governing bodies, administrative staff involved in delivering training and setting up the service were highlighted as areas needing improvement. The role of policy makers was also considered important for sustainable delivery of the service and included aspects such as ensuring provision of training, developing easy paper work and provision of adequate remuneration. However only one study sought the involvement of policy stakeholders and elicited their perception of the pharmacy-based chlamydia service (Taylor Nelson Sofres Healthcare, 2007) and none of the studies ensured an active involvement of stakeholders in the evaluation of the pharmacy-based chlamydia service.

4.4.3 Limitations of studies reviewed and of the literature review

This review is limited in that only studies published in English were included. The scope of some of the quantitative evaluation studies was limited by the survey question is, for example, is chlamydia testing from pharmacies is acceptable to the client? Some of the qualitative studies had very small numbers of participants. While the review was able to identify a large body of UK evidence, limited evidence were also available from the USA, Australia and the Netherlands, and none of the studies from other developed countries was available. This is probably due to the fact that the policy changes in UK increasingly required pharmacies to participate in the chlamydia service and hence its evaluation was encouraged. Evaluation studies that utilised mixed methods often failed to compare and contrast findings, tending to

focus on quantitative data and providing scant detail of qualitative analysis and very little qualitative data (quotations). However despite the variability of the studies included in the review, they had similar / coherent findings. It is also striking that the findings support each other strongly, irrespective of whether the studies were conducted using predominantly qualitative or quantitative approaches. The heterogeneity between the studies did not permit me to synthesize or generalize key findings as to how all these factors interact with one another and which factors are the most significant.

The quantitative meta-analysis undertaken in this review is only preliminary. Its purpose was to provide only pooled estimates of chlamydia positivity among those tested in a pharmacy setting. This would allow making comparisons with chlamydia testing undertaken in other health care settings. However the findings of this meta-analysis should be interpreted in the light of many methodological constraints. This meta-analysis only provides crude prevalence estimates of chlamydia. Due to the limited data available, it was neither possible to produce estimates stratified for age, gender and other risk factors, nor to employ any meta-regression techniques. Unlike the meta-analysis techniques used for randomised controlled trials in which stringent inclusion criteria can be defined based on study methodology, it is difficult to do this with observational studies such as the ones presented in the analysis in this review. This is because the observational studies themselves are prone to more biases and confounding, and may produce spurious findings. The publication biases are less important in the meta-analysis of observational studies in the background of numerous other biases and confounding factors that may introduce heterogeneity (Egger *et al.*, 1998).

4.4.4 Strengths of the review

This is a first review to date that offers a model that conceptualises the facilitators and barriers for the provision of, and access to, pharmacy-based chlamydia testing and treatment services. The model developed in this review highlights key areas to consider in the design and implementation of a pharmacy-based chlamydia services for young people. Many of the factors described in this model would also apply to other sexual health service provision through pharmacies or even to chlamydia

screening services in other health care settings. Hence this model could also be used for framework synthesis of qualitative studies of the above mentioned services (Carroll *et al.*, 2011). The final product would then be a revised model that may include both modified factors and new factors that were not anticipated in this original model.

The provision of structured summaries of the studies in this review (in tables 4-1 to 4-3) allows readers to judge the extent to which the themes and concepts might translate from one situation to other.

4.4.5 Recommendations for future evaluation

The review of findings permits some suggestions to be made for future evaluation of a pharmacy-based chlamydia service as follows:

- The views of strategic stakeholders (i.e. those involved in policy of a pharmacy-based chlamydia service) were not explicitly elicited in the studies reviewed, except in the TNS evaluation. Future evaluations should consider involving strategic stakeholders in suggesting what they want an evaluation to address

- There is a need to ensure that all pharmacy staff who have potential dealings with clients are trained to enable successful delivery of the screening programme. However, since the level of involvement of pharmacy staff would be less than those of the pharmacists, the assessment of the training needs of across the different staff types is essential

- There is a need to explore further the concepts of privacy, confidentiality, and anonymity, as well as embarrassment and stigma, and the ways in which they are interlinked, often being used interchangeably by service providers

- The reviewed studies did not report why invited pharmacies decided to take part, or not, in a particular pilot. A comparison of the perspectives of both the pilot pharmacies and those who were invited and decided not to take part, would be helpful in designing future service strategies to increase the participation of pharmacies

These recommendations have been incorporated into the studies that I conducted for this PhD that contributed towards an evaluation of the CT&T service.

CHAPTER 5: DESCRIPTION OF THE CT&T SERVICE

5.1 Introduction

This chapter first provides the aim of the pharmacy-based chlamydia service and provides a brief history of the service in Scotland and more specifically of the CT&T service in Lothian. It then describes the proposed specifications of the CT&T service. Description of a programme is a key step in an evaluation process. Not only that the programme description sets a frame of reference for all subsequent decisions regarding the evaluation of a programme, it also enables comparison with similar programmes. Proper interpretation of the evidence from the programme evaluation depends upon the availability of adequate descriptive information on the intervention and its context, so that the transferability of the evidence can be determined (Rychetnik *et al.*, 2002). The chapter ends with an overview of the Lothian Health Board area, the setting for the current research.

5.2 Aim and specifications for the pharmacy-based chlamydia service in Scotland

As per Scottish government directive, NHS Circular PCA(P)(2008)17[2] (Annex C Pharmaceutical Services Specification, Public Health Service, Sexual Health Service), the pharmacy-based chlamydia service was aimed to *'provide extended access through the NHS to advice and specific sexual health services as part of the Public Health Service (PHS) element of the community pharmacy contract'* [2]

Appendix B (Part 1) of the circular specified that the service was to provide chlamydia *testing* to sexually active individuals aged 15-24 years, whereas Part 2 specified provision of a chlamydia *treatment* service, where clinically indicated, as specified within a Patient Group Direction (PGD), to those over 13 years old.

[2] This is a Scottish government circular, and is available from *www.sehd.scot.**nhs**.uk/**pca**/**PCA2008**(P)17.pdf*

5.3 Brief history of the pharmacy-based chlamydia service in Scotland

Table 5-1 sketches the timelines for pharmacy-based chlamydia service in Scotland. In August 2008, the Scottish government gave directions to the local health authority to implement the pharmacy-based chlamydia service as part of the Public Health Service element of the community pharmacy contract. A dedicated funding for the provision of the pharmacy-based chlamydia services service was provided by the Scottish government to local health boards. It should be noted here that while provision of some sort of pharmacy-based chlamydia service was obligatory, the Scottish government provided some freedom to health boards to tailor the service according to their local circumstances. The target date for commencement of a pharmacy-based service was set at 29 August 2008[3].

Table 5-1: Timeline of the Scottish government directed pharmacy-based chlamydia service in Scotland

Timeline	Scottish government actions/directives
29 August 2008	Target date set by the Scottish government to start a pharmacy-based chlamydia service in pharmacies in all health boards
February 2010	Scottish Government reminder to start the service in those health boards where the service has not yet been implemented
October 2010	The Scottish government decision to change the status of the service from a 'national' to a 'local' service.
31 March 2011	Special funding from the Scottish government for a 'national' service ceases

Nearly 18 months following the initial directive, in February 2010, Scottish government reminded those health boards where the pharmacy-based chlamydia services roll-out was slow to develop, about their *'strong preference'* to have *'a national chlamydia service available through community pharmacies in all board areas'* (see Appendix 10, for the Scottish government reminder). Health boards were instructed to share with the Scottish Government, their respective health board's

[3] This is a Scottish government circular, and is available from *www.sehd.scot.**nhs**.uk/**pca**/**PCA2008**(P)17.pdf*

arrangements for; a) partner notification, b) incentives to pharmacies, c) data gathering and d) reducing the cost of the service by indicating best value in purchasing kits. This would allow the government to share with other health boards, the cost effective arrangements for the above stated issues. Moreover, the same letter stated that consideration was being given to some of the issues raised by health boards, including; a) the possibility of a national advertising material for the service, b) availability of learning resource through NES to be used alongside local training, and 3) reviewing current service specifications to ensure that they fit with the new SIGN guidelines for chlamydia published in March 2009. It was also indicated that the service would be reviewed in the summer of 2010.

In October 2010 a circular was issued to the health boards in *(NHS Circular: PCA(P)(2010)26)*[4] indicating a government decision to revise the status of the chlamydia service from a 'national' sexual health service to a 'local' service (see also Appendix 11, for the Scottish government decision letter sent to health boards). This meant that there would no longer be direct payments from central government to support the service costs, but instead the continuation of pharmacy-based chlamydia services would be locally negotiated by health boards and funded by local health board budgets. The Scottish Government circular[4] pointed out that this meant that in any health board areas where access to a chlamydia testing and treatment service through community pharmacy was judged to represent an appropriate and cost-effective option, it would be possible for the health board to continue such a service via their routine budgeting.

By the time of termination of the service, after 10 months, there had been only 4 tests requested via community pharmacy, of which 3 were eligible for the testing kits. All the three tested negative and hence no treatment was provided.

[4]This is a Scottish government circular, and is available from [*www.sehd.scot.nhs.uk/**pca/PCA2010**(P)26.pdf]*

5.4 Specifications and the implementation of the CT&T service in Lothian

This section details the service specifications for the CT&T service and outlines the timelines of implementation of the service in Lothian.

5.4.1 Service specifications for the Lothian CT&T service

The specifications described below are for the CT&T service (i.e. are Lothian Health Board specifications), and are broadly similar to the pharmacy-based chlamydia service specification provided by the Scottish government, unless specified otherwise. A quick reference guide to pharmacists pertaining to Lothian Health Board service specifications are provided in Appendix 13. The detailed Scottish government service specifications for a pharmacy-based chlamydia testing and treatment are described in Annex C of the NHS circular (PCA)(P)(2008)17[5].

5.4.1.1 Target population

The *testing* part of the CT&T service in Lothian was specified as for *16-20 years* old males and females. However it was stated that the service could also be provided to those within the age range of *15-24 years old*, if they were anxious to be treated. This meant that the Lothian specification allowed for the possibility of testing 15 year olds and those aged 21 to 24 years, as per the Scottish Government's specification for the testing service.

The *treatment* service was available for anyone over 13 years old, who stated they had tested positive for chlamydia, or were a partner of a chlamydia positive person.

5.4.1.2 Selection of pharmacies for the provision of CT&T service

Lothian Health Board decided to pilot the testing service in a limited number of pharmacies, before deciding to roll out the service more widely. It was decided to select those pharmacies for pilot which were located in geographically disadvantaged areas and where *'there is an identified unmet need for chlamydia testing in that population'* (Appendix 12). The treatment service was available from all pharmacies in Lothian. NHS Lothian therefore invited 66 community pharmacies to pilot the

[5] This is a Scottish government circular, and is available from [*www.sehd.scot.nhs.uk/**pca/PCA2010**(P)26.pdf]*

CT&T service. The 66 pharmacies being selected from all 166 pharmacies in Lothian were those whose geographic location had the potential to improve access to this sexual health service among socio-economically disadvantaged communities. Of these 66 invited pharmacies, 12 pharmacies ultimately agreed and started providing the CT&T service.

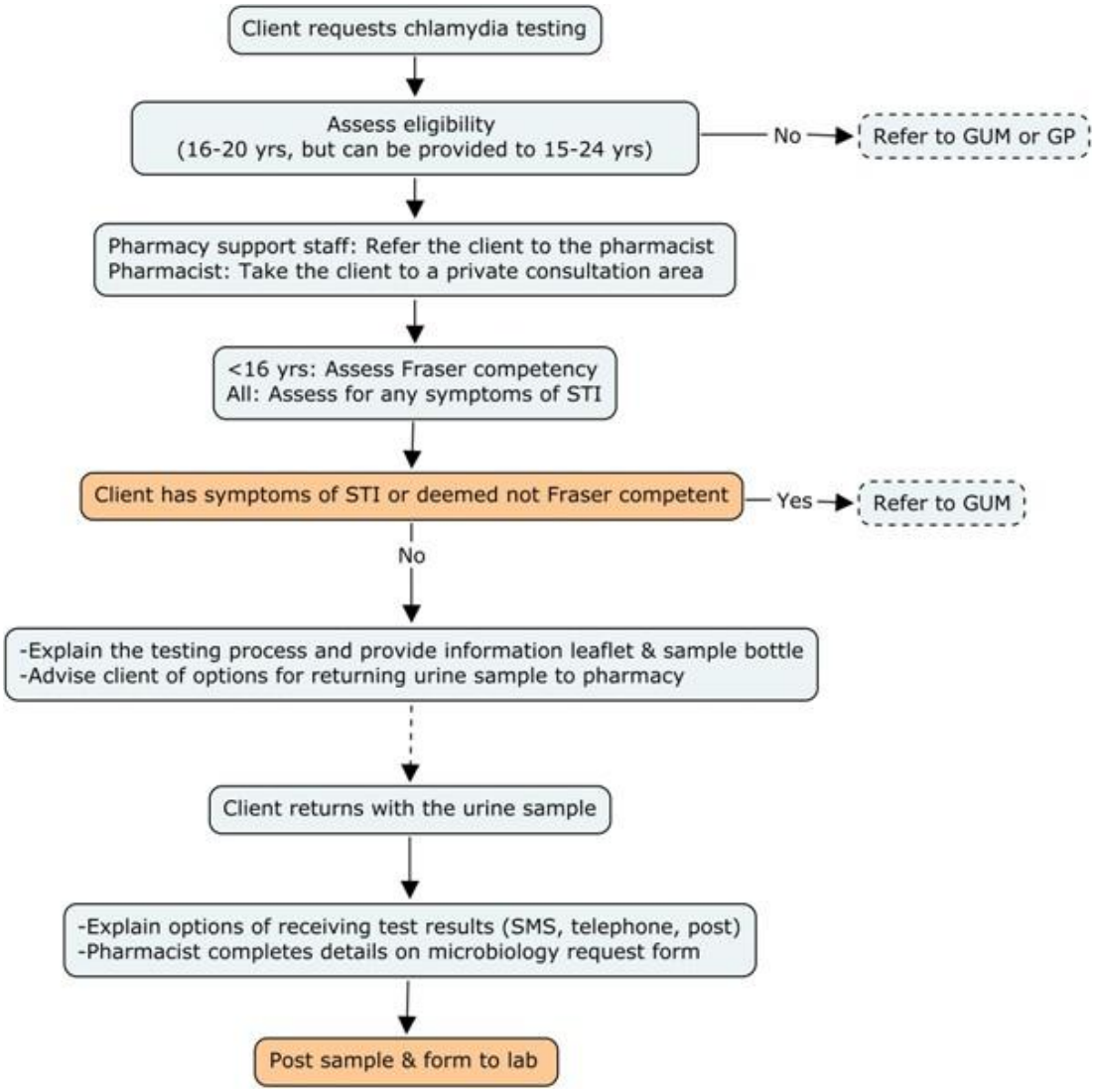
5.4.1.3 Engaging young people in the service

The CT&T service was only made available for clients requesting for it. This is in contrast to the Scottish government specifications that made the service available for clients requesting a chlamydia test as well as for those identified as suitable by a pharmacist or other member of their support staff.

5.4.1.4 Testing process in a community pharmacy

Counter staff may be the first point of contact for the client who wished to be tested for chlamydia in the community pharmacy (Figure 4-1). Hence it was advised that pharmacy support staff should know the details about the service and should be non judgemental in their interaction with the client. They could ascertain the age of the client for eligibility and refer to the pharmacist for counselling and provision of a kit. The client would be moved to the private area or consultation room for the remainder of the consultation. The pharmacists were instructed to confirm the client's age and to take the sexual history to identify any symptoms of STI. If the client is symptomatic, then they would be referred to GUM. If the client was deemed eligible, then s/he would be supplied with postal testing kit (PTK). The PTK (Figure 4-2) consisted of: i) urine sample bottle, ii) an absorbent sleeve in which the container fits, iii) a laboratory form to complete with details of how service user wishes to be contacted with the result (phone call, text or email), iv) information leaflet for the client and, v) information sheet about other GUM and sexual health clinics in Lothian that client or their partner could attend for testing and treatment. The samples of Lothian Health Board's forms and leaflets (iii to v) can be seen in appendices 14 to 16. In order to minimise the wastage of kits, it was decided by the Lothian Health Board that the absorbent sleeve and lab form would not be given to the client in the first instance, but only the sample bottle along with information leaflets.

Figure 5-1: Provision of chlamydia testing kit via community pharmacy



5.4.1.5 Return and postage of the sample

The client would hand over the sample to the pharmacist. Pharmacists would fill in their details in the lab form, package the sample and form in a postage-paid, pre-addressed envelope and post the completed kit to the Laboratory. In the case that the client doesn't return with the sample, then the pharmacist could replace bottle and leaflets to be able to use the same PTK for the next client.

Figure 5-2: Postal testing kit provided for the CT&T service

5.4.1.6 Test results

The test results were to be passed to the health advisor in GUM clinic for follow up. The client could also call on automated phone lines giving their PTK number and personal identification to get the result. If the result was positive, the client would be given three options for receiving treatment; i.e. GUM, GP or community pharmacy.

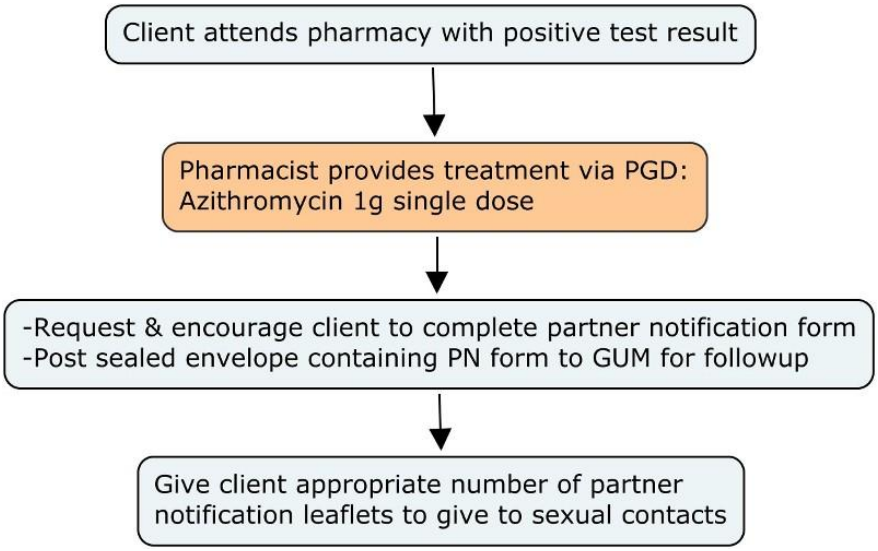
5.4.1.7 Treatment at community pharmacy

If the client opted for treatment from a community pharmacy, they would not need to return to the same pharmacy at which they were tested (Figure 5-3). The pharmacist would assess the client with a positive result for eligibility for treatment from pharmacy under the Patient Group Direction. The treatment is usually a single one off dose of Azithromycin antibiotic (1g). If Azithromycin is contraindicated for the patient, then s/he would be referred to a GUM clinic for further follow-up. If they pay for their prescriptions then the usual prescription charges would apply.

5.4.1.8 Partner notification

Upon receiving treatment from the pharmacy, the index patient would be encouraged to complete a confidential partner notification form for partner tracing (Appendix 17). This form would be returned by the index patient in the prepaid sealed envelope to the pharmacist, who will then post it to the GUM clinic. If the patient wishes to contact their sexual partners by themselves, then they would be provided with enough tri-fold information leaflet for partners (Appendix 18). Sexual partners of positive individuals would be offered chlamydia treatment and/or testing regardless of age.

Figure 5-3: Pharmacy provision of treatment and partner notification



5.4.1.9 Remuneration arrangements

The remuneration arrangements by the Scottish government were similar for all health boards. All community pharmacy contractors with whom the health boards have made an arrangement for the provision of the pharmacy-based chlamydia service element of the PHS were remunerated in terms of three stage payment as follows [NHS Circular: PCA (P) (2008) 17]:

i. The one-off readiness and administration payment of £270 is intended to remunerate staff for set up and ongoing administrative activity during the first 12 months of this programme. It covers set up costs including training, active co-

operation with local NHS Board sexual health co-ordinators, GPs and other patient referrers, and other administrative activity.

ii. A flat monthly rate of £40 for the availability of chlamydia services (equivalent to an annual rate of £480).

iii. £25 for each intervention where the patient is provided with treatment for chlamydia.

The start-up payments which were intended to incentivise rapid take up of the new services were no longer to be paid from 1 April 2009. Since the chlamydia testing service was launched late in Lothian mainly due to the delays of the NHS arrangements, the pharmacy contractors did receive the initial set up cost.

5.4.2 Timelines of the CT&T service in Lothian

Table 5-2 shows the timelines of the CT&T service in Lothian. Following the Scottish government set deadline for the service launch by 29 August 2008, it was decided by the key stakeholders in Lothian Health Board in December 2008 that while they are undertaking implementation arrangements of the CT&T service, an assessment of the training needs of the pharmacy staff would be helpful. In order to assess the training needs of pharmacy staff, I undertook a training needs assessment survey (TNA) in April-May 2009 (TNA is briefly discussed in 0, also see chapter 7 for full description of the methods and results of the study). In July 2009, more than 10 months after the Scottish government directive to start the pharmacy-based chlamydia service in their respective health boards, the NHS Lothian sent an invitation letter to 66 identified pharmacies, requesting their expression of interest in the provision of the service through their pharmacies (see invitation letter in Appendix 12). The pharmacies were identified to make sure that the pilot service is accessible to young people in areas of higher deprivation and where the specialist sexual health services are distant.

Since the treatment service was to be made available in all pharmacies, the Lothian Health Board invited all Lothian community pharmacies in October 2009, to a training evening regarding pharmacy-based chlamydia service. This training evening was informed by the TNA survey that I had undertaken. After the Scottish

government reminder sent in February 2010, to those health boards where the service had not yet been implemented (section 5.3), it was felt by the Lothian Health Board that there had been an excessive lapse of time since the training provided to pharmacists. They therefore organised another training session in Lothian, in March 2010, which was offered to pharmacists only.

Table 5-2: Timeline for implementation of the Lothian CT&T service

Timeline	The CT&T service implementation process
29 August 2008	Scottish Government target start date
April-May 2009	Training need survey was conducted in community pharmacies in Lothian as a component of my PhD research
July 2009	NHS Lothian sought expression of interest from 66 community pharmacies in Lothian to provide the CT&T service. The intention was to initially roll-out the service in 25 community pharmacies
October 2009	A training evening was conducted by NHS Lothian, all community pharmacies (pharmacists and their support staff) in Lothian were invited
March 2010	A second training evening was conducted by NHS Lothian for community pharmacists
June 2010	The testing service was started in 12 community pharmacies in Lothian
October 2010	Scottish government advised that specific funding for pharmacy-based chlamydia service would cease on 31 March 2011
31 March 2011	Lothian Health Board discontinued their CT&T service

The CT&T service in Lothian was eventually rolled out in 12 community pharmacies in June 2010 - more than 21 months after the initial directive by the Scottish government.

Following the Scottish government decision in October 2010 to reclassify the service (section 5.3), from a national to a local service (with the 'national' service contract, and hence dedicated Scottish government funding, ceasing on 31 March 2011), Lothian Health Board decided to discontinue the service from that same date -31 March 2011. Therefore the CT&T service in Lothian ran for a short period of 10 months only.

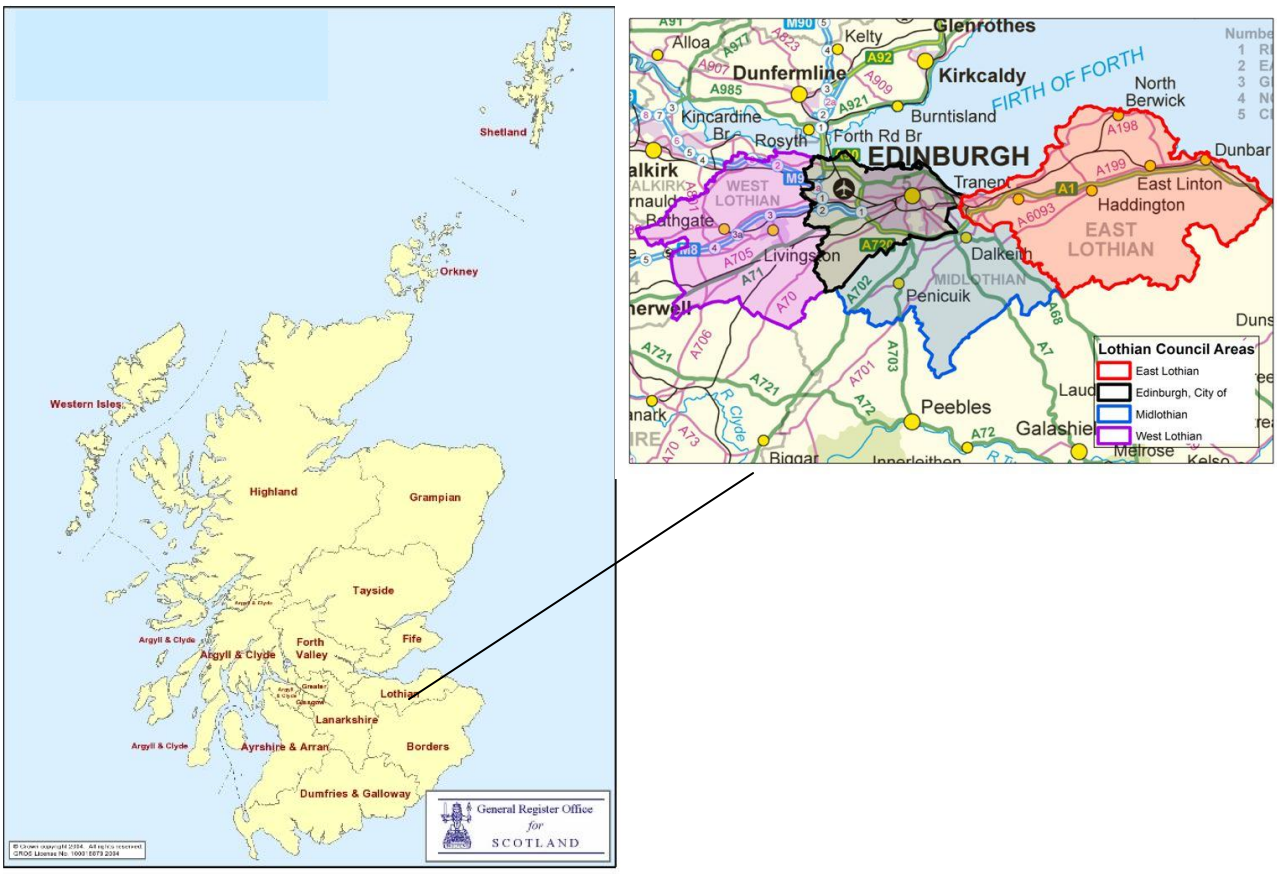
5.5 An overview of the study area – the Lothian Health Board

Current provision of health care in Scotland is shared between 14 geographically-based local NHS Boards (Figure 5-4a). Lothian Health Board is responsible for the south east of Scotland and is the health board with the second largest residential population ~ 800,000 people (General Resister Office for Scotland, 2011). The Lothian Health Board also shows the second greatest increase in projected population between 2004 and 2024 (11 per cent), only after the Border Health Board (15%) (General Resister Office for Scotland, 2011). The Scotland is further divided into 32 local authority areas for administrative control (Directgov). There are four local authority areas in Lothian, namely, Edinburgh City, West Lothian, Mid Lothian and East Lothian (Figure 5-4b). The principal settlement in Lothian is in the Scottish capital, Edinburgh (Table 5-4). The population aged 15-24 constitutes 14% of the total population of Lothian (General Resister Office for Scotland, 2011).

Figure 5-4: Maps showing a)* the health board areas in Scotland and b) local authority areas in Lothian**

a) Scotland: 2001 Health Board Areas

b) Local authority areas in Lothian



**Source: GROS (General Resister Office for Scotland, 2011)*

*** The Edinburgh University Data Library (EDINA)*

Table 5-3: Population statistics for local authority areas in Lothian, overall and for 15-24 years olds

Local Authority Areas	Total Population	15-24 years old
East Lothian	97, 500	11, 956
Edinburgh City	486, 120	72, 468
Mid Lothian	81, 140	10, 300
West Lothian	172, 080	21, 999
Total	836, 840	116, 723

Source: GROS (General Resister Office for Scotland, 2011)

5.6 Chapter overview

Current provision of health care in Scotland is shared between 14 geographically-based local NHS Boards (Figure 5-4a). Lothian Health Board is responsible for the south east of Scotland and is the health board with the second largest residential population ~ 800,000 people (General Resister Office for Scotland, 2011). The Lothian Health Board also shows the second greatest increase in projected population between 2004 and 2024 (11 per cent), only after the Border Health Board (15%) (General Resister Office for Scotland, 2011). The Scotland is further divided into 32 local authority areas for administrative control (Directgov). There are four local authority areas in Lothian, namely, Edinburgh City, West Lothian, Mid Lothian and East Lothian (Figure 5-4b). The principal settlement in Lothian is in the Scottish capital, Edinburgh (Table 5-4). The population aged 15-24 constitutes 14% of the total population of Lothian (General Resister Office for Scotland, 2011).

CHAPTER 6: OVERVIEW OF DESIGN AND METHODS

6.1 Introduction

In chapter 1, I have explained how the initial evaluation plans were affected by unforeseen circumstances that beset the CT&T service. Inevitably, the delayed timeline for the CT&T service, and the ultimate cancellation of the service, impacted the scope of the evaluation and hence the research that could be undertaken for this PhD. The studies that were in the event undertaken were planned initially with an evaluation in mind, and hence despite revisions made to them, their research designs reflect the perspective of programme evaluation. Therefore this chapter first provides an overview of programme evaluation methods. It then outlines the evaluation studies initially proposed and the revised plans following the implementation delays and low uptake that impacted the service in Lothian. Finally, there is a brief account of the rationale and the methodological decisions for each particular study. In the following chapters these studies will be reported in turn, with each chapter including full detail of methods used for that study.

6.2 An overview of programme evaluation

Programme evaluation is an essential organisational practice in public health. Patton defines evaluation as the systematic collection of information about the characteristics, activities and outcomes of programmes to improve programme effectiveness, make judgments about the programme, or inform decisions about future programme (Patton, 1987). Others focus on the use of evaluation to identify and measure outcomes of programmes, that is, conceptualising evaluation as a systematic assessment of the extent to which a programme caused the observed results (Green and South, 2006, Nutbeam, 1998, Pawson and Tilley, 2008).

Despite many different definitions and explanations of what evaluation is, there is one striking similarity - the *systematic* nature of an evaluative inquiry. Although evaluators employ the same methodological tools for data collection and analyses that are used by researchers in empirical studies, research and evaluation differ in two important aspects:

i. The origins of the research question(s): Evaluation questions are typically elicited from programme stakeholders, whereas in empirical research, questions arise from prior research or clinical understanding.

ii. The purpose of research: A key purpose of programme evaluation is to improve practice, whereas empirical research primarily focuses on testing hypotheses.

The results obtained from an evaluation enable managers and staff of that programme to create the best possible programmes by making modifications as needed, learning from mistakes, and monitoring progress toward achieving programme goals and short-term, intermediate, and long-term outcomes (Centre for Disease Control and Prevention and U.S. Department of Health and Human Services, 2005). However, the results of an evaluation can also inform design of other similar programmes, and can contribute to the policy making.

6.2.1 Types of evaluations

The major distinction between different kinds of evaluation is the stage of the programme at which it is carried out. A *formative evaluation* is carried out at the same time as an initiative is being developed and implemented and is frequently concerned with the process (Patton, 1987). It is therefore of greater relevance for those responsible for the delivery of the intervention to provide important information and feedback to guide ongoing decision making and actions to improve the outcomes of the intervention (Green and South, 2006). As a change-oriented evaluation approach, a formative evaluation is especially focused on identifying discrepancies between the expected directions and outputs of the programme and what is happening in reality, on analysing strengths and weaknesses, and on uncovering obstacles, barriers or even unexpected opportunities. This is turn generates understanding about how that programme could be implemented better. While formative evaluation is intended mainly to allow improvements to the delivery of the intervention currently being evaluated, it is also the case that some issues uncovered will be general enough to inform planning and delivery of other similar interventions in the future.

A *summative evaluation* is carried out towards the end of the programme or, in case of a continuing programme, after the programme has stabilised. Summative

evaluation is mostly outcome oriented and provides an overall assessment of the effectiveness and achievements of the programme (Green and South, 2006, Patton, 1987). This type of evaluation usually does not directly affect the current programme, but it helps stakeholders in deciding the future of this programme or similar projects.

Although formative evaluation is commonly contrasted with summative evaluation, but the distinction between them is not clear. Indeed, it is often the case that both are undertaken, since formative evaluation is seen as an integral component in summative evaluation. For example, formative evaluation can report early outcome measures which serve as interim markers to programme effects. Also, tracking linkages between inputs, outputs and outcomes can help in identifying causal mechanisms that would also inform summative assessment. It is important to note that in the evaluation literature, overlapping terms are often used in defining formative and summative evaluation. Furthermore, some published literature makes further distinctions, describing subtypes within these two forms of evaluation. For example, Thompson and McClintock (1998) have defined four stages of evaluation namely, formative, process, impact, and outcome. Formative evaluation is defined by Thompson and McClintock (1998) as a way of making sure that programme plans, procedures, activities, materials, and modifications will work as planned and hence this is carried out during the development of a new programme or modification of the existing programme. In their schema, process evaluation will look at how well the programme is working and whether it is engaging and reaching the target audience, and impact and outcome evaluations are defined as ways to evaluate the extent to which a program is meeting its intermediate outcomes and long term goals respectively (Thompson and McClintock (1998). In contrast, Ferris et al. (1992) have defined process and outcome evaluation simply as a precursor names for the formative and summative evaluation respectively.

Irrespective of the contesting claims as to what the different stages of evaluation should be termed, it is widely accepted that these stages are interlinked, and that formative evaluation is concerned with the *process* of implementing a programme, whereas summative evaluation is more concerned with decision-making about the

performance of a programme. This is generally achieved by comparing the observed outcomes with what had been expected. The results of both the summative and formative evaluation inform decision-making about future resource allocations (and ultimately about continuation of the programme).

As I discuss later in this chapter, while I would have wished to carry out both formative and summative evaluation of the CT&T service, the limited time-span of PhD study meant it was always unlikely that it would be possible to achieve proper summative evaluation on a well-established CT&T service.

6.2.2 Models and frameworks for programme evaluation

A typical aim of a programme such as the CT&T service is to produce positive change in health behaviour, such as a young person taking a chlamydia test with appropriate frequency (in relation to the individual's risk factors). Positive behaviour change of this sort is influenced by a diverse range of factors, both at the individual level (for example cognitive and affective) as well as at the environmental level (for example socio-cultural and logistical factors). Another issue in population health is that interventions need to be able to achieve positive outcomes in ever-changing social, organisational, economic and political contexts (Nutbeam, 1998, Rychetnik *et al.*, 2002). Thus interventions of this type are generally complex and dynamic, and hence are often beyond the close control of implementers. Therefore these types of interventions are not suited to being evaluated by experimental study designs. Pawson and Tilley (2008) have advocated the use of evaluation study designs that are capable of dealing with the issues outlined above.

In respect to public health programmes, the vast majority of evaluation approaches (referred to as models, frameworks, or theories) offer principles, rationales, and organisational structures for the procedural choices made by evaluators, so as to identify issues and problems with which they must deal (Green and South, 2006, Nutbeam, 1998, Patton, 1987, Rootman *et al.*, 2001). Two evaluation approaches commonly employed in health service research are the CDC framework and the realistic evaluation, and are briefly described below.

6.2.2.1 CDC framework for programme evaluation

The framework for programme evaluation developed by the U.S. Centre for Disease Control and Prevention (CDC) involved input from hundreds of public health professionals, practitioners working in evaluation and research in the academic field, and those involved in community projects (Centre for Disease Control and Prevention and U.S. Department of Health and Human Services, 2005).

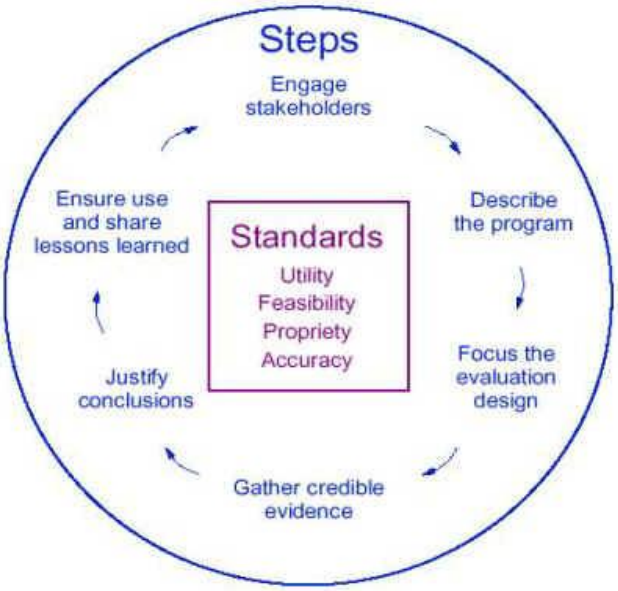
This CDC framework recommends that evaluators of an intervention apply evaluation 'standards' throughout the work (Centre for Disease Control and Prevention and U.S. Department of Health and Human Services, 2005). These standards (thirty in all) can be viewed as clustering into four domains, comprising standards to ensure:

- Utility: serving the information needs of intended users
- Feasibility: being realistic, prudent, diplomatic, and economical
- Propriety: behaving legally, ethically, and with regard for the welfare of those involved and those affected
- Accuracy: revealing and conveying technically accurate information

These evaluation standards serve as a guide, so as to make a rationale choice from amongst the many options available for undertaking each step in the framework. Applying these standards will also ensure that an evaluation of a programme would produce valid conclusions.

This CDC framework envisages the design and conduct of an evaluation of a public health programme as proceeding generally in steps (Centre for Disease Control and Prevention and U.S. Department of Health and Human Services, 2005). The framework details six steps (Figure 6-1), for which a general order pertains, in that generally earlier steps have to be completed to provide the foundation for subsequent progress. The figure shows the centrality of evaluation standards mentioned above.

Figure 6-1: CDC framework for the evaluation of public health programmes



This figure is adopted from (Centre for Disease Control and Prevention and U.S. Department of Health and Human Services, 2005)

I used the CDC framework to guide me as to the steps needed for my evaluation process. The steps are:

i. Engage with the programme stakeholders

ii. Describe the programme

iii. Focus on the evaluation design

iv. Gather credible evidence about the programme

v. Justify conclusions of the evaluation

vi. Ensure use of findings for the programme and share lessons learned

However, these steps are only guidelines and starting points for tailoring an evaluation to a particular public health effort at a particular time. This schema is a way of framing an evaluation rather than a specific blueprint. The ordering of the first two steps is not crucial, and likely to be dependent on the precise programme/context. Also, in an ideal world the steps would not be linear as implied by the list, but iterative, as shown in the diagram (Fig 5-1). So the step vi (ensure lessons learned) leads on to re-engaging with the stakeholders (i) and revising the

programme, which then needs re-describing (ii), followed by devising some check-back evaluation of that revision (iii), and so on.

6.2.2.2 Realistic evaluation

Whilst framing the questions for my intended evaluation of the CT&T service, and during the process of execution and analysis of the set of studies designed towards its evaluation, I adopted the realistic approach to evaluation, as recommended by Pawson and Tilley, so as to understand the *outcome* in terms of any interaction that exists between *mechanism* and *context* (Pawson and Tilley, 2008). The key feature of realistic evaluation is to capture the linkages between the context, mechanism and outcome of the intervention. The inter-related questions are:

i. Mechanism: what is it about a measure which may lead it to have a particular outcome pattern in a given context?

ii. Context: what conditions are needed for a measure to trigger mechanisms to produce particular outcome patterns?

iii. Outcome pattern: what are the practical effects produced by causal mechanisms being triggered in a given context?

These are linked questions that need to be asked about a programme in order that it can be understood in realistic terms. So for example, in order to understand why certain pharmacies did not take part in the service, it was necessary to understand the context in which such a decision could have occurred. Similarly the perceptions of the pharmacists were analysed in the context of their organisational position, such as being part of a chain pharmacy or owner of an independent pharmacy business.

6.2.2.3 Logic model for a programme evaluation

A logic model is a common tool employed by the evaluators to depict graphically how the programme is operating, its resources, to whom it targets, and what it intends to accomplish (Centre for Disease Control and Prevention and U.S. Department of Health and Human Services, 2005). The logic model not only provides a causal connection between activities and expected outcomes of a programme, but it also helps in formulating the evaluation questions at each stage of a programme. Logic models are used extensively in programme planning,

implementation and evaluations (Tucker *et al.*, 2006, Kaplan and Garrett, 2005). The basic components of a logic model include *inputs* (resources that potentially enable or limit programme effectiveness); *activities* (techniques, tools, events, and actions of the planned programme); *outputs* (the direct/tangible results of programme activities, for example, skills, products); and *outcomes* (changes in attitudes, behaviours, knowledge, skills, status, or level of functioning outside the programme or its staff). In section 5.3.2, a logic model is presented for the CT&T service.

6.2.3 The role of stakeholders in programme evaluation

Representing the needs and interests of the programme stakeholders throughout the evaluation process is fundamental to good programme evaluation. The first step in the CDC evaluation framework is identifying and involving stakeholders in the process of evaluation of a health system/service (with the intention of retaining them through the evaluation). This is particularly the case in community health projects (Centre for Disease Control and Prevention and U.S. Department of Health and Human Services, 2005, Green and South, 2006). CDC defines stakeholders for a public health programme as follows:

"Stakeholders are people or organisations that are invested in the programme, are interested in the results of the evaluation, and/or have a stake in what will be done with the results of the evaluation".

Engaging a range of stakeholders with different perspectives on the programme helps in building both an internal and external buy-in and support for the evaluation process (Patton, 1987). Stakeholder involvement would also make the evaluation process more objective, enhance communication among key partners, and ensure that the data collection is thorough and complete. The range of stakeholders consulted should, as far as is feasible, reflect the type of partnership in the project (Green and South, 2006). Stakeholders might include practitioners, programme managers, politicians, community workers and lay representatives.

6.3 Towards an evaluation of the Lothian CT&T service

This section describes my initial steps towards an evaluation plans. The stakeholders identified for the CT&T service are described. CDC framework suggests the use of logic model for aiding in the evaluation plans. The logic model developed for the CT&T service is also described in this section.

6.3.1 Identifying stakeholders in the CT&T service

The potential stakeholders for the CT&T service in Lothian were considered and identified in an early meeting with the programme implementers. Some additional stakeholders were added later from the list of sexual health strategy project board members involved in developing the Edinburgh & Lothian Sexual Health Strategy for 2005-2010 (NHS Lothian, 2005). These stakeholders were identified under the broad categories suggested in the CDC framework (Centers for Disease Control and Prevention, 2007), and are shown in Table 5-1. These are not exclusive classes of stakeholders, but four ways of thinking about stakeholders, and therefore some stakeholders appear in more than one category.

CDC also identifies participants or service users as a potential category of stakeholders. For the CT&T service, participants would be young people aged 15-24 years for whom the service is designed. The reasons for omitting participants from the list of stakeholders who might be involved in the evaluation of the CT&T service was that the CT&T service is a top-down programme that the Scottish government has directed to health boards to implement. At the time of planning the evaluation, the service in Lothian was not yet operational, so there were as yet no service users. However, while not involving possible future service users in the specifications of the evaluation, it was intended to seek views of the CT&T service in various ways from all stakeholders, including service users.

Table 6-1: Strategic stakeholders identified for the CT&T service in Lothian

Types of Stakeholders	Questions used to identify stakeholders	Stakeholders
Implementers	Who is directly involved in the operations of the chlamydia testing and treatment initiative?	• CT&T programme director • Public health pharmacist lead for Lothian • Laboratory lead for STI • Nurse counsellors in GUM clinic
Decision Makers	Who is in a position to do or decide something about this initiative?	• CT&T programme director • Lead clinician(s) for sexual health • Public health pharmacist lead for Lothian • Health promotion lead(s)
Partners	Who actively support and/or have invested in this initiative or in the population that the programme serves?	• NHS Lothian sexual health service, for example, GUM, Family Planning & Well Women service • General practitioners • Community outreach sexual service representatives for youth, for example, Caledonian Youth, ROAM clinic, LGBT • Sexual health specialists and practitioners • Public health pharmacist(s) • Health promotion group

6.3.1.1 Stakeholder terminology used in this thesis

Two different stakeholder 'labels' that are commonly utilised in this thesis are discussed below:

i. **Strategic stakeholders**: Stakeholders listed in Table 6-1 are those considered to be *strategic* in the vision, specification, launch and delivery of the service. One or more of each stakeholder type listed were later invited to participate in the stakeholder survey.

ii. **Key stakeholders**: Three of the strategic stakeholders (two sexual health specialists and a public health pharmacist lead) had a key role in the decision making of the CT&T service, particularly in respect of deciding the service

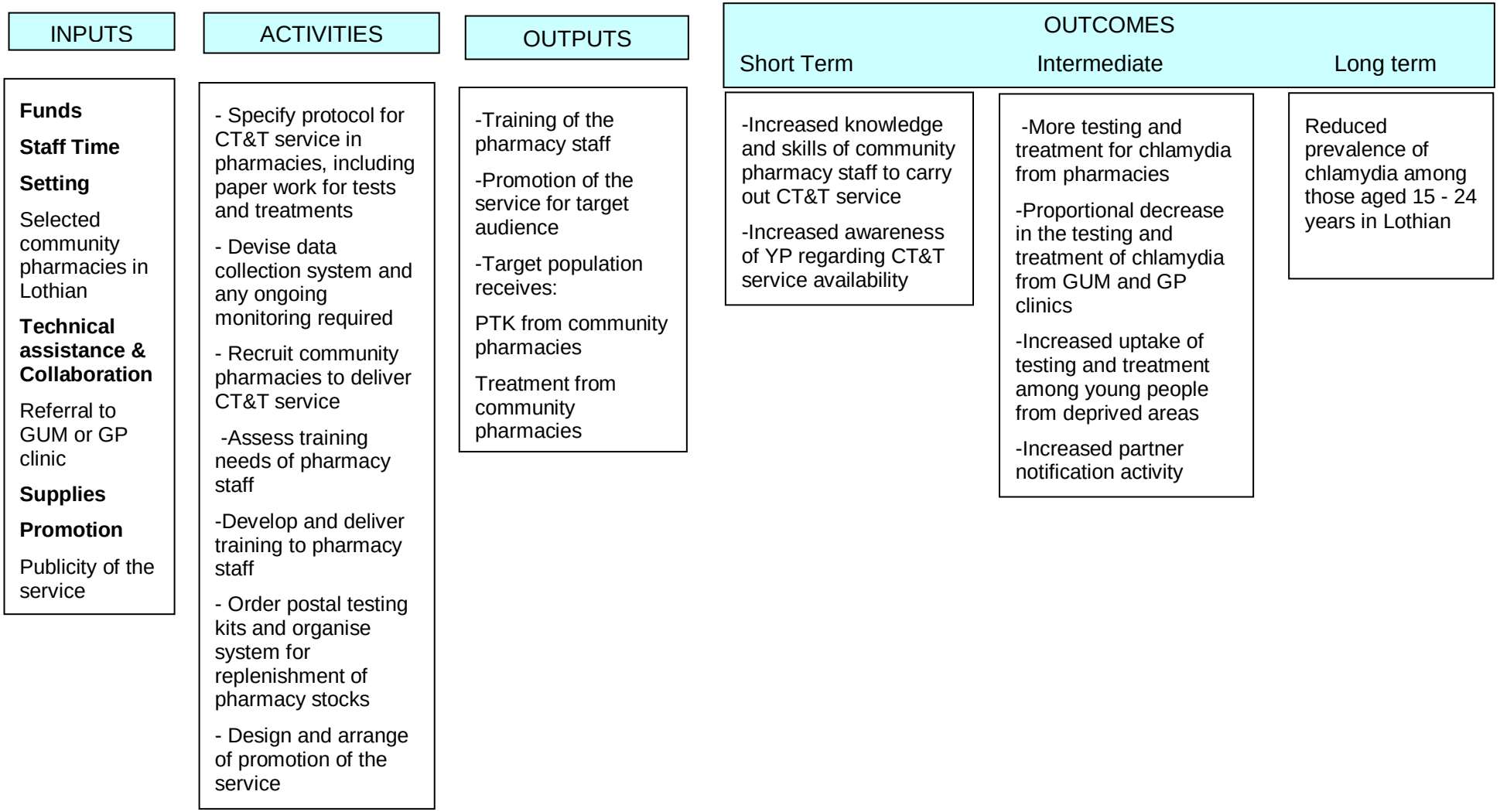
specifications. These were also the stakeholders with whom I had regular interaction with respect to the design of the intended evaluation studies as well as in facilitation of the studies ultimately undertaken.

6.3.2 Logic model for the CT&T service

The CT&T service has already been described in chapter 5. Figure 6-2 shows the logic model that I had developed for the CT&T service. The rationale for the logic model has been given in section 6.2.2.3. The figure reads from left to right and the first three columns indicate inputs, activities and outputs of the activities. The expectation is that the 'outputs' will lead to the hoped-for outcomes. The next three columns of the model show the outcomes, subdivided by timing - early, intermediate and longer term.

Activities specified were those that would be expected as part of programme planning and execution, such as specification of a protocol for the CT&T service, and training of the pharmacy staff. Outputs detailed are those which were expected from the proposed activities. Although the ultimate goal was to reduce the prevalence of chlamydia among 15-24 years old population in Lothian, there were more immediate and targeted outcomes such as availability of trained community pharmacy staff for the provision of chlamydia testing; increased access of young people to chlamydia testing; and behavioural changes among young people as a result of counselling that they receive during CT&T service provision.

Figure 6-2: Logic model for the CT&T service



6.3.3 Devising the evaluation plan

For the evaluation of the CT&T service, I proposed studies that would investigate aspects relevant to both the implementation as well as the expected outcomes of the service. This section describes briefly the initial plans for an evaluation of the CT&T service.

6.3.3.1 Focusing the evaluations questions

Since the CDC framework recommends engaging programme stakeholders in the evaluation, the first step was to provide them with an opportunity to reflect on the evaluation questions that I had drafted, and to identify any other questions, in respect to the CT&T service, which they considered important to evaluate. This was undertaken as a formal study (a survey) and is reported in chapter 8. The first column of Table 6-2 lists the evaluation questions initially proposed with respect to the CT&T service. The evaluation questions drafted were intended to provide a formative evaluation of the service as well as to provide a preliminary analysis of the outcome of the service – in terms of its impact on chlamydia testing activity in Lothian and detecting chlamydia positivity among young people.

Of these, only questions 1.3 to 1.8 were included in the stakeholders' survey, for their comment. Question 1.1 was excluded from the stakeholder survey because the training need survey had already been completed, fast-tracked in order to provide timely results to key stakeholders for the development of training evenings for pharmacy staff. Question 1.2 was also excluded from the stakeholder's survey since by this time it was already agreed with the key stakeholders that a post TNA survey would be useful to monitor the pharmacy staff competencies after delivering training and their practical experience with service provision.

All of questions 1.3 to 1.8 were affirmed as important in the strategic stakeholder survey. The second column of Table 6-2 lists the evaluation questions added following the stakeholder survey.

Table 6-2: Evaluation questions initially proposed and added following stakeholder survey

Initial questions proposed for the evaluation of the CT&T service	Additional questions identified in the stakeholders survey
Implementation / Formative evaluation questions	
1.1 What training do pharmacy staff need in order to implement the service in community pharmacies?	2.1 What is the level of satisfaction of the clients accessing the CT&T service?
1.2 Is the training provided to pharmacy staff able to develop competencies necessary for the provision of the service?	2.2 How likely it is that the clients would have tested or treated elsewhere if the service did not exist?
1.3 What are the challenges faced by community pharmacies in implementing the CT&T service?	2.3 Would clients find it acceptable to provide information on sex partners in community pharmacies?
1.4 What do community pharmacists/staff perceive as factors contributing to the success or failure of the CT&T initiative? (facilitators & barriers)	2.4 What proportion of youngsters (high risk) knows about the service?
1.5 What factors do clients perceive as affecting their access to the CT&T service? (facilitators & barriers)	2.5 Do young people want to get tested in pharmacies?
	2.6 How to promote the service?
	2.7 How would pharmacies cope with the time and resources if the demand of the service increases?
	2.8 Do pharmacists discourage some people in low risk group from being tested?
Effectiveness / Outcome evaluation questions	
1.6 What is the proportion of potential clients tested and/or treated in pharmacies? (compared to GP, clinic and GUM)	2.9 How many clients with positive results do not attend for treatment and contact tracing?
1.7 What is the proportion of partners of infected clients treated in pharmacies? (compared to GP, clinic and GUM)	2.10 What is the prevalence of infection compared to other testers?
1.8 What are the socio-demographic characteristics of the client assessing the CT&T service?	

6.3.3.2 Initial plans for studies to address evaluation questions

Table 6-3 lists the outline plans for evaluation studies to answer the final list of evaluation questions.

The assessment of training needs of the pharmacy staff (Q 1.1) was planned and executed very early on, to provide timely results to aid the development of training of pharmacy staff in Lothian. However it was initially envisaged that this would be the first part of a pre-post survey, in that we would execute a follow up TNA survey once the service had become fully established in Lothian, to monitor self-report of training needs at that point (Q 1.2).

Pharmacy case studies were planned to understand pharmacy staff perspectives and any difference in perspectives across the staff groups, on perceived and actual facilitators of and barriers to the implementation of the service (Q 1.3 and Q 1.4). It had been intended to group the participating pharmacies based on service uptake (low, medium and high provision pharmacies) and then select two pharmacies from each group as case studies. It was hoped this would enhance understanding of the differences in uptake. Outline plans were for in-depth interview with the pharmacy manager, a pharmacist, and a member of support staff in each 'case' pharmacy. The further questions identified in the stakeholder survey (Q 2.6 to 2.8) were to be addressed through the same case study approach.

Clients' satisfaction with the service (Q 2.1) was to be assessed by a survey of *service users.* It was hoped to include a survey questionnaire and a reply paid envelope with the testing kits, allowing a voluntary completion of the questionnaire by the service users. Perceptions of clients regarding facilitators of and barriers to accessing the service (Q 1.5) were to be assessed in the same survey. At this stage plans to address Q 2.4 to 2.6 were fluid, but the possibility of a sub-study with *potential* service users was under consideration.

Table 6-3: Initial ideas for evaluation studies to answer the evaluation questions identified

Initial ideas for evaluation studies	**Evaluation questions to be answered** (question numbers correspond to those listed in table 6-2)
Pre & post TNA survey	1.1, 1.2
Pharmacy case studies	1.3, 1.4 2.6 to 2.8
Client satisfaction survey	1.5 2.1 to 2.6
CT&T outcome analysis using routine data	1.6 to 1.8 2.9 to 2.10

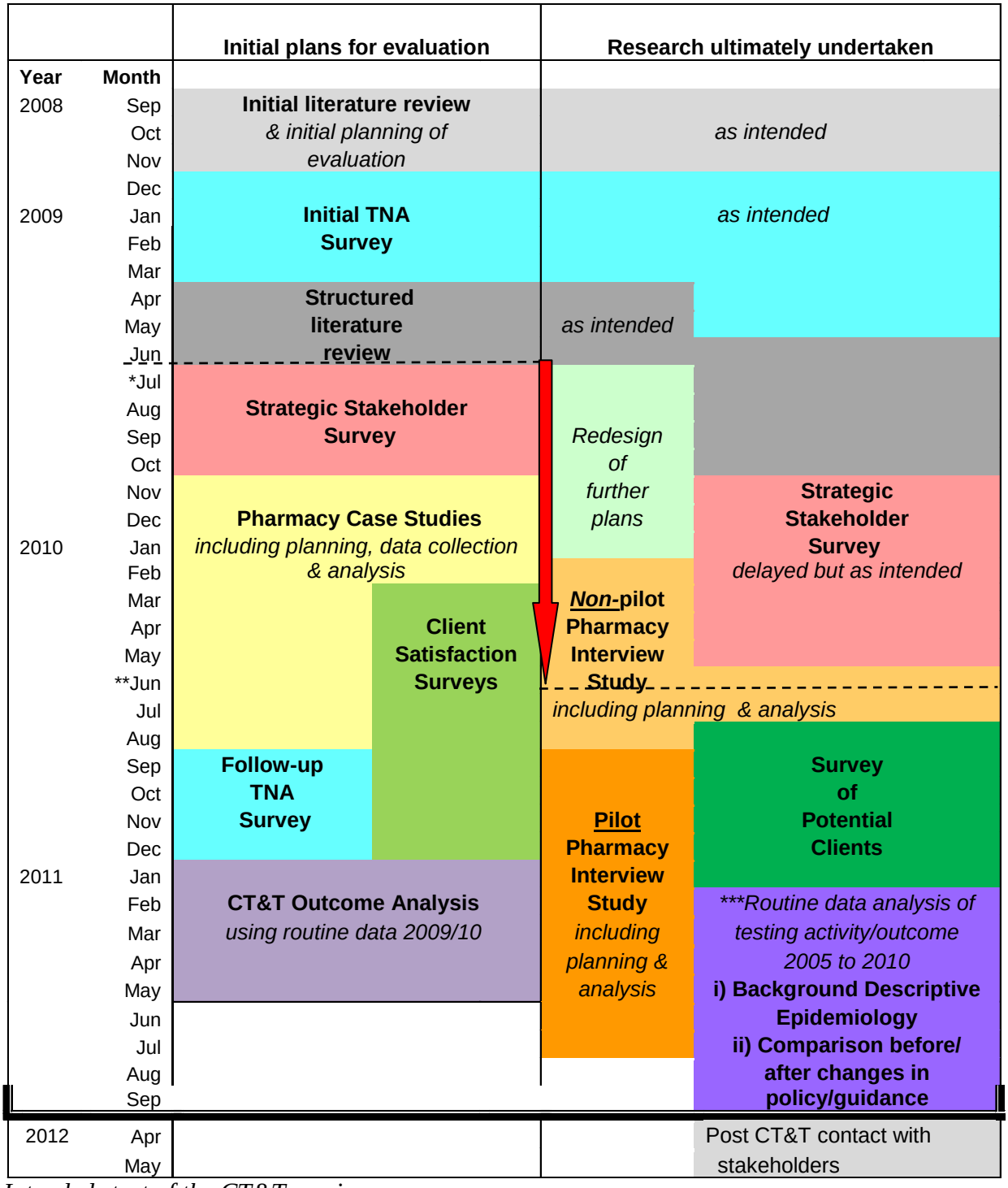
An outcome analysis was intended, using routine laboratory data. This would enable comparison of chlamydia testing and positivity rates across three settings, namely community pharmacies, GP practices and sexual health clinics (Q 1.6, 1.7, 2.10). A postal testing kit (PTK) number assigned to the forms to be filled in pharmacies, for laboratory documentation, would allow the identification of pharmacy testing in the laboratory dataset. The laboratory data would also allow analysis in terms of any variations in testing and positivity by age, gender and year of testing (Q 1.8). Analysis by deprivation categories of the clients was not possible, since the residential postcode of the clients was not documented on the PTK form.

6.4 Revisions to the evaluation studies originally envisaged

However, as has been described in Chapter 5, the CT&T service implementation was considerably delayed. As early as July 2009, it became clear that time was running out for completion of all the studies planned within the timescale of a PhD. It was therefore necessary to begin to re-think the evaluation plans. Then, once the service was launched, it became apparent that there was (to be) very limited uptake of the service. This means that further revisions were needed to study plans. The final straw was the termination of the service just under nine months after its initiation.

Therefore there had to be successive revisions of study plans, as events unfolded. However, at each point great care and thought was taken to try to ensure that the adapted evaluation plans would nevertheless elicit useful research findings – either for any future pharmacy-based chlamydia service, here or elsewhere, and/or for monitoring of chlamydia prevalence in Scotland. Figure 6-3 shows, in the left hand half, the evaluation studies initially planned, mapped against a timeline, with the dashed line showing the point at which the service launch was intended, initially (July 2009). The right-hand half presents the research studies ultimately undertaken, with the dashed line here indicating the actual launch of CT&T service (June 2010), with the red arrow indicating the delay to launch of service (11 months). The figure also shows the constraints of the PhD timeline - the thick black line indicating the end of the PhD funding period.

Figure 6-3: Chart mapping the initially-planned and finally-executed research studies shown against a timeline for the PhD, and the expected and actual launch dates of the CT&T service



** Intended start of the CT&T service*

***Actual start of the CT&T service*

**** This analysis is reported as a background work and needs assessment in chapter 3.*

The stakeholders' survey and the first part of the TNA survey were undertaken as originally intended. However, the very low uptake of the service meant that the pharmacy staff did not have any degree of real practical experience of service delivery, which might have allowed a later more 'informed' self-judgement of their competence to deliver the service, and/or need for further training. Nor, given the termination of the service, was there any great (formative evaluation) point in a reassessment. For these reasons it was felt that there was little value in the follow-up part of the original plan for the TNA survey, and so it was not undertaken. The design and methods for these two studies are outlined in 0 and 0 respectively.

However, all remaining studies had to be revised as circumstances overtook the CT&T service. The revisions to studies were as follows:

- The pharmacy case study design was not likely to be productive, because of the very low service activity within the pilot pharmacies, so it was redesigned as an **in-depth interview study with community pharmacists**, to ascertain their views on the CT&T service. The rationale and design for the study undertaken is outlined in 6.6.1.4.

- A client satisfaction survey was not feasible because of the paucity of service users. Only 4 clients requested the service from the pilot pharmacies. It was therefore decided that a substitute study of potential interest would be a **survey with potential clients**, to ascertain their views on the proposed CT&T service. The rationale and design for the study undertaken is outlined in 6.6.1.3.

- Similarly, the much delayed launch and low level of the CT&T service activity meant that there was no point in attempting to answer outcome evaluation questions (as listed in table 6-3) by analysis of routine testing data. However, it was judged that **analysis of routinely-collected chlamydia testing data for the previous 5 years (2006-2010)** was nevertheless of potential value, for two reasons. One was to provide an epidemiology of chlamydia with respect to Lothian Health Board. The other was to demonstrate a 'pilot' analysis of what would have been undertaken, had the CT&T service started sooner, and the

service been better taken up, to evaluate the impact of the introduction of the service on testing activity and positivity. A further purpose of this analysis was to assess the feasibility of using routine data for surveillance and monitoring trends. The analyses of routine data are therefore reported earlier in the thesis in chapter 3 as a background work for the CT&T service.

In addition to the above studies, after the CT&T service was terminated, it was felt that there is a need to investigate from key policy stakeholders about the reasons for delays in implementation of the CT&T service and also about the reasons for termination of the service in Scotland. Albeit a very small data, this part of data collection is reported in chapter 11.

6.5 Objectives of the research reported in this thesis

In Chapter 5, I have described the unforeseen circumstances that beset the CT&T service, and in section 6.4, I have outlined the revisions needed to initial plans for research studies. In so far as was possible, given the time and resource constraints on PhD research, the revisions were thought through to try to ensure that the research ultimately undertaken for this PhD would comprise an integrated set of studies contributing to the knowledge of implementing a pharmacy-based chlamydia service. If the CT&T service had continued, the study findings would have contributed to an overall evaluation of the CT&T service. However, these research studies also add to empirical knowledge that could be valuable to future planning of similar pharmacy-based chlamydia service elsewhere, and even for other public health service provision in pharmacies, as well as informing for the development of chlamydia screening services in other health care settings. The revised objectives of the PhD research reported in this thesis are as follows:

i. To provide an opportunity for strategic stakeholders to suggest the questions that the set of proposed evaluation studies should address and to give their feedback on different facilitators of and barriers to the CT&T service that might affect both its potential effectiveness and sustainability

ii. To assess the training needs of the pharmacists and the support staff for the provision of the proposed CT&T service

iii. To elicit the views of the potential clients about chlamydia services and to explore the factors that they perceive as facilitators of and barriers to their access to the CT&T service

iv. To investigate the factors perceived by community pharmacists as facilitators of and barriers to success of the CT&T service initiative, and reasons of pharmacists' participation or not in the service

v. to investigate the reasons for delays in the implementation of the CT&T service and its ultimate termination in Lothian and the rest of the health boards in Scotland

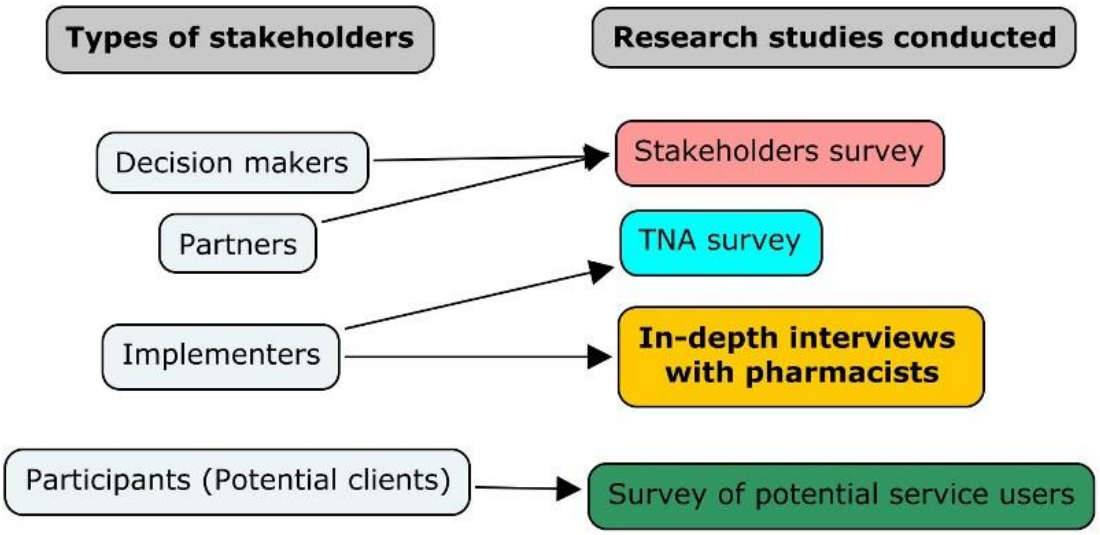
6.6 Outline of design and methods for the research studies reported in this thesis

This section outlines the studies undertaken for this PhD. The decision to use a particular method was based on the four evaluation standards as advocated by CDC - utility, feasibility, propriety, and accuracy. The studies undertaken are outlined below. More details of the objectives, methods, results and discussion of each study are given in the respective chapters.

6.6.1 Research studies undertaken towards an evaluation of the CT&T service

This section briefly describes the studies which at the time they were undertaken were expected to contribute to an evaluation of the CT&T service in Lothian. Figure 6-4 maps out the set of studies undertaken, involving four different groups of stakeholders as identified in the CDC framework of programme evaluation (Centers for Disease Control and Prevention, 2007). As stated in section 6.4, the first two studies were undertaken as initially envisaged, while the latter two had to be revised as events unfolded.

Figure 6-4: Research studies undertaken involving stakeholders of the CT&T service



6.6.1.1 Training needs assessment (TNA) survey

Ascertainment of competencies and training needs was required from pharmacists and their support staff to support the implementation of the CT&T service. The decision to assess their training needs through a postal survey was fairly straightforward. Firstly the information on the training needs of pharmacy staff was requested by the key stakeholders to be provided quickly, so that a customised training programme could be developed for pharmacists and their staff. Secondly, a competency framework for the provision of a pharmacy-based chlamydia service was already available (National Health Services and Harmonisation of accreditation group, 2008) and therefore it was decided to use it as a basis of eliciting their training needs against the identified items. Thirdly, the pharmacy staff often work on pro-rota basis. Hence it was felt that if they were invited for a postal survey, the likelihood of recruiting staff working on different days would be enhanced. Also, pharmacy environment is considered very busy and tight for work force, it was decided that it would be more suitable to use postal survey to gather this information at staff's own convenient time. Health technology assessment undertook an extensive review of the design and use of questionnaire for health service staff and patients (McColl *et al.*, 2001) and found that postal surveys are most suitable where the population is very geographically diverse and avoid the problem of respondents being unavailable when the interviewer calls.

Methodologically, a key advantage identified in the self assessment postal questionnaire is that no interviewer is involved during the process of self completion, so they avoid the potential for social desirability or interviewer bias and hence participants respond more truthfully to sensitive questions and are more comfortable in providing a critical or less socially acceptable response than when face-to-face with the interviewer (Bowling, 1997, McColl *et al.*, 2001). Hence a postal survey of the pharmacy staff was considered most suitable.

A training need assessment questionnaire was developed. This survey is reported in chapter 7. The results of this survey were communicated to the key stakeholders who then designed training evening for pharmacists and their support staff. The results were also communicated, on request, to pharmacist leads in other health boards in Scotland.

6.6.1.2 Strategic stakeholder study

The aims of the strategic stakeholder study were to confirm that the proposed evaluation questions were pertinent to them and to enable strategic stakeholders to suggest any other questions which they considered important. In addition, the survey was also designed to elicit the strategic stakeholders' views on various challenges that this service would face, and on the perceived outcomes of the new service.

For eliciting the views of strategic stakeholders, the choice of method was rather difficult. This was because of the type of respondents I was interested in eliciting their views - those stakeholders who hold some key position in their respective roles in the policy making of the CT&T service in Lothian. These stakeholders would comprise those with senior posts within the health promotion group, community pharmacy public health representatives, laboratory services for chlamydia testing, directors/managers of sexual health clinics and community outreach groups, and general practitioners with an interest in sexual health of young people.

In-depth interviews would have been the most obvious choice to ascertain such views. However I was as yet inexperienced in interviewing, and I was also fairly recently arrived from a different country, and so not yet very familiar with the organisation of such services in Lothian. Strategic stakeholders generally hold

senior-level positions in their respective organisations and it was thus felt it would be unlikely that they would be able to allocate the time needed for face-to-face interview with an inexperienced trainee researcher. Since the views/suggestions requested from them were potentially contentious, and ideally required some lone reflection by them on the issues, after priming. Furthermore, a part of this research would inform the decision on the evaluation questions for the rest of the studies and, at the time when the survey was decided, it was expected that there was limited time interval between this study and the initiation of the CT&T service. It was therefore decided that a survey would be a most appropriate way of eliciting information in the above mentioned circumstances. This survey is reported in Chapter 8, including details of the methods used. The results of the survey were used to modify and/or add additional questions investigated in the remaining studies.

6.6.1.3 Views of potential service users about the CT&T service

A study with potential service users is designed due to a number of reasons. Firstly, previous evaluations of community pharmacy chlamydia service for young people have identified, from service users, a number of facilitators of and barriers to access a pharmacy chlamydia service However these facilitators and barriers were mostly elicited in qualitative interviews undertaken as part of evaluations, and hence all interviewees were by definition utilising the pharmacy-based testing service. It is therefore unknown what actual or perceived barriers were preventing other young people (potential users) from accessing these services. Secondly, given published research is predominantly interview-based, the prevalence with which the various barriers or facilitators are perceived by potential young service-users is not known. Thirdly, it would be of interest to quantify young people's preferences regarding specific aspects of service delivery (such as alternative ways to obtain a testing kit, submit a urine sample, receive a test result notification, receive treatment and undertake partner notification) to inform future service developments according to the needs and preferences of young people. Lastly, it is not yet known if a young person's preference for a pharmacy-based chlamydia service is related to their previous experience of accessing other SH care from a pharmacy (such as EC), and / or to their previous chlamydia testing experience in other venues.

For eliciting the views of 'potential' service users, there were two inter-related decisions as to the selection of venues for recruiting young people in the study, and to the choice of research method. The very low uptake of the service meant that it was not possible to recruit informants from pharmacies. It was therefore decided to recruit participants from sexual health (SH) clinics. The rationale for recruiting young people from SH clinics is discussed in detail in chapter 9 (section 9.3.2). Briefly, it was anticipated that young people seeking sexual health care from these services are sexually active. Hence, this prevents a potential ethical issue of eliciting the sexual activity information from young people which was one of the eligibility criteria for this survey.

The second and the most important issue was the selection of the study design. One consideration was that, because target participants were not actual users but only potential users, the service itself needed to be explained before views could be asked. This might be difficult to achieve in the context of an interview or focus group. A further consideration was a risk to recruitment if the design decided required young people to participate in focus groups or in-depth interviews. This is discussed in detail in section 9.3.1.

The study design decided was therefore a self-complete questionnaire survey with potential service users. This study is reported in chapter 9. Study participants were recruited from three SH clinics in Lothian i.e. GUM clinic Edinburgh, Caledonian Youth (CY) and Midlothian Young People Advise Service (MYPAS).

6.6.1.4 Views of community pharmacists about the service

It had become evident during the CT&T service implementation that 54 out of 76 invited pharmacies did not agree to provide the CT&T service, and I was interested to ascertain why many invited pharmacies did not take part in the pilot CT&T service. It was therefore decided to recruit both pilot pharmacists (those who provided the CT&T service) as well non-pilot pharmacists (those who were invited to take part in the CT&T service but decided not to do so). The purpose was to understand the decision making process of taking part in the service, hence understanding why some pharmacies took part in the service and other did not. The

experience of those who took part in the service was explored and their views on the discontinuation of the service were evaluated.

An initial consideration was given to undertaking focus groups separately for the two categories of pharmacists. Eventually this was considered not feasible for the current research because in addition to the logistic issue of assembling these busy professionals at the same time, there were methodological difficulties with this research technique as well. Patton (1987) indicated that focus group are typically conducted with people who do not know each other. Since, it was likely that the potential participants in this professional focus group would know each other; it was not possible to guarantee confidentiality and anonymity in their responses. Moreover, the 'problematic silences (lack of disclosure) and problematic speech (strategic shaping of comments)' in group discussions might also become more pronounced when the participants know each other (Hollander, 2004). These processes limit the usefulness of focus groups as a tool for understanding individual thoughts, feelings, or experiences especially in the context where health professionals are allowed to interact together. While the issue of 'social desirability bias' could be completely ruled out in in-depth interviews or even in surveys, an in-depth interview is more suitable for eliciting detailed descriptions of people's knowledge, views, understanding, interpretations, experiences and interactions to meaningfully understand social reality (Mason, 2002).

For the pharmacists' qualitative interviews, the preference was to conduct the interviews face-to-face. However where this was difficult, telephone interviews were conducted. Interviews conducted face-to-face also offer the advantage of the interviewer being able to probe the participant for responses and clarify any ambiguities (Creswell, 2007, Mason, 2002, Patton, 1987). Many detailed and complicated questions can be asked. Face-to-face interviewing also offers advantage of understanding the body language of the respondent, hence further enriching the qualitative data. A theoretically informed approach, by using the theory of planned behaviour (TPB), allowed the development of interview guide (Ajzen, 1991). This study is reported in detail in chapter 10. A rationale for using TPB for this research component is also discussed in detail in section 10.3.4.

6.6.1.5 Additional data collection following the cancellation of CT&T service

In April 2012, about 12 months after the cancellation of the CT&T service, three key stakeholders of the CT&T service and a Scottish government representative of the Pharmacy and Medicines Division of the Scottish Government (PMDSG) were contacted through email, to elicit their recollection/views on the events leading up to that cancellation. The method and findings of this part of the data collection after the CT&T service terminated is reported as a short study in chapter 11.

6.7 Data analysis

The current thesis includes both the qualitative and quantitative studies. An overview of analyses undertaken for different studies is given below:

6.7.1 Quantitative data analysis

6.7.1.1 Overview of statistical methods

The statistical tools used to analyze the data collected from the quantitative research, employed a range of statistical methods, encompassing descriptive statistics, hypothesis testing and statistical modelling. Specialised statistical methods used will be detailed in the relevant chapters. The descriptive statistics reported frequencies and percentages for categorical variables. Association in r x c tables was tested by chi-square (χ^2). For the likert scale responses, the association has been tested and summarised by means of the non-parametric Kruskal-Wallis test. Spearman's rank order correlation (rho) is used in some places where it was felt important to report the strength of association between ordinal likert response variable and other categorical variable of interest. In terms of p-value, the Spearman's correlation coefficient test is equivalent to the Kruskal-Wallis test but has the benefit of giving a correlation coefficient that shows the strength and direction of association that exists between two variables. Confidence intervals (95%) are presented wherever informative.

6.7.1.2 Statistical software

Data entry for potential service user's survey and training needs survey were undertaken in Microsoft ACCESS software. This allowed controlled data entry with checks to avoid errors during data entry. However further data cleaning was done by exporting data into Statistical Package for Social Sciences (SPSS version 17) and running frequencies and ranges to identify any obvious errors, and undertaking cross tabulation of variables which were related. For the quantitative analysis, SPSS was used for further coding of data and analyses. Graphical methods have been used extensively, and due to the greater graph functionalities, have been produced using Microsoft Office Excel software. In some places, where exact values were felt to be more informative, the data table was also presented with graph. For the routine data analysis, the de-duplication and multiple imputations of missing values were also undertaken in SPSS.

6.7.2 Qualitative data analysis

For the analysis of in-depth interviews with the pharmacists, a framework approach was used (Ritchie and Spencer, 1994) This was carried out by drawing on a-priori issues and questions derived from the aims and objectives of the study (deductive) as well as those identified from multiple readings and interpretations of the raw data (inductive). A number of a-priori themes were also identified from a structured literature review; more themes were identified based on the theory of planned behaviour. A full account of the framework analysis is given in section 10.3.7. The following principles also guided my qualitative data analyses (Ulin *et al.*, 2002), which were consistent with Realistic Evaluation as described by Pawson & Tilley:

i. People differ in their experiences and understandings of reality; how respondents interpret and present a situation might not reflect assumptions made by a researcher.

ii. A social phenomenon can only be understood within its own context.

iii. Exceptional cases may yield insight into a problem or new leads for further inquiry.

iv. Understanding of human behaviour emerges slowly and nonlinearly.

v. A theory not only guides qualitative research, but is also a result of it.

Data collection and analysis ran in parallel so that findings that emerged from the current case were tested in subsequent cases.

6.7.2.1 Data management for qualitative analysis

All the interviews were tape recorded and transcribed verbatim with respondents' permission. Field notes were made immediately after each interview. Data management was aided by loading all the transcripts and the field notes to QSR NVIVO-8. Field notes were treated as memos attached to each transcript.

6.8 Ethical considerations

In the UK, 'Research Governance Framework for Health and Social Care' (Department of Health, 2005) set standards for research, including mechanisms for delivery, requirements for monitoring and assessment of research undertaken and

guidelines on research data storage. It also provides clarity on the roles of the sponsors, researchers, participants, host organisations and others involved in a research study. Under the framework, projects classified as research and those involve NHS would require ethical review by a NHS Research Ethics Committees (REC) and/or approval from NHS Research and Development (R&D) offices. The remit of NHS REC in England is outlined in 'Governance Arrangements for NHS Research Ethics Committee' (GAfREC) (Hocking *et al.*, 2008). A separate but similar document has also been produced for Scotland. Requirements for ethical review of NHS research are set out in paragraph 3.1 of GAfREC. It suggests that review and approval from the REC is required for any research proposal that would involve patients, service users, care professionals and other staff or volunteers, or their organs, tissue or data. This also includes all potential research participants recruited by virtue of their past or present use of NHS, including NHS patients treated under contracts with private sector. Similarly research that requires access to past or present NHS patient records, use of, or potential access to NHS premises or facilities (including NHS staff) also requires independent review by a local research ethics committee. Appendix 20 provides the NHS REC guidelines on the distinction between research and evaluation.

The training needs survey was identified from the outset as a service evaluation. Furthermore, it involved respondents who are actually outside of NHS. In any event, the stakeholders were clear that as a service evaluation it did not require ethical approval from the relevant ethics committee. However for the other studies designed to be part of the CT&T service evaluation, given they would collect data from NHS employees or service users, or would analyse routine NHS data, advice was sought from the scientific officer of the South East Scotland research ethics committee. After perusal of protocol, all these evaluation study components were judged as service evaluation, in accordance with the governance arrangements for research in the UK NHS (Ref number NR/0911AB9 and NR/1005AB8) (Appendices 21 and 22), and as such were judged not to require formal review by an NHS ethics committee. At that time, when the potential service users' survey was conducted in 2010, our research Centre had not formalised its rules for ethical approval, and in general if NHS studies were deemed not to need ethical approval by NHS REC rules, then they

were not ethically reviewed. However, it is now the case that all research analysing or collecting data from any human participant, requires ethical approval. For analyses of *anonymised* data (no new data collection) this is very light touch, but for all studies involving *new* data collection, ethical approval is required. Therefore, if any of these 4 studies were undertaken now, then I would now have to seek ethical review by the Centre of Population Health Sciences Ethical Review Group.

Regardless of the fact that formal ethical approval was not obtained, the conduct of all the studies sought to ensure good ethical practice. The information sheets to study participant emphasized the strictly voluntary nature of the research. The act of mailing back the questionnaire implied respondent consent. In the case of in-depth interviews, where I had direct contact with the respondents (either face-to-face or in telephonic interviews), the voluntary nature of the research was further emphasised both verbally as well in the information sheet for the participants. Information that could be identified to individuals was kept in a password-locked computer or locked filing cabinet. Further details on ethical considerations are discussed in the relevant study chapters.

6.9 Chapter overview

This chapter provides an overview of research undertaken for this PhD and explains some of the revisions to the research designs needed due to the delayed implementation and then negligible uptake of the CT&T service. (One substantial change to plans has been reported in chapter 3 - the decision to undertake the routine laboratory data analysis, and the before-and-after policy change impact analysis.) Chapter 6 has also explained briefly the rationale for choosing specific study designs for each research component, and gives an overview of analytical methods employed in the studies, and a discussion of ethical issues that have been considered for the various study components. The next chapters (7-10), provide in turn details of each study undertaken for this thesis.

CHAPTER 7: TRAINING NEEDS ASSESSMENT OF PHARMACISTS AND SUPPORT STAFF FOR THE CT&T SERVICE

7.1 Introduction

Previous evaluations of pharmacy chlamydia service have recommended that for a successful implementation of the chlamydia service in community pharmacies, both the pharmacists as well as the front-line community pharmacy workforce should be trained (Dabrera *et al.*, 2011, Taylor *et al.*, 2007). Moreover, evaluations in the UK have uncovered significant issues such as the unavailability of trained pharmacists to hand over the chlamydia testing kits to the potential clients (Baraitser et al., 2007, Brabin et al., 2009b), thus limiting the service uptake. It has also been found, in evaluation of opportunistic screening for chlamydia among general practitioners, that the success of screening depends on health providers having an adequate level of awareness and knowledge about chlamydia infection, and possessing effective communication skills (Ginige *et al.*, 2007). Therefore, in discussion with the key stakeholders of the CT&T service (see definition of key stakeholders in section 6.3.1.1), it was agreed that the first research to be undertaken would be an assessment of training needs, so that these findings could be utilised to inform planning of training programmes that could be offered prior to launch of the CT& T service. It was therefore decided to design a research study to ascertain respondents' self-reported competencies for delivering CT&T service, and corresponding training needs.

A case study evaluation undertaken to understand the skill mix in community pharmacies has shown that the role of pharmacy support staff has expanded vertically into areas such as management of service provision (Mullen, 2004). However, while pharmacy support staff generally have taken on additional tasks, they are only informally trained, often by shadowing or receiving explanations from another support staff member or from the pharmacists. It is noteworthy that other studies have found that support staff were willing to undertake further training during work time (Dabrera *et al.*, 2011, Taylor *et al.*, 2007). It was therefore decided that our training needs assessment would involve not just pharmacists but also pharmacy

support staff. Therefore this research aimed to identify the training needs among different categories of pharmacy staff. It is intended to forward the results of this survey to the key stakeholders so that a customized training programme for different categories of pharmacy staff could be developed.

7.2 Objectives

The objectives of this study were:

i. to identify, with respect to delivery of the forthcoming CT&T service:

    a. the self-reported *competencies* of community pharmacists and their support staff;

    b. the self-reported *training needs* of the pharmacists and their support staff;

ii. to carry out further analysis to:

    a. identifying within respondent (paired) discordance of the categorisation of insufficient competency and substantial training needs, for pharmacists and their support staff

    b. exploring the association of prior sexual health training of the pharmacist with self-reported training needs for the CT&T service

7.3 Methods

7.3.1 Study design

A self administered postal survey was undertaken with pharmacy staff in all the 166 community pharmacies in Lothian. The rationale for choosing self administered postal survey for this study has been described in section 6.6.1.1.

7.3.2 Development of the questionnaire

Methods commonly employed to assess training needs and competence of pharmacists includes self assessment of training needs and/or respondent's rating of a list of competence/ skills provided by the researchers (Cameron et al., 2006, Pfleger et al., 2008). A number of issues were considered while deciding to undertake a self assessment survey of the pharmacy staff. Firstly, for diseases for which there is not reasonably frequent consultation with clinical staff, knowledge tests are considered inappropriate (Taylor, 1998 , Crilly, 1998). Since this survey was undertaken prior to the start of the CT&T service, with pharmacy staff having not yet had any practical experience in provision of the chlamydia-related service, it was decided that a knowledge test would be inappropriate at this stage. It was felt more appropriate to undertake self assessment by the pharmacy staff of competency and training needs, as a first step prior to launch of the new service. A further consideration was that a number of key competencies, such as counseling skills would require assessment by observing performance which was not feasible within the resources of PhD research. Colhart et al. (2008), in their systematic review on the effectiveness of self-assessment by health professionals of their learning needs, did not find sufficient evidence regarding the valid assessment of learners need against which to compare self-assessed needs. The reliability and validity of any external measure of performance as a 'gold standard' had also been questioned (Colthart *et al.*, 2008). Finally, the key stakeholders had intimated a fairly urgent requirement for some insight to the training needs of pharmacy staff for CT&T delivery, so it was decided that self assessment of competency of pharmacy staff would be most appropriate to collect the information needed to inform advance training for CT&T.

Studies which have used predefine training need items in a questionnaire for respondents rating were either preceded by a qualitative study alone (Pfleger *et al.*,

2008) or aided with literature review (Feletto *et al.*, 2010), used validated questionnaires (Scott, 2010) or generic set of proposed competencies required for accreditation (Fitzgerald *et al.*, 2009). Since the competency and training framework for the accreditation of community pharmacists for delivering chlamydia screening and treatment was already laid out (National Health Services and Harmonisation of accreditation group, 2008), I used this framework as a basis for the items included in the training needs questionnaire.

The questionnaire was structured into three parts (Appendix 25). Part one ascertained the demographic information about the respondent. The remainder addressed the self-reported competencies and training needs for different aspects of the intended service. Part two of the questionnaire was applicable to all pharmacy staff (15 items). Part three addressed competencies required by pharmacists only, so was to be completed only by them (8 items). For each competency statement, the respondent was asked to respond twice, indicating: (i) the extent to which the competency applied in his/her case, on a 4 point likert scale (1=not at all; 2=somewhat; 3=fairly well; 4=very much so), and (ii) the level of training in the competency he/she judged as needed in his/her case, on a 4 point likert scale (1=none needed; 2=refresher; 3=top-up; 4=full).

Three opportunities for free-text comments were provided, regarding suggestions for training that would be helpful in delivery of the CT&T service and any concerns regarding the proposed service.

Initial testing of the questionnaire was undertaken with a lead pharmacist and two sexual health specialists, and this resulted in changes to clarify the meaning of questions and the order of the competency items. The questionnaire was then pre-piloted with colleagues uninvolved with the CT&T service, to record the time taken for completion of questionnaire and to comment on the comprehensibility of the questionnaire. The time taken was approximately 10 minutes and all the questions were judged to be clear and easy to understand. Therefore no further changes were made to the questionnaire.

7.3.3 Recruitment of the study participants

A list of all the 166 community pharmacies operating in NHS Lothian was provided by the Lothian pharmaceutical public health consultant. This total number of pharmacies in Lothian made it feasible to survey all of them, so no sampling was required and a formal sample size calculation was not undertaken. The pharmacy director/manager of each pharmacy were sent an introductory letter (Appendix 23), giving details of the study and 5 questionnaire packs. Each pack consisted of an invitation letter to the respondent (Appendix 24), a questionnaire (Appendix 25), and a reply paid envelope. I took advice from the key stakeholders regarding the number of questionnaires that should be sent to each pharmacy. It was suggested that 5 questionnaires would be sufficient to generally cover the staff within the pharmacy eligible for this survey. In case of shortage, the invitation letter to the pharmacy managers advised that more questionnaire packs could be requested if these were needed (by emailing the investigator). This resulted in sending 12 additional questionnaires to three pharmacies.

The pharmacy managers were requested to distribute packs to all members of staff having direct dealings with pharmacy clients. All questionnaires were anonymous with respect to identification of individual members of staff, but coded for a specific pharmacy. After 4 weeks, reminders were sent to those pharmacies (using the same initial pharmacy manager address) from where not all the 5 questionnaire had yet been received. This was suitably worded to be ignored if all eligible respondents within their pharmacy had already replied. For the subset of pharmacies from which no returns at all had been received (n=91), an additional blank questionnaire was enclosed with the reminder letter.

7.3.4 Statistical analysis

All analysis was undertaken in SPSS Version 17.0. Descriptive statistics were produced and the associations of staff categories with respondent characteristics were tested using chi square test. In order to simplify tabular/graphical reporting of ordinal response for competency and training needs items on likert scale, each item response is transformed into a binary categorical variable, with responses of ‘not at all’ or ‘somewhat’ for a competency statement (rather than fairly well or very much so)

being classified as *'insufficiently competent'* and training need responses of 'full' or 'top-up' being classified as indicating need for *'substantial training'*. Furthermore, to make the assimilation of the results easier, I have structured the list of 15 'all staff' response items into four thematic domains: knowledge about STIs in general and chlamydia infection in particular (3 items); understanding about chlamydia screening (3 items); communication with client in general, and on sexual health issues (4 items); and communication around screening service (5 items). Graphs displaying competency responses show also a vertical dashed threshold line at 50%, to enable easy visual assessment, overall or within domain, of items where more than half of all respondents have been classified as reporting 'insufficient competency' or they require 'substantial training'. The associations of staff categories with self-reported competency and training need were tested by the Kruskal-Wallis method applied to the ordinal scale responses on the original likert scale. A p-value of <0.05 was considered statistically significant.

I also examined discordance in reporting of insufficient competency and substantial training needs. Responses for each item were therefore examined in terms of a within-respondent (paired) discordance of the categorisations of insufficient competency and substantial training need, tested by the z-test for comparing paired proportions (each competency categorisation against its corresponding training need categorisation). Statistically significant discordance between the insufficient competency and substantial training need for an item is calculated as the difference in (paired) proportions, and reported as percentage point difference (ppd) and confidence interval (C.I.). This test was undertaken for items which showed marked discordance within individuals of insufficient competence and substantial training needs.

Free text comments have been coded in terms of the main themes that emerged and reported quantitatively, but where considered helpful to providing further insight, direct quotations have been included (referenced with unique but anonymous code number of respondent, categorised as P (pharmacist), T (technician) or CA (counter assistant).

7.4 Results

7.4.1 Response rate and demographic characteristics of the respondents

A total of 25.2% (235/933) completed questionnaires were returned, from 88 (53%) pharmacies. This gives an average of 2.67 completed questionnaires per pharmacy. Of all the respondents, 41% were pharmacists, while 32% & 26% respectively were technicians and counter assistants. Overall, the respondents were predominantly female (85.5% overall).

Table 7-1 shows the breakdown of some information across the three staff categories. In contrast to pharmacists, where about 70% were females, more than 95% of the technicians and counter assistants were female. The largest proportion of pharmacists (40%) was aged between 25 and 34 years as opposed to pharmacy technicians and counter assistants, where 51% and 35% of them were in the next older age band of 35 to 49 years. There was striking disparity across staff groups in proportions indicating they had received previous sexual health (SH) training (55% of pharmacists vs. 7% of the other groups). Of the 53 pharmacists who had received training, 35 (62%) received this in the context of provision of EC through pharmacies. There was also a significant difference between staff groups in expressed enthusiasm for the proposed chlamydia service, with pharmacists and technicians most enthusiastic (79% and 84% highly or moderately enthusiastic, versus 61% for counter staff (χ^2 value 10.041, df 2, p-value=0.007).

Table 7-1: Socio-demographic profile and other characteristics across the three staff categories

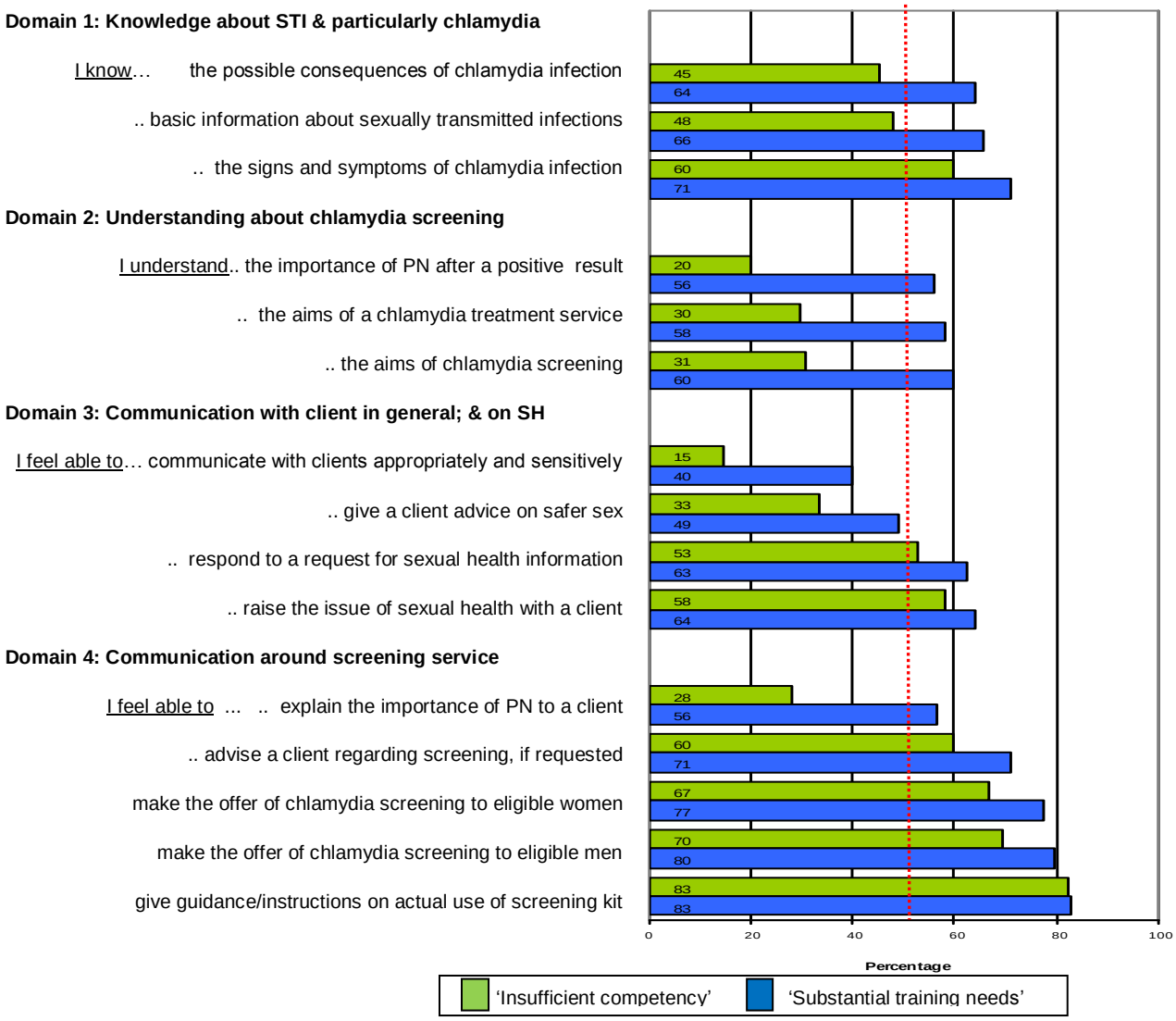
Characteristics	***Pharmacist*** *(N=97)*		***Technician*** *(N=74)*		***Counter Assistant*** *(N=61)*		**p_value**
	n	**%**	n	**%**	n	**%**	
Gender							
Female	69	71.1	72	96.0	58	95.1	0.000
Age							
< 25years	11	11.3	9	12.0	18	29.5	0.000
25 to < 35 years	40	41.2	13	17.3	3	4.9	
35 to < 50 years	26	26.8	38	50.7	21	34.4	
>= 50 years	20	20.6	15	20.0	19	31.1	
Received previous Sexual Health training	53	54.6	5	6.8	4	6.7	0.000
How often do you deal with someone asking for advice on Sexual Health							
Every week	24	25.0	4	5.4	3	5.1	0.000
Every month	12	12.5	4	5.4	4	6.8	
Very Seldom	48	50.0	40	54.1	27	45.8	
Cant recall	12	12.5	26	35.1	25	42.4	
How enthusiastic do you feel about the proposed programme							
Not at all or Somewhat	20	20.8	12	16.4	23	39.0	0.037
Moderately	43	44.8	33	45.2	19	32.2	
Highly	33	34.4	28	38.4	17	28.8	

7.4.2 Competency levels and training needs of pharmacy staff

7.4.2.1 Competence relevant to all staff: self-reported competencies and training needs of all staff combined

Figure 7-1 shows the proportion of responses coded as indicating insufficient competency and substantial training need for all staff items. It can be seen that in respect of insufficient competency the 50% threshold was exceeded for only 7 of the 15 items, compared to 13 items for substantial training need. Looking at responses by domain, insufficient competency was most prevalent for the 4th domain items on communication around screening service (60% to 83% for four of the five items), intermediate for 1st domain items on knowledge about chlamydia (45% to 60%), mixed for the 3rd (communication in general and on sexual health) domain items (15% to 58%), and uncommon in items of the 2nd domain, understanding service aims (20% to 31%). In the 4th domain, insufficient competency was most prevalent for giving guidance on the actual use of the screening kit (83%) and making the offer of chlamydia screening to eligible men (70%) and to eligible women (67%). Proportions responding substantial training need were generally higher, and a similar pattern by domain was evident, in that the highest prevalence of substantial training need responses were found in the 4th domain-communication around screening service (56% to 83%), and there was a mixed picture in the 3rd domain (40% to 64%). However the rates across the other two domains were more similar (56% to 71%).

Figure 7-1: Competencies relevant to all staff - in respect of each, percentage of all pharmacy staff responses classified as 'insufficiently competent' and/or as having 'substantial training need'



7.4.2.2 Competencies relevant to all staff: self reported competencies and training needs, subdivided by staff categories

Responses to competencies and training needs were also examined separately within the three staff groups. Tables 7-2 and 7-3 show for each competency, separately across the three staff categories, the proportions categorised with insufficient competency and substantial training need. Insufficient competency and substantial training need showed an increasing trend across the three staff groups, with pharmacists least likely to be thus classified and counter assistants most likely (Kruskal-Wallis tests were statistically significant for all but one competency item – see Tables 7-2 and 7-3 for p-values). For 4th domain competencies, more than half of respondents were classified as having insufficient competency in the case of only three of the items for the pharmacists (62% to 79%), four items for technicians (68% to 85%) and all five items for counter assistants (51% to 83%). In the same domain, more than half of the pharmacists were classified with substantial training needs for four items (56% to 77%) in contrast to all 5 items for technicians (71% to 85%) and counter assistants (77% to 90%).

Regarding the other domains (comprising 10 items), there were only three items where over half of pharmacists were classified with substantial training need - signs and symptoms of chlamydia (58%), advice regarding screening (56%) and raising the issue of sexual health (52%). In contrast, for CA this was the case for all 10 items (60% to 88%), and for technicians for 9 items (55% to 81%).

Table 7-2: Proportion of staff category coded as indicating insufficient competency and/or as having substantial training needs in respect of each competency - for domains 'knowledge' and 'understanding'

Competencies grouped by domain category	**Proportion indicating Insufficient Competency**				**Proportion indicating Substantial Training Need**			
Domain 1: Knowledge *about chlamydia infection*	Pharmacist (n=95)	Technicians (n=74)	Count. Assist (n=61)	P-value	Pharmacist (n=95)	Technicians (n=74)	Count. Assist (n=61)	P-value
possible consequences	24	52	70	<0.001	51	70	79	<0.001
information about STIs	32	49	71	<0.001	49	73	86	<0.001
signs and symptoms	41	68	78	<0.001	58	77	85	<0.001
Domain 2: Understanding *re chlamydia services*								
importance of partner notification if +ve result	8	23	33	<0.001	38	67	73	<0.001
aims of chlamydia treatment service	9	36	52	<0.001	36	71	79	<0.001
aims of chlamydia screening	12	36	52	<0.001	38	70	84	<0.001

* by responding 'Not at all' or 'Somewhat' in respect of this competency statement

** by responding that training need in respect of this competency is 'Top up' or 'Full'

$ Kruskal-Wallis p-value for ordinal response of items vs. pharmacy staff category

Table 7-3: Proportion of staff category coded as indicating insufficient competency and/or as having substantial training needs in respect of each competency – for domains 'communications with client' and 'communication around screening service'

Competencies grouped by domain category	**Proportion indicating Insufficient Competency**				**Proportion indicating Substantial Training Need**			
Domain 3: Communication** with client in **general and on sexual health (SH)	Pharmacist (n=95)	Technicians (n=74)	Count. Assist (n=61)	P-value	Pharmacist (n=95)	Technicians (n=74)	Count. Assist (n=61)	P-value
communicate appropriately and sensitively	8	16	23	0.298	29	40	60	<0.001
give advice on safer sex	17	39	53	<0.001	29	55	75	<0.001
respond to request for SH information	37	58	71	<0.001	44	69	88	<0.001
raise the issue of SH	50	61	67	0.006	52	67	81	<0.001
Domain 4: Communication** with clients regarding **screening service								
explain importance of partner notification	10	31	51	<0.001	34	71	77	<0.001
advice regarding screening, if requested	38	72	78	<0.001	56	81	84	<0.001
offer of screening to eligible women	62	68	72	0.030	72	79	84	0.005
offer screening to eligible men	63	73	75	0.026	73	85	84	0.006
guidance re use of screening kit	79	85	83	0.017	77	85	90	0.032

* by responding 'Not at all' or 'Somewhat' in respect of this competency statement

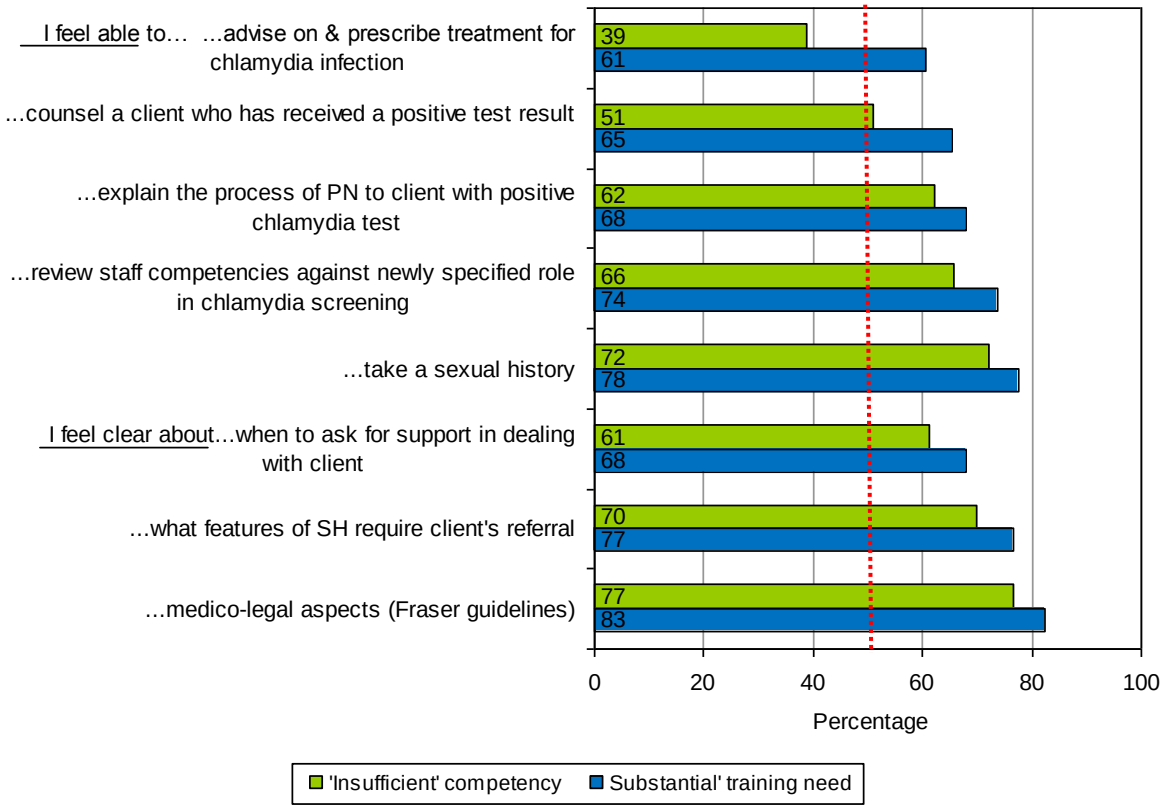
** by responding that training need in respect of this competency is 'Top up' or 'Full'

$ Kruskal-Wallis p-value for ordinal response of items vs. pharmacy staff category

7.4.2.3 Pharmacist only competencies: Self reported competencies and training needs

Figure 7-2 shows, for pharmacist-specific competencies, the proportion of responses coded as indicating insufficient competency and substantial training need. It can be seen that for 7 out of 8 items over half of all pharmacist respondents were classified as having insufficient competency and for all competencies, over half were classified as having substantial training need. The competencies with highest prevalence of insufficient competency and corresponding substantial training need were items such as 'clear about the medico-legal aspects (Fraser guidelines)' (77% and 83% respectively), 'able to take a sexual history' (72% and 78%), 'clear about what features of sexual history require client referral' (70% and 77%) and 'able to review own and staff competencies against newly specified role in chlamydia screening' (66% & 74%).

Figure 7-2: Pharmacist-specific competencies – in respect of each, percentage of pharmacist responses classified as' insufficiently competent' and/or as having 'substantial training' needs .



7.4.2.4 Overview of training needs

Table 7-4 shows for each of the three staff categories, the ten competencies most frequently classified as having substantial training needs. To enable cross-referencing between training needs identified in more than one staff categories, any competency in more than one column is colour-shaded, in a distinctive colour.

For pharmacists, 7 out of 10 competencies identified as needing more training were 'pharmacist specific'. The largest proportions of pharmacists indicated training need for medico-legal aspects (Fraser competency) (83%) and taking sexual history (78%). It is interesting to note that for training needs of technicians and counter assistants, all competencies except one in their 'most frequently classified' lists, were similar, though in different order. A high proportion of all the three staff categories indicated 'substantial' training needs (as categorized for analysis) for items within the domain of communication around screening service (77% to 72% for pharmacists, 85% to 79% for technicians and 90% to 84% for counter assistants). Furthermore, a high proportion of technicians and counter assistants indicated 'substantial' training needs for items within the domain of knowledge about STI (77% to 70% of the technicians, and 86% to 79% of counter assistants).

Table 7-4: For each of the three staff categories, the ten competencies most frequently classified as having substantial training need

Pharmacists		**Technicians**		**Counter Assistant**	
Training needs Item	*%*	*Training needs Item*	*%*	*Training needs Item*	*%*
Medico-legal aspects	83	Guidance re use of screening kits	85	Guidance re use of screening kits	90
Take a sexual history	78	Offer screening to eligible men	85	Respond to request for SH information	88
Features of SH require client's referral	77	Advice regarding screening, if requested	81	Basic information about STI	86
Guidance re use of screening kits	77	Offer screening to eligible women	79	Sign and symptoms of chlamydia	85
Review staff competency against role in chlamydia screening	74	Sign and symptoms of chlamydia	77	Offer screening to eligible women	84
Offer screening to eligible men	73	Basic information about STI	73	Offer screening to eligible men	84
Offer screening to eligible women	72	Aims of chlamydia treatment service	71	Advice regarding screening, if requested	84
Explain the process of PN to clients	66	Explain the importance of PN	71	Aims of chlamydia screening	84
Counsel a client with positive test results	65	Aims of chlamydia screening	70	Raise the issue of SH with clients	81
Advise on and prescribe treatment for chlamydia	61	Possible consequence of chlamydia infection	70	Possible consequence of chlamydia infection, *tied with*	79
				Aims of chlamydia treatment service	79

7.4.2.5 Suggestions regarding training that would be helpful for delivery of a new CT&T service

There were diverse views as to which staff categories need to be trained. Some pharmacists (n=5) proposed that training should be '*mandatory'* to the pharmacists. It was also suggested that locum pharmacists should be trained, in case the regular pharmacist in not available when a potential service user requests the CT&T service. It was common that respondents suggested training of all staff (n=6).

There was considerable variation in respondent's preferences for format of training. They requested visual training materials (n=6) such as *video clips* or a *DVD,* particularly on aspects such as '….*how to approach and deal with clients waiting to access this service'* (P-117) and '…*chlamydia testing and treatment service in action'* (P-212). Two respondents felt strongly that the '*training should not be distance learning'*, while other suggestions were a clear and well designed training pack, with MCQs, or an online reference tool.

Respondents commented that general STI training was required, and not chlamydia solely/specifically, and were of the view that there should be training for technicians and counter assistants with regards to sensitive communication on sexual matters.

7.4.2.6 Respondent's concerns about proposed CT&T service

When respondents were asked to comment on their concerns about the proposed service, 23% (n=51) specify some of their concerns. The most common concerns raised by pharmacists were workload (n=21) and time (n=19) required for consultations for the CT&T service. One pharmacist noted her concerns as follows:

> *'It is yet another service thrust upon pharmacists that we have no time to deal with. Just because we are open on weekends doesn't mean we should be taking on the roles of doctors/nurses/GUM specialists'. (P-161)*

Another pharmacist indicated that small independent pharmacies would not be able to cope with this workload, particularly those pharmacies with only one pharmacist.

> *'In single pharmacist's pharmacies, this is not possible at the moment'. (P-112)*

Many pharmacy staff also showed concerns about lack of or inadequate refresher training (n=17), being unclear about different components of the service (n=14) and

having doubts about the effectiveness of the service (n=7), and about lack of promotion or publicity of the service (n=5). There was also concern that low demand for the service would mean training would be forgotten by the staff. Some identified privacy and confidentiality concerns as reasons for expected low uptake (n=5). An owner of a small pharmacy from a village shared his experience of a very low uptake of EC service and indicated that a pharmacy in a small village poses a risk of not providing a confidential service.

> *'[In a] small community pharmacy, local people work in store and know everyone in village. Doubt if youngsters will come in- [We also] have poor uptake of emergency contraception service' (P-205).*

Some technicians (n=3) highlighted concerns on health and safety issues related to handling of the sample and others expressed doubt as to being adequately clinically trained to provide such kind of service (n=4). A technician sees her little role in providing such services.

> *'I think this should be the pharmacist job as he is the professional and best qualified to do this' (T-136).*

7.4.3 Further analyses of training needs and competency responses

7.4.3.1 Analysis of within-respondent 'discordance' in response regarding competence and training need for the same competency

In the methods section, I have explained the intention to look at within-respondent discordance of responses to competency and training need items. Across all staff items, there was a general tendency for categorisation with substantial training needs being more common than insufficient competency. That is, a substantial number of respondents reported adequate competency but nevertheless indicated a need to substantial training for that aspect of the service. These can be seen in the figure 7-1 as those competencies with greatest disparity in the pair of column heights. The greatest discordance (in the sense of 'substantial training need' despite *not* being categorised as having 'insufficient competency') was for the competencies understanding the importance of partner notification (37 percentage point difference *(*ppd), 95% C.I. 28 to 41 ppd), understanding the aims of chlamydia screening, (29 ppd, 95% C.I. 21 to 33 ppd), understanding the aims of chlamydia treatment service (29 ppd, 95% C.I. 21 to 33 ppd), explaining partner notification (30 ppd, 22 to 34 ppd) and appropriate/sensitive communication with client (26 ppd, 95% C.I. 18 to 30 ppd).

Paired categorisations (substantial training need by insufficient competency) were also examined within staff groups separately, and the item with greatest discordance overall, 'understanding the importance of partner notification', showed discordance in all three staff groups (for pharmacists 30 ppd, 95% C.I. 18 to 36 ppd; for technicians 41 ppd, 95% C.I. 25 to 50 ppd; and for counter assistants 42 ppd, 95% C.I. 23 to 51 ppd). Within-pharmacist discordance in categorisation (substantial training need by insufficient competency) for pharmacist's only items was most evident for the competency 'able to advise on and prescribe treatment' (21 ppd, 95% C.I. 9 to 27 ppd).

7.4.3.2 Association of prior sexual health training with pharmacist self-report of training need for CT&T service

It is noteworthy that for all but four of the 23 competencies enquired about, whether or not the pharmacist had had previous sexual health training had no statistically significant association with their professed training needs (Kruskal-Wallis, all $p > 0.142$). The four competencies for which there was an association were two 'all staff' items - knowledge of 'signs and symptoms of chlamydia' ('full' training judged needed by 15% of pharmacists responders if had had SH training, 59% if not, Kruskal-Wallis p-value 0.001) and possible consequences of chlamydia (13% v 49%, Kruskal-Wallis p-value 0.006) – and for two pharmacist-specific items - 'clear about the medico-legal aspects (Fraser guidelines)' (54% v 72%, Kruskal-Wallis p-value 0.044) and 'able to advise on and prescribe treatment for chlamydia' (29% v 44%, Kruskal-Wallis p-value 0.025).

7.5 Discussion

High rates of self reported substantial training needs are evident for almost all competencies necessary for delivering a CT&T service, in that for 13 out of the 15 items for all staff, and for all 8 pharmacist-only items, over half of all respondents were thus classified. Considering separately the three staff groups surveyed, categorisation as having substantial training needs showed a general trend that pharmacist responses were least likely to be thus classified and counter assistants' responses most likely, so that for only 7 of the 15 'all staff' items were over half of pharmacist respondents thus classified. The highest rates of substantial training needs were found for inter-communicative aspects of the 'all staff' competencies, in particular the five competencies specific to communicating about the CT&T service - for respondents overall, 56% to 83%, and for the pharmacists' subgroup of respondents, 34% to 77%. The highest rates of substantial training need for pharmacist-only competencies were for clarity regarding Fraser guidelines, criteria for referral, taking a sexual history and reviewing own and staff competencies for CT&T service (83% to 77%). The prevalence of competency responses classified as insufficient was generally lower, but the pattern was similar to that for training needs.

The following limitations are noteworthy. The pharmacy response rate was not high (50%) which may reflect time constraints on pharmacy staff and the sensitive nature of the research topic. Hence the respondent sample may be biased towards pharmacy staff more interested in the pharmacy sexual health role. Previous research has also suggested that the response rate for the postal surveys are comparatively lower then for the surveys administered face-to-face or through telephone (McColl *et al.*, 2001). In order to increase the response rate of the postal survey, I employed a number of techniques as recommended in the literature, such as using stamped return envelopes, coloured paper for questionnaire, sending a reminder and providing non-respondents with a second copy of the questionnaire (Edwards *et al.*, 2002, Edwards *et al.*, 2009) (McColl *et al.*, 2001). It is also possible that some questionnaires might not have been received, due to postal problems, incorrect or out of date addresses, and the reliance on the pharmacy manager to distribute questionnaires to other pharmacy

staff. There might also have been absence of some staff during the study period, due to annual leave.

The decision to send a questionnaire pack comprising 5 questionnaires to each pharmacy also might have limited the response rate, since it is possible that some pharmacy employs more pharmacists and support staff than the number of questionnaires sent. However it was clearly indicated in the letter to the pharmacy manager that more questionnaires could be obtained, should this be required, by contacting the investigator at the email address provided. An additional 12 questionnaires were posted to three pharmacies on their request. After the TNA survey, an additional short questionnaire was sent to pharmacy managers of each of the 166 pharmacy in Lothian (Appendix 26), in order to estimate the pharmacy staff workforce in Lothian who might need training for CT&T service (i.e. who had dealings with pharmacy customers/clients). The questionnaire response rate was low (a total of 66 questionnaires were returned) but these responses suggest that the number of staff per pharmacy who have face-to-face dealing with clients has mean of 6.94 (±SD 3.96). Thus there might be a slight under-representation of pharmacy staff in the current study, given that initially 5 questionnaires were posted to each pharmacy.

Although I was unable to compare respondents and non-respondents, the composition of the pharmacist respondents in terms of gender (29.5% male, 70.5% female) is broadly in line with the Scottish data in the UK-wide 2005 workforce survey for community pharmacists (35% male, 65% female) (Hassell *et al.*, 2006). Comparing by age, 79% of the pharmacists in this survey are ≤ 50 years of age which is similar to workforce data, which indicates that in 2005 71% of pharmacists were under 50 years of age. This may indicate slightly more representation of younger pharmacists in this survey, perhaps because of more interest in the service as compared to older pharmacists, or it could reflect differences in workforce demographics for Lothian compared to Scotland, or changes between 2005 and 2010.

Another limitation of this survey is the overall generalisability of the study findings. Given the survey was undertaken in only one health board in Scotland, the findings might not describe the situation in UK more widely. The essential foundation for the

provision of an effective CT&T service depends on what pharmacy staff are willing to provide and their relevant competence to do so. However, of the 15 competencies identified as required by all pharmacy staff for delivery of the CT&T service, more than half of all the community pharmacy staff responses were categorised as insufficiently competent for 7 of them. The finding of self reported substantial training need among counter assistants in general communication skills is concerning, particularly given the fact that they are very often the frontline 'gatekeepers' controlling clients' access to the pharmacist. Research has shown that training increases the involvement of pharmacy staff in such interventions, enhances their confidence and increases client uptake and satisfaction (Smith and Watson, 2004, Armstrong M *et al.*, 2005). A London pilot of community pharmacies has reported that clients emphasise the importance of excellent communication skills of counter staff (Baraitser *et al.*, 2007).

A self-report survey has limitations in terms of ascertaining actual competence or training need. Colthart et al. (2008), in their systematic review of self assessment of training needs by health professionals, reported over-estimation by poor performers and under-estimation by those who perform well. Accuracy of the self-assessment may be influenced by the purpose of the self assessment activity, that is whether self-assessment contributes towards formative or summative outcomes. The author suggested further research to explore the impact of the purpose of self-assessment on its accuracy.

At the time of this survey, the CT&T service had not been rolled out in community pharmacies of Lothian, so the high levels of insufficient competency regarding service process such as offering the service to the client and guidance about the actual use of the testing kit is perhaps not surprising, nor the fact that more than 56% of all staff were categorised as having substantial training needs in relation to one or more of these competencies. However it would be more worrying if pharmacists started providing services without receiving adequate training in the provision of different services (Cameron *et al.*, 2006). The high proportion of the three categories of pharmacy staff requiring training in *offering* the screening kit may also reflect that they perceived more training in communication skills. An Australian study also

reported that pharmacists shows reluctance to offer the kits to their potential clients and suggested more training on communication aspects (Taylor *et al.*, 2007). Those aspects of the service that require proficiency in *specific* communication around sexual health counselling could be best provided through face-to-face training. However those aspects requiring improvement in *knowledge*, for example, knowledge about STI might be provided successfully through written information materials (paper or online). High proportions of technicians and counter assistants indicated substantial training needs for knowledge about STI (with 77% to 70% of the technicians, and 86% to 79% of counter assistants requiring 'substantial training' in the knowledge domain). Therefore what is needed is a combination of face-to-face training on communication aspects and traditional written information about chlamydia and other STI to the pharmacy staff.

For all staff items, within respondent (paired) discordance in categorisation as having 'insufficient' competency and 'substantial' training needs indicates a high discordance for item response to 'communication with the clients appropriately and sensitively' (26 ppd). The discordance observed indicates that despite feeling competent in *general communication* aspects with the clients, the pharmacy staff respond in a way that suggests substantial training needs. This further emphasises the need for face-to-face training with role play on general communication aspects, to enhance confidence in communicating sensitively and appropriately with their clients. A high discordance was also found for the domain of 'understanding about chlamydia service'. Understanding is an abstract concept and discordance in responses seen for these items may suggest that the degree of this effect might depend partly on a competency context. Colthart et al. (2008), in their review of self assessment of learning needs of health professionals, reported that practical skills are better self assessed than knowledge. This might also explain some of the discordance identified in the domain of 'understanding about chlamydia service'. A further consideration might be to explore discordance in response with gender. However, Colthart et al. (2008) found inconclusive evidence regarding gender differences in the accuracy of self assessment.

It is interesting that a pharmacist specific item most notably showing 'discordance', as defined above, is regarding ability to advise and prescribe treatment for chlamydia. This discordance was least expected and suggests that despite feeling competent to advise and prescribe treatment for chlamydia, pharmacists were also extra cautious with respect to something so fundamental to their profession. Moreover, the evidence suggests that health professionals have a general tendency to favour 'more training' (Kerby *et al.*, 2005). This scenario might have contributed to some of the discordance in paired categorisations for the same competence, if the respondents tended to indicate a need for training despite self-report of apparently adequate competency.

A high prevalence of insufficient competency among pharmacists in respect of most of the activities specific to them, such as counselling, taking sexual history, partner notification procedures and referral, is of particular concern because taking a sexual history and establishing 'Fraser ruling' competency with under 16 year olds have for some years been important components of practice for contraceptive consultations in community pharmacies in the UK. Among pharmacists, previous sexual health training appears to have had little impact in terms of improving confidence regarding the more inter-communicative aspects of sexual health consultations with clients. A literature review of the role of pharmacists in public health provision has identified an association between pharmacists competency and their confidence in the provision of public health services (Eades *et al.*, 2011). It is therefore possible that the lack of association of prior sexual health training of pharmacists, with their training needs for CT&T provision is actually confounded by their lack of confidence in the provision of such services. While it may be possible to provide distance learning for knowledge about STI and chlamydia, or treatment guidelines for pharmacists, competencies involving practical skills, such a communication strategies and counselling skills tend to need training face-to-face and ideally also by role play exercises. An evaluation of the training of pharmacists for the provision of emergency contraception demonstrated that role-play was a successful training method (Bacon *et al.*, 2003). Such a face-to-face training may also be able to boost their self confidence in the provision of such services.

The general enthusiasm among pharmacy staff to deliver the chlamydia service, found in our survey, echoes the findings of an earlier Lothian survey, that nearly all of the community pharmacists (49/50) were willing to provide free chlamydia testing kits on their premises (Cameron *et al.*, 2007). However, previous research on pharmacists' views revealed that their motivation for offering an enhanced pharmacy service was to increase job satisfaction and to demonstrate to the public that the pharmacy was progressive and proactive (Thomas *et al.*, 2010). While such a scenario could lead to greater customer satisfaction and return visits by clients, it is noteworthy that in the London pilot there was no increase in business for the pharmacists involved (Baraitser *et al.*, 2007). There is a therefore a need for more in-depth exploration of their enthusiasm and monitoring of the extent to which this is sustained.

Qualitative responses to this survey brought to light their concerns regarding lack of training and their self-judgement as not qualified to deliver the service. Some pharmacists commented on the increase workload on them, to deliver many public health services. This supports the view that it would be helpful to spread the work of delivering such a service to pharmacy support staff, which further highlights the importance of training designed for this staff group.

The comparison of competence and training need carried out between pharmacists and pharmacy support staff in the present study was not performed to put comparative value judgement on their competencies. Rather the variation in the training need identified across the three categories of pharmacy staff suggests a requirement to develop tailored training catering the specific needs of different staff groups. The findings of this survey were communicated to the strategic stakeholders by presentations in two separate meetings with the stakeholders working on sexual health policy making in Lothian. The findings were used to inform two separate training sessions for pharmacists in Lothian. In addition, the report on the findings was distributed on request to other public health pharmacist leads involved in the implementation of pharmacy chlamydia service in other health boards of Scotland.

7.6 Chapter overview

This chapter has described the self-judged competence and training needs of pharmacy staff to provide the CT&T service. The training needs were demonstrated to vary significantly according to pharmacy staff group (pharmacists/ technicians/ counter staff). Competencies receiving the least affirmative responses by pharmacy staff (i.e. with greatest 'gaps' in knowledge/skills, as subjectively reported) were knowing signs and symptoms of chlamydia, raising the issue of sexual health, and offering, and advising on, chlamydia screening. Substantial training need is particularly indicated for inter-communicative aspects of sexual health, which is a challenge for pharmacy practice because training in such skills is likely require greater allocation of resource (staff time to undergo training and employing face-to-face trainers).

CHAPTER 8: SURVEY OF STRATEGIC STAKEHOLDERS

8.1 Introduction

The CDC framework for programme evaluation recommends identifying, involving and retaining stakeholders in the process of evaluation of a programme/service. The engagement of stakeholders in the evaluation of a programme/service mirrors the increasing prominence in research endeavours, of participatory models or "action" research. Stakeholders have the right and the responsibility to know what is happening in the programme, which aspects need corrective action, what the results are, and which lessons can be learned and shared with one another. However they should not simply be recipients of evaluation reports. One effective way for stakeholders to contribute to the evaluation of a programme is to involve them in the formulation of critical questions. They may also be involved in the collection and analysis of data. This enables them to participate directly in the assessment of the relevance, performance and success of the programme and in recommending how to improve the quality of current and future interventions.

A survey with the stakeholders was undertaken to elicit their views on the CT&T service, and on its evaluation. The exercise of identification of the stakeholders for the CT&T service evaluation has been discussed in detail in chapter 6 (section 6.3.1). This survey is restricted to the strategic stakeholders - those involved in the policy, design and implementation of the CT&T service (see section 6.3.1.1 for the definition of strategic stakeholders).

8.2 Objectives

The key objectives of the strategic stakeholder survey were as follows:

- To offer this subset of stakeholders the opportunity to provide input into the "evaluation objectives", to ensure that the key questions of most importance to them were included.
- To identify their interests, perceptions, and concerns in relation to the CT&T service initiative, and its evaluation.

8.3 Methods

8.3.1 Study design

The views of the stakeholders regarding the CT&T service were elicited through a self administered postal and online survey. The rationale for choosing self administered postal survey for this study has been described in section 6.6.1.2

8.3.2 Identification of strategic stakeholders

The strategic stakeholders for this survey represent those identified from stakeholders types suggested in Table 6-1. These stakeholders included public health pharmacists, other public health practitioners with special interest in sexual health, sexual health consultants, general practitioners, community outreach groups involved in sexual health care provision and partners of the CT&T service, for example lab personnel involved in chlamydia testing or involved in maintaining sexual health records. These stakeholders were identified in an early meeting with programme implementers and also from the list of board members involved in developing Edinburgh & Lothian Sexual Health Strategy for 2005-2010 (NHS Lothian, 2005). GPs whose practices are closer to the pilot CT&T pharmacies were also identified as strategic stakeholders, since they would potentially create an important collaboration with the pharmacists in terms of referring the patients to pharmacies or vice versa.

8.3.3 Development of the questionnaire

An open ended semi-structured questionnaire was developed (see Appendix 27). Details of the CT&T service were provided to the participants of the survey in a separate information sheet, so that they could give 'informed' responses to the questions in the survey (Appendix 28).

The questionnaire comprised three sections. Section A elicited the strategic stakeholders' concerns regarding different aspects of the CT&T service. For assessing the potential concerns that the stakeholders might have regarding the CT&T service, a first step was to identify the challenges that have been identified in the published literature on a pharmacy-based chlamydia services. I therefore enlisted the key items that were identified in my structured literature review to potentially impact the implementation or accessing the CT&T service (from the perspective of providers and users respectively). These items were then broadly categorised into

those related to the delivery of the CT&T service (7 items); concerns regarding provision of sexual health care via community pharmacies (3 items) and concern regarding young people knowledge of and views about the CT&T service (3 items). For each item, the respondents were asked to quantify their degree of concern on a 4 point likert scale (none at all; a little; moderate and strong) and then to elaborate the nature of their concern if they identified their concern as 'moderate' or 'strong'. After each question with listed items, the respondent was given an opportunity for free-text comments to communicate any additional concerns which were not among those listed.

Section B requested the respondent to focus on the evaluation questions devised for the CT&T service, as so far formulated, by quantifying the importance to the evaluation of each question, on a three point likert scale (not important; important and very important). These evaluation questions were identified in my initial meetings with key stakeholders to identify what these stakeholders want this evaluation to address. In this section a further opportunity was given to identify any additional evaluation question considered important (free text response). Information was also elicited in this section to broadly classify the respondent in terms of their stakeholder category i.e. public health pharmacist, general practitioner, sexual health specialist, community outreach group, public health promotion group, partner of the CT&T service, and other. Due to small number of stakeholders involved, other demographic information such as age or gender was not elicited in this survey, so as to be seen to be protecting respondent's identity, hoping thus to enhance the likelihood of frank responses.

Section C was optional, inviting the respondent to make suggestions in the free-text box provided to improve the CT&T service. Their suggestions were particularly sought in respect of what they think would enhance the CT&T uptake and any other aspect that they consider would potentially improve the success of the service.

Great care was taken in iterating to the final version, with much reflection and discussion with supervisors as to wording, structure and layout, aiming to maximise response rate. The final version of the questionnaire was pre-piloted with colleagues, but no changes to the questionnaire's wording or general design were suggested at

this stage. No formal pilot was undertaken, mainly because of the very small size of the pool of potential respondents, but also partly because of pressure of time to start final planning of the evaluation.

8.3.4 Recruitment and data collection

The total of 26 strategic stakeholders identified included public health pharmacists (n=3), public health practitioners with special interest in sexual health (n=7), general practitioner with special interest in sexual health (n=1), sexual health consultants (n= 5), community outreach groups involved in sexual health care provision (n=7) and partners of the CT&T service i.e. chlamydia reference laboratory representatives (n=3). An invitation was sent by email to all of these stakeholders, asking them to complete an online survey (Appendix 29). In addition to this recruitment through email, questionnaire packs were provided in a meeting of a *subset* of these strategic stakeholders which was held to discuss the implementation of the CT&T service. Stakeholders at the meeting were requested to pick up the questionnaire pack if they wished to respond via a paper questionnaire. The questionnaire pack consisted of the invitation letter (Appendix 30) and a reply paid envelope, in addition to the information sheet and the questionnaire as provided in the online survey. It is therefore possible that some stakeholders might have received questionnaires through both routes of recruitment.

A purposive sample of 7 GPs in Lothian was selected whose practices are closer to the pilot pharmacies. These GPs were handed out the questionnaire pack by my GP supervisor in a meeting of the general practitioners in Lothian.

The anonymous nature of the survey means that I could not differentiate which of the stakeholders contacted had replied. Therefore all the stakeholders who were sent an online survey invitation were sent an email reminder after two weeks, suitably worded to be ignored if they had already replied. No reminder could be sent to the GP stakeholders who were handed out the paper questionnaire.

8.3.5 Data analysis and synthesis

Data was imported from the online responses into SPSS (n=9). For paper questionnaire responses, data was directly entered into SPSS (n=8). The quantitative data (sections A and B) are presented graphically as stacked bar charts with each

stacked bar representing the distribution of responses across the likert scale offered for answering that section. These graphs allow easy visual comparison of strength/direction of responses across sub-items within a question, and because a single likert scale was used throughout an entire section, cross-referring between figures will enable comparison of strength/direction of responses across sub-items of questions within the same section.

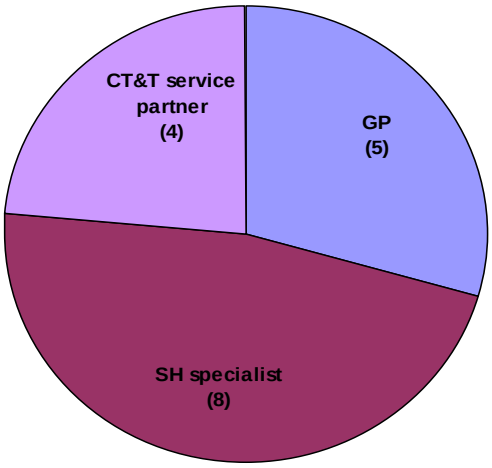
Due to the small number of respondents, n's are reported rather than percentages, which would imply more reliability than is the case. All textual data (from free-text items) were transferred to MS word and repeatedly read to identify themes. Further analysis employed a constant comparison method in which the textual data is scrutinised for differences and similarities within themes, keeping in mind the stakeholder category of the respondent. This analytic approach ensured that findings are systematically compared with the stakeholder categories. Qualitative data is reported using the acronyms: GP for general practitioner; SH for sexual health specialist and PT for the CT&T service partner such as GUM/lab, followed by a unique ID.

8.4 Results

8.4.1 Response rate

In all, 33 strategic stakeholders were invited to take part in the survey; 21 were sent an email invitation whereas 12 were posted or handed out a paper copy of the questionnaire; 5 of these stakeholders were those who were also invited through email as well for the online survey. In total, 17/33 stakeholders responded to our survey invitation. The overall response rate was 51.5% (for paper version 67% (8/12), for online survey 34.6% (9/26)). Figure 8-1 shows the distribution of respondents by stakeholder category. None of the respondents categorised him/herself under public health promotion or community outreach group. Since only one public health pharmacist responded to my survey, s/he was grouped under the CT&T service partner to ensure anonymity of his/her responses.

Figure 8-1: Strategic stakeholder respondents by self-classified stakeholder category (n=17).



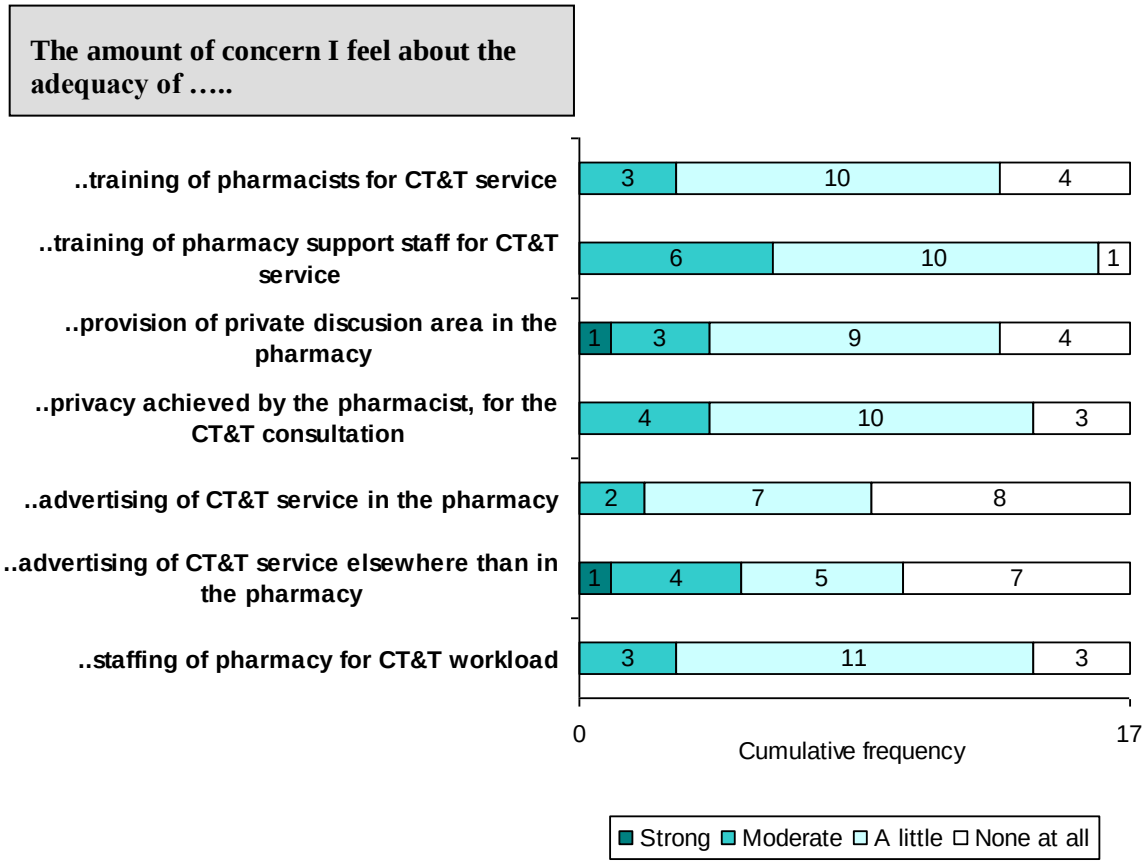
8.4.2 Responses regarding challenges to the CT&T service

This section reports the distribution of responses of the stakeholders on their strength of concerns about the specified challenges to the CT&T service. As explained in methods, the stacked bar graphs show the distribution of responses across the likert response scale offered, with strongest concerns shown in darker colouring (shown as a legend key in each figure).

8.4.2.1 Delivery of the CT&T service

Figure 8-2 (corresponding to question 1 in the survey questionnaire) shows the distribution of respondents' level of concern about the delivery of the CT&T service in community pharmacies. More respondents identified training of support staff for CT&T service as of concern (n=16 responding a little or moderate concern), than did for training of pharmacists (n=13).

Figure 8-2: Strategic stakeholders' concerns about the delivery of CT&T service in community pharmacies (n=17)



In added comments it was suggested that the only way to achieve quality and consistency of service would be by first specifying the core service expected, and then devise pharmacist training to reflect that, with accreditation.

> *Only by instituting a core service spec[ification] with associated training and awarding accreditation status will you ensure consistency of approach and up-to-date knowledge and awareness through standard training or online training. (SH-4)*

A few respondents also highlighted the importance of ongoing training for pharmacy support staff, to address the high turnover in staff.

> *Is there a high turnover of staff and therefore ongoing training need? (SH-5)*

Two respondents indicated that training of support staff is needed to develop an *'empathic'* and *'friendly'* attitude among them for young people.

Looking at the combined response regarding the provision of privacy in a pharmacy setting (2 items) all but 3 respondents had some level of concern. Sexual health specialists, GPs and CT&T service partners highlighted the difficulty of achieving privacy in a pharmacy setting, primarily due the space issue.

> *Not all have suitable spaces. (SH-7)*

Other concerns were related to the shop environment, that it is not being conducive to achieving privacy.

> *Assessing client need to talk to pharmacist can be overheard by shoppers. Discretion [is] difficult if pharmacy [is] full of other clients / shoppers. (GP-4)*

One respondent also quoted occasions where he/she witnessed the consultation of the client out of the private area or consultation room even when it was available, or the consultation room was not free and hence pharmacist provided advice on the shop floor.

> *In almost all circumstances this is not a concern, however, I have witnessed occasions when although a private area existed it was not used as it was either already engaged or the pharmacist was busy and gave a quick answer. (PT-3)*

It is interesting to note that advertising of CT&T service *elsewhere* was identified as more of a concern than advertising in pharmacies. One respondent indicated a strong

concern and another four respondents indicated a moderate concern to advertising elsewhere than in pharmacies. This is in contrast to only two respondents indicating moderate concerns on advertising in the pharmacies. A GP respondent who indicated strong concerns regarding the advertising of service expressed doubts about the message reaching the target audience.

> *Not sure if the message has got there yet? My feeling is not. (GP-1)*

A sexual health specialist also indicated concerns regarding *very low awareness in SH services (SH 7)* among young people.

With regard to staffing for CT&T service, two respondents were concerned about the amount of workload that would be increased due to this service, whereas a sexual health specialist indicated that pharmacists might not always be available to respond to the clients need.

> *We know from EC72 it is difficult sometimes to get pharmacist (on lunch, A/L [annual leave], S/L [sick leave]) so service was not always available. Will YP be sent away if pharmacist is too busy? (SH-8)*

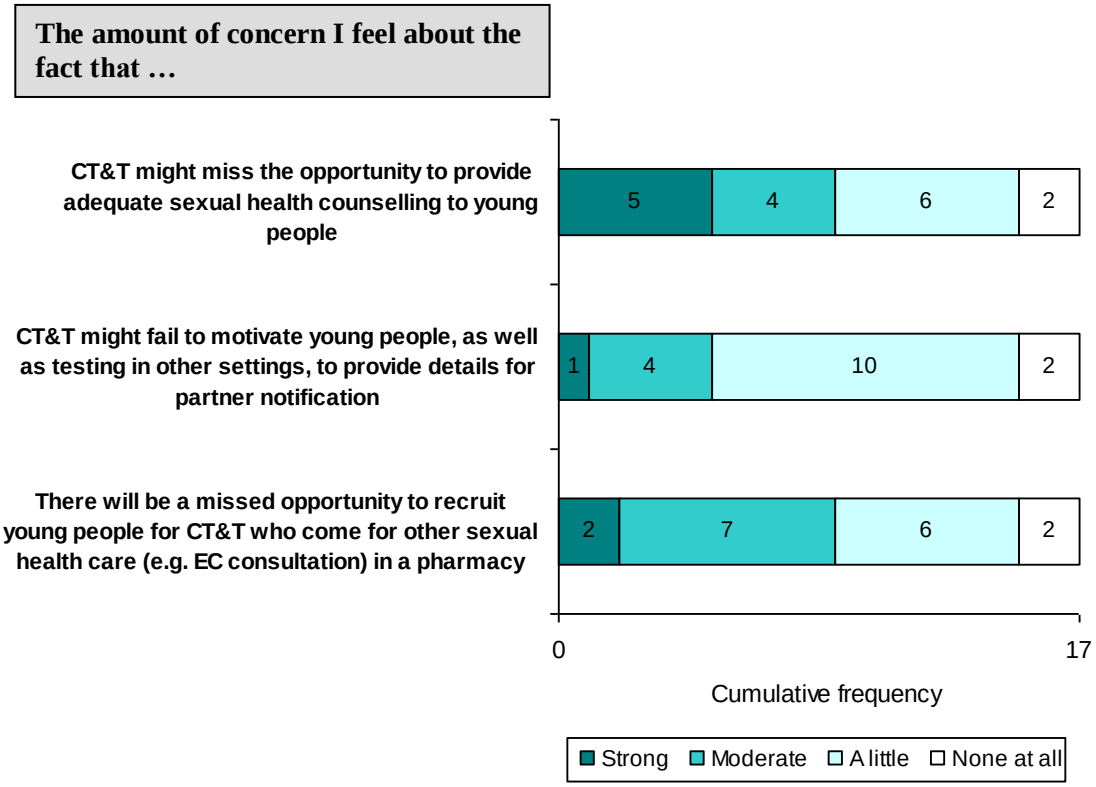
The above quote further supports the importance of training pharmacy support staff for CT&T service to provide advice to young people about the service, as also highlighted in the TNA survey (chapter 7), but still leaves the dilemma that if an actual consultation with a pharmacist is needed – for example having the testing explained or to be treated, then either the client has to wait, or be asked to come back later, because counter staff cannot do that part of the consultation.

8.4.2.2 Provision of sexual health care via community pharmacies

Figure 8-3 (corresponding to question 3) shows the distribution of respondents' level of concern about the sexual health care provision through community pharmacies. In each of the three items all but two stakeholders indicated some level of concern, and the most frequent recording of strong concern was regarding concern about CT&T service missing the opportunity to provide sexual health counselling to young people (n=5).

Strong concerns regarding SH care provision were predominantly reported by SH specialists (7/8 responses of strong concern across the three items were indicated by SH specialists).

Figure 8-3: Strategic stakeholders' concerns about the sexual health care provisions via community pharmacies (n-=17)



The most often cited explanatory factor was the nature of the pharmacy business with high workload which makes them less likely to do in-depth counselling.

> *Gaining trust and honesty, assessing risk and wider sexual health need is time consuming...very much doubt that pharmacists will have time or expertise to work with the youngest clients. (SH-5)*

An even stronger theme that emerged from the above quote and also often quoted particularly by the sexual health specialists was their concern that pharmacists lack expertise and are unfamiliar with sexual counselling of young people.

> *They [pharmacists] will also be less well informed than most doctors and nurses working in specialist sexual health settings. (SH-3)*

Concerns were also raised that pharmacy support staff were also inadequately trained to respond to sexual health queries from young people.

> *Strongly feel that is may be a missed opportunity, especially if pharmacy staff assisting the young person is not educated to answer questions relating to other areas of sexual health. (PT-2)*

One stakeholder cited the possible low uptake of the service might result in a lack of practice and a resultant lack of confidence. Clear service specifications were deemed necessary to avoid unnecessary tests and the resultant wastage of resources.

> *Need to be really clear as to the age and gender that chlamydia testing is most efficacious rather than blanket spread and inappropriate use of lab time and CT&T resources. (SH-4)*

Another concern identified was the possible failure of the pharmacies to *'refer or signpost YP to service locally'. (SH-8)*

In terms of partner notification aspect of the service, all but two stakeholders indicated some level of concern. However the two stakeholders, who were both sexual health specialists, also noted that concern regarding partner notification is not specific to pharmacies.

> *This is a problem everywhere, not just in pharmacies. (SH-2)*

However one stakeholder took a different perspective on partner notification through community pharmacies that less pressure on young people to notify their partners (compared to attendance at a sexual health clinic) would increase the likelihood that they could be engaged in testing for chlamydia in pharmacies.

> *Although I expect this to hold true (i.e. CT&T in pharmacies may leave young people feeling less pressure to disclose to partners), by reducing this pressure we may be more likely to engage young people in the service - it is a balance of the good and bad and whether T&T [testing and treating] chlamydia on a one to one basis is enough to have a larger scale effect. (PT-2)*

The respondents have a range of views in terms of proactive vs. reactive[6] (or opportunistic) offering of the CT&T service in community pharmacies (9/17 have strong or moderate concerns). One stakeholder indicated that the intervention is not designed for opportunistic testing. Some respondents felt that the pharmacy is an

[6] The current model of the CT&T service required the client to request the test in the pharmacy. Thus it is a *reactive* model where the pharmacist offers consultation on clients request for chlamydia testing. It is different from the *proactive* model implemented in other parts of UK, Australia and Netherlands which used an opportunistic screening approach whereby the pharmacist offers chlamydia testing during EC consultation and/or offer it to all young people of the target age group.

inappropriate point for actively offering the service, despite missing an opportunity for increasing coverage of testing. One reason cited was that the *young person may not have same relationship / trust in pharmacist as doctor / nurse (GP-4).*

Those who were in favour of proactive offer strategy suggested linking it with the provision of EC, C:Card and other sexual health consultations. The proactive approach was also indicated as a possible way of increasing the awareness of this service.

> *Increased knowledge of one service (EC) can help increase knowledge / literacy of the other (chlamydia) and vice versa. (GP-1)*

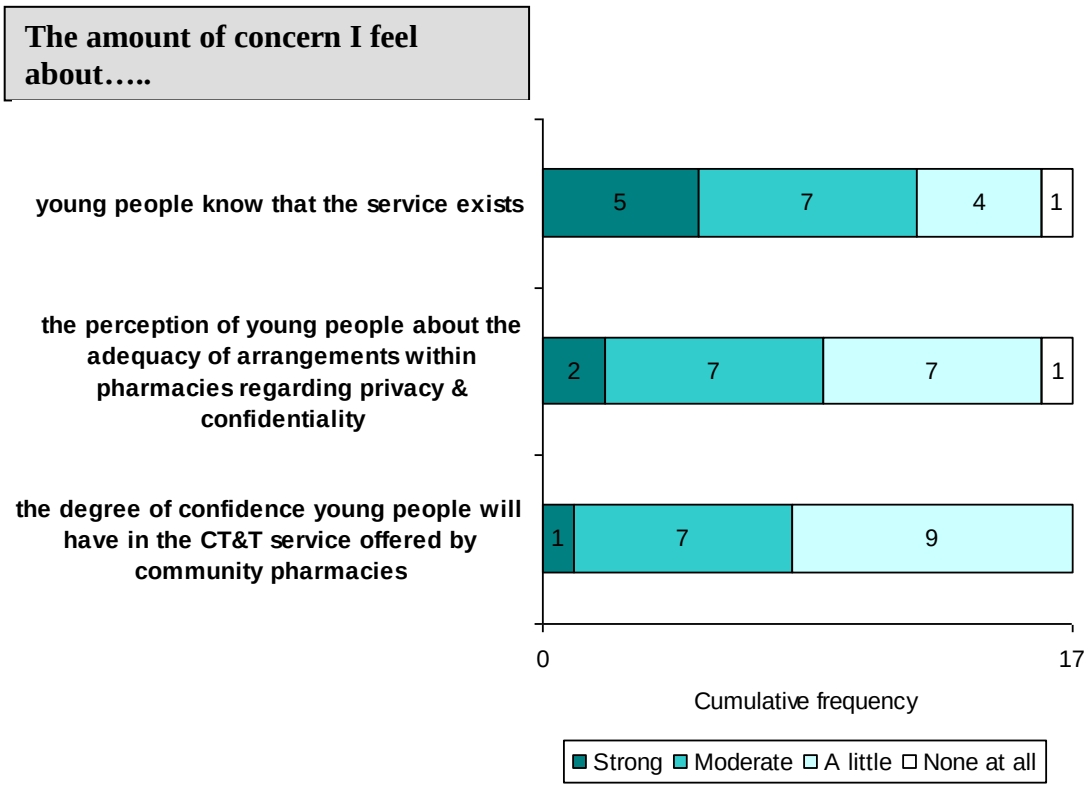
The above stakeholder further explained that increased use of long acting contraception has led young people to consult less for EC and this has resulted in less opportunity for health professionals to provide sexual health counselling.

> *As LARC [Long Acting Reversible Contraceptive] use increases in YP, they are consulting less for contraception, so we are more reliant on their assessing us [GPs] or new services such as this for chlamydia testing. (GP-1)*

8.4.2.3 Young people's knowledge of and views about the CT&T service

Figure 8-4 (corresponding to question 5) shows the distribution of respondents' level of concern about young people's knowledge/ perceptions of the CT&T service. Across the three items there were only two responses (out of 51) that did not express some degree of concern. The strongest concern was expressed regarding whether young people would know about the service, with nearly three-quarters (12/17) reporting moderate/ strong concern. About half of respondents also reported moderate/ strong concern regarding both whether young people would feel arrangements for privacy were adequate, and whether they would have confidence in the CT&T service.

Figure 8-4: Strategic stakeholders' concerns about young people's knowledge of and views about the CT&T service in community pharmacies



Many stakeholders acknowledged the difficulties of promoting the service among young people, while two respondents indicated that only a universal service through all pharmacies could help in promoting and advertising the service among young people.

Need to get YP through door. This can be difficult and take time. Advertise in places where YP go and ensure professionals who work with YP are aware of service. (SH-8)

It is difficult to know how to advertise this effectively. (SH-1)

Publicity around this type of service is always a bit tricky and only once the service is delivered universally can the message be spread in a more organised manner. (PH-1)

When asked to suggest ways to promote the service among YPs, the most common suggestion was promotion through schools (n=5). However one stakeholder noted that educational institutions should not be the only locus for promotion since vulnerable young people often do not attend.

If educational institutions are the main way of sharing info it is clear that not all young people are in education, and that those who are not are often the most vulnerable and hardest to reach group. (PT-2)

Other service promotion suggestions were through local youth services (n=4), social networking sites and websites (n=2), posters (n=1), leaflets handed out in GP clinics (n=1) and through referral agencies (n=1). It was also indicated that the best advertising would be by 'word of mouth' (n=3) or 'following a positive experience' (n=1).

There were a range of views among stakeholders with regard to the level of confidence that young people would have in community pharmacies delivering the CT&T service (8/17 have strong or moderate concerns). Stakeholders indicated that the degree of confidence of young people would depend on their previous experience with the pharmacy service. While it was acknowledged by a respondent that *'confidence is very difficult to win in young people',* a CT&T service partner stated that the belief that YP had a low level of confidence in the pharmacy service is a misconception. The importance of training all pharmacy staff to improve the image of the pharmacy was emphasised.

This is a perception rather than actuality and we need to work on the image of pharmacy in general and the level of service provided as well as the level of training required to be demonstrated by all members of staff not just the pharmacist. (PT-4)

Achieving privacy and confidentiality in a community pharmacy setting is indicated by a partner stakeholder as '*a big hurdle in relation to all its services [and] not just*

CT&T'. Many other stakeholders also indicated concerns regarding difficulties in achieving confidentiality and/or privacy at the pharmacy counter. A suggestion given by a GP stakeholder to overcome this problem is for the pharmacist to offer telephonic consultation with young people who wish this.

> *Would pharmacies do telephone consultations for this. Then young people could just come in and pick up a pack (named) and might find that easier? (GP-1)*

Another potential problem that was identified by the stakeholders was related to child protection issues, raised by 4/8 sexual health specialists who responded to this survey. One stakeholder explained it as follows;

> *Assessment of child protection issues and what pharmacists do when they have cause for concern in black, white and 'grey' situations. Issues for both young person and professional if wrong call is made or issue ignored. (SH-5)*

8.4.3 Perceived benefits of the service

The respondents were also asked to indicate in free text what they think are key benefits of the service from three perspectives: to young people, to community pharmacy and with respect to public health. For each perspective, themes found in the key benefits stated have been further categorised into the sub-themes, as shown in tables 8-1 to 8-3 (one table for each perspective). For young people, increased accessibility to chlamydia testing was the most often cited benefit of the CT&T service (n=14) (Table 8-1). For pharmacists, many respondents felt that CT&T would extend the role of community pharmacists towards patient care (n=8) and would improve their knowledge and skills (n=5) (Table 8-2). From a public health perspective, some respondents considered this service as a way of decreasing prevalence of chlamydia (n=6) and inequality in health outcome (n=3) (Table 8-3).

Table 8-1: In respect of young people - key benefits of the CT&T service

Theme	Sub themes	Examples of views
Increased accessibility (n=14)	Geographical access More options and choice Quick - No appointment needed Extended opening hours Availability in area of high prevalence Anonymous service	*'Potentially superb access which I think currently being partly loss as not sufficient awareness' (GP-1)* *'Another good alternative to going to GUM' (PT-1)* *'Wider access - especially for boys and in areas of high prevalence' (SH-5)* *'Easy access in areas away from main services' (SH-6)* *'Anonymity especially if able to travel to pharmacy out with locality' (SH-5)*
Normalising chlamydia (n=3)	Less medicalized provision Destigmatize testing	*'Increased normalization / knowledge of chlamydia testing as an ordinary routine aspect of life of an urban youngster' (GP-1)*
Providing SH service to 'hard to reach' population (n=3)	Treatment of partners Reaching young people in general & boys in particular	*'Treatment of partners of index cases will be expedited' (SH-1)* *'Might catch young people who would otherwise not use GP or clinic services' (SH-3)*

Table 8-2: In respect of community pharmacy - key benefits of the CT&T service

Theme	Sub themes	Examples of views
Extended role (n=8)	Holistic role Job satisfaction Engagement with target audience Improved services	*'Increase health provider (holistic role), Linking in with other health promotion work they do' (GP-1)* *'Allowing them to be more involved in patient care' (SH-8)*
Knowledge & skills (n=5)		*'Would add to their awareness of sexual health issues' (PT-1)*
Business (n=3)	More customers	*'Should attract more people into the shop' (SH-2)* *'May reach new customers' (PT-3)*

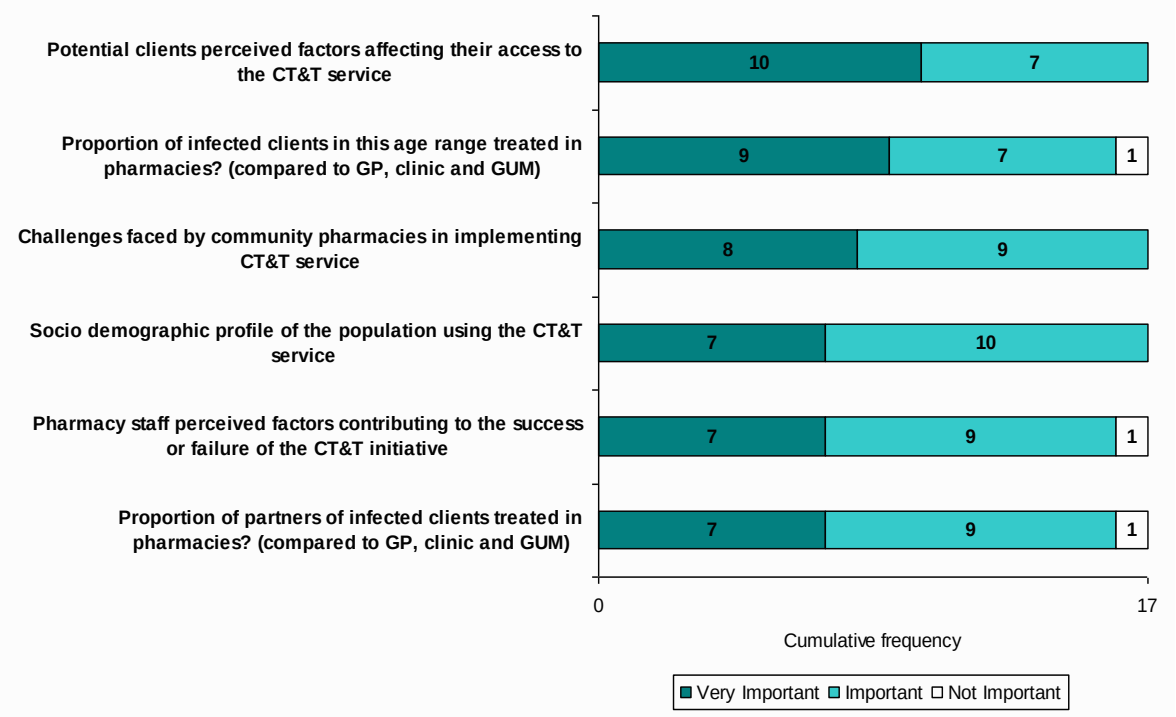
Table 8-3: In respect of public health - key benefits of the CT&T service

Theme	Sub themes	Examples of views
Prevalence (n=6)	Reduce prevalence Reduce re-infection Expedite partner treatment	*'May reduce burden and chlamydia in young people' (PT-3)* *'Reduced ongoing transmission of chlamydia and any other STIs identified following CP [community pharmacy] intervention' (SH-4)*
Inequality (n=3)	Deprived areas Wider cultural groups Very young age group	*'If targeted in areas of deprivation, could reduce health inequalities of access' (SH-4)*
Awareness & Acceptability (n=3)		*'I think increased knowledge / awareness is as important as the test and treat' (GP-1)* *'Break down stigma of chlamydia testing and sexual health' (SH-8)*
Cost effective (n=1)		*'Affordable increase in chlamydia testing in under 25 age group' (SH-6)*

8.4.4 Strategic stakeholders views on proposed questions to be answered through this evaluation

Figure 8-5 shows the ratings by respondents regarding the importance of the questions that I propose for this evaluation. The evaluation questions proposed were classified as either very important or important by all the respondents for 3 evaluation questions, and by all but one respondent for the remaining three evaluation questions.

Figure 8-5: Strategic stakeholders' ratings of importance of the evaluation questions proposed to them in the survey



Other evaluation questions that stakeholders suggested are grouped under the following themes:

Client satisfaction

- *Would clients find it acceptable to provide information on sex partners (via proposed form that will go to GUM)? (SH-1)*
- *Client satisfaction with the service?(PT-1)*
- *Has anyone asked YP if they want to get tested in pharmacies? (SH-8)*

Service promotion

- *What proportion of youngsters (high risk) knows about this service? (GP-1)*

- *How to promote? (SH-7)*

Service / logistical planning

- *Are there links to local YP services? (PT-1)*
- *How likely is it that clients would have had a test elsewhere / attended for treatment elsewhere if this facility had not existed? (PT-2)*
- *Do pharmacists discourage some people in low risk group from being tested? (GP-1)*
- *What if demand increases? Where will pharmacy find time / resources to deal with increased numbers? (GP-4)*

Outcome evaluation questions

- *What is the prevalence of infection [among those tested in pharmacy CT&T] compared to other testers?(SH-2)*
- *How many [clients with] positive results do not attend for treatment and contact tracing? (GP-5)*

8.5 Discussion

This study has ensured that I have involved the strategic stakeholders, from a very early stage, in the evaluation of a public health programme, in accordance with the 'good practice' of programme evaluation. Areas of concerns for stakeholders on different components of the CT&T service were identified. In addition, key evaluation questions were explored in terms of their relative importance from the stakeholders' point of view and suggestions were sought to add other possible questions that this evaluation should address.

Survey limitations include the possibility that stakeholders' views were not necessarily representative of pharmacy chlamydia service stakeholder nationally in Scotland or more broadly in the UK. For example, the stakeholders were surveyed before the implementation of the CT&T service; hence they might have offered responses that reflected what they had read in the literature or received wisdom. Their views might differ from those stakeholders who actually experienced the implementation of chlamydia service in their health boards. Following the service termination in Lothian, there was not time for a formal study to be undertaken with the same stakeholders, to compare any change in their views and to reflect on their overall view of the service. However, after the CT&T service ended, a subset of four stakeholders (3 of them having also been among those invited to participate in this survey) were contacted to give their reflections on the reasons for Lothian Health Board's decision to terminate the service and to identify any obstacles to the service implementation in Lothian. This contact was to help me in my discussion of the service failure in Lothian. Some of the views expressed in the replies are quoted (anonymously) in the final discussion chapter of this thesis (section 11.2).

Despite the invitation to health promotion and community outreach groups to take part in the strategic stakeholder survey undertaken prior to the implementation of the CT&T service, none of the respondents categorised themselves as such. Therefore I cannot be sure whether these groups are represented in this survey or not. However, it may be possible that the stakeholders whom I pre-classified as belonging to health promotion and community outreach groups, have labelled themselves as SH specialists or partners of the CT&T service.

A potential limitation of this study, a survey, is that it is unable to elicit rich background information that can shape further enquiry relevant to the topic. It is arguable that views of strategic stakeholders should have been sought through in-depth interviews, in which case more nuanced understanding might have been possible. Well conducted in-depth interviews are also able to provide contextual information, and are considered more suitable for eliciting a detailed account of people's knowledge, perceptions, experience and interactions to meaningfully understand social reality (Mason, 2002, Miles and Huberman, 1994). However, knowing from the outset that interviews would not be feasible for this study component, it was decided to have a semi-structured format for the survey questionnaire (by giving frequent opportunity to respondents for free text comments). This allowed for any views or concerns not actively sought in the questionnaire to be put forward by respondents. Another potential limitation of this study was the variation in response rate for the online and paper versions of the survey (35% response rate for the online survey versus 67% for the paper version of the survey). There could be several explanations for this variation. Firstly, a meta-analysis comparing response rates from online and paper surveys found that response rates have been consistently very low for online surveys (Shih and Xitao, 2008). Secondly, the provision of the questionnaires to a GP personally, by my GP supervisor at a GP meeting, might have enhanced response rate either because the GPs might feel more obliged to respond to their colleague's request, or because of the nature of the meeting, which might have had attending more public health spirited GPs. Thirdly, the GPs who knew that their neighbouring pharmacies would be providing the CT&T service, might have had more interest in the service, and been more likely to respond than other stakeholders who were recruited for online survey.

It should be noted that an assessment of the training needs of pharmacists and support staff was not included as a potential evaluation question in the stakeholders' survey. This is because the training needs assessment (TNA) survey of pharmacy staff had already been undertaken before the stakeholder survey. However when asked to reflect on their concerns regarding training of the pharmacists and their support staff, 13/17 stakeholders noted strong or moderate concerns for the training of pharmacists and 16/17 noted strong or moderate concerns for the training of the

pharmacy support staff. Most of their concerns highlighted here echoed the findings of the TNA survey (chapter 7) such as a need of ongoing training due to the low uptake of the service, training focusing on the eligibility criteria and importance of signposting and referrals and child protection issues. However in the survey of stakeholders it was also suggested that in the training to be provided, a non-judgemental attitude should be encouraged among pharmacy staff. Moreover, clear service specifications were recommended as the way to achieve quality and consistency of the service. The importance of clear service specification and well structured training to ensure that all staff and pharmacists follow strict protocol has been raised in the previous pharmacy chlamydia service evaluation as well (Taylor *et al.*, 2007). Clear service specifications are important to avoid wastage of resources, as would occur if the service is provided to ineligible clients.

In addition to reflecting on their concerns regarding training, stakeholders indicated that sexual health counselling is difficult to achieve in the pharmacy setting due to the difficulty in achieving privacy and business nature of the pharmacy environment. The sexual health specialists particularly indicated their perceptions towards the entrepreneurial attitude of the pharmacists. Many stakeholders highlighted their concerns regarding insufficient skills of pharmacists to provide sexual health counselling to young people. In the TNA survey, pharmacists indicated insufficient competency to take a sexual history (72%), raise the issue of sexual health with the client (51%) and respond to sexual health requests (37%). Provision of a sufficient number of pharmacy support staff may allow pharmacists to provide adequate counselling as suggested in the current survey. Another pharmacist survey exploring their ability to provide partner notification for STIs in the pharmacies showed that, pharmacists' perceived lack of ability to provide sexual health counselling was not the result of insufficient skills and knowledge, but was perceived to be due to the lack of time to undertake such a task (McNutt *et al.*, 2009).

Advertising of the CT&T service in pharmacies and elsewhere was identified as a 'strong' or 'moderate' concern by only 2/17 and 5/17 of the stakeholders. This is in contrast to their concerns about the young peoples' knowledge of this service (12/17 stakeholders indicated strong and moderate concerns). The pharmacists' in-depth

interview findings also highlighted inadequate advertising as a major concern of a low uptake of the service. These contradictory findings might be because of their mentioned underlying belief of the difficulties of advertising such a service among young people. A previous study of chlamydia screening activity in general practice identified hesitance of prominently displaying chlamydia screening promotional material in most practices (Freeman *et al.*, 2009). Reported barriers in that study were staff's perception that displaying posters would cause offence or embarrassment to young people and distribution of chlamydia leaflets by receptionists was also considered inappropriate due to the same reasons.

Provision of a private discussion area and achieving privacy were identified as concerns primarily due to the shop environment not being conducive to achieving privacy. This has been reported as a barrier in many previous pharmacy chlamydia service pilot studies as well (Baraitser *et al.*, 2007, Bloomfield *et al.*, 2002, McNutt *et al.*, 2009, Taylor *et al.*, 2007). However it was also acknowledged in the present study that achieving privacy in a pharmacy setting is a hurdle in relation to all its services and not just the pharmacy chlamydia service. Current changes in the pharmacy contract require the pharmacy to provide a private consultation area / room. However, requesting such a consultation at the reception, and the fact that the pharmacist may resort to giving quick advice at the counter due to a busy shop environment are the underlying reasons for not achieving privacy, as explained by respondents in this survey and also in the pharmacists' in-depth interviews. Similarly there were mixed views on proactive versus active service offer to young people in the pharmacy setting. Those stakeholders not in favour of actively offering the service explained it as an inappropriate point of proactive offer due to the lack of privacy. However some stakeholders identified it as a feasible add-on to EC service and such like. Most of the previous pilots of chlamydia service in pharmacies adopted a proactive offer approach by offering chlamydia test to YP during EC consultation (Brabin et al., 2009b, Gudka et al., 2010, Taylor Nelson Sofres Healthcare, 2007, Thomas et al., 2010, van Bergen et al., 2004). However this strategy means that men would be excluded from being tested.

Undertaking partner notification, by filling out partner notification forms, was identified as difficult not only in a pharmacy setting but also in other clinical settings. However it was also considered to provide a less pressurised setting for young people to provide partner's contact information and a resultant increased likelihood of getting tested in a pharmacy. Previous studies have identified other strategies for encouraging partner notification through pharmacies. Pharmacies have been identified as feasible for accelerated partner therapy (vouchers for treatment of partners from a pharmacy) and patient delivered partner therapy (treatment for partners is handed out to index patient in a pharmacy) (McNutt *et al.*, 2009, Cameron *et al.*, 2010).

Potential benefits identified for this service by stakeholders were increased accessibility in terms of geographical access, no need of appointment, extended opening hours and wider availability. Increased accessibility has been a major facilitator identified in a number of other studies (Anthony and Watson, 2008, Baraitser *et al.*, 2007, Taylor *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007). However, a trade off between increased accessibility and lower level of privacy achieved needed further exploration from young peoples' perspective. The stakeholders also noted that the service would be able to reduce the overall prevalence of chlamydia and inequity by providing access in deprived areas and to wider cultural groups. Previous evaluation of chlamydia service in large chain pharmacies in London identified that the chlamydia testing was less likely to reach deprived population (Taylor Nelson Sofres Healthcare, 2007). The uptake of chlamydia testing was not proportionate across the ethnic populations in London and more likely to reach woman and those working full time, who have achieved or are receiving higher university education.

All the potential evaluation questions listed in this survey were considered important by the stakeholders (at least 16/17 stakeholders rated it as very important or important for every question listed). In addition new questions were identified by the stakeholders. Some of these questions were incorporated into my later evaluation components, such as questions about young peoples' knowledge about the service; or whether they wanted to be tested in pharmacies; or the appropriateness of filling out

the partner notification form in the pharmacy. However some of the identified questions could not be incorporated as the numbers of pharmacy CT&T tests were negligible to answer those questions. These questions were primarily related to the clients' satisfaction with the service or related to service logistic planning and outcome evaluation. However these potential questions identified could be used for future evaluations of a pharmacy-based chlamydia service or in other health care settings.

8.6 Chapter overview

This chapter provided new insights into stakeholder concerns regarding different aspects of the CT&T service. Sexual health counselling for young people was identified as difficult to achieve due to their perceived lack of privacy in a pharmacy setting and insufficient sexual health consultation skills among pharmacists. However, in order to achieve quality and consistency in provision of the CT&T service, clear service specifications were considered important in addition to ongoing training of the pharmacists and their support staff. Although stakeholders indicated their concern regarding young people knowing about the service, they also acknowledged difficulties in promoting the service among young people. All the proposed evaluation questions were identified as important and some additional questions suggested by stakeholders were incorporated in the later components of this thesis research.

CHAPTER 9: POTENTIAL SERVICE USER'S VIEWS ABOUT THE CT&T SERVICE IN LOTHIAN

9.1 Introduction

Community pharmacists have expressed their willingness to provide chlamydia service to young people (Cameron *et al.*, 2007). More broadly, the feasibility of community pharmacy based approaches to chlamydia service has been demonstrated (Baraitser et al., 2007, Brabin et al., 2009b, Gudka et al., 2010). However, a pharmacy-based chlamydia service needs also to be acceptable to the target population for whom a service is designed, since there is little utility in offering chlamydia testing in community pharmacies if there is unwillingness among this group to accept the offer.

In this chapter, I report a survey of potential users to quantify the extent to which different facilitators of and barriers to access a pharmacy-based chlamydia service, as identified in the literature and in the stakeholder survey, might impact their decision to access the CT&T service.

9.2 Objectives

The objectives of this study were:

- To assess acceptability to young people of the various aspects of community pharmacy-based chlamydia service
- To describe the level of importance that the young people place on various facilitators and barriers identified from the literature
- To investigate whether the degree of acceptability by young people for different aspects of CT&T service differ by their age category, previous experience of EC access from a pharmacy and previous experience of chlamydia testing in other venues

9.3 Methods

9.3.1 Study design

A self administered survey was undertaken with potential service users accessing sexual health services in Lothian. The rationale for choosing self administered postal survey for this study has been described in section 6.6.1.3

9.3.2 Study population

The ideal study population for this study would have been all the sexually active young people in Lothian. However, information regarding their current sexual activity status is not readily available, and it would be fairly impossible to maintain such information in primary care setting databases. It would, therefore, require explicit elicitation of sexual activity status from all potential respondents, and that would have been inappropriate and unethical to elicit such information in a pharmacy setting. Seeking care in the sexual health clinics for services - such as EC, long acting reversible contraception, C-card scheme, pregnancy testing, abortion, STI testing and sexual health counseling - is indicative that they are sexually active. Hence the study population for this survey comprised young people aged 15-24 years seeking care for sexual health at three clinical settings in Lothian: the GUM clinic, Mid-Lothian Young People Advise Service (MYPAS) and Caledonian Youth (CY).

9.3.3 Brief overview of the study settings

Genitourinary Medicine (GUM) Clinic

This is an NHS run sexual health clinic that offers services on all aspect of sexual health, including but not limited to STI testing and treatment, provision of contraception and advice on sexual health. Its services are not limited to any particular age group. In Lothian, the GUM clinic is located in Edinburgh. There are also a number of outlying smaller satellite GUM clinics in Lothian, which provide specialized sexual health services, usually once a week for approximately 2 hours. For the current research, the questionnaires were distributed at the reception of the main GUM clinic, Edinburgh.

Midlothian Young People's Advice Service (MYPAS)

This is a community based charitable organization that works with young people in the areas of sexual health, mental health and substance abuse. It provides free service to young people and has three drop-in clinics across Midlothian. For the current research, the questionnaires were distributed from all the three branches.

Caledonian Youth (CY)

This is a charitable organization that provides free sexual health education and services to young people in Scotland. It is partly funded by the Scottish Government. It is located in Edinburgh, Forth Valley and Grampian and annually provides nearly 20,000 consultations to young people. For the current research, the questionnaires were distributed only from the Lothian branch (Edinburgh).

9.3.4 Sample size and sampling

Probability sampling techniques have been recommended to elicit views in a survey because these increase the likelihood of obtaining samples that are representative of the population. They provide the most valid or credible results because they are most likely to reflect the characteristics of the population from which they are selected (De Vaus, 2002). However, one of the pre-requisites of a probability sample is to have a sampling frame. For the current research, it was not possible to obtain such a list from the SH clinics as young people accessing the GUM clinic as well as MYPAS and CY mostly use the drop-in service and need not to be registered at the clinic. Hence, recruiting young people accessing a sexual health service makes a reasonable choice for two reasons. Firstly, young people can be deemed to be sexually active if, they are seeking a contraceptive service, or care for STI or pregnancy. This would avoid having to elicit their eligibility by explicitly asking whether they are sexually active. Secondly, it provides a sample of the population from which to elicit preference for a CT&T service as an alternative to other options such as a GUM clinic, GP or SH drop-ins, since they are already accessing a sexual health service and hence could make an informed judgment.

It was indicated by the contact persons at all the three sites that the survey questionnaires could be distributed only for a limited time frame (on an average of 3 weeks each), since a number of other research and evaluations were also taking place

at these sites. Hence a time frame of three weeks was agreed to prevent research overload on patients. The numbers of questionnaires handed over to be distributed at each site were roughly to cover the expected turnover of young people during the study period in each site: 240 in the GUM clinic (including 40 in the pilot phase), 100 in MYPAS and 100 in CY. Only 45 questionnaires were distributed within the study time frame from CY.

9.3.5 Recruitment of the study participants

In each setting, young people who were aged 15-24 years were identified by the reception staff at the time of their registration for a consultation. The reception staff were directed to supply a sealed questionnaire pack to any eligible young person. Each questionnaire pack comprised an invitation letter to the young person along with an information sheet (Appendix 31), a self administered questionnaire (Appendix 32), and a reply paid envelope. The person thus invited to participate was asked to complete the questionnaire and return by means of the reply paid envelope supplied. The questionnaire was distributed from each setting for three weeks between December 2010 and April 2011.

9.3.6 Development of the questionnaire

The survey questionnaire contains 44 questions / items (Appendix 32). Of these, 5 pertain to socio-demographic characteristics such as age, gender, years of schooling and ethnicity and 5 questions pertain to the previous use of pharmacy for EC or the testing for chlamydia in the last 12 months. The socio-demographic information was assessed towards the end of the questionnaire. A further 34 questions/items covered ten topic areas of using a CT&T service. These topic areas were informed by my earlier literature review of the facilitators and barriers for young people in terms of accessing the pharmacy chlamydia service The ten topic areas were: (a) service access options (5 items); (b) sample return procedures (single choice question); (c) arrangements for reporting results (best choice question); (d) testing venue options (best choice question); (e) treatment venue options (4 items); (f) partner notification procedures (3 items); (g) selection of a pharmacy based on store facilities and pharmacy profile (7 items); (h) selection of a pharmacy based on opening times (best choice question); (i) selection of a pharmacy based on different location options (4

items); and (j) confidence in a CT&T service (4 items). Items within topic areas *'a, e, f, g, i and j'* were assessed on a 4 point likert scale (1=definitely not; 2= probably not; 3=probably yes; 4=definitely yes). Items within topic area *'g'* were assessed on a 4 point likert scale (1=very important; 2=moderately important; 3= of little importance; 4= of no importance).

An information box was incorporated within the questionnaire at three instances before introducing topic areas that are related to chlamydia testing, treatment and partner notification. Respondent were also offered opportunities (at three different points in the questionnaire) of making a free text comment to identify any other aspect that they considered important in relation to accessing CT&T service.

9.3.6.1 Pilot testing of the questionnaire

The questionnaire was pilot tested by giving it out to young people at the GUM clinic to assess the feasibility of distributing it in a clinic setting and to assure that it could be easily understood and completed by young people in less than 10 minutes. In total, 40 questionnaires were distributed in one week before the Christmas holidays in 2010. Thirteen respondents returned the questionnaire by using a reply paid envelope. The respondents had been asked to record the time taken to complete the questionnaire and the average time recalled for filling in the questionnaire was 7.6 minutes (range 2-15 minutes). The level of comprehension of the questionnaires was measured by the number of questions left unanswered in the questionnaire and by asking respondents to identify any questions which they found was difficult to comprehend. The respondents did not identify any particular question as difficult to understand and / or answer. Therefore no modifications to the questionnaire were needed and since the target population was identical to that of the survey proper, the completed questionnaires were included for the final analysis.

9.3.6.2 Further amendments in the questionnaire

After all the GUM clinic questionnaires had been distributed, and approximately 8 questionnaires had also been distributed through MYPAS, it was realised that no question ascertaining the gender of the respondent had been included. Hence the remaining questionnaires from MYPAS were recalled; the question on gender was added and new questionnaire packs were submitted for distribution through MYPAS

and CY. Therefore gender of the respondents was ascertained only in MYPAS and CY settings.

9.3.7 Statistical analysis

Data was entered in MS access and transferred to SPSS version 17 for analysis. Descriptive statistics were produced. In questions where respondents were asked to tick more than one response (multiple choice question), the multiple response frequency percentages were produced from a denominator of total respondents (n=78). Hence adding up the multiple response frequencies would sum to more than 100%. However where respondents were asked to indicate a single best choice, a few respondents nevertheless indicated more than one choice. In such a case, frequencies were adjusted for multiple responses by diving it with the total number of multiple responses to provide an adjusted percentage of responses rather than the percentage of cases (to imply that each person has given one preference). In such a case, the percentage response would add up to 100%.

The questionnaire items which were assessed on a likert scale are presented graphically in the stacked bar chart. I have not plotted 'of no importance' in figure 9-5 in the stack bars but would make the bars total 100%. This means that the total height of the bar shows some degree in favour of importance. Similarly those indicating 'definitely not' in figures 9-1 to 9-4 are not shown in the graph.

Spearman's Rank order correlation coefficient test was applied to likert response items and age categories (1=15-19, 2=20-24); previous EC access from pharmacy (1=No, 2=Yes) and reported chlamydia testing in the last 12 months (1=No, 2=Yes). In terms of p-value, the Spearman's correlation coefficient test is equivalent to Mann-Whitney U test but have a benefit of giving a correlation coefficient that shows the strength and direction of association that exists between two variables.

9.4 Results

9.4.1 Response rate

A total of 78 out of 385 questionnaires distributed were returned by young people, hence an overall response rate of 20%. Responses by health care settings were: GUM clinic 13% (32/240); CY 13% (13/100); and MYPAS 73% (33/45).

9.4.2 Characteristics of survey respondents

Table 9-1 shows the socio-demographic characteristics of the respondents and their access to pharmacy EC service, and chlamydia testing in last 12 months. Of all the respondents, 53% were 15-19 years old. In the later questionnaire responses, when gender of the respondents were asked (n=40), female respondents predominate (85%). Respondents were predominantly of white UK origin. None of the respondents indicated their origin as Asian or African. Nearly 29% of the respondents are still studying in school. Half of the respondents were tested for chlamydia in the past 12 months; the GUM clinic was the most common venue of testing (63%). Among those tested for chlamydia, 24% were diagnosed positive.

Table 9-1: Characteristics of the respondents including previous testing for chlamydia and use of EC

Variable	n	%
Age of the respondent		
15-19	41	53
20-24	36	47
Gender (n=40)		
Male	6	15
Female	34	85
Ethnic origin		
White UK	67	88
White others	8	11
Mixed	1	1
Age leaving school		
Not Yet finished	22	29
15-17 years	38	49
18+ years	17	22
Current status*		
Working full time	22	29
Working part time	13	17
Unemployed	5	7
Studying full time	46	60
Studying part time	3	4
Tested for chlamydia in the past 12 months	38	50
Diagnosed with chlamydia in the past 12 months (n=38)	9	24
Venue of testing for chlamydia in the past 12 months (n=32)		
GUM	19	63
SH drop-in	8	27
GP	3	10
Family planning/ well women clinic	2	6

Table 9-2 shows the previous knowledge of the respondents about the CT&T and EC services and their suggestions for promoting CT&T service. 42% of the respondents already knew about the pharmacy CT&T service. Of those who knew about the service, they mainly learned through their family or friends (53%) or through their GP (40%). Of all the respondents, 72% suggested it being advertised in SH clinics, and another 66% and 65% through SH drop-ins and pharmacies. The knowledge of the pharmacy EC service was indicated by 85% of the respondents and 42% of those who knew had previously accessed pharmacy EC service.

Table 9-2: Knowledge about the pharmacy EC and CT&T services and suggestions for promoting CT&T service

Variables	n	%
Already know about the CT&T service	32	42
How did you know about the service (n=32)*		
Through media	5	17
By pharmacy staff	4	13
In-store promotion	4	13
Told by GP	12	40
Learned from family or friends	16	53
Suggestions to promote/advertise CT&T service through various venues*		
Sexual health clinics	55	72
SH drop-in	50	66
Pharmacies	49	65
GP practice and health centres	44	58
Social networking sites on internet	41	54
Web based information	27	36
Pubs and clubs	27	36
Others	2	3
Knowledge about the pharmacy EC service	65	85
Previously received EC from a pharmacy (n=65)	27	42

* Multiple responses possible

9.4.3 Acceptability to respondents of different aspects of the CT&T service

Table 9-3 describes the preference of the respondents for different aspects of the CT&T service. When asked to identify their preferred location for the chlamydia testing, 32% indicated the GUM clinic and 34% indicated SH drop-ins. Among those who preferred the GUM clinic, 70% of them were the respondents from the GUM clinic (n=20). Similarly those who preferred SH drop-in, all were either respondents from MYPAS (n=25) or CY (n=6) (data not shown). Pharmacy was indicated as preferred by only 11% of the respondents (equally distributed among the three survey venues). 59% of the respondents indicated their preference to hand over their urine sample to the pharmacy rather than directly posting it to the laboratory. For a test notification, a phone call was the preferred choice (34%), following by face-to-face consultation (24%). For timings of accessing the CT&T service, 44% of the respondents favoured early evening (between 5 pm to 8 pm) to visit the pharmacy. Weekends were not a popular choice (Saturday 9% and Sunday 5%).

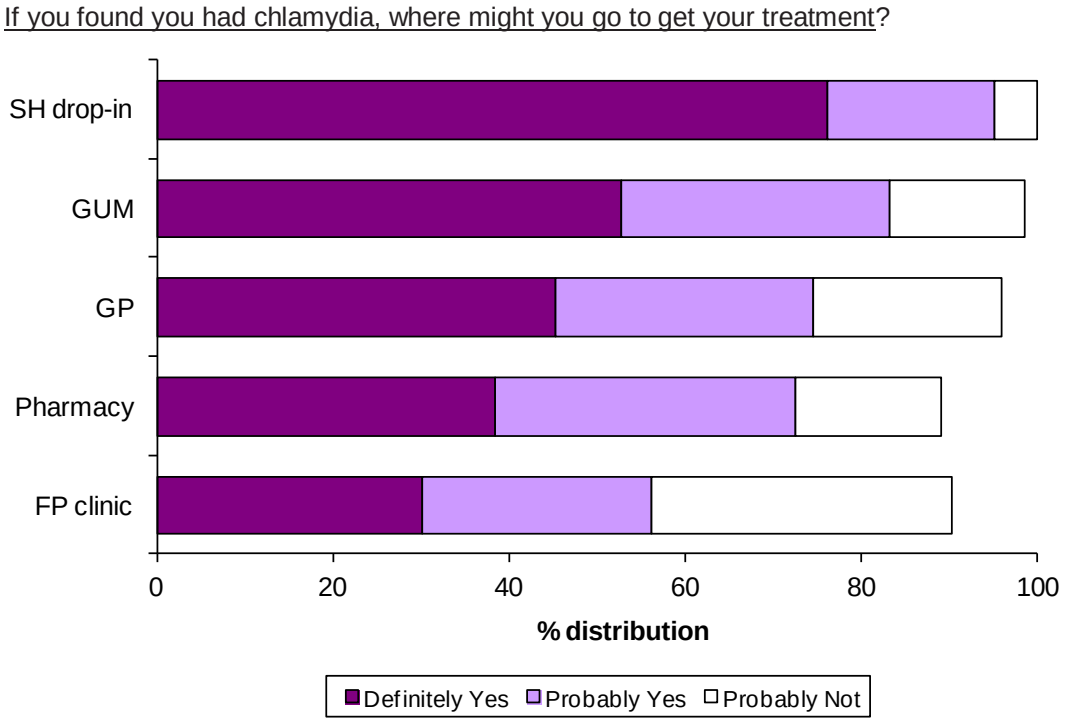
Table 9-3: Respondent preferences regarding venue for chlamydia testing and for different aspects of the CT&T service

Variable	n	%
Preference for the venue of testing for chlamydia*		
SH drop-in	31	34
GUM clinic	29	32
GP clinic	14	16
Pharmacy	10	11
Family planning clinic	6	7
Preference re sending urine sample bottle to the laboratory		
I would prefer to give it to the pharmacy for them to post it to the laboratory	46	59
I would prefer to post it my self to the laboratory	32	41
Preference about the test result notification*		
Phone call	28	34
Face-to-face consultation	20	24
Text on mobile phone	14	17
Email	11	13
Letter	9	11
Comfortable about filling out partner notification form in the pharmacy		
Very Comfortable	10	13
Fairly Comfortable	34	44
Fairly uncomfortable	21	27
Very uncomfortable	12	16
Preferred time to visit a pharmacy*		
Early morning	22	29
Office Hours (9 am to 5 pm)	15	20
Early evening (between 5 pm to 8 pm)	34	44
Saturday	7	9
Sunday	4	5

* Adjusted for multiple responses. ‘n’ shows exact number of responses. % has denominator of total responses so add up to 100% (see section 9.3.7 on description of statistical analysis).

Figure 9-1 shows the respondents indication of the level of acceptability for different venues for treatment of chlamydia. Although these responses are not directly comparable with their preference for chlamydia testing (as different response options were used in the two questions), however as was the case with testing, 76% indicated SH drop-ins as a possible treatment venue (i.e. indicated 'definitely yes' to sexual health drop-in as a treatment venue), followed by the GUM clinic (53%) as a possible treatment venue. A likelihood for a pharmacy as a possible treatment venue was indicated by only 38% of the respondents. A Spearman's rank order correlation (Appendix 33) shows a strong positive correlation between age category and a likelihood of accessing treatment from a GUM clinic (r_s =0.52, p=0.000); and a weak positive correlation between age category and a likelihood of accessing treatment from a pharmacy (r_s=0.26, p=0.028).

Figure 9-1: If needing a treatment for chlamydia, likelihood of accessing this at various service venues as listed



A positive correlation was also seen between respondents' previous access for EC from a pharmacy and a likelihood of accessing treatment from a sexual health drop-in (r_s=0.37, p=0.032).

For filling out partner notification form in the pharmacy, 57% of the respondents indicated that they would be *'very comfortable'* or '*fairly comfortable'* (Table 9-3). Figure 9-2 shows the respondents indication of their acceptability for different options of partner notification. A likelihood for different partner notification options (indicating 'definitely yes' or 'probably yes') was for them telling their partners (87%), whereas a likelihood for other PN options were indicated by only half of the respondents.

Figure 9-2: Likelihood of accepting various options for partner notification

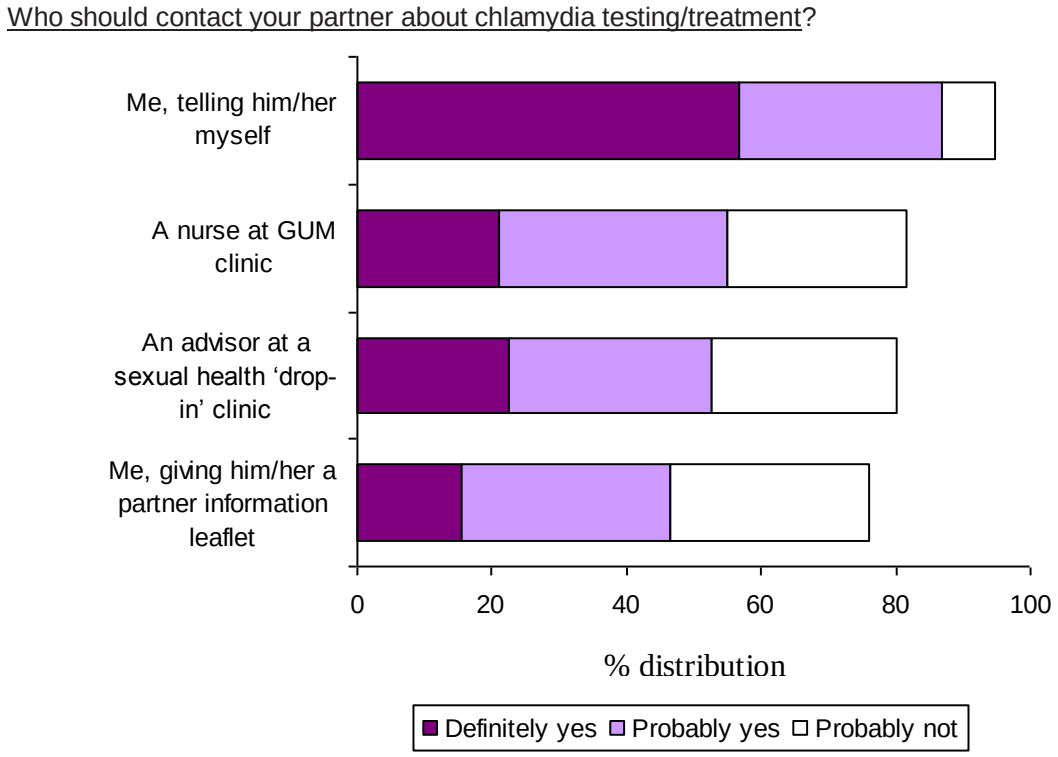
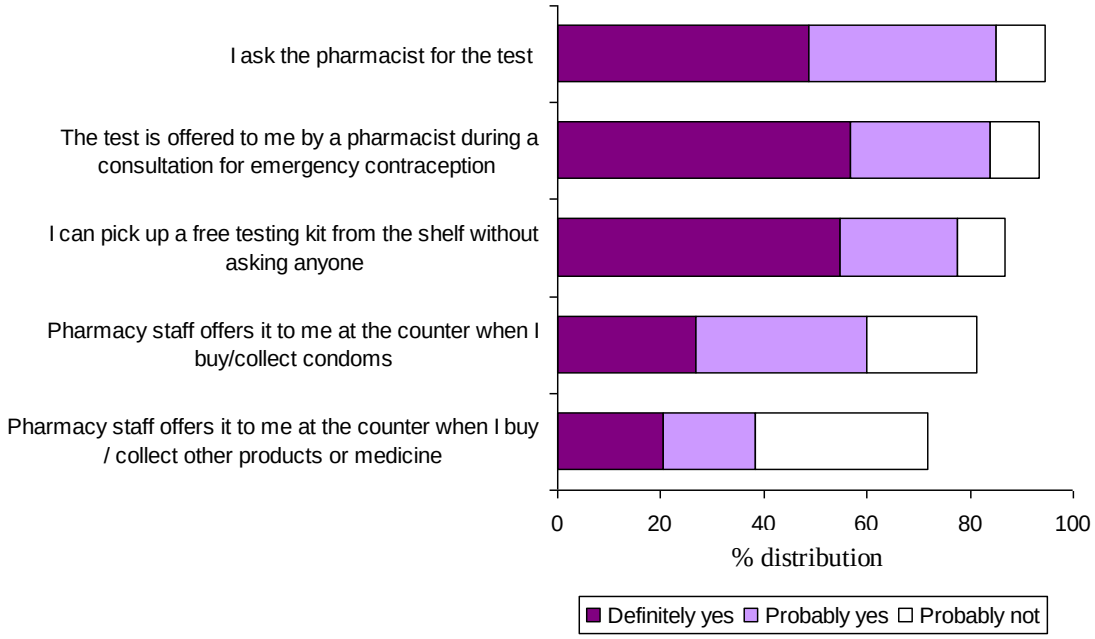


Figure 9-3 shows the respondents indication for their level of acceptability for different approaches of getting chlamydia testing kit from a pharmacy. The most acceptable approach was by asking the pharmacist for the test (85%), and if the test is offered by the pharmacist during EC consultation (845%). Picking up a free kit from the shelf was indicated as acceptable for 77% of the respondent. All the above three options were positively correlated with age category (Appendix 34). Pharmacy staff offering of chlamydia test at the counter when buying other products or medicine was least likely to be accepted by the respondents (21 % indicated 'definitely yes').

Figure 9-3: Acceptability of various approaches to obtaining chlamydia testing kit from a pharmacy

Which of the following ways would be acceptable for you to get a testing kit form the pharmacy?



Respondents were overall confident (indicating 'definitely yes' or 'probably yes') about the confidentiality of testing (93%), reliability of result (93%) and knowledgeable staff (90%) in a community pharmacy setting (Figure 9-4).

Figure 9-4: Respondent's confidence in different aspects of the CT&T service

Are you confident that pharmacy testing and treatment service would have?

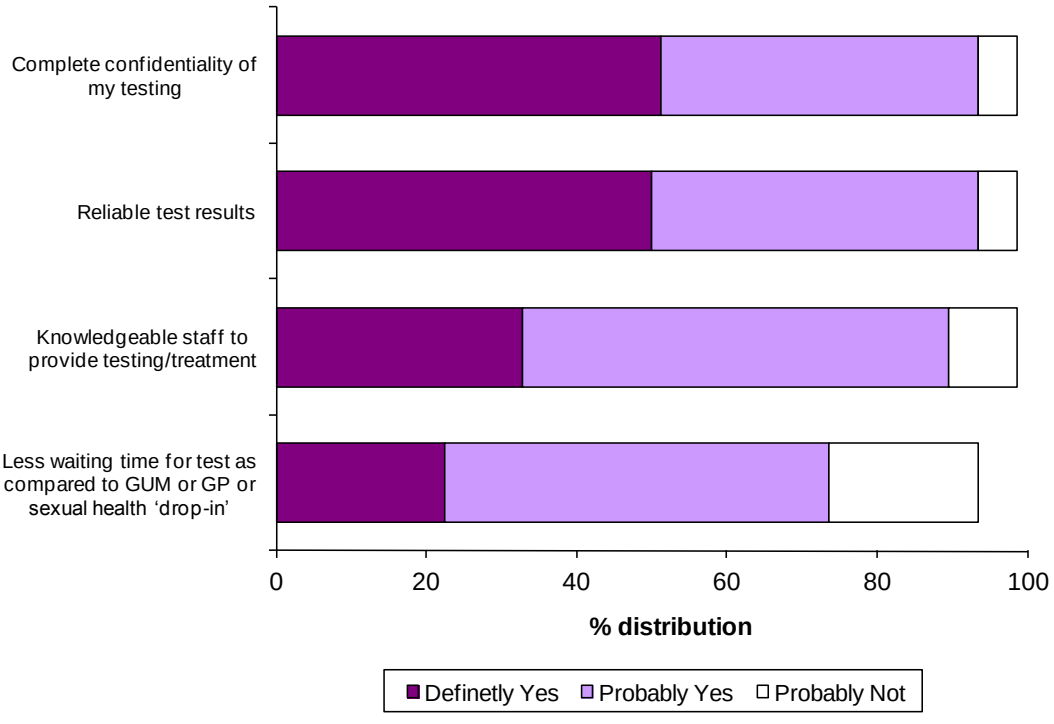
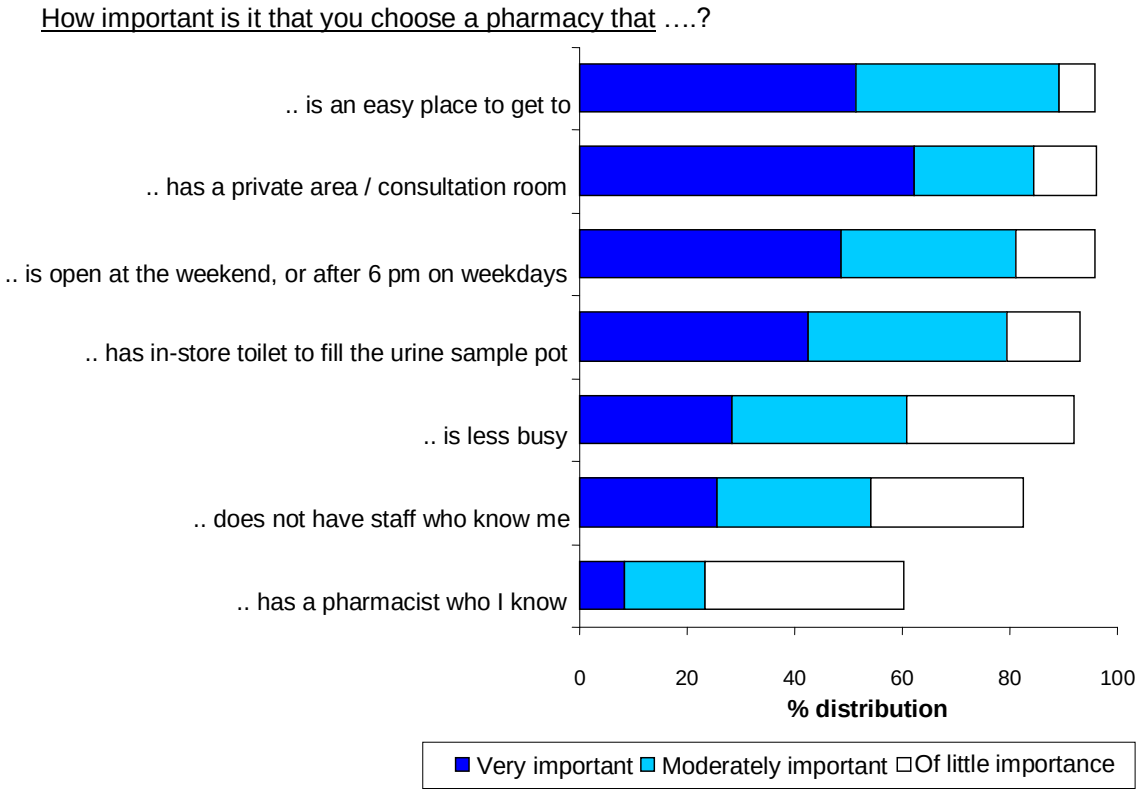


Figure 9-5 indicated the level of importance of various aspects in selecting one pharmacy store over another for chlamydia testing. The most important aspects (indicating very important or moderately important) were convenient location of a pharmacy (89%) and pharmacy with a private area or a consultation room (84%). Importance of a pharmacy with an in-store toilet was weakly negatively correlated with previous chlamydia testing (r_s=-0.23, p=0.049) suggesting that those not previously tested for chlamydia are more likely to place importance on an in-store toilet (Appendix 35). Importance of a less busy pharmacy was negatively correlated with age category (r_s=0.36, p=0.002) indicating that younger respondents (aged ≤ 19 years) are more likely to place importance on a less busy pharmacy.

Figure 9-5: Importance of various aspects in selecting one pharmacy store over another for chlamydia testing



9.5 Discussion

The results of this study suggest that respondents felt confident that a pharmacy would offer complete confidentiality for testing, provide reliable test results and have knowledgeable staff to provide the service (90% to 93%), demonstrating that for young people the pharmacy could be an acceptable additional venue for testing. That said, respondents indicated a preference to be tested in a GUM clinic (32%) or drop-in clinics (34%), with only 11% indicating a preference for pharmacy testing. However, when the respondents were asked to indicate their level of acceptability for each choice of *treatment* venue, 38% of the respondents indicated 'definitely yes' for getting treatment from the pharmacy. The most important aspects in selecting a pharmacy for the CT&T service were identified, by indicating the feature as 'very important' or 'moderately important', as: pharmacy with a convenient location (89%); a consultation room (84%); in-store toilet (80%); and long opening hours (81%). Those not previously tested for chlamydia placed more importance on toilet facilities at the pharmacy chosen for chlamydia testing, whereas younger respondents (≤ 19 years) placed more importance on a less busy pharmacy.

An important feature of this study is that it was preceded by the stakeholder survey (chapter 8) and a number of questions are derived from that survey in addition to those identified in the literature review. One example of such a question was to elicit young peoples' preference for different options of partner notification and whether they would feel comfortable to fill in the partner notification form in a pharmacy, as given in the Lothian CT&T service specifications. The results of this survey showed that 43% of the respondents felt uncomfortable in filling out a partner notification form in a pharmacy and preferred that they would themselves tell their partner about the possible risk of chlamydia (87%). These results might indicate that other options, for example, treatment vouchers handed over by index patient to their partners may be more feasible option and would result in an effective partner notification (Cameron *et al.*, 2010).

This is the first study to quantitatively explore young people's preferences and level of acceptability for different aspects of a pharmacy-based chlamydia service. Previous studies have identified facilitators and barriers mostly through qualitative

interviews (Anthony and Watson, 2008, Dabrera *et al.*, 2011, Taylor Nelson Sofres Healthcare, 2007). Quantifying the preferences of young people with respect to different aspects of a pharmacy service could help in developing a pharmacy model in terms of aspects which are most important to them. Potential clients' preferred model would improve their uptake of the service.

More than 42% of the respondents in our survey indicated that they already knew about the service. However it may indicate a 'social desirability bias' as the service was not promoted in any of the health care setting and the uptake of the service does not reflect that it would have been advocated by family or friends who previously used it. It is regrettable that the service was withdrawn within 10 months of its launch and hence the survey also had to be discontinued. It also severely limits the sample size that could be achieved for this survey; otherwise more survey venues could have been explored.

An important consideration of this study is a choice of the study design. Qualitative research on sexual health matters with young people have been acknowledged to be very difficult in terms of receiving participation and suffered from various setbacks (Heritage and Jones, 2008, Balfe *et al.*, 2010). In the Heritage and Jones (2008) focus group study, in order to improve participation of young people, the researchers had to diverge from their original plan on conducting focus groups and needed to use individual interviews in addition to the planned focus groups. In an in-depth interview study on the perspective of young people on undertaking chlamydia screening, Balfe et al. (2008) reported that despite their efforts to recruit young men, they receive no participation from them. Even for women who agreed to be interviewed in the first place, there was a fairly high dropout rate. The authors acknowledged that their inability to recruit men in the research would be an important absence especially when men are an important vector of chlamydia infection. As discussed in section 6.6.1.3, there was also a danger of not eliciting frank response from young people in a qualitative research method.

The reluctance of young people to participate in qualitative research also became evident by my experience in the pilot of this survey through the GUM clinic, where the respondents were invited to take part in the in-depth interview to further elaborate

on their views about the proposed service. However, despite the fact that those completing the pilot questionnaires were offered some incentive to agree to interview, in appreciation of their time for participation, none of the pilot respondents showed any willingness to be interviewed. It was further considered that social and academic *time* constraints for young people would also make their face-to-face participation in qualitative research more difficult. Anticipating a difficult participation of men in qualitative research and also to enhance a frank account of their perspective, a self-administered interview was therefore considered the most appropriate method for the current study. It was also decided that an invitation to be interviewed would not be made in the survey proper.

A limitation of this study is an overall low response rate of 20% which might have introduced non-response bias. The response rate for this survey was anticipated to be low since it has been demonstrated that questionnaires eliciting views and/or behaviour of a sensitive nature are less likely to be returned (Edwards *et al.*, 2002, Edwards *et al.*, 2009). The response rate from hard-to-reach groups such as young people and ethnic minorities have also been identified as low compared to the general population (Sheldon and Rasul, 2006). Many techniques have been recommended to increase response rate as much as possible. I adopted suggestions by Edwards et al (2002, 2009) to use a personalised invitation letter, using university logo, coloured questionnaire and postage stamped reply paid envelope. The questionnaire also underwent several revisions to ensure the shortest possible questionnaire and readability. In this regard it is encouraging to know that the item non-response to the questionnaire was minimal and ranged from 1 to 7 of the 34 items. Sending reminders was not possible in the current study since, for confidentiality reasons, contact information was not recorded when handing out the questionnaire. One measure that is commonly employed to evaluate the potential bias introduced by study non-participation is the collection of minimal data on non-respondents for comparison with respondents. However, most studies have found little evidence for substantial bias due to non-participation by comparing the characteristics of respondents and non respondents (Galea and Tracy, 2007). Institutional review boards and ethic committees also usually prohibit the collection of such data. It was planned that more survey venues would be explored such as

Healthy Respect drop-in sites in high schools and further education. However the short span of the service resulted in a limited time to implement such plans.

The response rate for the survey differed markedly across the three health care settings. In MYPAS, the response rate was 73% (33/45 questionnaires returned). The reception staff handed out the questionnaire and suggested the option to YP of filling in the questionnaire while waiting for the consultation. In contrast, only 13% (13/100) questionnaires were returned from Caledonian Youth. The response rate from the GUM clinic during the pilot phase of the survey was 33% (13/40 questionnaires returned) in contrast to only 8% (16/200) questionnaires returned in the survey proper at the GUM clinic. One possible explanation might be that during the period of survey proper the GUM clinic was in a transition phase of its relocation and merger with a family planning clinic. This might have distracted staff from the process of handing out questionnaire packs. The remarkably higher response rate from MYPAS might represent the research culture of that organisation, perhaps leading to extra enthusiasm by counter staff, to hand over the questionnaire to respondents, and greater encouragement to potential respondents to complete the questionnaire while they waited for their consultation (personal observation). Another possibility is that selection bias might have occurred in this study such that despite the reception staff being instructed to hand out the questionnaire to all eligible patients, it might be possible that MYPAS pre-selected recipients as folk likely to respond. One study has shown that recruiters for sexual health studies often do not approach all eligible young people, for various reasons such as their perception of young people's lack of knowledge about screening, time pressure and a lack of guidance (McNulty *et al.*, 2004). Reminders to the reception staff about the study objectives might have been able to improve the recruitment of more young people.

The profile of GUM clinic respondents differ from MYPAS and CY respondents in terms of age category and the history of chlamydia testing, for example, 19% of the GUM clinic survey respondents were in the ≤ 19 years old age category as opposed to 81% and 69% of the respondents in MYPAS and CY respectively (p-value <0.001). There was also a statistically significant association (p-value <0.004) of the history of chlamydia testing in the past year across the three study locations (72% in GUM clinic vs. 31% and 38% in MYPAS and CY respectively). It is therefore possible that any associations seen between the age category and preferences for different aspects of the pharmacy service have been confounded by some other unknown profile of the respondents that are also related to the sites of this study. Similar assumption might also hold true for any association observed between past history of chlamydia testing and preferences for different aspects of the pharmacy service. The study sample was however not of a sufficiently large size to stratify it on survey venue and then to provide reliable estimates for any association between age category, or past history of chlamydia, with preferences for different aspects for pharmacy service. Also, due to the unavailability of non-responders' data, it could not be evaluated whether this variation reflects the actual difference in the service users' profile in the three settings or the variation also exist in terms of response rate across the three survey venues. The fact that respondents profile did not differ between MYPAS and CY, despite the wide variations in the response rate from the two settings (73% in MYPAS vs. 13% in CY) needed further investigation in terms of research culture in the two settings which might have an impact on response rate.

Considering the overall response rate, it is important to note that it is difficult to obtain participation from young people. Previous studies have reported difficulties in recruiting young people, particularly for research on sexual health issues (Heritage and Jones, 2008) and one other study reported a similar response rate (Brugha *et al.*, 2011). The low response rate might also reflect an often low uptake of chlamydia screening by young people, hence their lower interest in participation in studies regarding chlamydia screening. A recent study of NCSP in South East of England found that only 1% of male and 3% of female population are being tested for chlamydia (Johnson *et al.*, 2010), although this figure would also reflect the low rates of young people being offered chlamydia screening. Hence a low response rate for

this survey is not unique in the context of research on sexual health in general and chlamydia screening in particular.

I did eventually manage to get participation from a diverse population, including respondents in employment, unemployed and/or studying. Respondents were also equally spread across the two targeted age bands (i.e. 15-19 years and 20-24 years). However female respondents predominated (among those for whom gender was ascertained) as did respondents of white UK origin. However this reflects the gender profile of young people accessing sexual health services in Lothian, comprising predominantly females, and reflects the predominately white local population (Taylor Nelson Sofres Healthcare, 2007). Due to the lack of information on gender for nearly half of the respondents and hence a very small numbers available for the analysis of gender (n=34 females and n=6 males), the gender differences in the respondent's preferences to different aspects of a CT&T service could not be ascertained. Previous studies have found that men were more willing than women to be tested in the non-medical settings (Lorimer *et al.*, 2009a, Lorimer *et al.*, 2009b).

Lower acceptability for the pharmacy as a testing or treatment venue for chlamydia, as compared to sexual health clinics, supports the findings of another study that the clients would feel stigmatised if offered screening in a non-clinical setting (Lorimer *et al.*, 2009a). A recent study from Ireland indicated that more than 90% of respondents did not want screening services to be located in pharmacies and almost all rejected public non-health care screening settings (Brugha *et al.*, 2011). The results of our survey may also be biased because the survey sample was drawn from sexual health clinics, and hence it is possible that patient's preference for a service is positively influenced by their familiarity with the service already experienced. A similar study conducted among young people who have visited pharmacies might have shown different preferences, and/or who are sexually active but have never used a city sexual health clinic because of fear or inconvenience in terms of distance or hours. Imamoglu et al (2006) proposed a three-factor model in which attitudes mediated between familiarity and preferences for various nursing care facilities enquired about. Increased familiarity seemed to predict enhanced favourable attitudes in the case of assisted living facilities, but to unfavourable attitudes in the

case of nursing homes. A recent review of determinants of obstetrics service use suggest that specific facility use in previous delivery and antenatal care is highly predictive of the health facility used in the index delivery (Gabrysch and Campbell, 2009). The possible reasons suggested for the ongoing use of the same or similar service was that women become familiar with a setting and this makes them more likely to use it again. Similarly, previous use of EC has been demonstrated to influence women's choice to use EC again (Bharadwaj *et al.*, 2011). Further investigation is needed, however, into the role of familiarity in decision-making among young people with respect to drop-in services such as CT&T.

It is reassuring that the survey respondents have confidence in the level of privacy achievable in the pharmacy, knowledge of its staff and the reliability of the results if tested in a pharmacy. Hence their indication of a pharmacy as a less likely option for testing or treatment could not be linked to the above potential barriers identified in the previous research (Taylor *et al.*, 2007, Thomas *et al.*, 2010). A preference for a face-to-face consultation for receiving test results by nearly 24% of the respondents and the highest level of importance that they had placed on the availability of a consultation room (62%) might suggest that consultation and counselling are the main reasons that direct their choice of venue for the CT&T service. Previous research in relation to pharmacy provision of EC service indicated that the pharmacy was perceived as a business environment, making it a less personal space for a private consultation and having less scope for counselling (Weiss *et al.*, 2007).

The study indicates that CT&T service proactively offered by the pharmacist during EC consultation or when buying condoms were acceptable to young people. These results contradict the findings of our qualitative study of pharmacists who perceived that young people might feel offended if offered CT&T service during EC counselling. Similarly other studies demonstrated that pharmacists are reluctant to offer chlamydia screening during EC consultation (Brabin et al., 2009b). Provision of kits on the shelf (to be self picked) as well as young people asking for it from the pharmacist is widely acceptable to young people in the current study. However the provision of kits on the shelves may result in a low return of sample. The high price of a chlamydia testing kit is primarily due to its absorbent packaging needed for

postage of the sample. Thus the current screening model of Lothian may be adopted by only providing the sample bottles on the shelves with information leaflet and asking the clients to return the sample for its postage through pharmacies. 60% of the respondents in our study preferred returning the sample to the pharmacy for postage.

Despite the termination of the service in Lothian as well as the rest of the Scotland, community pharmacies are an active venue of chlamydia screening programme in England. The proportion of tests offered to the young people through pharmacies in South-West England reaches nearly 6% of all tests and 9% of all the treatment provided to index patients and 9% of treatment provided to partners (National Chlamydia Screening Programme, 2008). The findings of this survey may help in improving the uptake of screening in community pharmacies. Further research by implementing a similar study on young people accessing chlamydia service through different venues such as community pharmacies, SH clinics and GP clinics may be needed to validate the findings of this study.

9.6 Chapter Overview

In summary, this chapter has described preferences and acceptability of young people attending sexual health services for different components of the CT&T service. In addition, it has reported their level of preference to use pharmacies, as compared to sexual health clinics or GP surgeries, to get chlamydia testing and treatment. The degree of importance which young people would place on choosing one pharmacy over the other, were also elicited.

CHAPTER 10: QUALITATIVE INTERVIEWS WITH PHARMACISTS

10.1 Introduction

This chapter explores the views and experiences of pharmacists who were invited by NHS Lothian to be the first wave to offer the CT&T service, both those who agreed (labelled *pilot-service pharmacists*) and those who declined to provide the service (labelled *non pilot-service pharmacists*). Understanding of the service provider's perspective increases the scope for improving the service specification of a pharmacy-based chlamydia service. The specification can be adjusted to meet provider's concerns, thereby helping in the roll out of the service to all pharmacies after the pilot phase and enhancing likely feasibility and sustainability in practice.

10.2 Objectives

The following objectives are determined for the in-depth interview study with the pharmacists:

Pilot-service interviewees:

i. to ascertain the reasons for participating in the CT&T service;

ii. to explore their experience of the implementation of the CT&T service;

iii. to explore their views on the subsequent discontinuation of the service.

Non pilot-service interviewees:

iv. to ascertain their reasons for not participating in the CT&T service.

All pharmacist interviewees:

v. to identify their views on different aspects of the CT&T service;

vi. to ascertain their perceived facilitators of and barriers to the provision of the CT&T service;

vii. to ascertain their perceived facilitators of and barriers to young people, in accessing the CT&T service;

viii. To explore their views on the perceived attitudes of the key players of this service; i.e. other pharmacy staff, GPs and the potential clients.

ix. to identify their views on the potential impact of the service on population sexual health.

10.3 Methods

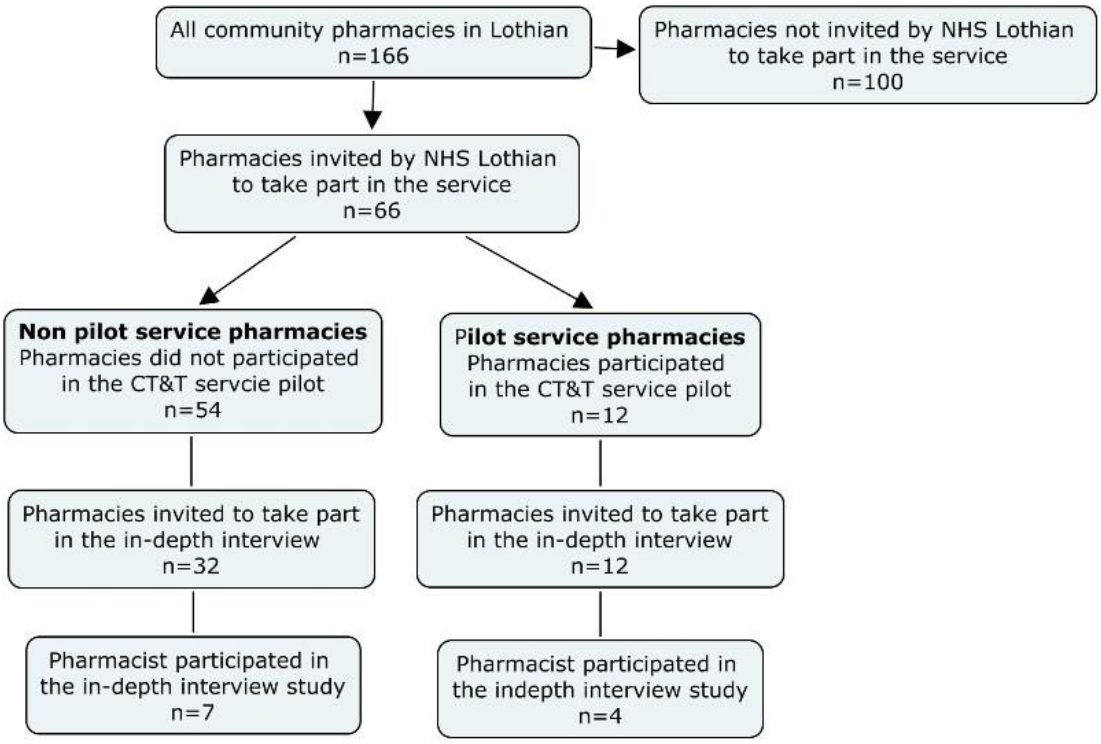
10.3.1 Study design

This study element employed a qualitative approach by undertaking in-depth interviews with pharmacists from both groups i.e. providers and non-providers of the CT&T service. The rationale for choosing self administered postal survey for this study has been described in section 6.6.1.4

10.3.2 Sampling strategy

Having chosen the in-depth qualitative interview approach, the next stage was to identify pharmacist interviewees and begin the process of recruiting participants for the study. In order to understand the variation in views, interviews were undertaken from those pharmacists whose pharmacies participated in the service as well as those who did not participate in the service. Figure 10-1 shows the sampling of pharmacists for in-depth interviews.

Figure 10-1: Flow diagram of sampling of pharmacists for in-depth interviews



In total 66 out of 166 community pharmacies were sent an invitation by NHS, Lothian to take part in the CT&T service. Of these, 12 pharmacies took part in the pilot. All the 12 pilot service pharmacies were invited to take part in the in-depth interview study. Of the 54 invited community pharmacies, which did not participate in the service, I used purposive sampling and invited n=32 non pilot-service pharmacies to take part in the in-depth interview. Purposive sampling relies on selecting interviewees by virtue of characteristics thought by a researcher to be likely to have some influence on their perceptions and experiences (Mason, 2002). In the current study, I purposively sampled pharmacies to represent a range of deprivation areas where located, urban-rural classification and local authority areas of Lothian.

10.3.3 Recruitment of the study participants

It was decided to undertake the interviews with non pilot-service pharmacists **(NP)** first, to allow a little more time and experience for the pilot-service pharmacists **(PP)** to deliver the CT&T service. In the first phase, the interviews with the non pilot-service respondents took place between July and November 2010. The recruitment process involved an initial approach by an invitation letter (Appendix 36) with an enclosed participant information sheet, and an intention to participate form and a reply paid envelope. Only 5 pharmacists replied and indicated their intention to participate (n=1) or not (n=4). For those who did not reply, a follow-up telephonic call was made approximately two weeks after the initial contact to allow prospective participants the opportunity to consider their involvement in the study and identify questions. The telephonic recruitment approach was undertaken until the appropriate numbers of pharmacists were recruited.

In the initial stage, four pilot interviews were conducted. There were a number of goals for the pilot interviews; such as, whether my initial interview questions were comprehensible and seemed relevant to interviewees, whether interviewees required prompting, what degree of depth pharmacists would provide, how long interviews might take to conduct and what would be the most suitable time and place for the interviews. Another important consideration for the pilot interviews was to provide me, as a novice researcher, with practical experience in interviewing, in addition to my theoretical training. After the pilot interviews, further recruitment of pharmacists

was undertaken until it was felt that data saturation has occurred. Any new theme that emerged was added in the interview guide for its confirmation in the subsequent interviews, for example, one of the themes that emerged in the initial interview was miscommunication regarding the mandatory requirement of toilet within the pharmacies to be able to provide the service. This theme was then added in the later interviews and it emerged that the pharmacists thought that the content of the invitation letter sent to them was not clear which lead to this miscommunication. Ultimately after 7 interviews, no new information was forthcoming.

In the second phase, all the 12 pilot-service pharmacies were invited to take part in an in-depth interview. Only one replied to take part in the study. The remaining non responders were approached through telephone and another 3 interviewees agreed to take part in the study. The recruitment took place in April 2011 and the interviews were undertaken in May 2011. By this time it was a common knowledge among the pilot-service pharmacies that the CT&T service had been withdrawn from Lothian. In order to confirm whether data saturation has occurred, it was necessary to undertake more interviews from the pilot-service pharmacies. But the rest of the 8 pilot service pharmacists declined to participate, indicating reasons such as; irrelevant as the service has been withdrawn, there was no uptake and hence no meaningful experience with the provision of the service.

10.3.4 The theoretical approach for in-depth interviews

The main reason for adopting a theoretically informed approach for this qualitative research is that it provides a framework to develop new insights and perspectives that benefit the gathering, interpretation and analysis of data (Miles and Huberman, 1994). Such a framework can enable the identification of factors that systematically influence the effectiveness of intervention and hence help built a cumulative understanding of what works and how (Pawson and Tilley, 2008).

There is a diverse range of theories potentially relevant to understanding implementation of a CT&T service from the perspective of providers, and this encompasses a wide range of disciplines from psychology, sociology, behavioural economics and management sciences. However these theories are often based upon overlapping concepts. For example, Michie et al. (2005) identified a total of 33

psychological theories that consist of a total of 128 constructs and that can be summarised into 12 common domains. Some of the common domains identified in this study - beliefs about capabilities, beliefs about consequences, motivation and goals, and social influences - overlapped with those identified by Fishbein et al (2001). Michie et al. (2005) further discussed that since the consensus on their domain list was reached independently of the Fishbein and colleagues (2001) study and in the context of a different set of behaviours, this provides further validation of the utility of these domains in understanding of the behaviour change processes inherent in implementation of evidence-based practice.

Previous studies in pharmacy practice have adopted a range of theoretical paradigms and no single theoretical perspective is considered 'right or best' to explore a certain topic of research (Nosrgaard *et al.*, 2000). Each paradigm is chosen to serve a specific purpose. Health promotion theories are useful when the purpose is to understand priorities and implementation strategies of health promotion interventions within an organisation. For the current research, health promotion paradigm was chosen because I wanted to investigate the process of implementation of a newly developed health promotion intervention, i.e. CT&T service, in pharmacy practice. For health promotion theories, the two most commonly used paradigms are those of organisational theories and behavioural theories.

Pharmacy practice studies carried out within an organisational paradigm have explored the relationship and interaction that facilitate or inhibit practice change in community pharmacies. Some of these have focused on the management practices in community pharmacies, using models such as diffusion stages of Rogers' 'Innovations in Organisations' (Rogers, 1995, Pronk *et al.*, 2001) and Leavitt's diamond of organisational change (Roberts *et al.*, 2005). However, organisational theories are most useful when trying to understand how interventions are implemented or incorporated into practice once a decision (implicit or explicit) to do so has been made. For example, Roger's Innovation in Organisations theory consists of five stages; the first two in the initiation sub process and the later three in the implementation sub process. In my research this was not entirely the case since I was focussing on explaining why a pharmacist might intend to implement the service or

not. My study sample included both the providers and non providers of the CT&T service. Hence in order to capture the perspective of both types of participant, it was decided to use a common theoretical framework to seek to explain a pharmacist's decision to implement a service in their own organisation, where that decision reflects a behavioural intention.

Studies of changing behaviour in health promotion interventions focused on changing the behaviour of patients, consumers as well as providers (Munro *et al.*, 2007, Eccles *et al.*, 2005). Well-studied theories related to changing an individual's behaviour include the health belief model (Hochbaum, 1958), the theory of reasoned action (Fishbein and Ajzen, 1975), the theory of planned behaviour (Ajzen, 1985, Ajzen, 1991), and the social cognitive theory (Bandura, 1989).The health belief model is one of the oldest theory and was originally developed in the 1950s to explain why health screening programmes offered by the U.S. Public Health Service, particularly for tuberculosis, were not very successful (Hochbaum, 1958). However, the health belief model focuses on an individual's perception of the threat posed by a health problem, the benefits of avoiding the threat and factors influencing the decision to act. It is considered more suitable to study the behaviour of those receiving the service rather than those of providers. The Social cognitive theory explains how people acquire and maintain certain behavioural patterns (Bandura, 1989). The main concept advocated by Bandura is 'triasidic determinism', i.e. the behaviour; personal factors and the environment all affect each other. Personal factors include cognitive, affective and biological factors. Behavioural factors include the concept of 'self-efficacy' or the beliefs about the behaviour. Environmental factors include the physical space, the equipment available and the behaviour of others within the environment.

The theory of planned behaviour (TPB) (Fishbein and Ajzen, 1975) and its predecessor, the theory of reasoned action (TRA), is one of the widely used theories to study behaviour change in the health provider and the patient / customer (Godin and Kok, 1996, Godin *et al.*, 2008). It is built upon a simple proposition that much ***behaviour*** that an individual performs can be predicted simply from a person's

intentions to perform those behaviours. Such intentions are called ***behavioural intentions***.

From the general account, it is apparent how these various approaches to theory overlap and make each other similar. In particular, there is a considerable overlap between the social cognitive theory and the constructs of the theory of planned behaviour. Since the Theory of Planned Behaviour has *influenced* my analysis of behavioural intentions of the pharmacist regarding the implementation of the CT&T service, this theory is explained further below.

10.3.4.1 Theory of Planned Behaviour

The TPB is an extension of TRA developed by Ajzen and Fishbein (Fishbein and Ajzen, 1975). It proposes a model about how human action is guided. The TPB is based on the premise that behavioural intentions can be used as a proximal measure of behaviour. Using the TPB to study the behavioural intention of health providers offers an atypical context. It assumes that clinical practice is a form of human behaviour and can be described in terms of theories relating to human behaviour that will have no influence on their health (although potentially on health of others), rather the impact of their behaviour is likely to be on their clinical practices.

The three core constructs that constitute the TPB are illustrated in Figure 10-2 and are explained below:

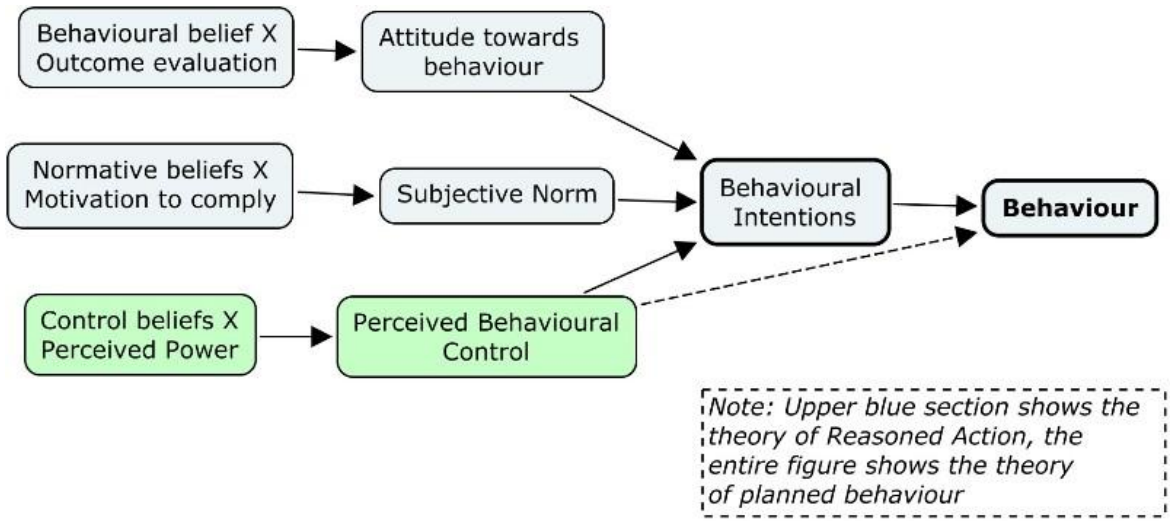
Attitudes *(towards the behaviour)* refer to an individual's overall evaluation of their behaviour. In the case of community pharmacists, for example, they might perceive how the implementation of the CT&T service would have an impact on their status as a public health professional or on their business.

Subjective norms *(about the behaviour)* are an individual's own estimate of the social pressure to perform or not perform the target behaviour. In a community pharmacy setting other groups might include other pharmacists, GPs, customers and the interviewee's professional organisation(s).

Perceived behavioural control is the extent to which an individual feels able to perform the behaviour. In the case of community pharmacists, their perception of

facilitators of and barriers to providing the CT&T service might influence their intention to provide the service.

Figure 10-2: Diagrammatic illustration of the Theory of Planned Behaviour



The model of the TPB maintains that the relative importance of the constructs in influencing behavioural intentions will differ for different behaviours. Furthermore, regarding a specific behaviour, they could differ between populations, and even between individuals within the same populations.

The research employing the TPB is most commonly elicited through quantitative surveys and Ajzen also suggested some prescriptive questionnaires for eliciting TPB for illustrative purpose. However Ajzen acknowledged that these questionnaires, despite having been used in prior research, might not be appropriate for a particular behaviour, population or time period. Since the focus of this research was to gain in-depth understanding of the behaviour intention from the perspective of respondents, a qualitative approach was chosen as the most appropriate method for addressing the research objectives.

10.3.5 Development of the interview guide

To address the study objectives, eight major topic areas were explored. These topic areas are derived from the findings of the systematic overview of the relevant literature, and also reflect the three constructs of the TPB. These topic areas are as follows:

1. Exploration of specific aspects on the service
2. Decision to take part in the service
3. Experience of providing the service
4. Views on discontinuation of the service
5. Perceived barriers and facilitators for young people
6. Perceived barriers and facilitators for pharmacy
7. Perceived attitude of the key players: pharmacy support staff, GP and potential clients opinion of the service
8. Views on the potential impact of the service

Topic areas 1-4 covered the objectives i-iv of this study. Topic areas 5 to 8 further explored the themes identified in the literature review and grouped under three main components of the TPB. The *perceived behavioural control* (identified barriers and facilitators in delivering/accessing the service in terms of staff, capacities, resources and structures were assessed and presented in topic area 5 & 6 and it covered objectives vi & vii of the study. The *subjective norms* (perception that pharmacy support staff, potential clients and GPs would approve them to provide the service was presented in topic area 7 and covered objective ix of the study. An *attitudes and beliefs* of the pharmacists about the benefit of the service was covered in topic area 8 and constitute objective ix of the study.

The interview guide underwent several slight revisions as interviews were completed; some changes were the simple addition of a question, if a new theme emerged, such as the level of decision autonomy to take part in the service. Some comprised a prompt, if it tended to yield inadequate responses. The final interview guide is attached as Appendix 37. Participants were also given a one-page information sheet to read as well as received a verbal explanation of the interview process.

10.3.6 Transcription of interviews

All interviews were audio recorded after permission had been sought from the interviewees. Transcription was undertaken as soon as possible after interviews. The

initial 3 transcriptions were undertaken by me, with the later transcriptions undertaken by an experienced transcriber in the department. However, I still listened to all the recordings repeatedly, to allow me to add comments and some measure of conversation analysis in terms of pause and duration, emphasis on particular word or phrase, or even laughter and instances of hesitation and hedging (for example, 'um's and 'ah's). Although the intentions were not to undertake a conversation analysis, it gave me deeper insights into whether, for example, the interviewee felt strongly about some issues. After interviews, brief notes were made such as to reflect on the interview process and contextual observations made during the whole process which I thought might be useful in interpreting the results (for example, the location of the pharmacy in terms of its geographical accessibility, its size, whether promotion leaflets were available for clients for other services offered by the pharmacy, its opening hours, the level of privacy achievable in the pharmacy and achieved during the interview). These field notes were added as memos in the transcripts. These memos together with the added comments on the transcripts from listening gave me valuable information regarding the context in which the comments were made by the interviewees and in the cross-case comparisons.

10.3.7 Analysis and presentation of data

Transcripts were uploaded into QSR Nvivo-8 (2008), a qualitative data management software package. Data were analysed using a framework analysis approach (Ritchie and Spencer, 1994). It employs intensive study of transcripts to define emerging themes and form a framework that is applied systematically to the raw data. Briefly this process of qualitative data analysis occurs in five key steps: i) familiarization, ii) identifying a thematic framework, iii) indexing, iv) charting and, v) mapping and interpretation. The benefit of framework analysis is that it allows for the inclusion of a-priori as well as emergent concepts and is suited to research that have a pre-designed sample (for example, professional participants). Hence framework analysis is aptly suited for applied social science and policy research and is more commonly used in studies in health care settings (Atreja *et al.*, 2005, Gerrish *et al.*, 2004, Lacey and Luff, 2001, Read *et al.*, 2004).

I followed the overall process of framework analysis, but adapted the different stages to the requirements of this study. During the familiarisation stage, I read the transcripts extensively and listened to the audio tapes and field notes. An initial coding framework was then developed, both from a-priori themes as mapped out in the conceptual framework developed from literature review (Figure 3-3) as well as from emerging themes from the familiarisation stage. This thematic framework was however further developed and refined during subsequent stages. The next two stages, indexing and charting occurred simultaneously and involved the process of applying this thematic framework to the data and arranging the data according to themes. This analytic approach ensures that findings are systematically compared. These stages of analysis have been facilitated by use of qualitative data management software, such as NVIVO that I have also used for my research. The data have now been segregated by main themes and sub ordinate themes, and were revisited and resorted on several occasions before settling on the final themes. Appendix 38 provides an excel output of nodes and sub-nodes developed during this analysis process. However the analysis is not presented in the form of charts, rather the data reporting undertook a more conventional way of qualitative data reporting involving discussion of each theme with supporting data excerpts as well as the discussion of relevant literature and cross themes comparison. The data reporting is further discussed later in this section.

A final stage of mapping and interpretation was then undertaken, by identifying the relationship between themes and subordinate themes. It was during this stage that a cross case and constant comparison method was employed. The latter technique involves going back and forth through the interview transcripts to compare the data from different transcripts to define concepts and find association between themes and provide explanation to different phenomena. Annotations that were added throughout the coding process helped to track conceptual decisions and ideas as they occurred. During this process, schematic maps of themes and sub themes were also developed, individually as well as a final conceptual framework. Some of these thematic maps and the final conceptual framework are presented in the result section and in the overarching discussion respectively.

All primary analyses were undertaken by me. However, credibility of the data analysis was established by presenting analyses i.e. themes and conceptual abstractions of the data in supervision meetings to challenge the meanings and the basis of my interpretation of the data. It is also important to emphasise here that my analysis of the interview data is based on the perspective that the responses are a straightforward reflection of the interviewee's experience and understanding of events in relation to the CT&T service. However I also acknowledge that I had a part in defining aspects of their account through my choice of questions and topics for inclusion in the interview topic guide and through my requests for clarification and expansion during the interview.

The reporting of interview data has been addressed by Silverman and other qualitative methodologists. The use of verbatim versions of participant's speech has been recommended, in contrast to summaries and abstract interpretation (Miles and Huberman, 1994, Patton, 1987). Miles and Huberman (1994) advocated that there must be a balance between one extreme which involves reproducing large chunks of transcribed text and the other extreme, in which attempts are made to cherry pick only the most appropriate excerpts from interviews or, worse still, to use them to fit emergent themes or theories, at the cost of ignoring deviant data or cases. Hence, in this thesis, I have made an attempt to respect the authenticity of the interview data by avoiding, wherever possible, reducing pharmacists' responses to fragmented snippets. However this was not always possible, and sometimes it is necessary to 'pick' in order to avoid reproducing large sections of text that contain one relevant comment.

For reporting purposes, pharmacists were assigned an acronym: NP for non pilot-service pharmacists and PP for pilot-service pharmacists. In each sub group, the prefix letters were followed by a unique identification number. In some places, where important, the type of pharmacy (chain or independent pharmacy) is also reported.

The format of this chapter is somewhat different to previous chapters. As is usual with qualitative research, discussion is interspersed with the reporting of the interview data. This is particularly useful in this study because of a number of topic

areas explored and the two interviewee groups. This includes making comparison with the findings of other studies within this thesis, to discuss the relevant published evidence, and to offer my own interpretation of the findings. Hence the next section presents the results and a simultaneous discussion of the themes. This is followed by considerations of the strengths and limitation of this study and lastly a conclusion section presents the summary of findings of this study.

10.4 Results and discussion

The interviews lasted from 15 to 40 minutes each. Table 10-1 summarises the characteristics of the interviewee pharmacists and the pharmacies.

Table 10-1: Description of study participants by gender and years of experience and by pharmacy classification

	Pharmacy classification				**Pharmacist's socio-demographic profile**	
Acronym	***Pharmacy Type***	***Deprivation quintile****	***Urban-rural classification***	***Local authority***	***Gender***	***Years of experience***
Non Pilot-Service Pharmacists (NP)						
NP-1	Independent	2	Accessible rural	Mid Lothian	Male	3.5
NP-2	Independent	1	Other Urban	West Lothian	Female	31
NP-3**	Independent	4	Large Urban	Edinburgh city	Female	4
NP-4	Large Multiples	1	Other Urban	West Lothian	Female	6
NP-5	Large Multiples	4	Large Urban	Edinburgh city	Female	Not Asked
NP-6	Small Chain	2	Large Urban	Edinburgh city	Female	Not Asked
NP-7	Large Multiple	2	Large Urban	East Lothian	Female	10
Pilot- Service Pharmacists (PP)						
PP-1	Independent	1	Large Urban	Edinburgh city	Female	4
PP-2	Independent	1	Other Urban	East Lothian	Female	33
PP-3	Independent	1	Large Urban	Edinburgh city	Male	17
PP-4**	Small chain	3	Large Urban	Edinburgh city	Female	16

*Deprivation Quintile: 1 is the most deprived and 5 is the least deprived

**Telephonic interviews

All but two interviews were conducted face-to-face. The remaining 2 interviews (NP-3 & PP-4) took place by telephone. Potential interviewees were given a choice to be interviewed out of work hours, but all preferred to be interviewed during a quiet period or a lunch hour and, for convenience, in their work place. All the face-to-face interviews occurred in the consultation room or a dispensary.

The eight topic areas explored (section 10.3.5) are presented in this section.

10.4.1 Exploration of specific aspects of the CT&T service specifications

I asked the interviewees to reflect upon different aspects of the service, particularly the age group targeted, mechanism for engaging young people in the service and with regard to the aspect of partner notification to be undertaken in the pharmacy.

10.4.1.1 Age group targeted[7]

When asked to comment on whether they think that the targeted age group of 16-20 years for the chlamydia testing service in Lothian is appropriate, all pilot pharmacists and a couple of non-pilot interviewees indicated that the high prevalence of infection in this age group suggested a rationale for targeting the service at the under 20's.

> *I understood it, it made utter sense to me but it didn't fit in to the people that were asking me for it and that's why I only gave out two. And I do think you need to restrict it because, you know, it was proven, in the data that we were given.....that if you're 27 years old, chances are you've not got it, although I know there's exceptions to that. (PP-3)*
>
> *I assume that this is one of the highest groups so… so that's the first step. (NP-5)*

The reasons given by some interviewees indicate their misapprehension of the prevalence data.

[7] The current CT&T service in Lothian was targeted for young people aged between 16 to 20 years. The 'testing' service can also be provided to clients 15-24 years of age who request the testing kit. Moreover 'treatment' could be provided to clients ≥ 13 years old (see also section 5.4.1.1).

I would probably make it wider, to be honest. You've got a lot of sexually active girls in their late 20s who can contract chlamydia. And, you know, they're coming into child-bearing age and obviously it can affect fertility. […] just personally, I would say late, late 20s, you know, you've got more uptake, I think, on that. (NP-4)

Views regarding the age group targeted might reflect their training knowledge for CT&T service. While all the service-pilot interviewees attended training, none of the non-pilot interviewees attended the training offered to all the community pharmacies in Lothian before launching the CT&T service. However despite their understanding of targeting a younger age group, all of the interviewees wanted to increase the age limit to 25 years or late 20s. The most common argument given for increasing the age limit was that an older age group are more likely to use the service. Others considered that the service is more needed in this age group because there is more involvement in sexual activity in the 20s.

I sort of think when people go to university they're more likely to a) need it and b) you know, be more confident to come in and speak to somebody about it. So I would say to 20 is maybe a bit low, yeah. (NP-7)

From the above quotes there is an indication that despite understanding the rationale of targeting the younger age group (due to its high prevalence), but still wanting to increase the targeted age group (to increase the uptake) rationally reflect their desire to provide the service that has a potential to be successful and efficient in terms of uptake of the service. However this area needs further exploration.

10.4.1.2 Child protection issues: Fraser competency

For the lower age limit, interviewees were also asked if they would be comfortable dealing with clients under 16 year olds if they request testing. Most of the non pilot interviewees indicated that they would be comfortable dealing with sexual matters of this age group, with the major justification cited being their involvement already in EC service and that they are thus trained to assess Fraser competency.

I'm quite comfortable with them because I've dealt with them under the EC72 service. (NP-6)

However, some of the pilot pharmacy interviewees had reservations about dealing with young clients under 16 years old. One interviewee indicated that she is not trained for counselling young people and hence would prefer to refer young people to

specialist sexual health services. While recalling his experience with EC provision, another interviewee quoted:

> *I thankfully never had to. To be honest with you, I probably would pass them on to someone else. Yeah. I'm not comfortable with that at all, no. I've done EC72 for a 14-year-old and several 15-year-olds but... yeah, it's not very... yeah, it's not very nice. (PP-3)*

There was no suggestion from the available data that the socio-demographic profile of the pharmacist, such as gender or age group would affect their reluctance to deal with a very young age group. In a training programme for pharmacists for the provision of EC, application of the Fraser guidelines for women aged less than 16 years was found to be problematic, but details of the barriers experienced and how they were addressed were not reported (Taylor, 2003).

10.4.1.3 Mechanism for engaging young people in the service[8]

Interviewees were asked to indicate their preference for either a reactive or proactive way of engaging young people to the CT&T service. The idea of a *proactive* offer of the service to young people was rejected by all but one of the non-pilot service interviewee, and only one of the pilot-service interviewees. Main reasons cited were their concern that young people would feel offended to be offered this service.

> *I think, you know, people could be quite insulted if you're going to just ask them straight out "do you want this?" or "do you need this?" (NP-7)*

> *I would feel very awkward about that because it's a very private kind of thing anyway…so I really did feel self-conscious offering that to someone; yeah, who am I to say that they've got a sexually transmitted infection? (PP-3)*

Other reasons cited for not favouring a proactive offer were the busy retail environment of a pharmacy and the lack of privacy achievable, in a pharmacy setting, to offer the service to potential clients.

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[8] The current recruitment model for accessing pharmacy CT&T service in Lothian requires the client to request the chlamydia test in the pharmacy. Thus it is a *reactive* model where the pharmacist offers consultation when clients request chlamydia testing. An alternative model, which was tested in other parts of UK, Australia and Netherlands, was the *proactive* model using an opportunistic screening approach whereby the pharmacist offers chlamydia testing during EC consultation and/or offers it to all young people of the target age group.

I think from a time point of view probably the young person asking. Yeah I think probably a young person asking. I think it would be quite hard to do it on a whole sale basis on the front shop. (NP-2)

We're not usually on a one-to-one with customers, which… you know, so it's not really appropriate, is it, to start asking about (laughs) you know "are they at risk of these things?" or whatever, you know, so…(NP-5)

The other issues apparent in the above quotations, of workload and lack of privacy in a pharmacy retail environment have also been broadly raised as barriers to chlamydia testing and are discussed in detail in the relevant themes.

Those who were comfortable with the idea of a proactive approach, considered it appropriate during an EC consultation. It was described as a way of effectively removing the barrier for young people to ask for the service.

I think it's hard for people to ask for the service, you know, unless they're very confident and don't mind anybody really knowing a lot of their business. It's something that we could speak about to women who come in for the emergency contraception and we could talk to them as well. (PP-1)

And just because obviously we are very settled with providing levonelle, it's probably just come hand in hand so it would be quite easy to just tie in with levonelle, like you could offer it to everyone that comes out for levonelle. (NP-4)

In order to avoid causing offence to young people, alternative strategies suggested were handing out health promotion materials during EC consultation, or to have the kit available at the till to be picked up.

I think it would be easier if the patients didn't have to ask for the kits. If they were just available for them to lift. (PP-2)

I mean, if there was a leaflet that you could hand out, yes, so that when you were doing a, you know… administering contraception or something like that, you know "have you thought about this?" I mean, that might be useful, but erm… (NP-5)

Previous evaluations of pharmacy chlamydia services have reported that in practice testing kits have been offered only to a selected subset of eligible EC clients, for similar reasons of causing offence (Brabin et al., 2009b). This is particularly true if screening is to be offered in a non-sexual health consultation context (Taylor Nelson Sofres Healthcare, 2007). A study undertaken in GP surgeries also reported that staff were failing to back up the advertising of chlamydia screening, in that they were not

routinely offering opportunistic screening to their target population (Freeman *et al.*, 2009). The study further reported that staff believed giving young patients a leaflet would cause patients embarrassment, resentment or offence. However these views are contradicted by the perceptions of young people who preferred chlamydia screening to be offered to all young people in the target age group, rather than being offered only in the sexual health context, to prevent them feeling singled out (Pavlin *et al.*, 2008, Hogan *et al.*, 2010). However, pharmacy practices differ from GP practices in terms of the amount of privacy achievable in pharmacy to offer such services. It emerged in the potential service user's survey that they would feel comfortable being offered a service in a sexual health context. Therefore, there is a need to explore the perspective of young people about the best approach of engaging them for community pharmacy-based chlamydia service.

10.4.1.4 Partner notification[9]

All the interviewees except one expressed positive views about the partner notification (PN) aspect of the service, understanding its importance, and describing it as necessary for preventing further transmission of infection.

> *I don't think anybody sensible would disagree with it really, you know. (PP-2)*
>
> *I'm not uncomfortable with asking them, it's just whether you actually get the results back, you know, whether people would actually be willing to give it to you, I don't know. (PP-4)*
>
> *M: Do you have any issues asking for partner information from young people?*
>
> *No, because they can only say yes or no. I mean, they'll either give you or they won't and if they won't give you, there is nothing you can do. But if they say yes then you're preventing someone else from having chlamydia so I think I'd be quite happy to ask them. (NP-4)*

The above quotes also indicate that despite appreciating the importance of PN, the interviewees recognise the difficulties inherent in successfully carrying it out, and its

[9] The current CT&T model in Lothian encouraged clients to fill in the partner notification form in the pharmacy at the time of receiving treatment. The clients are encouraged to fill in the form by giving contact details of their partner(s) and return the form in the sealed envelope to the pharmacist. The pharmacist would post it to the GUM clinic for the health advisor to contact the partners. If the client wants to contact the partner(s) themselves, then an appropriate number of information leaflets for the partner would be handed out.

ultimate reliance on the client. However they consider the current pharmacy model as not only an opportunity to emphasize the importance of PN to the clients, but also consider it as an enabler for young people.

> *Obviously it's more awkward for them to do it as well if they were to contact their partners or ex-partners directly, I think it's better for them to write it down, let us send it away and then let the GUM clinic get in touch with them. (PP-1)*

The pharmacist who expressed a negative attitude about the PN and absolutely rejected the idea of carrying out PN through pharmacies, cited a number of objections for example, the lack of training of the pharmacist to carry out such task, people's perception about the liability of the pharmacist, inadequacy of privacy that a shop environment could offer, and people's expectation of carry out such task by GPs and specialists.

> *We're not really trained up for that sort of thing, you know! It would really be just to know how liable we are for things you know, because quite often people don't seem to think that it's our place to do stuff like that and we get… you can get a lot of complaints and, you know, we try to explain that we're just doing our job but…They seem to think that may be tit's information that we shouldn't have. They expect that sort of thing to come from doctors or hospitals or, you know, specialists. (NP-3)*

The above pharmacist had a consistently negative attitude on most aspects of the service and had also declined outright the invitation to carry out the CT&T service through their pharmacy. However she was not the only one who identified confidentiality issues in the pharmacy related to PN. Another pharmacist working in a small chain pharmacy also put it as follows:

> *I would think they'd be much more likely to want to go to the GUM clinic or their GP. Because they're passing over confidential information, they may not be happy passing that information over in the shop, even if they're told that it's sealed and that no-one else can read it. (NP-6)*

The above views are contradictory to those interviewees who work in the large chain pharmacies, who considered that pharmacists have only limited involvement in the PN aspect of the service, and that it offers reasonable privacy to the client to fill out PN form.

> *I'm not going to ask their details, I don't need to know! But I mean, it would be… And again, they could use the consultation room for that, they can sit down and they can do it and it's quiet and private and they don't have to worry about it, I think it's OK. (NP-7)*

This contrast in views of the interviewee working in a small chain or independent pharmacies as opposed to those working in large chain adds weight to another pharmacist's suggestion to offer the service in large pharmacy with *'less personal' (NP-1)* settings. Besides the barrier related to achieving confidentiality and privacy in a pharmacy setting to carry out PN, there was also an indication of a selective approach of carrying out PN. Those having multiple partners or in an older age group were described by one interviewee as an appropriate target group for carrying out PN.

> *Well we have to rely on them being honest. I don't mind approaching them with it. Probably 16-20s won't be very happy but with maturity that does change doesn't it. You gotta take on it on person to person basis. It depends whether they have multiple partners or not. (NP-2)*

However the barriers stated in terms of patient's age and relationship status are not exclusive to the pharmacy setting, it apply in all health care settings including GUM clinics and general practices (Pavlin *et al.*, 2010). The difficulties inherent in carrying out PN have been acknowledged in the stakeholders' survey as well (section 8.4.2.2). A systematic review of partner notification did not find sufficient evidence of younger people being most at risk of chlamydia re-infection due to failure to undertake PN by this age group (Trelle *et al.*, 2007).

In general, most of the pharmacists stated they were comfortable dealing with PN processes and considered PN through a pharmacy to be acceptable. Previous studies reported that 80% of pharmacists found patient delivered partner therapy (PDPT) acceptable through a pharmacy (Cameron *et al.*, 2007) and that it was a popular choice among partners of index patients as well (Cameron *et al.*, 2010).

10.4.2 Decision whether pharmacy will take part in CT&T service

I asked each pharmacist to indicate the reasoning for his/her decision to take part or not in the service. The themes that emerged from the response data were broadly categorized as reasons for non-participation and reasons for participation.

10.4.2.1 Reasons for participation

Enthusiasm for the CT&T service seems to be related to the location of the pharmacy, which would influence the likely uptake of the service. Some define it as a location in a deprived area, whilst other as an area that have a good proportion of young population client base.

> *Mufiza: Do you think that your pharmacy is appropriate for this service?*
>
> *Interviewee: Mm-hm, mm-hm.*
>
> *Mufiza: In what aspect?*
>
> *Interviewee: From both the deprivation and the high proportion of young people. (PP-2)*

However one pharmacist also considered the location of the pharmacy close to the GP as an enabler to the service, in addition to its location in the deprived area, due to the likelihood of easy referral when needed.

> *It was obviously a good idea for us to get involved with it because of the [deprived] area that we're in and we have a good relationship with the surgery next door as well, so any query in that sort of area, you know, we can always phone them and talk to them about it. (PP-1)*

Two pharmacists indicated their experience of providing EC, which had a good uptake in their opinion, and they considered CT&T as a natural progression from providing the EC service.

> *Well, it just seemed like a good service because we do give out quite a lot of the emergency hormonal contraception and it seemed like the obvious kind of step to go along with it. (PP-3)*

The above quotes suggests that the pharmacists anticipated a good uptake of the service either because of their location in an area which they believed would trigger demand (area of high deprivation or relatively predominant young population) or the current practice environment (i.e. the provision of EC) that enables the provision of CT&T as well.

A higher demand would also mean that pharmacies were more likely to benefit in terms of remuneration. An incentive for the provision of the service was explicitly mentioned by one pharmacy owner.

> *You know, any kind of service like that, which is a) a good service and b) we actually get paid for, you know, I'm happy to do. (PP-3)*

A recent survey of community pharmacists in Grampian, Scotland also indicated the lack of remuneration was a barrier of provision of SH service in pharmacies (Gale and Watson, 2011). As discussed in detail, under the 'incentives' theme (section 10.4.6.3), this remuneration would infact benefit only the owner of the pharmacy. Therefore, an appropriate remuneration model for such a public health service provision should ensure that any pharmacist *employee's* contribution to service delivery is rewarded in the same way (Grindrod *et al.*, 2009).

Two pharmacists also indicated that their decision to take part in the service was facilitated by its pilot nature and their previous involvement in the pilot service for EC.

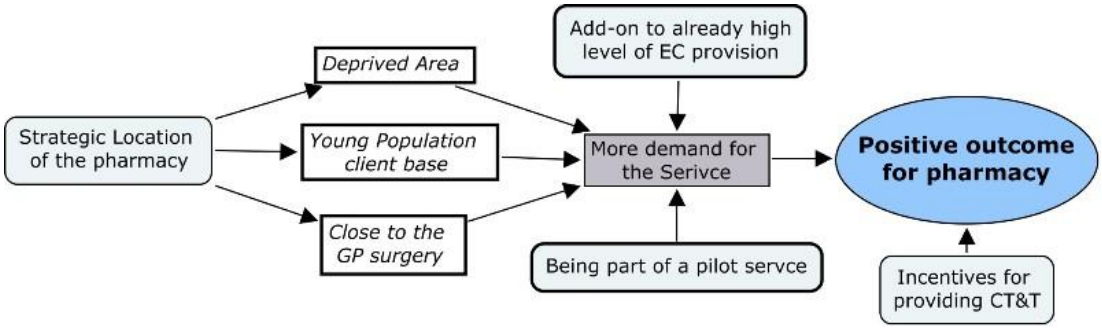
> *I know now that pharmacies across the board are providing emergency contraception but prior to that we were involved in EC72 but not all pharmacies were and I just thought that because we were one of the pharmacies that was providing that at that stage it might be a good addition. (PP-4)*

There is a suggestion that their willingness to be involved in the pilot might also hinge upon the potentially greater demand for the service if it is limited to only a few pharmacies rather than if provided as a blanket service in all the pharmacies. This is also apparent in the following quote:

> *This shop was an EC72 pharmacy and we did a lot of them and then when it went all over, you know... I suppose then you've got, you know... I did about 700 of the things, of the EC72s over the five years or whatever it was. But I suppose what the problem now is that we're all doing it. (PP-3)*

Figure 10-3 illustrates a conceptual diagram of various factors that were identified to contribute to the pharmacists' decision regarding participation in a pilot CT&T service. As can be seen, the various reasons noted by the interviewees can be directly or indirectly linked to their perception of increasing profitability in their business.

Figure 10-3: Reasons for participation, given by pharmacy interviewees who pilot the CT&T service



The impact of perceived demand on pharmacists' participation in a service has been discussed in-depth in the previous literature (Mackie *et al.*, 2004). Another evaluation of a pharmacy-based chlamydia service found that pharmacists linked their participation to the increased sales of other products, greater customer satisfaction and return visits, factors responsible for increase business profit (Baraitser *et al.*, 2007). Incentives are further discussed in detail in section 10.4.6.3.

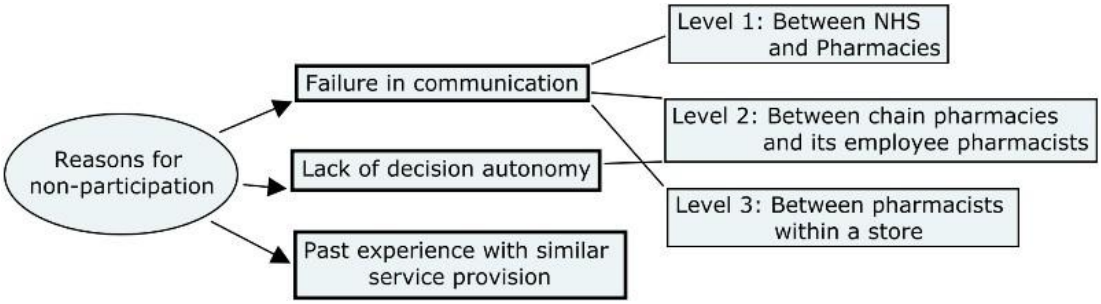
10.4.2.2 Reasons for non-participation

For the interview sample of non pilot-service pharmacists, only one out of 7 interviewees indicated that their pharmacy decided not to take part in the service:

> *I think it was decided not to do that. (NP-3)*

However, the above respondent did not provide any further reasoning for such a decision. The remaining six pharmacists were keen to provide the service. The major themes that emerged for the remaining interviewees for non participations were failure in communications at various levels, lack of decision autonomy and based on their past experience. These themes are displayed in Figure 10-4 and unfolded in detail below.

Figure 10-4: Reasons for non-participation, given by pharmacy interviewees who did not pilot the CT&T service



10.4.2.2.1 Failure in communication

The failure in communication appeared to have occurred at three levels; i) between NHS and the pharmacies, ii) within the pharmacy chain, between pharmacy manager and pharmacists, and iii) between pharmacists within a pharmacy. At the NHS level, many pharmacists indicated that they had never come across with any such invitation.

> *Mufiza: What I know is that this invitation was sent in July 2009?*
>
> *Interviewee: Mmm… holiday time! Sorry! (laughs). I don't know… well, I would not remember July 2009, I have to say. I would actually be on holiday in July 2009 so…! (laugh). Because I'm always away on the first weeks of the school holidays. (NP-5)*

Another interviewee noted:

> *Certainly since I said I would do it, I haven't had any body enquire. (NP- 3)*

The above quote hinted to the possibility of missing an invitation if sent in a holiday period, and was noted by another non-pilot pharmacy interviewee as well. The fact that no reminders were sent by the NHS would have resulted in a missed opportunity to recruit more pharmacies, had who not received / acted upon the initial invitation.

One pharmacist was not clear whether or not she had signed up for the service. In her immediate response she explained that she had signed up for the service, but later in the interview expressed doubts as NHS didn't approach her to implement the service.

> *I haven't been sent any sample pots. I wonder if I have signed up. I am not sure. I need to talk to somebody to see. (NP-2)*

The above quote indicates that the failure of communication, or perhaps deficiencies in communication also resulted because the NHS didn't acknowledge the pharmacy reply. Another aspect of failure of communication was related to the ambiguity about the toilet requirement for community pharmacies, as reflected in the following quote:

> *Well, we had initially said that we were quite keen on participating. And to be honest, this might even be just crossed wires and poor communication, but I got the impression – and I thought there was maybe some paperwork which mentioned this where they were looking for people to pilot it yet there was a requirement to allow the patient access to, or they thought it would be useful to allow the patient access to a toilet and toilet facilities for doing the testing. (NP-1)*

As can be seen in the NHS Lothian invitation letter to pharmacies for participation in the service (Appendix 12), the fact that a public toilet is not obligatory for participation was not explicitly indicated in the invitation letter. Instead an impression was given that the public toilet is actually needed, either within the pharmacy or if they know of its availability in the vicinity.

A second level of failure of communication occurred within pharmacy chains where the employee pharmacists might not know what decision was taken at the senior managerial level. Due to the hierarchy of the decision making process in chain / multiple pharmacies, the senior managers based at headquarters usually communicate decisions about service delivery within their pharmacies (Phipps *et al.*, 2009). Thus it may happen that if a pharmacy chain decides not to take part in a certain service, the decision might not be adequately and explicitly communicated to all the pharmacists working within the chain store.

> *I don't know actually because that's…If we haven't signed up I would be surprised we haven't signed up because we usually do but I'm not aware of this service. (NP-5, chain pharmacy)*

A third level of failure of communication occurred within a pharmacy, where more than one pharmacist works. In such scenarios, deficiencies in communication might have occurred due to a rota system for alternating two or more pharmacists, and hence decisions within the pharmacy are not adequately communicated among each other. As a pharmacist from a chain pharmacy noted:

It doesn't mean it hasn't got buried, which unfortunately happens…You see, because we both work opposite ends of the week, occasionally we get miscommunication! And I'm wondering if this is one of them. (NP-5, chain pharmacy)

This statement implies that failure of communication is more likely to happen in multiple / chain pharmacies which often operate a rota system between the pharmacists. This disconnection from the day-to-day activity of the pharmacy, of the part-time pharmacists (or even more so of the locum pharmacists), results in them dealing in a partial knowledge environment (Phipps *et al.*, 2009). This may become more of a problem as pharmacies introduce new services. In any case, there is perhaps a need for more documentation of processes and decisions taken within the pharmacy for the purposes of information sharing.

10.4.2.2.2 Decision autonomy

The hierarchy of decision making processes in chain pharmacies may act as a barrier to providing a service within pharmacies. The following quote from a pharmacist working in a chain pharmacy reflects that such decisions occurs at the higher organizational level, and cultural ethos of the chain pharmacies meant that employee pharmacists as well as other staff working in a chain pharmacy embraced the policy of their pharmacy chain:

Mufiza: Do you think there are any factors that would deter the pharmacies from doing a service like this?

Interviewee: No (Very spontaneously). Not for [Name of their chain], no because we're being very pharmacy-services aware and this is a pharmacy service. So no, I think I would be surprised if anyone who works for [Name of their chain] didn't want to do this. (NP-4, chain pharmacy)

It is not clear that how far such decision would affect or is based on pharmacists' personal interest in any such services. One could envisage circumstance when there is a mismatch between what chain pharmacy decides in contrast to what employee pharmacists want. As suggested by the following quote, pharmacists working in independent pharmacies are more autonomous in terms of their decision of whether to be involved in a service or not.

I usually say yes to most things. Because I quite like development work you know. I think pharmacy could develop quite nicely along these lines. (NP-2, an independent pharmacy)

Following the emergence of the above theme about decision autonomy, I explicitly asked the pharmacists in the pilot pharmacy interviews about who took the decision whether to take part in the service or not. In the three instances of independent pharmacies, the owner pharmacist took the decision.

> *I'm the manager and a partner in the business as well. Well, I mean it's really up to me because it is an independent pharmacy; it's really up to me what we do. (PP-3)*

But in the instance of a small size chain pharmacy, this decision was taken by the employed pharmacists as quoted below:

> *It was basically myself and my job share partner [name of colleague], the other pharmacist that works the other days from me. You know, I just checked with her that she was happy to do it. And then I think we must have e-mailed the boss just to, you know, verify with him whether he was alright with it. (PP-4)*

Since none of the pilot pharmacies was a large chain, there is a need to further explore the levels of perceived autonomy in large chain pharmacies compared to independently owned pharmacies and small chain pharmacy.

10.4.2.2.3 Past Experience

Past experience also guided the decision of some pharmacists on whether or not to take part in the service. One pharmacist, who had worked in another health board in Scotland, explained that she was part of a group that had pioneered the pharmacy-based chlamydia service in their respective health board. She left before the service was implemented, but knows that the service was successful in that health board.

> *Interviewee: They did this very early on. They did this about may be four five years ago […] and everybody was quite positive about the outcomes.*
>
> *Mufiza: O.K. And you were also involved in that [service]?*
>
> *Interviewee: I left sort of about that time. But I was part of sort of group that was piloting it. So it was very well thought of in Town D & E. And it would seem to work fine. (NP-2)*

This interviewee currently works in an independent pharmacy in Lothian and was quite keen to take part in the service. Conversely, the other pharmacist described her negative experience with a similar pilot service, where she handed out chlamydia test kits during EC consultations. She illustrated her experience as follows:

I don't think I did, simply because we've had it available for a while and absolutely zero interest in it, nobody's interested at all. Not even asking, you know "do you do it?" or... nobody's interested. (NP-6)

These two contrary views point towards the individual nature of perceptions regarding success or failure of the same programme, and that the provider's decision to deliver the service depends greatly upon their past experience. This pharmacist (NP-6) further elaborated that even during EC consultations, when she tried to bring up the issue of STIs and testing, the client became *'uncomfortable'*. It raises the possibility that concerns of displeasing the customers could also potentially influence the intentions of the pharmacists to offer the service. However it is important to note here that the CT&T service in Lothian, did not require proactive offering of the service to their clients.

10.4.3 Experience of being part of a pilot roll-out of CT&T

Overall only 4 clients were handed out a chlamydia test kit; and this involved only two pharmacies since one pharmacy was responsible for handing out 3 of these kits. Hence none of the pilot-service pharmacists have any meaningful experience to reflect on. All the pilot-service pharmacists indicated their disappointment with the low uptake.

Well, I was actually very disappointed because we had no customers at all. You know, we put up the notices, the surgery knew we had it, no-one came. Big disappointment! (laughs) (PP-2)

Notwithstanding this outcome, one pharmacist was satisfied about the fact that he contributed in some way to public health. Another pharmacist described it as a waste of resources.

I only gave it out twice so it was limited but, you know, I was happy to do something. (PP-3)

Very, very low uptake! Hardly anybody came at all […] so it's such a waste of resource really, you know. (PP-4)

This issue of low uptake was also indicated in the stakeholder survey, TNA and by the non-pilot pharmacy interviewees before the start of this pilot service. Previous evaluations of a pharmacy-based chlamydia service also reported a low uptake, but even in such a scenario, the uptake in a similar service was reported to be on average 10 tests / pharmacy / month (Baraitser *et al.*, 2007), whereas in another pilot, the test

uptake ranged from 2 per month to 9 per week in different pharmacies (Taylor Nelson Sofres Healthcare, 2007).

10.4.4 Delays in service implementation by the Lothian Health Board

Some evidence also suggest that there were concerns regarding prolonged delays in the implementation of CT&T service in pharmacies, due to the unexpected emergence of swine flu, which he thought diverted all NHS attention.

> *It was unfortunate the way swine 'flu just fell right in the middle. And I kept on asking [name of colleague] about it –[…] I kept on asking her "when's this chlamydia thing starting?" and she was just saying "we're just so busy with swine 'flu, I don't know, it's just getting pushed back and back." (PP-3)*

As discussed in detail in section 5.4.2, the CT&T service suffered many delays in its implementation in Lothian. Pharmacists received a two hour training session in October 2009 and March 2010 and ultimately the service was started in June 2010. However, since the second training evening was very brief and did not cover all aspects of service provision, a couple of pilot pharmacists felt that they were not ready to deliver the service.

> *There was a big gap between our training and actually going live so by the time we got to going live I had forgotten a lot of how to fill out the form, you know. (PP-3)*

This might indicate that pharmacists required a full training, particularly on those aspects related to the practical aspects of service provision.

10.4.5 Discontinuation of the service

Pilot pharmacy interviewees have mixed feelings about the discontinuation of the service. Two interviewees indicated that they expected the service to continue for some time, to observe its effect. It was felt that the service was discontinued too soon. However, one interviewee indicated that it is inappropriate to direct resources and time to a service which had not demonstrated any demand.

> *I was actually quite surprised when it stopped as early as it did because it hadn't really been given a fair crack but I know that the GUM clinics and doctors are seeing to it, but anyway… (PP-3)*

> *I'm not all that disappointed about that because I think if you are going to put the time into getting yourself fully up to speed with something and then it doesn't really happen it's almost a bit of a waste of your time. (PP-4)*

Many interviewees also indicated their experience with the EC provision, which took a long time to catch on. The evaluations of similar service indicated that the service took time to gain popularity (Anthony and Watson, 2008, Taylor Nelson Sofres Healthcare, 2007). A similar concern was also raised in the stakeholder survey who indicated that these services usually gain popularity with time (section 8.4.2.1).

10.4.6 Interviewees' perceptions of facilitators of and barriers to CT&T service for pharmacists as providers

To understand the facilitators and barriers that may have an influence on pharmacists' decision to take part in the CT&T service, participants were asked what factors they thought would make it more difficult or easy for a community pharmacy to provide a CT&T service. The key facilitators and barriers identified were workload, physical infrastructure of pharmacies and business incentives. These themes, and their subordinate themes, are listed in Table 10-2 and described in detail below.

Table 10-2: Facilitators of and barriers to provision of CT&T service

General Themes	Subordinate Themes
Workload	New pharmacy contract
	Workforce shortage
	Paperwork
Physical infra-structure of the pharmacy	Consultation room
	Toilet facility
	Area dedicated to service provision
	Health & Safety
Incentives	Financial incentives
	Meeting business targets
	Professional development
	Public health service provision

10.4.6.1 Workload

With the new pharmacy contract in force, community pharmacies are now asked to expand their role to provide a number of public health services (Scottish Executive, 2003). Typically, this has meant that community pharmacies are extending their roles and taking on tasks previously performed by general practitioners. Published evidence generated after these contractual changes suggests that community pharmacists enjoy aspects of their new roles, particularly those enhancing their professional status and enabling the pharmacist to move from a monotonous role of dispensing (Eden *et al.*, 2009). However as suggested from the following quotes, pharmacists also experience a sense of burden and that for some there is a lack of endorsement of the new role of pharmacists in providing a number of public health services. They indicated that they felt their workload and dispensing volumes are already very high and expressed concerns about the number of new services which they perceived as being imposed on them.

> *I think a lot of things being put into community pharmacy; we don't always have the time we would like to give to these things because it obviously takes us off the shop floor. (NP-5)*
>
> *A lot of pharmacies don't really want to do extended services because we're so busy; the new contract has given us a huge workload now and that's just another extra thing. (PP-2)*

Due to the increasing involvement of pharmacists in the provision of public health services and a resultant increase in the workload, their work environment has become increasingly pressurized, which increases the likelihood of dispensing errors and compromising patient safety (Gidman *et al.*, 2007), as also typified from the following statements:

> *Sometimes it's just really, really busy and if you know that you've got, you know, loads of prescriptions waiting to get checked, somebody else waiting for methadone, blah, blah, blah, blah, it can be really distracting, you know, so yeah, time's definitely one thing. (PP-4)*
>
> *I tend to think of developing our role is important. It makes it more interesting. The only thing is that it's difficult to give this type of new service a lot of attention when you are still doing volume dispensing and you are sort of on your toes and something would happen. Funding has got to be right. (NP-2)*

The latter quote also indicated that the enthusiasm for the new opportunities to enhance the pharmacist's professional role is tempered by the realization that the extra services are an addition to an existing heavy dispensing workload, unless their extra work is appropriately incentivized. In this regard it is important to note that pharmacy contractors *are* remunerated for providing extra services (The Scottish Government, 2008). However, this does not translate into increased personal income for employed pharmacists such as those working in chain pharmacies (discussed in detail under the theme *'Incentives'* in section 10.4.6.3). This is further complicated by the fact that a competitive business environment in a community pharmacy often necessitates meeting certain business targets as well as pleasing their customers by providing quick services, as suggested in the following quote:

> *So time is always the thing with the community pharmacy, I'm afraid, so it's time. Because nothing's done by appointment, you know, it's just… people just walk in and expect to be seen. Which, you know, nine times out of ten is fine but there's always… (NP-5)*

However, one pharmacist, although mentioning increased work load, did not anticipate that demand for this service would be high enough to cause an actual, extra burden.

> *But workload, I suppose; if someone felt they really didn't have time. But given that the numbers aren't likely to be massive that you're seeing on a weekly basis, I can't really see that is valid either. (NP-1)*

In contrast only one interviewee from a large chain pharmacy did not view the proposed service as an extra burden, and she assumed that the CT&T would be provided as an adjunct to an EC service.

> *I don't think it would be seen as a big workload to do it because we are already doing levonelle. (NP-4)*

A workforce shortage partly explains increased workloads, a concern particularly noted for independent pharmacies with limited staff, as narrated in the following example:

> *When I first put my name down for it I was the only pharmacist working here…But now I have a second pharmacist working in the shop so I suppose a limit to the service is if I'm on my own and too busy… you know, I'm not giving a good service by, you know… not only to the person who's getting EC72 or a chlamydia testing but also to the other customers as well. (PP-3)*

Maybe ones that have larger premises with more pharmacists. We've got only one on at a time so… I mean, the larger [name of a chain pharmacy] stores and things maybe have a couple so they've got more scope to be able to do the extra services. (NP-3)

However this increased workload is not just perceived as due to the workforce shortage. The following quote from an interviewee working for a large multiple store, assumes that the additional paperwork needed results in increased workload:

A paper-work is a big issue because there's always a lot of paper-work with the smoking cessation and paperwork with, you know, supplying the emergency contraception. There seems to be a lot of paperwork … (NP-7)

Thus increased workload is considered due to heavy dispensing responsibility, with shortage of staff to carry out some tasks of the pharmacist and increased paperwork related to these services. Previous evaluation of the new pharmacy contract also highlighted that increased requirements of recording and paperwork has substantially contributed increased workload (Blenkinsopp *et al.*, 2007).

10.4.6.2 Physical infra-structure of the pharmacy

The interviewees highlighted the physical infra-structure needed within a pharmacy to support the implementation of the CT&T service. Two facilities particularly indicated as important for CT&T service provision were the presence of a consultation room and a toilet. A dedicated area for service provision was also noted as important.

10.4.6.2.1 Consultation room

All the interviewees considered the presence of a consultation room as a pre-requisite to deliver the CT&T service through pharmacies.

I think it should be do-able in most places, providing you've got consultation rooms or just some sort of level of confidentiality available, I think that is probably fairly important. (NP-1)

And those pharmacies which do not have a consultation room (one pilot and one non-pilot pharmacy), describes it as a barrier as exemplified in the following quote:

We don't actually have a completely private consultation room at the moment… and I think that for us is probably… and for the client, is probably a barrier because although for emergency contraception we tend to take them through back into the dispensary we're not really technically supposed to do that. But there's not another, you know…

> *there's not really another option because I feel that talking to them about that in the middle of the front shop is not acceptable either. Which takes them away from all the other customers but it's not completely private in terms of there are other staff in the dispensary and then, depends on what time of day, there can be delivery drivers banging on the back door, you know, so it's not… Yeah, certainly if I was the client and that was happening, I would probably feel quite uncomfortable. (PP-4)*

Similar views were exemplified by other pharmacists, as to the importance of having a consultation room for the provision of confidentiality and privacy (see section 10.4.7.2).

Since the implementation of the new pharmacy contract, all pharmacies are required to provide a professional service area, particularly a consultation room/area available from the pharmacy (Annex to NHS Circular PCA(P)(2007)28). The Scottish Government also provided grants to pharmacies to support improvement and upgrading to pharmacy premises, including the consultation area, to facilitate the provision of core and additional services through pharmacies (NHS circular PCA(P)(2008)21). Currently 36% (n=65) of the pharmacies in Lothian do not have a consultation room (Data courtesy: Aileen Muir, Public Health Pharmaceutical consultant for Lothian)

10.4.6.2.2 Toilet

Another facility which interviewees considered key to the delivery of this service, yet which is not widely available in pharmacies, is a toilet for the clients.

> *The only thing is we don't have a toilet out here, we have it in the back shop where the staff room is so…I mean, it would be possible but it wouldn't have been ideal but that was one of the things that we were a wee bit concerned about. (PP-1)*

Some pharmacists considered the toilet as important to increasing the return rate of urine sample:

> *As the toilet's actually there and they do it there and then. It's very easy to go home and dump it down and forget all about it or continually put it off. (NP-6)*

Despite the fact, that toilet facility was not a mandatory requirement for service delivery (see section 10.4.2.2.1), it was considered as an enabler by both the pilot and non-pilot pharmacists.

10.4.6.2.3 Area dedicated to service provision

Despite the presence of a consultation room in most pharmacies, and toilet access in some, many interviewees suggested improvement in the physical layout of the pharmacy. They particularly indicated the importance of having a dedicated area for the service provision, which includes facilities such as a consultation room and a toilet facility in one place or in close proximity. Based on her experience with the pregnancy testing service, one interviewee described the importance of having a toilet close to the consultation room:

> *And the toilet, well here the toilet's right next door to the consultation room, it's not a problem. When I was doing the EC72, when I had to do pregnancy testing, I just used to get them to go straight into the toilets, do it, you know, the test […] but then it depends how handy the toilet is to the consultation room, you know. Because in some of the shops you might have to parade the person through the shop to go to the toilet, you know. (NP-6)*

Another non pilot-service interviewee highlighted the difficulties with the layout of the pharmacy where the consultation room is not close to the dispensing area:

> *Well, the problem probably with every pharmacy is it takes the pharmacist off the shop floor. And as you see, we're not very well set up because our consultation room is not attached to our dispensary, which is really a problem for us, it takes us away. (NP-5)*

However, the above quote also suggested that the desire to remain close to the dispensary during a consultation might impede an uninterrupted and a completely private consultation to their client due to pharmacist requiring a continuous involvement with the dispensing. On one hand, it impedes the confidentiality available for consultation due to the possible interruption by other pharmacy staff, on the other hand it was noted that such a layout would provide a more discrete service to the clients, as noted in the following quote:

> *Well, we've got a consultation room that you can access from both the dispensary and the shop...so it needn't be obvious; we're not going out and hauling them in. You know, we can just sort of pop our head out the door and say "come on", mm-hm. It's quite good that way. (PP-2)*

A dedicated area is also considered important on health and safety grounds, as explained by the following pharmacist:

> *And just where ours is positioned, which is right through the dispensary and directly opposite the controlled drug cabinet, with health and safety and just, you know… you have seen through the back there, it's not very big, you know, we are really very limited and with the number of staff that work in there, three or four, it really probably wouldn't have been practical. (NP-1)*

As evident from the above quote and also further elaborated later, pharmacists interviewed from non pilot pharmacies generally described independent pharmacies as *'quite tight for space' (NP1).* However pilot-service pharmacists either did not bring up the issue of inadequate physical space, or as in a case of an independent pharmacy owner, considered the shop layout appropriate in terms of a space within his pharmacy:

> *Mufiza: Do you think there are any structural factors which would impact the service in some way?*
>
> *Interviewee: No, my shop is set up well for this kind of thing, I've got the consultation room through there with a computer in it and I've got an advice room through there which is generally used for supervision of methadone. Yeah, so there's the consultation room and it's only a small shop so it's really well laid-out in my opinion. (PP-3)*

It should be kept in mind that pilot-service pharmacies are a self selected sample, and it is hence likely that they were tend to be those pharmacies who considered their physical layout and space as suitable for the service.

A previous bio-photographic study, which aimed to analyse the relationship between community pharmacy workspace and practice, has indicated an inadequacy of space in pharmacies to incorporate the provision of public health services (Rapport *et al.*, 2009). However pharmacists working in large multiples are, in general, perceived as more satisfied with the space and layout. The same study identified that the current layout used by many pharmacies is designed to maximize product sales and is not conducive to service provision.

10.4.6.3 Incentives

Many interviewees indicated that if the service generated income, this would be a key facilitator for provision of CT&T. This factor was identified irrespective of whether it was an independent or a chain pharmacy or whether it was a pilot or a non-pilot pharmacy.

> *Umm…was there payment for the service? Because that may influence…Because [Name of a chain pharmacy] is about business, just being honest about it, I think probably a lot of pharmacies would be aware that it's going to generate income. And also they have got targets to reach for services, income and things, so that probably would be a factor, they would be willing to do it on that basis. (NP-4, a chain pharmacy)*
>
> *Any kind of service like that, which is a) a good service and b) we actually get paid for, you know, I'm happy to do. (PP-3, an independent pharmacy)*

The financial benefits were seen to drive participation of independent and chain pharmacies in different ways. In case of an independent pharmacy, the incentives directly benefited the pharmacist who was often also the owner of the business. Whereas, in case of a chain pharmacy, the employee pharmacist needs to reach business targets. The second quote above echoed the findings of another study that pharmacists working in chain pharmacies are often under pressure to reach business targets (Murphy, 2007).

However, when asked which pharmacies should be targeted for invitation to provide this service, the independent pharmacists were perceived as being attracted more to such a service, due to the direct financial benefits to them. The employee pharmacists described the lack of financial benefits to them personally, in terms of bonuses or wages, if they got involved in such services.

> *It won't have as much an impact on a pharmacist that works for chain. They wouldn't particularly benefit. I don't know you want to go down the road targeting her… difficult. (NP-2, an independent pharmacy)*
>
> *But I think when you're based in a store it's not quite so immediate, the need (laughs) to get more money, so it's not something that, you know, affects us really directly, it doesn't affect wages or anything. So I think that would probably be the main thing; it would be the small, independent who would be more likely to say yes straight away, yeah. (NP-7, a chain pharmacy)*
>
> *I am not too sure of the incentives, to be honest, because I'm not a manager here, you know, I'm just one of the pharmacists that works here (PP-1)*

In contrast to the above findings, which indicated that pharmacists perceived more benefits for owner pharmacists and hence their likely involvement in the service provision, a survey of community pharmacists conducted in 2009 indicating that

11% of the chain pharmacies in Great Britain were providing chlamydia testing as opposed to 3.1% of independent pharmacies (Bush *et al.*, 2009). It might be due to the fact that despite independent pharmacies wishing to be more involved in the service oriented roles due to the financial pressure from chain pharmacies, the latter are more likely to attract commissioning from the NHS due to an obvious ease of doing so whereby a contractual agreement with the chain pharmacy meant that a number of pharmacies working within the chain would provide the service. This dilemma might be seen in the earliest pilot of pharmacy chlamydia service in the UK, which was commissioned by the Department of Health through the pharmacies of a large chain (Taylor Nelson Sofres Healthcare, 2007).

In addition to the business reasons, some interviewees however also indicated professional satisfaction gained by providing patient-oriented services and in developing a new pharmacist's role in service provision.

> *I usually say yes to most things. Because I quite like development work you know. I think pharmacy could develop quite nicely along these lines. (NP-2)*
>
> *We're being very pharmacy-services aware and this is a pharmacy service. So no, I think I would be surprised if anyone who works for Boots didn't want to do this. (NP-4)*

In an evaluation of the recruitment strategies of pharmacists in dispensing EC, pharmacists who participated in the project considered that non-participation would be costly, not only in terms of client flow but, just as importantly, in terms of being viewed as old fashioned and not oriented to providing a health service (Cockerill *et al.*, 2004).

10.4.7 Interviewees' perceptions of facilitators of and barriers to CT&T service for young people

Interviewees were asked to provide an assessment of the CT&T service in terms of facilitators and barriers to young people accessing it. They spoke about the factors which they believed were clear benefits of the service in comparison to other providers of chlamydia testing such as GP practices, GUM or FP clinics. They also described the drawbacks that such a pharmacy setting could have for young people who wish to get tested for chlamydia. Across all in-depth interviews (both pilot and non pilot interviewees), the factors thought to act as barriers and facilitators were summarized using five main themes: convenience and access; privacy, anonymity and confidentiality; lack of promotion of the service; motivation for testing; and attitude and manner of the pharmacists. These themes, and their subordinate themes, are listed in Table 10-3 and described in detail in the respective theme heading.

Table 10-3: Facilitators of and barriers to access CT&T service for young people

General Themes	Subordinate Themes
Convenience and Access	Availability, when other are closed
	Geographical access
	No need for appointment
Privacy, Confidentiality and Anonymity	Embarrassment
	Stigma
Lack of promotion of the service	Inadequate advertising
	Difficulties in targeted promotion
Motivation for testing	Perceived risk of chlamydia
	Socio-demographic of the client
	Socio-demographic of the pharmacist
Attitude and manner of the pharmacist	Non judgmental
	Approachable

10.4.7.1 Convenience and access

Ease of access and the convenience of a CT&T service, were mentioned by the majority of the interviewees as facilitators for young people to use the service. Important aspects were availability when other health care services are closed, geographical access and no need for appointment for a pharmacy service.

Some interviewees considered that no need for an appointment with the pharmacists would alleviate a current frustration for many people wanting to otherwise arrange appointments with other health care professionals. One interviewee cherished the perceived access advantage that community pharmacies offer over other health care providers.

> *You can get access to something easier is better than having to make an appointment or the rest of it. I mean that's the beauty of community pharmacy really that there is almost a no wait situation. So if there are any worries and concerns than you can alleviate from it quite quickly. I think it's a good idea. (NP-2)*

What emerged from the above quote is the fact that a *'no wait'* situation could also provide better outcomes as anxieties are relieved more quickly. This view was echoed in another pharmacist's response as well:

> *I think it's important to have things like that in pharmacies as well because they can have someone to talk to there and then as well. As I say, it's by no appointment so they can come in even if they wanted to ask about it without getting tested, just maybe find out some information. (PP-1)*

However this quick advice could lead to a trade-off against the more detailed consultation that the GPs could provide, which is particularly warranted in a sexual health consultation. A survey of patients' satisfaction with pharmacist consultation indicated that patients who received longer consultations and were provided with more types of information during consultation, reported the highest satisfaction with the service (Schommer, 1995). Another survey reported that although people frequently identify the pharmacist as a good source of advice, in practice they generally prefer to consult with a GP (Hughes *et al.*, 2008). However no need for an appointment remains a unique selling point for community pharmacies, as the clients are more likely to access a service if they are not required to make an appointment within the pharmacy (Blenkinsopp *et al.*, 2007).

Some interviewees also described convenience of a pharmacy service in terms of it being a one-stop shop, where testing, treatment and partner notification could all be carried out in one place, without needing repeated appointments, as is the case in GP surgeries.

> *I think it's so much easier for them to come in here, get the test, then come in here, we'll do the prescription, we'll get all the contacts... Yeah, it's just so much easier; we're far more accessible than making appointment. (PP-2)*

Accessibility of the service was described in terms of the long opening hours that the pharmacy offers and its opening over the weekend. Some interviewees indicated that a pharmacy may be an alternative option when other health care services are not available. This was particularly compared with GUM clinic which offers drop-in services only on selected days/hours in a week. Another interviewee compared it with the GP surgeries which are not open over the weekend.

> *Pharmacies are kind of … they're all over the place, they're open weekends, they're open kind of later as well sometimes and you can just pop in and, you know. (NP-7)*
>
> *So particularly at weekends and things like that, normally GPs aren't available, you know, at least somebody could come in on a Saturday and be treated. (NP-5)*

The geographical advantage that community pharmacies offer was compared by interviewees to the specialist sexual health services (such as GUM clinics). The fact that community pharmacies are distributed widely within the community, close to work, home or on the way to school has been cited as advantages by many interviewees. A location close to home gives an advantage particularly to YP in terms of maintaining confidentiality of access from their parents as it would require less time to be away from home, as compared to accessing GUM clinics that are far away and would require longer time for them to access those clinics.

> *They can find one that's local to them, it's going to take them much less time – because I think these things are the things that put them off going to certainly the GUM clinic, you know, it's the journey in, the wait all day…you know, if they're 15 or whatever, how do they explain to a parent where they're going and why they've been away all that time whereas they can probably manage to squeeze a visit into a pharmacy without too much difficulty. (PP-4)*

The issue of anonymity and the interlinked theme of confidentiality and privacy are discussed further in detail in the next section.

10.4.7.2 Privacy, confidentiality and anonymity

The notion of '*confidential*' or '*confidentiality*', '*private*' or '*privacy*', and '*anonymous*' or '*anonymity*' for YP were invariably raised and discussed by the interviewees. Whilst these are inter-related concepts, there are distinctions, so it is important to define these terms before these are further discussed. The Concise Oxford Dictionary defines confidentiality as: 'intended to be kept secret' while privacy is defined as 'the state of being free from public attention'. Anonymous is defined as: 'of unknown name, of unknown authorship'. In the ethics literature, confidentiality is commonly understood as akin to the principle of privacy.

When asked to reflect upon the barriers for young people in accessing the pharmacy CT&T service, immediate issues were identified by a few interviewees in terms of respecting the confidentiality of clients in pharmacies. It was perceived by many interviewees that young people might consider a pharmacy as a less confidential place to access such a service.

> *I think; a shop like this is the type of place where our staff here will know virtually everyone who comes through the door, young or old, and they all know them… I mean, I like to think that our staff are 100% on that and everyone here is certainly very, very clear on the need for confidentiality. And they do see things on the daily basis which would probably be fodder for gossip but I am pretty sure that, in a community of this size, had any of that been leaked we would know about it by know. So I like to think that we would be well set up for that. (NP-1)*

Another interviewee quoted:

> *I mean, I wonder sometimes whether people are maybe put off if they perceive that maybe not all of the pharmacy staff will keep it to themselves. (PP-4)*

Such comments also hinted at the traditional image of the local independent pharmacies where staff are engaged, both as having a health care role but also as being ordinary members of society. The staff and the owner are often on first name terms with customers and there is thus a potential for confidential information to be leaked. However it was not just the matter of confidentiality being maintained at staff

level. Some pharmacists also discussed the potential barrier for a young person if s/he believes that the pharmacy consultation might be disclosed to his / her GP.

> *It's a busy shop, they'll see other people they know so we've got to be very discreet. If they know a member of staff, that's another thing. Or if they suspect that we're going to tell the surgery, a lot of them don't want that reported – well, we don't but I don't think they realise that we don't. (PP-2)*

This fear of inadequate confidentiality might not be limited to the nature of a pharmacy staff-client interaction or the possibility of a pharmacist-GP interaction. It was also viewed as a result of the shop environment, with open access and, often, limited space. Hence many pharmacists considered the consultation room to be a pre-requisite, to establish privacy in their consultations.

> *You do need to have a consultation room, there is NO WAY you can do something like that. (NP-6)*
>
> *We have a consultation room so we're quite happy about that. And I mean, at quiet times they can come in and speak to us, at the minute they can ask to use the consultation room, I don't think that's a problem if they want to speak privately, yeah, to us. (NP-7)*

While consultation rooms are now often a part of community pharmacies, they are not universally available. In my interviewee sample, only one independent pharmacy from the non-pilot pharmacies was without a purpose made consultation room. She particularly felt the limitations and described her situation as follows:

> *I take people into the kitchen or to this office, we have a private area but it's not really confidential. I think that puts people off. (NP-2)*

Furthermore the necessity for making an initial request for a consultation at the counter constitutes a barrier of stigma and embarrassment to many young people. This embarrassment is considered less of an issue in a clinic environment, whereas a busy shop environment can be daunting to young person, if needing to ask for the service at the counter.

> *I mean, especially with the consultation rooms and things like that, it's confidential to sit down and speak about these things and things shouldn't really get heard out there if we're in here anyway. The only thing is the initial coming in and asking for it. […] It is embarrassing, especially for young people. I think it is… sometimes for them to go to a clinic they see that as a place to go so they're quite happy to do that whereas here they're scared in case they have to ask in front of people*

in the shop and if they're from this area and they know people that work here, they might not want to ask. (PP-1)

One of the primary objectives of the pharmacy chlamydia service was to provide accessible care to young people in a non stigmatised environment. It is important to note here that there are many reasons of embarrassment associated with accessing a pharmacy-based chlamydia service, as identified in the literature, such as knowing someone in the store, knowing the pharmacist, having to ask for the kit, and the pharmacist's age and gender (section 4.3.7.1.2). However, it may be that if the service is accessed in an area where the staff or other shop clients are *un-known* to the young person, then the concerns of embarrassment and stigma may be diminished. Thus a choice of getting CT&T in any pharmacy, and not necessarily close to their home, might overcome the embarrassment as well as the fear of not getting an anonymous service, as the following quote suggests:

… and they can probably go into… they can change area if they want, can't they, they can come into one where they're anonymous…?, which a lot of people do. (NP-5)

Another pharmacist quoted:

I think if there's an awareness that the service is there and you can get it in literally any pharmacy in Lothian, I think that will be a good thing, or even a list of the pharmacies that do offer it, because then they can choose to go to a pharmacy on their way to school where no one will know them or on way to work or on the way home from work or in a city centre or…if they don't want to go to their local pharmacy but they'll know that the services are there. (NP-1)

The choice to access any pharmacy is particularly considered as an advantage over a GP setting by several pharmacists in terms of offering anonymity, as was also indicated in a following quote of the pharmacist working in a pharmacy from a large urban area:

You don't necessarily have to go to your own GP … or you would have to with your own GP but you don't necessarily have to go to your usual pharmacy so you can go to a pharmacy somewhere else if you're… you know, if embarrassment is a problem. (NP-7)

These findings echoed the findings of other evaluation studies of a pharmacy-based chlamydia service that considered the issue of anonymity less of a case in a pharmacy service than having to go to their own GP (Anthony and Watson, 2008,

Taylor *et al.*, 2007, Taylor Nelson Sofres Healthcare, 2007). Another study exploring the facilitators of EC provision through a community pharmacy indicated that pharmacist perceived EC provision as a means of accessing EC to those who wished to remain anonymous to their GP or other provider (Bissell *et al.*, 2006).

Although a community setting offers its own advantage, of being close to the service user's home or work, thus providing easy access, it is clear from above examples that pharmacists believe that young people might prefer to go to a place where their identity remain anonymous. However there is a need to weight the advantage of providing an anonymous service from a pharmacy against the important epidemiological information that might be missed out. Some level of identification of the individual is crucial in risk factors identification and further follow-up of at risk individuals. The routine data analysis (chapter 3) identified the lack of patient's information on postcode as a hindrance to identify the equity of coverage and diagnosis of chlamydia in a Lothian population.

10.4.7.3 Lack of promotion of the service

All the interviewees (both pilot and non pilot pharmacies) commented that the CT&T service was not adequately advertised by the NHS and that for young people a lack of awareness of the service would be a main barrier to the uptake of the service.

> *They don't know it's available. It's not been advertised. They just don't know it's around so they just don't know to ask for it. (NP-6)*

> *I think potentially people are not aware that it was in existence…and then it potentially… I mean, I don't know but potentially the perception of how much privacy they would get may have impacted whether people would come to us or not. But I do think in the main it was probably because people didn't know it was even there, you know. (PP-4)*

Most of the interviewees refer to their experience with EC provision, where due to similar lack of promotion, the service took a long time to take on.

> *So I think it's basically because it's not advertised, they don't know it's available. I think more people are becoming aware of the fact that you can get emergency contraception in pharmacies. And I mean, that's been going for quite a long time, about a year now?....I think there's still quite a few people out there who know that you can actually get it in a pharmacy, they still think they've got to go to the doctor or they've got to go to family [planning clinic]. (NP-6)*

The most common suggestions for promotion of the CT&T service were through schools, colleges and in-store pharmacy promotion.

> *I mean obviously posters in the pharmacy where it's done is going to be a big help because people will catch sight of those. And I would say in schools, school nurses? I don't know if they do have anything to do with it. So erm… I don't know, what are young people up to these days? (laughs) I would say probably through the schools is the best thing. (NP-7)*

Other suggestions given were promotion through GP surgeries, GUM clinics, recommendations during EC consultation by the pharmacists, information on NHS24, and teenage magazines.

In my earlier interviews with the non-pilot pharmacies, having identified the theme of 'lack of promotion of the service' as a potential reason of the low uptake of the service by the clients, I asked specifically the pilot pharmacy interviewees for views on how the service was advertised. They highlighted the ineffective advertising material provided by the NHS from in-store pharmacy promotion. Another interviewee criticised the little attention given by the NHS on the promotion of the service. Following are some of the quotes of the interviewees from pilot pharmacies:

> *Well, the notices that we were given were tiny wee ones…and with just writing on them, you know, there were no pictures or…they weren't attractive, you know, and I think it would have been appropriate for colourful, bigger ones to go up in libraries, health centres, in our window. Do you not think so? Sorry, I've taken it down (while referring to the poster she has), we had one and it was an A3.[…] it didn't stand out. (PP-2)*

> *If you are going to put money and time into providing a service then, you know, you have spent all that money on resources and it almost seems a little short-sighted not to promote it. (PP-4)*

Although the lack of advertising was considered the main barrier, the intrinsic complexities and difficulties in carrying out promotion were also acknowledged by the pilot service interviewees. It was the views of pilot interviewees that promotion strategies needed to be targeted but cost efficient, and that promotion through TV would be inappropriate.

> *It's not really something you want to advertise on TV or anything like that. (PP-1)*

> *I don't think nightclubs would be too happy having it up on their wall, would they? (laughs) I mean, TV but TV's expensive. You know, in the middle of Coronation Street or something like that, imagine how expensive that would be! (PP-3)*

The stakeholder survey respondents have also identified difficulties in carrying out promotion of the CT&T service to young people (section 8.4.2.1). The hesitance of GP surgery staff to display posters or hand out leaflets about chlamydia screening has also been recognised in previous studies (Freeman *et al.*, 2009). In a promotional campaign for chlamydia in England called 'Worth talking about', it was advocated that, in order to be effective and to avoid causing offence to young people, chlamydia screening promotional strategies should be positive, non-judgemental and action oriented (Quilliam, 2011).

10.4.7.4 Young person's motivation for testing

Some interviewees stated that although discussing sexual health would be expected to be a barrier for young people, this barrier might be easier to overcome if a young person perceived him / herself to be at high risk of having contracted chlamydia.

> *It's very much depend on the client and what's their motivation for being tested. There might be a very high motivation for being tested in which case you would probably overcome the uncomfortable feelings that you would have discussing it. (NP-2)*

Thus the perceived risk of getting chlamydia and its consequences may overcome the barrier of communication with the pharmacist. There are multiple factors assumed to contribute to the perception of risk including previous diagnosis of chlamydia, multiple or new sexual partners and not using a condom, as discussed by interviewees. Risk perceptions are further complicated by the fact that chlamydia often does not produce physical symptoms. Another study reported that in the absence of symptoms, young people were not sufficiently motivated to seek out screening themselves (Pimenta *et al.*, 2003). This concern was also raised by a few pharmacists as follows:

> *Just knowing that even if they haven't used protection and they don't have any symptoms that they might still have something but, you know, a lot of people aren't educated to know that sort of thing so they're not going to come in if they don't feel like they have anything wrong with them just to be tested to make sure. (PP-1)*

> *It depends on the client really, on how mature they are. You know whether they want to be tested or not or whether they think it's worth it. (NP-2)*

Personal attributes of a young person is also perceived to contribute to the motivation for testing. For example, some interviewee considered *'older ones'* tend to get tested and other described it to depend on the '*education of the patient'*. However in terms of gender of the young person, being male was not considered to be a barrier for getting tested for a young person.

> *Mufiza: What do you think about the boys? Are they going to come to get the service?*
>
> *Interviewee: Erm… yeah I think… I think if they know that they've got it, they will. I think if they know, because they're going to panic if they think it's going to affect their fertility or like do things down below and I think boys will be quite quick to protect that area. But I think as long as the boy gets to find out, I think if he is made aware, I think the boy will come in. I don't think a boy would carry it and not care. I think he'd be quite worried about protecting his 'area' (laughs). So I think if they know they had it I think they would come in, traditionally. (NP-4)*

However, for young girls, it was perceived to be barrier in deciding to seek testing in a pharmacy where they find male pharmacist.

> *I think perhaps young women might not come in and speak to a young male pharmacist about it. That could be a factor. (NP-2)*

These views were from the non pilot-service pharmacists, but amongst the pilot pharmacy interviewees, apart from the young age of the clients, other socio-demographic factors of the client such as their gender and education level or the age or gender of the pharmacists were not identified as barriers to testing in a pharmacy setting. My argument is further strengthened in the next section on 'attitude of the pharmacist', in that participating pharmacists do not recognise or acknowledge personal factors, such as their attitude or socio-demographic profile as affecting the uptake of the service. However their views are different from those pharmacists who participated in a pilot chlamydia service in Manchester, where the pharmacists felt the gender and age of young people might have been a barrier to their choice when seeking a test in the pharmacy (Thomas *et al.*, 2010). In another evaluation of a pharmacy-based chlamydia service, a pharmacy who withdrew from the pilot study

indicated their lack of a female pharmacist as a barrier to recruiting young girls (Gudka *et al.*, 2010). Moreover clients (young people) also indicated their selective approach of getting tested, if the pharmacist was identified as being young and/or female (Taylor *et al.*, 2007). These contradictory perceptions of the pilot pharmacists and non-pilot pharmacists in my study compared to those recruited in previous evaluations might result from the virtually non uptake of the chlamydia testing in the present study. Hence the pilot-service pharmacists might have been cautious in describing any personal factors as the potential reason of the failure of the service.

10.4.7.5 Attitude and manner of the pharmacists

A few non pilot-service pharmacists indicated that the uptake of service would also depend on what contributed to the young person's expectations of the attitude of the pharmacist. Young people would feel at ease if the pharmacist is *'approachable'* and *'non-judgmental' (NP-1).* Some pharmacists reflected on this aspect while referring to their experience of EC service provision.

> *I think it depends again on how approachable the pharmacist is really? We tend to get quite a lot of people coming in here for advice [for EC]. You know I am quite open and I don't mind talking about things. We give a lot of advice. (NP-2)*

Sexual health care provision such as EC and CT&T are relatively new roles to pharmacists. Judgmental attitudes revealed by the pharmacist or by their support staff toward the young people accessing sexual health services would impede quality of service delivery, influence uptake of the service and ultimately would have a negative influence on the service user (Gudka *et al.*, 2010). It was also emphasized, in the stakeholder survey, on the training of the pharmacists to adopt a non-judgmental and friendly manner towards the clients. This is further discussed in section 10.4.8.1.

10.4.8 Interviewees' perceptions of attitude of key players of the CT&T service - pharmacy staff, GP and potential clients

According to the Theory of Planned Behaviour, an important component that determines a person's intention to perform some action is a subjective norm. Subjective norms *(about the behaviour)* are an individual's own estimate of the social pressure to perform or not perform the target behaviour. In a community pharmacy setting, these 'subjects' might include GPs, other pharmacy staff and potential clients. The need for policy makers to consider the influence that clients' as well as doctors' attitude could have in a pharmacy service delivery has been highlighted (Hoti *et al.*, 2011). Therefore, I asked pharmacists their perceptions of their support staff, potential clients and GPs attitude towards a CT&T service.

10.4.8.1 Perceived attitude of the pharmacy staff

In the current CT&T service model, pharmacy support staff are not involved in delivering the service. However they are the gatekeepers, controlling a client's access to the pharmacist. Most pharmacists indicated that their pharmacy staff would be comfortable with the availability of the service in the pharmacy. They perceived that their staff are clear about their level of involvement in the service and would refer the client to the pharmacist immediately.

> *I think it was just that, you know, the service was there, they weren't uncomfortable with it, they were quite happy that it was there but they didn't see it as their role, you know, it was really the pharmacist's role. (PP-4)*
>
> *I think they would be quite happy. They are very good at referring. (NP-4)*

Many pharmacists explained their staff attitude, by referring to the other services which their pharmacies are already providing, particularly the EC, methadone, needle exchange and smoking cessation. Although it is not a direct measure of pharmacy staff attitude towards the service, 61% of the counter staff in our TNA survey indicated their 'moderate' or 'high' enthusiasm for the service. Only 14% of the counter staff expressed concerns about the proposed CT&T service and this was mostly regarding their insufficient knowledge or training to communicate with the customer. This finding is also echoed in the following response of a pharmacist:

> *I think they might be a bit uncomfortable about talking to a client and in this pharmacy they are not awfully comfortable about doing these extended services. But they don't mind dropping me in it (laughs). […].Although again that might be just the training issue. I have tended not to develop that very much here because of our premises. (NP-2)*

Thus from those interviewed/surveyed, the issue is not so much of the staff disapproval of the service per se, but their lack of confidence to deliver the service, which could be overcome by training, if the pharmacists provides this. Thus it could be speculated that the pharmacist's attitude, and resulting training provision to their staff, has an important effect on the attitude of his/her staff.

10.4.8.2 Perceived attitude of the potential clients

Extending the role of the community pharmacist will only be effective if the new roles are what the potential clients find acceptable. A few pharmacists felt that clients would respond positively to this service being provided by the pharmacy. Some interviewees indicated that trust building would depend upon the increasing use of service, a relationship that is dynamic and evolving.

> *But these sorts of things have been growing in popularity, people are, I think, more aware of what a pharmacy can do. (NP-1)*
>
> *I think that the more people maybe see us as the point to come to, probably the better these services will do, they'll maybe actually think of coming and asking us rather than going straight to the GP or whatever so...(NP-5)*

The above quotes indicates that as the public become more accustomed to the extended role of pharmacists, a newly added service is more readily accepted by customers. The above interviewee also foresees the shift of first port of call to pharmacies rather than to GPs, which might result in improved access to health care. However the pilot service pharmacy interviewees had different views. They perceived that young people would prefer to go to the GP or specialist SH clinics, an opinion which might partly reflect their experience with the very poor uptake of the service.

> *I don't think they would prefer to come here. And I think that's probably backed up by the fact that we only did two. GUM clinics are, you know, very specialized and...Yeah, I'd say we were the last port of call out of the three (referring to GP and GUM clinic). (PP-3)*

The findings of the potential service users' survey indicated that young people preferred to be tested or treated in the specialist SH clinics. However these results may be biased because the sample was primarily derived from the SH clinics. In another in-depth interviews study conducted with women on the perception of EC provision by pharmacists, it was found that women do not see pharmacists as health professionals but rather associate pharmacy as a place of business, which is less personal and will not tend to give counseling and advice (Weiss *et al.*, 2007).

10.4.8.3 Perceived attitude of general practitioners

As pharmacists are extending their roles and taking on tasks previously performed by GPs, it would be interesting to know how pharmacists perceive the attitude of GPs towards this shift of the pharmacist's role to a more patient oriented service. Overall the pharmacists perceived that the GPs would be very supportive of delegating their role to pharmacists to perform the CT&T service.

> *Well, the ones here are very encouraging. They want us to do it. (PP-2)*
>
> *I think they're getting used to pharmacies, aren't they, getting more and more involved in these things! (NP-5)*

The benefits indicated by most pharmacists were mainly related to 'self interest' of a GP on shifting their work load to pharmacists.

> *I think they're probably quite glad of it. Obviously it takes away some of their workload. (PP-1)*

On the contrary, the main reason given for the perceived lack of GPs support can be described as 'political', i.e. pharmacists' encroachment on GPs territory.

> *Doctors are not sort of, erm... a homogeneous lot. There's good, bad, there's ones who would be quite happy for the pharmacist to be completely involved in everything and others who think pharmacists should be just standing there counting pills, […] I think we're stepping on their prescribing toes, you know… (NP-6)*

The more negative perceptions of GP behavior towards pharmacist's role, such as the pharmacists' encroachment of boundaries and business, were indicated only by non-pilot pharmacists. This might suggest that once the pharmacists get involved in this new role, their negative perceptions towards GP's attitude would wear off.

However it was not just the case that interviewees perceived GPs as reluctant to delegate the clinical role to pharmacists. There was also evidence of some pharmacists not wanting to move into diagnosis and prescribing and exhibiting a differential attitude towards doctors. As one pharmacist quoted:

> *I don't think there's many pharmacists… they're not experts in this unfortunately, so us giving advice sometimes is a bit… you know, it's not the best because we're not experts, so whether we're giving the right advice sometimes, you wonder. (NP-5)*

These findings seem to confirm the conclusions of other studies that suggest community pharmacists' reluctance to encroach on doctors' territory, for example by refusing to accept a prescribing role, meant that they 'unwittingly committed themselves' to remain in a subordinate role in a paramedical occupation (Eaton and Webb, 1979). However few pharmacists were quite positive and confident about their newly developed public health role. As one pharmacist said:

> *I think there are even more things which we can obviously do. So yeah, I think it's evolving the right way and I think this is the sort of thing that we should be doing, rather than just checking prescriptions all the day. So yeah, I quite enjoy doing things like that. (NP-4)*

It appeared that young pharmacists were more enthusiastic to take on a new role of extended public health service provision. A study by Hughes and McCann confirms some of the above findings that community pharmacists were considered by GPs on the periphery of the primary health care team and conflict between business and health care permeated the GPs attitude (Hughes and McCann, 2003). Similarly community pharmacists also felt that such views influence their position in the hierarchy of health care professionals.

10.4.9 Potential impact of the CT&T service

The interviewees' attitude towards the potential impact of the CT&T service was generally favorable. The interviewees considered this service as not only effective from a 'society perspective' (i.e. by reducing prevalence), but also considered the cost effectiveness of this service from 'health service perspective'. By taking part in the service, they see themselves as health professionals contributing to public health by reducing chlamydia prevalence.

Well only in that, chlamydia is one of those hidden diseases the more people you can reach the more you can help. And I see that it is a part of my role as a community pharmacist just helping people in my community. The fact that people can have chlamydia and would not know is a worry. (NP-2)

Well, I knew the statistics for chlamydia with the youngsters and I thought "well, it'd be good if we could do something about that". (PP-2)

It is reflected from the above quotes that pharmacists see themselves as public health providers who perceive the CT&T service as an opportunity to deal with the disease, hence benefiting their community. One pharmacist however attempted to provide another perspective of the effectiveness of the CT&T service. While giving an example of the pharmacy smoking cessation service, he indicated that these services would also benefit the NHS in the long run.

And I think we can make an impact really and we definitely have an impact in this community with smoking [cessation], I mean, there are probably upwards of a hundred patients who were smoking who we've managed to get off in the last year or year and a half. So that's going to have a knock-on effect for what the cost of these patients to the NHS is, going forward. And I think same is certainly true of chlamydia as well. If the pharmacy can make a large reduction in the prevalence of this, a pharmacy in general, then obviously it's going to be cheaper than treating separate related problems down the line or just the number of people needed to treat to keep this down or to, hopefully, virtually eradicate it locally. (NP-1)

Although the interviewees were generally pessimistic about the possible impact that the service could have in terms of lowering prevalence and cost saving impact on the NHS, but at the same time they also anticipated a low uptake of the service.

I am not overly sure how much uptake there would be of it. (NP-2)

They linked the low uptake mainly with an inadequate service promotion (a theme discussed in detail in section 10.4.7.3) and consequently young people are *'unaware'* of the service. The way in which pharmacists frame the outcome of a pharmacy CT&T service (positively or negatively), indicates the combination of their realistic and unrealistic approach. In the above scenario while the pharmacist perceive this service as a way of reducing or *'virtually eradicating' (NP-1)* chlamydia, they also expects a low uptake of the service. This indicates that interviewee's perception of

impacting the chlamydia prevalence through the CT&T service is rather theoretical or aspirational.

10.5 Discussion

10.5.1 Strengths and limitations

A major strength of this study is that the interview questions for this study were underpinned from the outset by a theoretical model for behaviour (i.e. the Theory of Planned Behaviour (TPB)) as well as being informed by a structured literature review on a pharmacy-based chlamydia service. This provided me with a priori evidenced model within which the data was explored. The TPB proved to be a useful framework for examining a pharmacist's motivations for the provision of a CT&T service. The analysis and interviewing occurred iteratively with the findings from earlier interviews checked and expanded upon in later interviews. The study is also unique in that the perspectives of both the non-pilot and pilot pharmacists were included in this study. None of the previous evaluations of a pharmacy-based chlamydia service incorporated the views of non-pilot pharmacist, which I consider is a crucial exclusion in the sense that the reasons of non participation in the service could not be elicited. Identification of reasons for non participation of pharmacists in the current study led to an important finding of miscommunication that existed at various levels. Had the service been continued, these finding would have led to the recruitment of many more invited pharmacies in the service. Nevertheless these important findings would help improving the recruitment of potential providers in the future services.

Overall the pharmacists who participated in this study presented positive views of the intervention. They generally showed enthusiasm to provide the CT&T service, but due to deficiencies in communication with NHS Lothian, many of them were unable to do so. Those interviewed may represent a self selected sample of those pharmacists who were interested in providing the service and might not represent the views of those who declined to be interviewed. Moreover there is also a possibility that some participants may have self-censored their comments or provided socially acceptable or politically correct responses during the interview process (Creswell, 2007).

Given the very poor uptake of the service, the pilot-service interviewees did not have enough experience to reflect meaningfully on different aspects of the service. This

meant that both the non pilot-service interviewees and pilot-service interviewees considered hypothetical the facilitators and barriers for the service as well their perception on the clients, GPs' and staff attitudes towards the service. However, many interviewees indicated their thoughts while exemplifying other pharmacy service provision, particularly in relation to the EC service. It may be possible that their response might differ had they been actively involved in the service. However the findings of this study not only confirmed those of other chlamydia service evaluation studies, but also offered an unfolding of the connection among different themes which was not possible in the review of the literature.

The poor response of potential clients to the service also affected the participating pharmacists' motivations to take part in the in-depth interview study. Out of a total of 12 participating pharmacists, I was able to recruit only 4 pharmacists to the in-depth interviews. The primary reason cited for declining the invitation to participate in in-depth interviews was that the uptake of service was very low and hence they had no meaningful experience to share. It might be possible that if local public health pharmacists were collaborated in the recruitment process, the participation of the pilot pharmacists could have been improved. Seven out of 32 non participating pharmacists were recruited for interviews. It was felt that saturation was reached at this stage for non participating pharmacists' interviews. Strauss and Corbin suggested that saturation is about reaching the point in data collection where it becomes 'counter-productive' and 'the new' that is discovered does not necessarily add anything to the overall story, model theory or framework (Strauss and Corbin, 1998). Ritchie et al. (2005) outline seven factors that would determine how quickly or slowly saturation would be achieved in qualitative interviews. These included "the heterogeneity of the population; the number of selection criteria; the extent to which 'nesting' of criteria is needed; groups of special interest that require intensive study; multiple samples within one study; types of data collection methods use; and the budget and resources available" (Ritchie and Lewis, 2005). The most important factor among the above six is the heterogeneity of the population that determines the sample size. Guest et al. (2006) undertook a systematic analysis of their data from a study involving reproductive health care in Africa. They examined the codes developed from the sixty interviews undertaken for this study, to evaluate at which

point their data were returning no new codes, and were therefore saturated. Their findings suggested that data saturation had occurred at a very early stage - thirty four of the thirty six codes developed for their study, were developed from their first six interviews. Guest et al. (2006) concluded that for studies with a high level of homogeneity among the population, a sample of six interviews may [be] sufficient to enable development of meaningful themes and useful interpretations. Despite the fact that I carefully sampled my study population so as to include the perspectives of pharmacists from a wide variety of settings, such as urban vs. rural, deprivation quintiles and large chain vs. independent pharmacies, it turned out to be rather a homogenous sample of pharmacist with not much diversity identified in their views and so that the saturation might have achieved early. Another reason for achieving early saturation might be that an extensive literature review informed the development of the interview guide such that almost of the possible topic areas and probes were covered. This was further aided by an iterative interview process in the sense that previous interview informed the modification of interview guide for the next interview. Such a systematic process of data collection also resulted in an early saturation of concepts.

External reliability of the qualitative study – the extent to which others may be able to replicate the findings given the same study design and sample – was addressed by overall transparency in the research process including details on how sampling occurred, a full description of the interview guide and details on how existing theory influenced the research. In terms of internal reliability, a number of techniques were used to attend to this. These included: recording the interview so that an accurate record of what was said could be maintained; presenting verbatim quotes of what was said in the interview; and avoiding unnecessary truncation of quotes or convenient summaries of what pharmacists might have meant.

Both the interviews and the analyses were conducted by me. The lack of an additional perspective in analyzing the qualitative data, was compensated for by a general process of peer review in the form of discussion with my supervisors about the data and its interpretation.

10.5.2 Discussion on the main findings

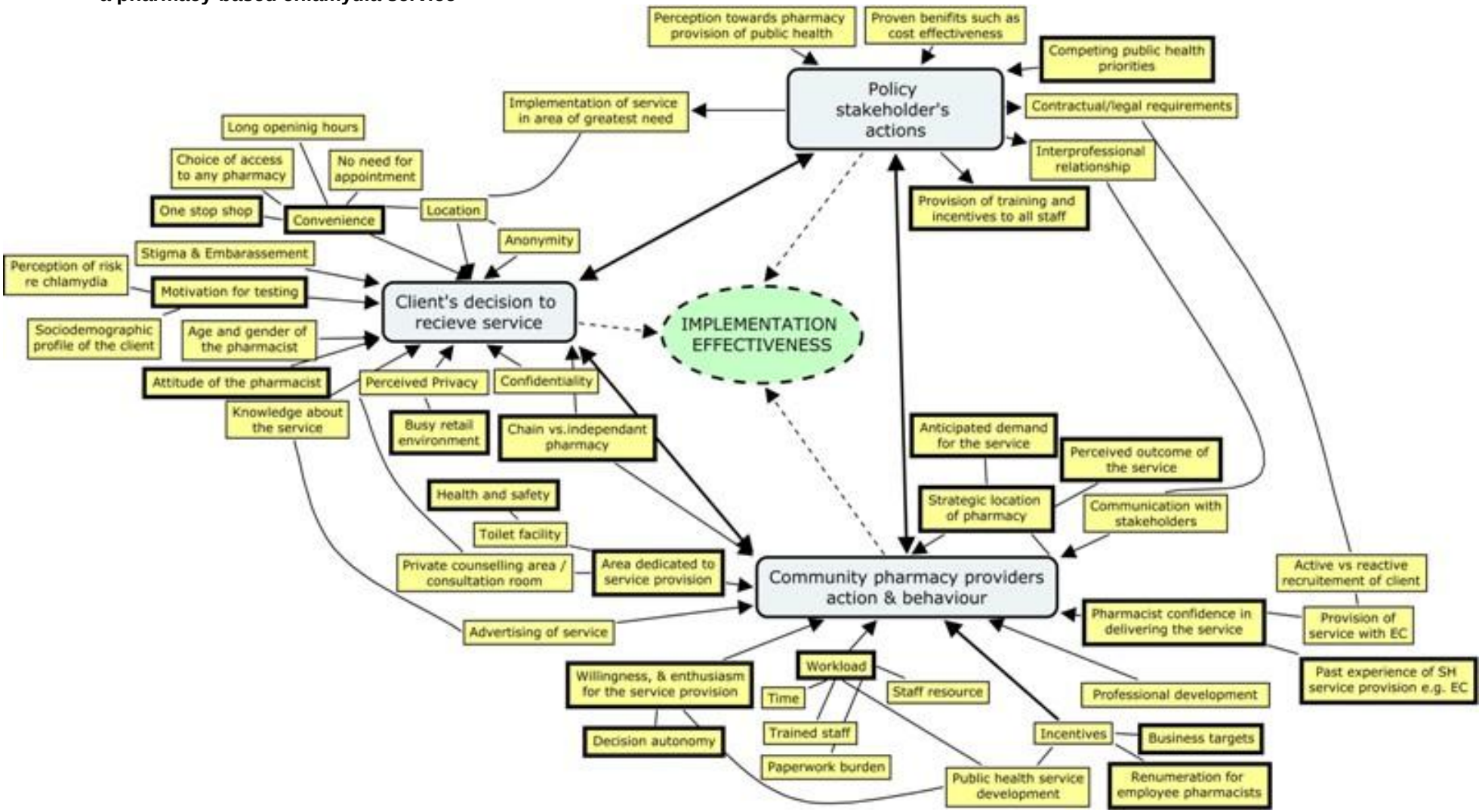
This study explored the perspective of pharmacists on the implementation of a CT&T service. Facilitators and barriers for the clients and service providers were identified and an acceptable pharmacy chlamydia service model was explored. Those pharmacists who participated in the pilot CT&T service anticipated a good uptake of the service because of the location of the pharmacy in an area of high deprivation, with higher clientele of young people, or close to the health service. However the interviewees were disappointed with the very low uptake of the service. Lack of promotion of the service was indicated as the main reason of such a low uptake and as a result continuation of the service for longer might have been needed to see an effect on uptake. Failure of communication between pharmacies and NHS Lothian was identified as a primary reason of non participation of the pharmacies in the service.

In this chapter the intention has been to identify a CT&T service model that reflects the perspective of the service providers. Table 10-4 summarizes the findings of interviewees' suggestions on the CT&T service model for community pharmacies in Lothian. Most interviewees wanted to increase the age group to at least up to 25 years, in order to increase the uptake of the service. Provision of the service upon client's request was considered most favourable, due to the business nature of the pharmacy and privacy concerns. The partner notification model was broadly acceptable for almost all the pharmacists, considering it as a health care professional duty. A consultation room was indicated as a definite requirement, however given the space issues particularly in the small pharmacies, toilet access to the client is considered inappropriate.

Table 10-4: Identifying an acceptable CT&T service model

Components of the service	Current Model	Recommendations
Age Group Targeted	- Particularly for clients aged 16-20 Years. - Could be provided to 15-24 years.	Targeting under 20's is considered logical due to high prevalence in this age group. Increasing the age group to at least mid 20's is desirable to increase the uptake of the service. Preferred to refer the younger clients to specialist clinics.
Mechanism of engaging YP in the service	Reactive engagement: Pharmacist responding to client's request for CT&T.	Reactive engagement of YP by responding to client's request for CT&T –Most favourable. Proactive offer by the pharmacist during EC consultation-Less favourable. Proactive offer by the pharmacists during non-sexual health context-Not at all favourable.
Partner notification model	Asking patient to fill in contact information within the pharmacy.	Broadly acceptable.
Consultation room	Definitely needed.	Definitely needed.
Toilet Access	Desirable.	Not possible in a current pharmacy set-up due to space and health & safety issues.

Figure 10-5: Extension of preliminary conceptual model to create the final model of facilitators and barriers to the provision of, and access to a pharmacy-based chlamydia service



This study also offered better understanding of the facilitators of and barriers to accessing of the CT&T service by young people, and also the facilitators and barriers relating to the provision of the service, in the pharmacy setting. The conceptual model developed earlier following my literature review (Figure 4-3) is now revisited and the revised model is given in Figure 10-5. The themes identified in yellow boxes with bold boundaries represent those additional themes identified in this study. Moreover many of the themes identified earlier in the literature review are now unpacked so that the connections between them become more evident and many of the sub themes linked to the major theme are now identified. These sub-themes and their connection with the major themes have been revealed both explicitly as they were identified by pharmacists but also as they emerged from analysis of interviews to reveal the aspects of the service which were not immediately apparent. For example in the case of convenience of access to the service as a perceived facilitator for young people, the study identified many dimensions of convenience such as its availability when other health services are unavailable due to long opening hours of the pharmacy and its availability over the weekend, no need for appointment, choice of access to any pharmacy rather than having to go to only their registered GPs, and easy geographical access. A further analysis suggested that easy geographical access becomes less imperative if the client wants an anonymous service. In such a case, a client may prefer to travel a distance to access a service where he/she is unknown to the provider, other clients in the shop and there is less chance of being caught by their parents. Similarly the inter-related concept of privacy, confidentiality and anonymity was unpacked. It emerged in this study that although lack of privacy for young people was perceived as a key barrier, the provision of a consultation room might not overcome this and offer complete privacy because pharmacists needed consulting rooms to be close to the dispensary due to the workload of the pharmacist warranting their continuous involvement with dispensing. Similarly the need to ask for a consultation at the counter of a busy pharmacy in itself creates a great barrier for the potential client. The issue of confidentiality was interpreted differently for the small and the large pharmacies. For the small independent pharmacies, the provision of confidentiality was considered challenging to the personalised nature of the pharmacy setting with pharmacy staff often on first name terms with their customers.

While this might increase the chance of potentially leaking the information regarding a client's access to the CT&T service, the pharmacist felt confident that this did not happen in their pharmacies. The large chain pharmacies are considered to provide a 'less personal setting' that might be more reassuring to the clients in the sense of them not knowing the staff. The issues of embarrassment and stigma were interlinked to anonymity in the sense that getting a service in an area where the staff and other customers are 'unknown' to the client could help in alleviating their embarrassment about requesting the service at the counter.

Due to increasing involvement of pharmacists in the provision of public health services in addition to their core dispensing work, appropriate incentives for the provision of this service may help counter their perception of a high workload on them. However an important theme emerged in this study was that it is equally necessary to incentivise employee pharmacists for the provision of these extra services in addition to any direct benefit available to the proprietor pharmacists. It became apparent in many instances that pharmacists would prefer a model of service with greater potential to generate an income. Hence their consideration of a wider age range for potential service clients which might increase uptake; and their preference for being part of a 'pilot' service that would potentially attract new customers to their pharmacy; and the pharmacy location which has a higher proportion of young client base for their pharmacy and also due to the location of the pharmacy in an area with higher deprivation. .

Similarly it would appear that the proprietor pharmacist might prefer to provide the service as it increases their income directly, whereas employee pharmacists might prefer to provide it in order to achieve business targets for their pharmacy. However the theme relating to incentives was further unfolded and it emerged that it is not only the financial benefits that matters to pharmacists but also their professional development and the reputation of the pharmacy as service oriented entity. It was encouraging to note that both the participating and non participating pharmacists were enthusiastic to deliver the CT&T service and were positive to see the emerging role of pharmacists as public health providers. However, they were equally concerned about the increased workload due to their new role as public health

providers and indicated that the extensive paper work and limited staff resource accentuated these problems.

Interviewees generally perceived the attitudes of support staff, clients and GPs to be positive about pharmacist involvement in the CT&T service. The pharmacy support staff were seen as referring agents at the counter, and the pharmacists believed that if staff were uncomfortable, this would be a result of their lack of training in communication with the client on SH issues. Pharmacists reported their staff attitudes had generally been positive towards the provision of other public health services. While reflecting on the low uptake of the service, some interviewees believed that the clients might prefer to seek care from specialist health care facilities. This might be due to interviewees perceiving that pharmacists are not yet seen as health care professionals. GPs were perceived to be largely supportive of delegating their role to pharmacists for such a service due to shifts in their own workload. However the subordinate role of the pharmacist was either preferred by some pharmacists or was the result of their perception that GPs would consider them as encroaching on their territory. The role of stakeholders involved in policy making emerged particularly in relation to provision of training to all staff and the consideration of financial incentives for pharmacists delivering the service, including the employee pharmacists. The emergence of competing public health priorities also had an impact on the service as pharmacists indicated that the CT&T service implementation was considerably delayed due to the swine flu and consequently also there was a long time between training and actual implementation of the service.

10.6 Conclusion

This study provided a valuable understanding of the perceptions of service providers on different aspects of offering the CT&T service in community pharmacies. It provides a framework for an evaluation of a service from the pharmacist's perspective. It also suggested an acceptable model of a chlamydia service in those settings where the service is in place (such as in England) or is planned to be developed. Future research should also directly explore the perspectives of pharmacy support staff, potential clients and GPs regarding pharmacist involvement in this public health role.

CHAPTER 11: RESPONSES RECEIVED TO POST-SERVICE INFORMAL CONTACTS WITH CT&T STAKEHOLDERS

11.1 Introduction regarding rationale for contact made

In order to help with my reflections on the trajectory and ultimate cancellation of the CT&T service in Lothian, I contacted by email a small subset of key stakeholders of the CT&T service, and asked for their reflections on the factors that might be associated with the CT&T service cancellation. I also elicited the views of a government representative about the rationale for Scottish government changing the pharmacy-based chlamydia service status from a 'national service' (which all health boards were obligated to provide) to a 'locally negotiated service' (where offering it or not was the decision of the local health board). This chapter presents the findings of these informal email contacts.

11.2 What I asked

In April 2012, nearly 12 months after the CT&T service terminated in Lothian, I contacted by email 3 key stakeholders for the CT&T service, to ask for their understanding of the rationale for the decision by Lothian Health Board to discontinue the service. These three key stakeholders were a small subset of stakeholders initially contacted for the Stakeholder Survey. The question asked regarding the termination of CT&T was *'what were the additional reasons (over and above withdrawal of direct funding) that led to Lothian Health Board's decision to terminate the service in Lothian?'*

An additional question asked from two of the stakeholders who were involved in service implementation was *'what you think were the obstacles in the successful implementation of the service in pharmacies in Lothian?'*

I also contacted through email a representative of the Pharmacy and Medicines Division of the Scottish Government (PMDSG), to ask for a copy of the report on the review of a pharmacy Chlamydia service in Scotland which was mentioned in their

earlier communication to local health boards (Appendix 10). However, the representative replied that, in fact, no formal review of the service had been undertaken. I then replied enquiring as to the rationale for Scottish government changing the pharmacy-based chlamydia service status from a national service (with specific additional funding) to a locally negotiated service (which would have to be funded out of the health board's general budget). In the first instance the representative responded informally, but when I requested permission to quote from this response, with the assurance of preserving anonymity, the representative provided instead 'attributable comments' (Appendix 19 provides a full transcript).

The responses received are reported in this chapter. Quotations from the Scottish government representative will be attributed, but the other 3 stakeholders have been promised that quotations from their responses will preserve their anonymity. For this reason, they will be referred to only as stakeholders I, II and III.

11.3 Responses received

Responses from the above four stakeholders (i.e. three key stakeholders and a representative from the PMDSG) were very brief – a total of 788 words from the three CT&T stakeholders, and 177 words from the Scottish government representative.

The CT&T stakeholders suggested a number of reasons that led to the termination of the CT&T service in Lothian. One of the stakeholders suggested that one reason for failure to press for CT&T continuation by Lothian Health Board was that the GUM clinicians were unwilling to delegate this aspect of sexual health service provision to pharmacies. *'Perhaps most importantly the GUM service was very lukewarm about the pharmacy chlamydia project... It was always rather ironic that they were loudly claiming they had far too much to do and could not cope with the demand at GUM but were determined not to hand over any part of their workload to any other provider, they just wanted more staff for GUM'* (Stakeholder I).

Another point of view that emerged was a lack of need for such a service in certain health boards. For example, it was noted that in Lothian '*screening of chlamydia was not seen as an area with any great gaps in accessibility to existing services'* (Stakeholder II).

The premise on which the pharmacy-based chlamydia service was introduced in Scotland was to expand outreach. However, one stakeholder noted that not all health boards took steps to realise the government's vision in this respect. For example, '*two health boards, NHS Greater Glasgow & Clyde and NHS Lothian have elected to pilot the service in a small number of pharmacies rather than implement the service in all pharmacies'* (Representative from PMDSG - April 2012).

While the question asked was for reasons *apart* from funding, that might explain Lothian Health Board's decision to terminate the service, one respondent judged that withdrawal of government funding was the main reason:

'I am not sure [if] there are many more reasons beyond the withdrawal of funding' (Stakeholder III).

In the opinion of stakeholder II, the reason why CT&T service was not considered a priority in terms of continuing the service out of the routine budget of the Lothian Health Board was due to changing beliefs about the cost effectiveness of chlamydia screening. The premise upon which screening, or at least encouragement of chlamydia testing, was initially based, was a widely held belief that chlamydia infection risked causing long term complications such as PID and infertility. However, the newly-emerging evidence was far less strong regarding such consequences (section 2.2.3). Hence stakeholder II noted that: *'The national stand on screening has not yet changed but this was definitely a factor in the decision making [of service termination in Lothian] as it was considered unlikely to be cost effective and no longer such a priority'*.

This view was further supported by the Scottish government representative:

'The revised SIGN guidelines of March 2009 on the management of genital chlamydia infection recommended that resources for chlamydia testing in women should be targeted firstly in those aged 15-19, then those aged 20-24; and in men at those aged under 25 and all patients attending GUM services. The guideline did not recommend more universal screening. Therefore changing the community pharmacy chlamydia testing and treatment service to a locally negotiated service allowed NHS

Boards to apply a more targeted approach, based on local needs, which fitted better with the SIGN guidelines.' (Representative from PMDSG - April 2012).

The CT&T stakeholders also suggested a number of reasons that led to the delays in implementation of the CT&T service. A view expressed about the barriers to implementation was that *'everyone, particularly senior clinical management staff have too much to do and so they prioritise according to what they personally believe to be the most important things'* (Stakeholder I).

The above stakeholder further explained that:

'A lot of activities in Lothian Health [Board] at that time ground to a halt because public health people were heavily involved with preparing contingency plans for bird flu (including …the pharmacy team)' (Stakeholder I).

With respect to the CT&T service, some of the practical constraints were not anticipated at the outset. An unbudgeted cost was noted:

'[there was] no transport infrastructure to support transport of tests from community pharmacy to labs. The solution was to provide postal kits which are more expensive' (Stakeholder II).

A further issue was inadequate infrastructure in pharmacies to support a pharmacy-based chlamydia service: '*Few pharmacies have a toilet and this means an inconvenient method of obtaining a sample' (Stakeholder II).*

11.4 Further discussion

Further discussion drawing on stakeholders' responses to my follow-up emails will be integrated into the final discussion chapter 12, as part of a broader discussion of both obstacles to the launch, and the subsequent termination of the CT&T service.

CHAPTER 12: CONCLUDING DISCUSSION

12.1 Introduction

This final chapter provides an integrative discussion of the key findings of my research, and their implications for policies on pharmacy-based chlamydia services. Included in this discussion is some reflection on Lothian Health Board's decision to cancel the CT&T service as well as the earlier obstacles to its implementation. The chapter concludes with recommendations for future research in this area.

12.2 Further consideration of the delayed launch and subsequent cancellation of the CT&T service

When I commenced the intended evaluation it was expected that the CT&T service would be launched around July 2009, and continue in the long term as an option for chlamydia testing and treatment among young people. However the unforeseen circumstances and events outlined in chapter 5 meant that the evaluation I could eventually undertake for my thesis was curtailed radically. This was because there was a considerable delay in implementation of the service, negligible uptake of the service in the first months, and then the final straw, termination of the service only 10 months after its launch.

This discussion draws on my own observations and reflections during my research, evidence from official documents relevant to the service, on the published literature that discusses the obstacles to implementation of public health programmes and on stakeholders viewpoints sought after the discontinuation of the service in Lothian (as reported in chapter 11).

12.2.1 Competing priorities

Implementation of the CT&T service suffered from competing priorities, both ongoing and temporary. For Lothian Health Board, one important competing priority at the time of implementation of the CT&T service, as indicated by the stakeholders, was the threat of swine flu pandemic (Section 11.3). This view is supported in the following extract from the minutes of a meeting of the National Sexual Health and HIV Advisory Committee (National Sexual Health and HIV Advisory Committee, 2009), where Professor Anna Glasier (the Sexual Health Lead of Lothian Health

Board at that time) raised her concern about the potential impact of a swine flu pandemic on sexual health services generally in Lothian and elsewhere in Scotland:

'In the pandemic phase, it is intended that sexual health and contraception services would be suspended. Repeat prescriptions provided by GPs would also be suspended and would be maintained by pharmacies. She expressed concern that contraception would not be available from GPs and that pharmacies could be inundated with prescriptions'

The threat of swine flu might explain some delays in implementation of the programme, due to contingency planning for swine flu, and wishing in the interim to avoid introduction of any additional workload for pharmacies. However, it cannot be the entire explanation, given the relatively brief swine flu peaks and the fact that this outbreak did not attain the feared pandemic status.

12.2.2 Evidence of effectiveness

The policy stakeholders also suggested that the newly emerging evidence on the effectiveness of chlamydia screening was far less strong regarding its consequences on long term complications such as PID and infertility (Section 11.3). This weakened the rationale for the Scottish government specifying provision of pharmacy-based chlamydia testing as an obligatory national service for all the health boards in Scotland. In this regard, it is of note that it has been demonstrated in the literature that in the past health programmes have been encouraged to expand at a national level because government policies have evolved in parallel with, rather than as a consequence of, the development of an evidence base (Sowden and Raine, 2008). It has been observed that this raises the risk of programme failure, if newly emerging evidence does not support what have been, essentially, *pre-emptive* service policy decisions. This seems to echo what has occurred in the case of the pharmacy-based chlamydia service in Scotland, since the service expansion was decided in August 2008, whereas the SIGN guideline for chlamydia, which was known to be in preparation at the time, was published only in March 2009. That guideline *discouraged* universal screening. It is noteworthy that Scottish government's decision to downgrade the status of the pharmacy-based chlamydia testing service,

from national to a local service, was not made until two years after the publication of this SIGN guideline.

12.2.3 Inter-professional barriers

When stakeholders were contacted post CT&T service, about the reasons for delays in implementation of the CT&T, an important viewpoint that emerged was resistance from GUM clinic to delegate provision of sexual health care to pharmacies (Section 11.3). Professional resistance to delegating responsibility to other health care providers is not a new phenomenon. Hughes and McCann (2003) described 'professional autonomy and professional dominance' – how certain professions not only control the scope of their own work, but also define the limits of work of other professionals. They noted a hierarchy in the attitude of physicians towards pharmacists, in that physicians questioned the role and skills of pharmacists in certain activities and felt greater involvement of pharmacists in prescribing to be inappropriate (Hughes and McCann, 2003). Similarly, Bradshaw and Doucette (1998) suggested that the attitudes of physicians could either hinder or facilitate an expansion of the community pharmacist's role. Inter-professional relationships and their potential impact on the success or failure of a service need further exploration so that, in any future service innovation in pharmacies such problems might be minimised and stronger inter-professional relationships be developed. For example, pharmacists expressed positive attitudes towards a proposal of a provision of a consultation room in pharmacies for sexual health specialists to provide a local clinic services (Gale and Watson, 2011).

12.2.4 Conflicting vision of the service

Evidence also suggests that programmes sometimes fail due to a loss of direction and conflicting vision of programme stakeholders (Ritchie *et al.*, 2008). With respect to the pharmacy-based chlamydia service in Scotland, the government vision had been to 'expand outreach' by making chlamydia services available to young people through all community pharmacies within a respective health boards. However, even if that vision existed at governmental level, it was not shared at all local health board levels. Hence, as noted by representative from PMDSG (Section 11.3), the Lothian and the Glasgow and Clyde health boards modified the government vision by making

chlamydia services available only through selected pharmacies in deprived areas. Therefore, the key theoretical underpinning of this service, in the sense of providing wide geographical access to the service, was lost in some health board areas by offering the service in only a limited number of pharmacies. This loss of universal availability might be especially problematic regarding the initial vision for the service, given it is aimed at young people, whose confidence to ask at a pharmacy counter for a test might be undermined if there is any doubt whether that particular pharmacy actually provides a testing service.

The original government vision could be viewed as a health promotion activity, in that the Scottish government directive was to make the pharmacy-based chlamydia service available to *'client[s] requesting a chlamydia test or to those identified as suitable by the pharmacist or a member of their support staff'* (NHS Circular: PCA(P)(2008)17, underlining added by me). In other health boards in Scotland, active 'recruitment' was adopted, for example by pharmacists offering chlamydia testing during EC consultation. It has been found that while the passive recruitment might ensure higher motivation for the service among users, health promotion through active recruitment supports efforts to expand reach (Lee *et al.*, 1997, Vidrine and Vidrine, 2011). However this 'health promotion' aspect of the vision was not operationalized in the specification of the CT&T service in Lothian, which was as a personalised care model delivered from pharmacies. As described in section 5.4.1.3, the service specification for Lothian directed that the service would be available to only users *requesting* it - that is through passive 'recruitment'.

Another viewpoint of key stakeholders that emerged from the post CT&T service email contacts with a small subset of stake-holders, and which is relevant to implementation of government vision for sexual health services, is that the objectives of the service were not clearly communicated to the stakeholders and that they were not always informed about the outcome of the service (Section 11.3). Those sexual and pharmacy health professionals in Scotland who did try to implement the government vision might well feel a little betrayed by this lack of sharing information/rationale. Sexual health professional generally might well feel (even) more cautious about investing too much resource and effort on the next government

directive for some 'national and specifically funded' service innovation (the special funding for which might be later withdrawn). It is important that the government should have a more collaborative relationship with service providers, sharing the evidence and reasoning for their service decisions, so that health professional stakeholders feel they are active partners in achieving future new policy 'visions'.

12.2.5 Advertising and promotion

Persistent evidence that emerged during my data collection with pharmacists was a lack of effective advertising of the service. It was felt that this was the main reason the uptake of the service remained very low. The letter from the Scottish government to heath boards informing them of their ultimate decision regarding the withdrawal of a pharmacy-based chlamydia service as a national service is attached in Appendix 11. One of the reasons indicated in this letter was *'the evidence of low uptake of the national service to date'*. For public health services such as CT&T, awareness through health promotion campaigns has been identified as a key factor in ensuring uptake (Carr *et al.*, 2009). In addition, active promotion is required by the use of other media, such as local newspapers, billboards, buses, television; and collaboration with other providers (Carr *et al.*, 2009). This issue has also been highlighted in a recent evaluation of the pharmacy smoking cessation service, where service users indicated that they only became aware of the service while passing or visiting their pharmacy (Hametz *et al.*, 2011).

For some years health promotion campaigns have been part of the community pharmacy contract in Scotland (The Scottish Government, 2008). Under this umbrella, in-store advertising must be provided in all community pharmacies within the health boards, for up to four campaigns per year, each for at least a 6 week period. This mode of advertising has been utilised for a number of services that were made available in pharmacies, such as smoking cessation and seasonal flu vaccination. In contrast, chlamydia services have never been advertised in community pharmacies through any such PHS health promotion campaigns. Furthermore, given that the CT&T testing service provision in Lothian was limited to only 12 of the 166 community pharmacies and that the only mode of advertising of

the service was through an A4 size (black and white) poster display in pilot pharmacies, the service remained largely unnoticed to the potential target audience.

12.2.6 Funding the service

When the policy stakeholders were contacted to suggest reasons why the Lothian Health Board decided to terminate the CT&T service, the withdrawal of government funding had been described as one of the key reason (Section 11.3). Adequate funding and budgeting is crucial for service success and sustainability. McNaughton et al. (2011) noted that one reason for an unsustainable service was that much of the ancillary cost in a public health intervention delivered through community pharmacies were either not anticipated in advance or were underestimated in budgets. Hence there needs to be a rational and realistic prior budgeting of the funding required for any public health programme, and careful decision making so as to ensure a balance between the need for a service and its value-for-money in the long run.

When the Scottish government decided to alter the status of the pharmacy-based chlamydia service from an 'obligatory national service' to an optional 'locally negotiated service', it meant that local health boards were required to find funds for the service from their routine budget, if they decided to continue the service. The government stated that this removal of dedicated funding was because there was a *'lack of value for money'* from the national service (Appendix 11). It is notable that the Lothian Health Board decided to terminate the service, and did not try to secure any funds from within its local budget in order to be able to continue CT&T. This indicates that the CT&T service was not considered a priority, presumably for the board for the reasons previously described.

12.3 Discussion of main findings across studies

While in chapters 7 to 11, specific findings of each study are discussed in relation to the published evidence, this section offers an integrative discussion of those findings across the studies. Despite the limitations in the scope of the evaluation that could be eventually undertaken, the completed research nevertheless makes a substantive contribution to the evaluation literature on pharmacy chlamydia services. The findings of this PhD research are reflectively reported so that, over and above the evaluation objective of the research, the results and discussion can in the future contribute to planning of chlamydia services in other areas/countries, and to planning of other pharmacy services and other public health services aiming to improve sexual health.

12.3.1 Service planning

The evaluation findings show flaws in CT&T service planning and execution. For example, failure of clear communication has been identified as a key reason why many pharmacists did not take part in the service (section 10.4.2.2.1). Better communication between those strategic stakeholders involved in the implementation of the service, and candidate pharmacies, might have increased the chance of recruiting more pharmacies and increasing coverage. As further discussed in section 12.3.6, in order to improve the uptake of the service by young people, promotion of the service should become a key ingredient of service planning and implementation (sections 8.4.2.3 & 10.4.7.3). Given the concerns raised by pharmacists, there is also a need to develop infrastructure standards for delivering such a service in pharmacies, for example ensuring privacy of consulting space, and appropriate availability of health and safety procedures (for example, availability of hand washing facilities), which are not available in many pharmacies (section 10.4.6.2).

12.3.2 Accessibility versus anonymity

Increased accessibility is identified, both by strategic stakeholders and pharmacists, as a unique selling point of the pharmacy chlamydia service (sections 8.4.3 and 10.4.7.1 respectively). When young people were asked what aspects would be important in selecting a pharmacy for the CT&T service, the three key aspects identified were a pharmacy with a convenient location (89%), a consultation room

(84%), and extended opening hours (81%) (Figure 9-5). Similarly, in-depth interviews with pharmacists have identified a number of dimensions to the enhanced accessibility that pharmacies can offer, such as availability of a CT&T service when other health services are unavailable, no requirement for a prior appointment, and easy geographical access. However, further analysis of the in-depth interviews suggested that easy geographical access might become less imperative if a client wants an anonymous service, which could argue for attending a pharmacy a bit further away from home/ family/neighbours. The fact that a consultation room is on offer to provide an adequately private consultation would not remedy this situation. The intending CT&T client has to ask for the service at the counter and this could be challenging, because the young person might be known by some of the counter staff, perhaps even by the pharmacist. Other shoppers also might recognise the client, and hence pose a risk to confidentiality/privacy. This issue was especially raised by pharmacists in a sub-rural or rural location, where convenient access would mean accessing a service in a local pharmacy only and pharmacists and other staff are often on first name terms with their clients (Sections 7.4.2.6 and 10.4.7.2). This also argues against the decision by Lothian health board to offer the CT&T service in deprived areas, whereas it seem young people might prefer to avail themselves of such a service at a slightly less local pharmacy, but one still accessible on foot or by bus.

One way of improving accessibility, while also maintaining anonymity, would be through the provision of kits on the shelves to be self picked by young people. This option was identified as 'definitely' acceptable to nearly 55% of young people, second only to the most frequent preference of being offered the test by pharmacists during an EC consultation (57%) (Figure 9-3). The Lothian CT&T service had tried to offset the cost of the service by providing only partial kits (the sample bottle without the absorbent packaging sleeves), and this provision being preceded by a consultation with the pharmacist. This service model could be modified in a way that preserves the cost saving, but enables greater anonymity, by providing similar low cost partial kits on the shelves to be freely picked by young people. However, in the absence of a pharmacist's consultation, there would still be a risk of wastage of the partial kits unless precise and easy-to-follow instructions are provided on their use.

12.3.3 Work load

The busy retail environment of pharmacies has been cited by stakeholders as a barrier to provision of chlamydia service by pharmacies (section 8.4.2.2). A persistent finding that appeared in this research (sections 7.4.2.6 and 10.4.6.1), as well as in published literature (section 4.3.7.2.6), is that pharmacists express the view that the continued growth in the delivery of public health through pharmacies is steadily increasing the work load for pharmacists. The in-depth interviews identified two key aspects that contribute to the work load of pharmacists. Firstly, lack of training of pharmacy support staff to further support the work of pharmacists in some areas of public health provision has been identified as a factor contributing to increasing work load. Secondly, complicated paper work in relation to existing services is perceived by pharmacists to further contribute to work load. The importance of developing pharmacy workforce for the provision of CT&T service will be discussed in detail in section 12.3.5. However in addition to effective workforce development, it may also be important to take measures to minimise the paperwork related to the service provision.

In the survey of potential service users, 11% of respondents indicated their preference to be tested for chlamydia in a pharmacy (section 9.4.3). If we take this figure to be true, and also assume that 35% of the young population, aged 16-24 years, would be tested for chlamydia (the figure set for NCSP targets for 2010/11) every 1.5 years, then an average of 21 tests per month would be requested by young people from each of the 12 selected Lothian pharmacies (Appendix 39). It might be advisable to inflate the percentage of young people deciding on pharmacy testing to 16%, since the 11 % estimate was based on my survey of young people from sexual health clinics only, and the preference for pharmacy testing may be higher among those who would like testing but do not go to GUM or a drop-in clinic. In such a scenario, a total of 30 tests per month would be requested in each of the 12 selected pharmacies in Lothian. Hence the pharmacists need to be reassured of the minimal day-to-day workload that would be anticipated from the provision of the CT&T service (section 10.4.6.1). Moreover, with this level of uptake, the pharmacy chlamydia service might be viewed as an adjunct to other sexual health services, by providing opportunistic screening to young people living in deprived areas.

12.3.4 Sexual health counseling

Strategic stakeholders raised a concern that in a pharmacy setting, sexual health counselling for young people would be less well delivered (section 8.4.2.2). Multiple factors were indicated as contributing to this perception such as; lack of privacy in a pharmacy setting, the high workload of pharmacists, and pharmacists having insufficient counselling skills. Partly echoing this, competencies for which the largest proportions of pharmacists were categorized as having substantial training needs were those aspects related to sexual health communications (section 7.4.2.4), such as investigating medico-legal criteria (Fraser competency) (83%), taking sexual history (78%), explaining the process of PN to clients (66%) and counseling a client who has received positive test results (65%).

It is furthermore interesting to note that prior sexual health training of pharmacists had no statistically significant association with their professed training needs (section 7.4.3.2). This finding is particularly interesting since pharmacists indicated that their prior training on sexual health provision occurred mainly through distance learning, for the provision of emergency contraception. This lack of association between currently self-reported training needs for CT&T provision and general aspects of sexual health service provision, such as taking a sexual history and advice on safe sex that were also covered in EC training, suggests a need for ongoing training, in particular face-to-face training suited to learning needed for conducting sexual health consultations.

12.3.5 Workforce development

Pharmacy workforce development is crucial for the success of a service. With the introduction of public health services in pharmacies, it is equally important to train pharmacy support staff, such as technicians and counter assistants, in addition to the provision of training to pharmacists. This is firstly because the counter staff are often the front line gatekeepers of the service. Amongst pharmacy support staff self-reported training needs were most marked for inter-communicative aspects of providing the service (sections 7.4.2.2 and 7.4.2.4). Hence, support staff as well as pharmacists, need to be trained in communication skills in sexual health matters. A few stakeholders suggested that training of pharmacy staff would also aid their

understanding of the importance of the service and promote a non-judgemental attitude towards young people (section 8.4.2.1). Secondly, with the increasing provision of multiple public health services through pharmacies, well trained support staff would be able to ease work pressure on pharmacists by undertaking initial explanation and discussion with the potential clients about a service. This would allow more time for pharmacists to undertake in-depth counselling of their clients (section 8.4.2.2 & 10.4.6.1). It is notable that while the Scottish government specification indicates that the pharmacy-based chlamydia service may be offered by pharmacists or other member of the staff, the distance learning pack referred in the specifications were developed for pharmacists only (NHS Circular: PCA(P)(2008)17) .

It may be possible to provide distance learning about the facts of STIs and chlamydia, and treatment guidelines. However, developing competencies involving practical skills such as communication strategies tends to need training face-to-face, and ideally also by role play exercises, particularly for an issue such as sexual health. Face-to-face training would require greater allocation of resources (such as logistical arrangements for training, staff time to undergo training and employing face-to-face trainers). Of course this would add to the cost of the service.

Despite the evidence provided to key stakeholders through the report on the training needs survey, regarding the differential training needs of pharmacy staff, the two training evenings organised by NHS Lothian demonstrated very limited participation of support staff. This is despite the finding of them being 'highly' or 'moderately' enthusiastic to provide the service (technicians 84% and counter assistants 61%) (section 7.4.1). Several factors might have contributed to their low participation; such as training being provided in the evenings with no incentives or reimbursements offered. It is also likely that pharmacy support staff judge that attending training would give little advantage in terms of their professional development. Reimbursement for their time to attend the training and provision of other incentives such as certification for CPD might help in improving participation.

12.3.6 Advertising and promotion of the service

A major setback to the CT&T service was the very low uptake. In the interviews with the pharmacists, the key explanation proposed for this was inadequate advertising (10.4.7.3). A number of strategic stakeholders acknowledged difficulties in promoting the service among young people (section 8.4.2.3). They felt that the impact of service promotion through educational institutes such as schools or colleges would be limited, since hard-to-reach groups in deprived communities were often absent from school and seldom went on to further education. Hence multiple channels of promotion were advocated by stakeholders and pharmacists such as through social media, other venues of NHS, in-store promotion and educational institutes (sections 8.4.2.3 and 10.4.7.3). While referring to their experience in the provision of EC, pharmacists further indicated that the EC service also suffered from inadequate advertising and suggested that this might indicate short sightedness by those who planned the implementation of the service, since they failed to address such a crucial element of service planning.

12.3.7 Targeted testing and service standards

The analyses of routinely collected chlamydia data complemented other studies by describing the context in which policy developments for chlamydia testing in community pharmacies took place (chapter 3). While the sexual health service standards for chlamydia surveillance among 15-24 year olds were met briefly for females in 2009 only, these service standards were not ever achieved for males in the years analysed. Similarly the recommendations in the 2009 SIGN guideline to achieve 60% of all chlamydia tests among <25 year olds was not ever met (section 3.4.5). These findings suggest that service audits should also focus on identifying barriers to achieving the targets and in this way enable timely action to be taken to tackle any barriers identified. For example, if service advertising appears to be a barrier then health boards might make more concerted efforts to remedy this. Perhaps in addition to the development of service standards, it might also be important to incentivise health boards to achieve any targets set.

Routine data analysis further highlighted that among those requesting testing positivity rates for 20-24 year old males were comparable to those aged 15-19 years

old (section 3.3.5.3). This suggests that might be important to emphasize testing among both 15-19 and 20-24 year old males, contrary to the CT&T service specifications in Lothian which put extra emphasis on testing 16-19 year olds.

12.3.8 Routine data specifications

In addition to the recommendations specific to the successful service implementation, the collection of routine chlamydia data for surveillance needs to be improved. The stakeholder survey raised a number of 'outcome' related questions of interest to sexual health policy makers and practitioners (sections 6.3.3.1 and 8.4.4). Even if the uptake of the CT&T service had been sufficient to provide reliable testing activity data on CT&T, few of these questions could not have been answered through an analysis of routine laboratory data. This is mainly because of the unavailability of key variables in these routine data, such as information on reason-for-test and, within the GUM service, the socioeconomic status of the person tested (such as could be obtained via residential postcode or Scottish datazones) (section 3.4.1) Similarly, for CT&T testing, it was envisaged that there would be no information on postcode of the tested person, which would have been needed if wishing to evaluate the area deprivation status of those using the CT&T service.

Postcode information was largely available for those who were tested via their GP. The decision not to collect postcode information in GUM clinics and the CT&T service has been justified on the basis of ensuring confidentiality and anonymity. However, since SIMD categorisation is based on datazone information, it is not be necessary to collect full postcode information from patients. Instead, an automated computer system could be developed that would derive datazone from a patients' postcode without recording postcode information in the patient's record, thus giving reassurance to patients as to the 'anonymity' of this level of data recording.

Furthermore, if these data are to be useful for monitoring of public health interventions, information on reason-for-test is needed. This is partly because positivity rate is strongly related to reason for test, but also because it would enable determination as to whether an increasing testing trend reflects increased opportunistic testing or is a result of testing following partner notifications, diagnostic testing following abortion, or symptomatic testing. Lack of this

information also prevents investigation of the variations in rates of opportunistic testing by health care settings and health board areas.

12.4 Policy making and political considerations

As Pawson and Tilley (2008) said *'programmes are products of the foresight of policy-makers. Their fate ultimately depends on the imagination of practitioners and participants. Rarely do these visions fully coincide'*. The reasons suggested in the policy literature for unsustainable services are numerous (Garn, 1999, McNaughton *et al.*, 2011, Ritchie *et al.*, 2008, Petticrew *et al.*, 2004). Pressure to achieve targets in too short a timeframe is an obvious contender, and arises when there is felt to be a need to satisfy public and health professionals needing to be seen as action oriented, or to appease powerful lobbies. Service is also unsustainable when there is local strategic stakeholders' disagreement regarding the effectiveness of the service and lack of programme ownership. Such factors often lead to short-lived community partnerships and programme failures. All of these factors could have impacted on the short existence of Lothian Health Board CT&T service. In respect of the pharmacy-based chlamydia service in Scotland, policy makers were faced with a dilemma of having insufficient evidence of the effectiveness of chlamydia screening, coupled with an imperative to be seen to be taking action to tackle the (apparently) rising prevalence of chlamydia infection in young population that was projected as an emerging public health problem. This might have become particularly crucial when their counterparts in England were spending £150m in total on chlamydia screening campaign.

A notable aspect of the pharmacy-based chlamydia service in Scotland was that no formal evaluation was built into it by the Scottish government. In contrast, other pharmacy public health services, such as smoking cessation and emergency contraception had concurrent evaluations commissioned by the Scottish government. This also included the requirement for health boards to adhere to the government's directions to create national dataset for evaluation purposes (Hametz *et al.*, 2011, The Scottish Government, 2008). Given the lack of a national dataset, for the pharmacy-based chlamydia service in Scotland, it is difficult to make any comparison of service effectiveness across the different health boards. This overall lack of evaluation also

means that if, in the future, evidence and/or circumstances emerge that argue for reintroduction of a pharmacy-based chlamydia testing service, there would be little documented past experience to guide the service specification and implementation, and so optimise its chances of effectiveness and efficiency.

12.5 What could have been done better in this PhD?

Doctoral study is a process of becoming a trained professional researcher. Hence it would not be surprising if at the end there are some misgivings, when looking back on the research undertaken. Certainly in this case there are things I wish I had (could have) done differently. In particular, if the local NHS REC deemed the research studies proposed as service evaluation, and hence not requiring ethical review, I would have sought ethical approval outside the NHS REC system. Putting aside any feasibility constraints (in terms of resources or time), other improvements would have been: (i) regarding the potential service users survey, for it to have encompassed both GUM & sexual health clinic service users and young people who had not ever used such services, and even better for it to have been preceded by some in-depth interviews and then piloting with them of the questionnaire; (ii) to have included a final interview study with key stakeholders, about the CT&T service in Lothian, and in particular to have included some formal interviews with non-pharmacy health professionals involved in sexual health - general practitioners and GUM clinic and sexual health drop-in centre clinical staff. (iii) There are also considerable regrets that the service was launched so late, and half-heartedly, because I had particularly looked forward to interviewing pharmacy staff about their experience of delivering the service, and had hoped to elicit some CT&T-service-users views as well. (iv) Regarding TNA, it would have been more useful to re-assess their training needs after the CT&T service had started to investigate the impact of training on their skills and change in their competence level.

That said, I nevertheless feel that I have learned a huge amount from my PhD studies and the entire process, both about research and more broadly, much more than might have been the case if the launch and delivery of the service had gone as expected/hoped, and a straightforward evaluation had been possible.

12.6 Recommendations

Research to date suggests that the pharmacy-based chlamydia services usually have low uptake. However, what is not clear is whether it is nevertheless an efficient way of reaching an otherwise hard-to-reach, if small, subset of the population. Research is needed therefore to examine the long term effectiveness of pharmacy-based chlamydia services, in achieving the desired outcomes of reducing chlamydia prevalence particularly among hard-to-reach populations. There is also a need to critically examine the cost effectiveness of the intervention from an equity perspective i.e. whether the ability to benefit from the service differs according to the socio-economic circumstances. This information would enable conclusions to be drawn as to whether access to a pharmacy-based chlamydia service would improve health outcomes among the deprived community.

The future collection and analysis of data on chlamydia screening requires the monitoring of both surveillance rate (population tested) as well as positivity (positive results as a proportion of all tested). Both of these require information on reason-for-test if useful interpretations are to be possible.

Expansion of chlamydia surveillance may not be cost effective, unless it is able to target high risk sub-populations and therefore surveillance data also requires information on the socio-economic indicators of the tested population. Subtle analysis of changes in surveillance and positivity rates constitutes a potentially illuminating area of investigation. For the purpose of evaluation of any national public health service, there is therefore a need to develop nationally agreed minimum datasets containing well specified standard variables providing socio-demographic information, and an agreement on process and outcome measures. These could be established at the outset of service planning and enable ongoing high-quality routine monitoring and evaluation of service delivery.

Strategic stakeholders' involvement should be ensured throughout the evaluation of a programme. It would be worthwhile to elicit the views of strategic stakeholders on the policy goals in relation to the implementation of any intervention/service. Some of the main questions that should be addressed in future might be: which issues do stakeholders believe to be the most important and relevant to the successful

implementation of a service?; to what extent do stakeholders' personal views on issues such as the policy goals of a service or the potential impact or success of the service differ from those which they express as representatives of organizations?; do individuals belonging to the same stakeholder group hold similar views and are these different to those of other stakeholder groups?

Future evaluations might also incorporate a before and after design for assessment of training needs and competencies of pharmacy staff. Consideration should also be given to formal recognition of their training in order to assure competence and improve their attendance in training events.

There were mixed attitudes among pharmacists about their provision of a chlamydia service to young people. For the future planning of pharmacy chlamydia services, it would be worthwhile to know whether these attitudes vary by age, gender or employment status and by pharmacy type such as multiple versus independent pharmacies. Many a community pharmacy is now delivering multiple services. Does the quality of service delivered differ between pharmacies offering single or multiple services?

Lastly, the general public is accustomed to accessing pharmacy advice and services without an appointment. With the move to deliver more pharmacy services (many of which would require counselling), it might become necessary for pharmacists to operate appointment-based systems. How would clients feel about this in general? In particular, would it be acceptable to young people to make appointments for community pharmacy services? Given the fact that potential users of pharmacy service are typically attracted by the unique selling point of not needing an appointment, such a change could render outdate much of the current evidence on the appeal of pharmacy based services.

12.7 Conclusion

The Lothian CT&T service was been designed to improve access to chlamydia services for young people living in deprived areas in Lothian, which generally are more geographically distant from the existing (non-GP) chlamydia services available in Lothian. The enthusiasm found among pharmacists to deliver the CT&T service, and the acceptability to potential service users of the various characteristics of the service, suggests that as part of a multi-faceted approach to chlamydia service, pharmacy-based testing and treatment would be a useful additional choice for young people.

Despite this, the uptake of the service was very low. It is possible that this is due to the virtual absence of advertising for the service. Furthermore, the service was short lived, being cancelled after 10 months. Both these circumstances might reflect the fact that the initial impetus for the service was at Government level, not within Lothian Health Board, and the service funded mainly by special central government funding that ceased after 10 months. This highlights the importance of robust commitment to any new service initiative that is being considered, in particular among key policy-makers/ budget-holders in the area.

Nevertheless the research findings of this thesis are useful to inform, and enhance the chances of success of planning of future initiatives in provision of chlamydia testing to young people in community pharmacies. Furthermore, many of the findings will be of considerable utility in developing chlamydia services in other health care settings, and even for other public health programmes in pharmacies.

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APPENDICES

Appendix 1: Caldicott Guardian approval letter for accessing routinely collected laboratory data on chlamydia testing for analysis

Lothian NHS Board

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NHS Lothian

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Date 23 December 2010
Your Ref
Our Ref JMS/JI/10175
Enquiries to Jim Sherval
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Dear Dr Fairhurst,

EVALUATION OF CHLAMYDIA TESTING AND TREATMENT (CT&T) TRENDS IN LOTHIAN FOR 5 YEARS (2006 TO 2010)

Thank you for the information supplied

Request received from	Mufiza Kapadia
Summary of proposal	This analysis of routinely collected data will form part of the PhD project of the principal investigator who is evaluating Chlamydia testing and treatment service in community pharmacies of Lothian.
Patient identifiable information requested	Age, Gender, Postcode (~~district only~~) TO CALCULATE DATAZONE
Approved	Yes
Reason for decision	REGISTER BASED EPIDEMIOLOGY & SERVICE EVALUATION
Advice	DATA TO BE SENT SECURELY. WHERE WILL MAPPING EXPERTISE BE SOURCED? DZ CAN BE CALCULATED BOTH CURRENT & TRANSFER.

Yours sincerely

Dr Alison McCallum
Director of Public Health & Health Policy

INVESTOR IN PEOPLE

Headquarters
Waverley Gate, 2-4 Waterloo Place, Edinburgh EH1 3EG

Chair Dr Charles J Winstanley
Chief Executive Professor James J Barbour O.B.E.
Lothian NHS Board is the common name of Lothian Health Board

Appendix 2: Univariate logistic regression analyses of each of the three chlamydia outcome measures by age, gender and year of testing

	Population Surveillance Rate			Population Diagnostic Rate			Positivity Rate		
Variables in the model	**Crude Odds Ratio**	**95% Confidence Interval**		**Crude Odds Ratio**	**95% Confidence Interval**		**Crude Odds Ratio**	**95% Confidence Interval**	
		Upper	**Lower**		**Upper**	**Lower**		**Upper**	**Lower**
Age category (in years)									
15-19	1.71	1.68	5.15	4.82	5.50	1.74	3.49	3.26	3.73
20-24	2.62	2.58	5.55	5.21	5.92	2.66	2.55	2.39	2.72
25-29	1.56	1.54	2.30	2.15	2.47	1.59	1.58	1.47	1.69
30-34	1.00		1.00				1.00		
Gender									
Female	3.47	3.43	1.74	1.68	1.79	3.51	0.55	0.54	0.57
Male	1.00						1.00		
Year of testing									
2008	1.08	1.06	1.00	0.96	1.05	1.09	0.94	0.90	.98
2009	1.12	1.10	0.96	0.92	1.00	1.13	0.86	0.82	0.90
2010	1.02	1.00	0.88	0.84	0.92	1.03	0.85	0.82	0.89
2006-2007	1.00		1.00				1.00		

Appendix 3: Multivariate logistic regression analysis of population surveillance rate (including interaction term between age group and gender)

Variables in the Equation	Log Odds	S.E.	Sig.	Adjusted OR	95% C.I. for OR	
					Lower	Upper
Age Category (in Yrs)			<0.001*			
15-19	0.12	0.02		1.13	1.09	1.17
20-24	0.85	0.02		2.34	2.28	2.41
25-29	0.43	0.02		1.54	1.49	1.59
30-34	0			1		
Gender			<0.001**			
Female	1.06	0.01		2.88	2.80	2.96
Male	0			1		
Year of Test			<0.001***			
2008	0.08	0.01		1.08	1.07	1.10
2009	0.125	0.01		1.13	1.12	1.15
2010	0.031	0.01		1.03	1.02	1.05
2006-07	0			1		
Age category by Gender			<0.001****			
15-19 yrs by Female	0.612	0.02		1.84	1.77	1.92
20-24 yrs by Female	0.193	0.02		1.21	1.17	1.26
25-29 yrs by Female	0.034	0.02		1.04	1.00	1.07
30-34 Yrs by Male	0			1		
Constant	-2.992	0.013	<0.001	0.05		

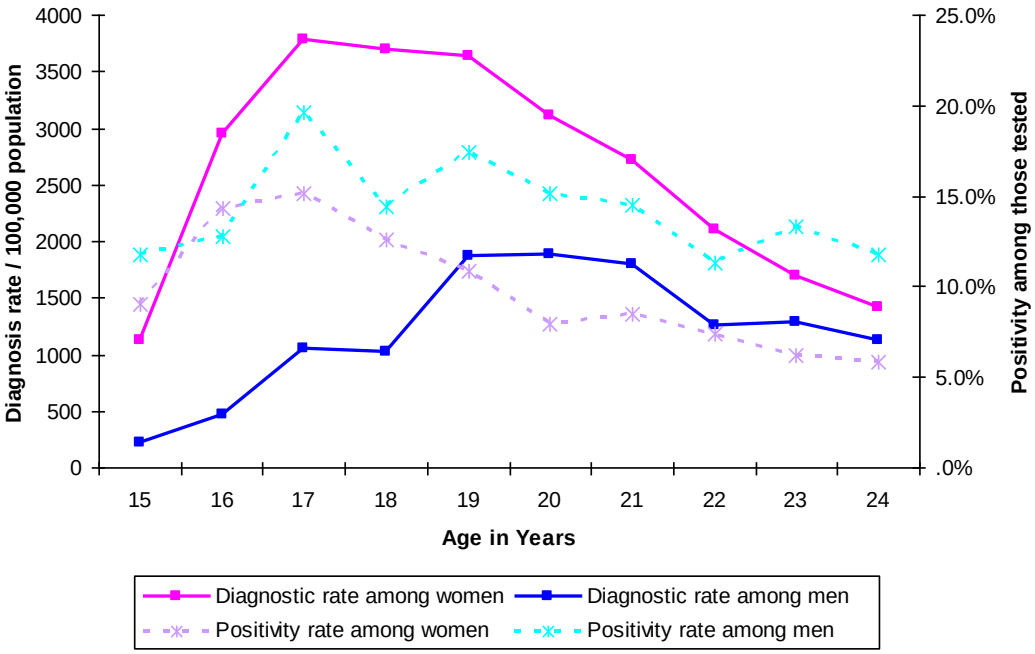
**Wald statistics: ***4609.56(3), **5433.33(1), ***337.33(3), ****1289.21(3)

Appendix 4: Multivariate logistic regression analysis of population surveillance rate (including interaction term between age group and year of testing)

Variables in the Equation	Log Odds	S.E.	Sig.	Adjusted OR	95% C.I. for OR	
					Lower	Upper
Age Category (in Yrs)			<0.001*			
15-19	0.49	0.01		1.64	1.59	1.68
20-24	0.95	0.01		2.57	2.51	2.64
25-29	0.50	0.01		1.65	1.61	1.70
30-34	0			1.00		
Gender			<0.001**			
Female	1.26	0.01		3.52	3.48	3.56
Male	0			1.00		
Year of Test			<0.001***			
2008	0.06	0.02		1.06	1.03	1.10
2009	0.08	0.02		1.08	1.04	1.12
2010	-0.01	0.02		1.00	0.96	1.03
2006-07	0			1.00		
Year of test by Age category			<0.001****			
2008 by 15-19 yrs	0.05	0.02		1.05	1.00	1.10
2008 by 20-24 yrs	0.07	0.02		1.08	1.03	1.12
2008 by 25-29 yrs	-0.06	0.02		0.94	0.90	0.98
2009 by 15-19 yrs	0.16	0.02		1.17	1.12	1.23
2009 by 20-24 yrs	0.08	0.02		1.09	1.04	1.13
2009 by 25-29 yrs	-0.05	0.02		0.95	0.91	1.00
2010 by 15-19 yrs	0.17	0.02		1.18	1.13	1.24
2010 by 20-24 yrs	0.07	0.02		1.08	1.03	1.12
2010 by 25-29 yrs	-0.10	0.02		0.91	0.87	0.95
Constant	-3.12	0.01	<0.001	0.04		

Wald statistics (df): * 5814.77(3), **45694.01(1), ***27.75(3), ****232.27(9)

Appendix 5: Diagnostic rate and positivity among 15-24 year olds in 2010



Appendix 6: Pooled estimates of multivariate logistic regression analysis for positivity rate on the imputed datasets

	Log Odds	S.E.	Sig.	Adjusted OR	95% C.I for EXP(B)	
					Lower	Upper
Age Category (yrs)			<0.001*			
15-19	1.530	0.053		4.617	4.160	5.123
20-24	1.173	0.051		3.231	2.921	3.573
25-29	0.576	0.056		1.779	1.594	1.985
30-34	0.00			1.00		
Gender						
Female	-0.848	0.033	<0.001**	0.428	0.401	0.457
Male	0.00			1.00		
Year of testing			<0.001***			
2008	-.084	0.034		0.919	0.860	0.983
2009	-.231	0.036		0.794	0.740	0.851
2010	-.216	0.036		0.806	0.751	0.865
2006-07	0.00			1.00		
SIMD Quintiles			<0.001****			
1 (Most deprived)	0.464	0.039		1.590	1.472	1.718
2	0.383	0.038		1.467	1.363	1.579
3	0.238	0.041		1.269	1.171	1.374
4	0.178	0.043		1.195	1.098	1.299
5 (Least Deprived)	0.00			1.00		
2 fold Urban Rural classification						
Rural	0.153	0.057	<0.001*****	1.165	1.043	1.301
Urban	0.0			1.00		
Constant	-2.919	0.061	0.000	0.054		

Wald statistics (df): *1194.23(3), **651.15(1), ***60.38(3), ****171.70(4), *****7.298(1)

Appendix 7: Modeling the number of tests required to show a significant change in the population surveillance rate, pre CT&T (2009) to when it was expected to be fully established (2011)

My intention had been to use and compare the routine dataset with pharmacy testing activity dataset in order to determine whether the introduction of chlamydia testing in pharmacies had: (i) produced any statistically significant change in surveillance rate overall; and/or (ii) increased the proportions tested in the target population (those living in deprived areas). Given a negligible uptake of pharmacy testing and a short time span of the service for less than a year, this analysis plan became redundant.

Instead I have undertaken a modelling analysis to fulfil aim i, by ascertaining what increase would have been required, in the number of tests per year among 15-24 year olds, in order to give a result of a statistically significant increase in the number of tests for chlamydia.

Aim

To undertake scenario analyses for a range of increases in annual number of tests, from before introduction of CT&T (2009) to once it was fully launched (2011, say, if it had not been cancelled), to ascertain the threshold at which the difference in the proportion of the 15 to 24 year old population tested is statistically significantly different from prior to CT&T.

Methods

The total 15-24 year old population in Lothian in 2009 was 115655 (labelled N_{2009}). The corresponding population for the (comparator) year 2011 was 117,455, so this denominator is labelled N_{2011}. For the year 2009, the number of 15-24 year olds tested in Lothian was 22836, which is equivalent to a proportion of tests in this age group of 0.197, or annual surveillance rate of 197 tests / 1000 population. These are shown in columns 1 and 2 of Table 6-A. I then calculated proportions of young people tested in 2011 across a range of 'scenario' numbers of tests (larger than the 2009 figure, ranging from 22900 to 23645) (columns 3 and 4). The z-test for the difference in proportions (2009 to post CT&T) was run for each scenario proportion, and the p-values were obtained. The z and p values are listed in Table 6-A (columns 5 and 6). The scenario numbers of *additional* tests are listed in the last column of the

table, calculated as the difference between the scenario number (b) and the actual number of tests in 2009 (a) in each row.

Table 7-A: Scenario analyses for the difference in proportion of tests for chlamydia (2009 to post CT&T), for Lothian population 15-24 year olds

Pre-CT&T (2009)		**Hypothetical - Once CT&T established (2011)**				
No. of Tests (a)	Population Proportion tested* (a/N_{2009})	Scenario no. of tests in a year (b)	Population. Proportion tested* (b/N_{2011})	Comparison of the two proportions Z	p-value	Increase in no. of tests in a year (b-a)
22836	0.1974	22900	0.1950	-1.5081	0.93	64
		23000	0.1958	-0.9898	0.84	164
		23100	0.1967	-0.4723	0.68	264
		23200	0.1975	0.0444	0.48	364
		23300	0.1984	0.5602	0.29	464
		23400	0.1992	1.0752	0.14	564
		23500	0.2001	1.5893	0.06	664
		23511	0.2002	1.6458	0.05	**675**
		23550	0.2005	1.8461	0.03	714
		23600	0.2009	2.1027	0.02	764
		23645	0.2013	2.3334	0.01	**809**

*The population estimates for the denominator are obtained from GROS.

Results

Table 6A presents the figures used for calculations explained in methods above, and the results (p value for difference in proportions of each scenario increase in number of tests). It can be seen that as expected, the p value for the difference in proportions falls from 0.93 to 0.01 as the scenario number of tests increases. The smallest

increase in number of tests required to show a statistically significant change in the proportion of the population tested (at 5% level of significance) is 675 tests. Similarly, the smallest increase in number of tests required to show a statistically significant change in the proportion tested (at 1% level of significance) is 809 tests.

In the scenario analyses reported above, I have used the binomial test of *proportions* of the population having chlamydia tests, between the baseline and post-CT&T years being compared. For baseline, the surveillance rate (proportion of tests, 0.197) used was as per data for 2009, and increase in tests required (at 5% level of significance) was 675, arising from the increase in proportion tested of 0.27%.

However this absolute 'change in number of tests needed' will partly reflect the change in proportions needed to show a statistically significant difference between the two years being modelled (absolute difference in proportion =0.27%), but will also reflect any change in population size between the two years. If these scenario analyses are re-done for the situation where the population in 2011 is unchanged from 2009 (n=115655) then the increase in number of tests needed would have been 314 (The corresponding absolute difference in proportions remaining 0.27%). This is considerably fewer than the 675 in Table 6A.

However, another consideration is whether 2009 is a good baseline year to choose in terms of observed surveillance rate. As reported in chapter 3, the surveillance rate for 2009 was higher than years before or after, transiently, very likely due in part to the introduction of new chlamydia policies/ guidance, and dissemination of these to sexual health clinics and GPs. If instead the baseline year is taken as 2010, with surveillance rate (proportion 0.185), and the scenario analyses are re-run for 2011 (actual population denominator), than an additional 445 tests would be required to show a statistically significant change (at 5% level of significance), 230 fewer than when using 2009 as baseline.

While the increase in number of tests needed to show statistically significant change at x% varies according to base-line rate (to a small degree) and changes in population (quite markedly), in all situations modelled the increase in proportion of tests needed was fairly constant (for 5% significance, absolute increase in proportion of 0.27%). For further interpretation of these results, see section 3.5, page 86.

Appendix 8: Example of search strategy used in OvidSP database for literature review

Search strategy:

1. Pharmacies/
2. Community adj3 pharmacy*.mp.
3. Pharmacists/
4. Community pharmacy services/
5. 1 or 2 or 3
6. Chlamydia/
7. Chlamydia infection/
8. Chlamydia trachomatis/
9. exp Sexually Transmitted Diseases/ not HIV.mp.
10. Contact Tracing/
11. 5 or 6 or 7 or 8
12. 4 and 9
13. Limit 10 to English Language

Appendix 9: Harden quality criteria applied to studies included in the review

Criteria	Bloomfield (2001)	Van-Bergen (2001)	Golden (2001)	Golden (2005)	Baraitser (2007)	Taylor (2007)	TNS (2007)
1. An explicit theoretical framework underpinning the study and/or literature	✓	✓	✓	✓	✓	✓	X
2. Aims and objectives clearly stated	✓	✗	✓	✓	✓	✓	✓
3. A clear description of context of the study	✓	✓	✓	✓	✓	✗	✓
4. A clear description of the sampling and recruitment procedures	✓	✓	✓	✓	✓	✓	✓
5. A clear description of methods used to collect and analyse data	✗	✓	✓	✓	✓	✗	✓
6. Attempts made to establish the reliability or validity of data analysis	✓	✓	✓	✓	✓	✓	✓
7. Inclusion of sufficient original data to arbitrate between evidence and interpretation	✓	✓	✓	✓	✓	✓	✓

Criteria	Cameron (2007)	Watson (2008)	Anthony (2008)	Muir (2008)	Brabin (2009)	Tineli (2009)	McNutt (2009)
1. An explicit theoretical framework underpinning the study and/or literature	✓	X	X	✓	✓	✓	✓
2. Aims and objectives clearly stated	✓	✓	✓	✓	✓	✓	✓
3. A clear description of context of the study	✓	✓	✓	✓	✓	✓	✓
4. A clear description of the sampling and recruitment procedures	✓	✓	✓	✗	✓	✓	✓
5. A clear description of methods used to collect and analyse data	✗	✓	✓	✗	✓	✓	✓
6. Attempts made to establish the reliability or validity of data analysis	✓	✓	✓	✓	✓	✓	✓
7. Inclusion of sufficient original data to arbitrate between evidence and interpretation	✓	✓	✓	✗	✓	✓	✓

Criteria	Gutka (2010)	Thomas (2010)	Anderson (2011)	Dabrera (2011)	Emerton (2011)	Gale (2011)	Cameron 2010, 2011)
1. An explicit theoretical framework underpinning the study and/or literature	✓	✓	✓	✓	✓	✓	✓
2. Aims and objectives clearly stated	✓	✓	✓	✓	✓	✓	✓
3. A clear description of context of the study	✓	✓	✓	✓	✓	✓	✓
4. A clear description of the sampling and recruitment procedures	✓	✓	✓	✓	✓	✓	✓
5. A clear description of methods used to collect and analyse data	✓	✓	✓	✓	✓, ✗	✓	✓
6. Attempts made to establish the reliability or validity of data analysis	✓	✓	✓	✓	✓	✓	✓
7. Inclusion of sufficient original data to arbitrate between evidence and interpretation	✓	✓	✓	✓	✗	✓	✓

Appendix 10: Scottish government reminder to health boards to start the service in their respective health boards, if they have not yet done so.

The Scottish Government

To: Chief Executives, NHS Boards
Copy to: Directors of Pharmacy, NHS Boards
Sexual Health leads, NHS Boards

17 February 2010

Dear Colleague

COMMUNITY PHARMACY PUBLIC HEALTH SERVICE: CHLAMYDIA TESTING AND TREATMENT

The Scottish Government is committed to maximising the potential of community pharmacy to contribute to the delivery of Public Health initiatives, where this is cost effective, and where it fits with national and local strategies for the particular service concerned.

Circular NHS (PCA)(P)(2008) 17, issued on 22 August 2008, provided Directions for the Public Health Service (PHS) element of the new community pharmacy contract. The Directions place a duty on Health Boards to arrange for the provision of PHS for persons in their area as an additional pharmaceutical service.

This has provided a framework for a national Chlamydia testing and treatment service in community pharmacies to support improved access to sexual health advice and treatment.

It is clear that some Boards have put a great deal of effort into the development of a local service and we are grateful to them for the efforts they have made in this respect. However, as the roll-out of the community pharmacy Chlamydia testing and treatment service has been slow to develop in a number of other Boards' areas we wish to remind all Boards of their duty to implement this service.

We are conscious that in some instances there have been problems encountered locally in setting up a new service at relatively short notice and in some others that Boards have opted to pilot a Chlamydia service in a limited number of community

pharmacies before rolling out the service more widely. However, we are keen for all Boards to do everything they can to progress the full roll-out of the service within their area as soon as possible.

Introduction of running improvements

For the present, given positive buy in from those NHS Boards who have already arrangements in place, our strong preference remains to have a national Chlamydia service available through community pharmacies in all Board areas.

We are therefore currently reviewing issues already raised by Boards which may be affecting roll out of the initiative. Some of these require further advice from Boards now to allow running improvements to be introduced into the service as soon as possible. These are:-

-Identification of best value in purchasing test kits to reduce current spread in costs. (This issue is being raised with National Procurement for further advice. Boards are invited to provide details of their current purchasing arrangements for test kits and costs.)

-Partner notification
(this is understood to be handled differently across Boards. Boards are invited to provide details of local arrangements and how these relate in particular to Pharmacy led services. This will help to inform the issue of relevant guidance/good practice).

-Payment arrangements
(Board views on alternative models for service payment to best incentivise take up and deliver value for money are invited.)

-Data flow
(Board views on what data is needed from participating pharmacies is sought to enable Boards to manage effectively the service provided.)

A number of other issues already raised by Boards are being progressed separately. These are:

-Education
(SG are to discuss with NES a learning resource to be used alongside local training.)

-Advertising
(The possibility of national advertising materials is being considered.)

-Revised service specification
(The current specification will be reviewed to ensure that it fits with now published SIGN guidelines.)

Review of progress

During the summer we will be reviewing whether:

- current evidence is that this national Community Pharmacy initiative is effective in improving services for patients;
- how well it is being integrated into local strategies for the delivery of Chlamydia services;
- there is sufficient evidence that a national service through community pharmacy should be retained and, if so;
- what changes or developments may be desirable either nationally or within local protocols to improve the cost effectiveness of the service and/or its integration into local service implementation strategies.

NHS Boards are accordingly invited to provide, as soon as possible, advice which they consider may be helpful in respect of the issues listed above. Any decision to discontinue Chlamydia testing/treatment through community pharmacies would not be taken lightly. NHS Boards will, however, wish to note that in the event that the evidence available in the summer suggests that this service is not currently cost effective as a national service, the funding released will be redeployed within the national Community Pharmacy contract Global Sum and it will then fall to each NHS Board to make supplementary replacement local arrangements to involve community pharmacy as each sees fit.

Any changes to the national payment structure will of course require to be negotiated with Community Pharmacy Scotland.

If you wish to discuss any issues arising from this letter or wish further information, please contact: Molly Robertson on 0131 244 3457. Responses to this letter should be sent to Brian West at brian.west@scotland.gsi.gov.uk, if possible by the end of March.

Yours sincerely,

FRANK STRANG	**MIKE PALMER**	**PROFESSOR BILL SCOTT**
Deputy Director, Primary Care	Deputy Director, Public Health	Chief Pharmaceutical Officer

Appendices

Appendix 11: Scottish government decision letter regarding reclassification of pharmacy chlamydia service from national to local service

Chief Medical Officer and Public Health Directorate
Public Health Division

T: 0131-244 2448 F: 0131-244 7157
E: mike.palmer@scotland.gsi.gov.uk

The Scottish Government

Chief Executives, NHS Boards

Copy to: Directors of Public Health
Directors of Pharmacy
Sexual Health Strategy Leads
Sexual Health Lead Clinicians

19 October 2010

Dear Colleague

CHLAMYDIA TESTING AND TREATMENT SERVICES

Circular PCA (P)(2010)(28) advises that from 1 October 2010 chlamydia testing and treatment services currently being provided as part of the national community pharmacy contract will instead be provided through locally negotiated services. The pharmacy element of the services will continue to be funded by Scottish Government for the remainder of 2010/11. No decision on Scottish Government funding beyond that date can be made until budgets for 2011/12 have been set.

The replacement of a national contract-based service with locally negotiated services reflects the evidence of low uptake of the national service to date and its lack of value for money. However, Ministers continue to attach great importance to accessible sexual health information, advice and services for young people, including chlamydia testing and treatment. They therefore wish to emphasise the continued importance of maintaining opportunistic testing and treatment services which meet local needs and which are delivered in ways which suit local circumstances. Pharmacies will clearly continue to have a role to play in that provision, but this will vary across Scotland.

Boards are therefore reminded of the need to continue to provide opportunistic chlamydia testing and treatment services (which is a Key Clinical Indicator for sexual health services) in line with current SIGN guidelines and QIS standards, and which meet the needs of their young people. Performance management of sexual health service provision will be undertaken by QIS and Scottish Government in forthcoming visits.

Yours sincerely

Michael Palmer.

MIKE PALMER
Deputy Director

St Andrew's House, Regent Road, Edinburgh EH1 3DG
www.scotland.gov.uk

Appendix 12: Invitation letter sent by the Lothian Health Board to selected community pharmacies for participation in the CT&T service

Public Health and Health Policy
Deaconess House
148 Pleasance
Edinburgh
EH8 9RS

NHS Lothian

Date 24th July 2009
Our Ref AM/AL/LMH

Enquiries to Linda Haggarty
Extension 89409
Direct Line 0131 536 9019
Direct Fax 0131 536 9164
Email aileen.muir@nhslothian.scot.nhs.uk

Dear Colleague

Chlamydia Testing from Community Pharmacy a Pilot Study

As you will be aware there has been a new SIGN Guideline No 109 published recently which sets out all the parameters and criteria for the management of Chlamydia Infection and NHS Lothian is reviewing all its services that deal with testing, treatment and contact tracing in line with this new guidance.

Whilst there has been a national specification for the delivery of a Community Pharmacy testing service for quite some time, the logistics involved in setting this up within NHS Lothian in the most efficient and straightforward manner have taken some time to determine.

To make sure that the service delivery model we implement meets the needs of the patient, complements the other services already running and is achievable from a busy community pharmacy we would like to test it out in a small number of pharmacies before roll out across all pharmacies.

A number of geographical areas across NHS Lothian, where there is an identified unmet need for Chlamydia testing in that population, have been chosen. **We are looking for a total of 25 pharmacies from these areas to pilot the service**.

At the moment we are not in a position to define exactly what would be expected from the pharmacies involved in the pilot but this also allows those participating to influence the development of the final model of delivery.

One of the criteria which the sexual health services would like to fulfil is for the urine sample to be produced freshly on the premises. We need to determine whether this is achievable and therefore will have to scope out how many pharmacies would be happy for patients to use their toilet for this purpose and if not whether there is an alternative to this such as access to other toilet facilities nearby.

Some of the details of the service which need to be firmed up are who would inform the patient of the result and how that would be done; telephone call, text, face to face, as well as how accurate contact tracing could be ensured.

Since a private conversation with the patient will be needed to explain at the outset what is involved in taking the test, how the results will be given to the patient and any subsequent action they may need to take as a result of the test it is felt that those pharmacies applying would need to be confident that they can provide a good level of aural and visual privacy to clients wishing to use the service.

Could all those interested please contact:
Tracy Morton - email tracy.morton@nhslothian.scot.nhs.uk, fax **0131 537 6552** or letter
Pharmacy Department, Royal Edinburgh Hospital, Morningside Terrace, Edinburgh EH10 5HF indicating their willingness to take part and the facilities they would be able to provide by the **24th August 2009.**

We are writing out to all the pharmacies in the defined areas and will only be able to involve 25 pharmacies in the pilot so a selection process may be required should the responses in any one area exceed the number of sites identified for that locality.

Since Chlamydia testing is a core service to be provided from every community pharmacy we feel it is important that the model we develop for its delivery has input from all parties involved. It will be exciting to be able to help shape the delivery of a new service and I look forward to hearing from you.

With all good wishes.

Yours sincerely,

AILEEN MUIR
Consultant in Pharmaceutical Public Health

Courtesy: NHS Lothian.

Appendix 13: Quick reference guide provided by Lothian Health Board to pharmacies piloting CT&T service

Quick Reference Guide for Chlamydia Testing Service

Counter Staff

Clients may approach you and ask for a chlamydia test. This can be done for both male and female clients.
Chlamydia Testing should be targeted at 16-20 year olds, however the service can be provided to 15-24 year olds.
Ask the clients age?
Tell client the pharmacist will see them.
Make them feel relaxed and be non judgemental with the client.
Refer the client to the pharmacist

Pharmacist.

Assessing symptoms
Move the client to a private area.
Ask the client if they are requesting a test because they are experiencing any symptoms.
If the client has symptoms of an STI they should be told that they need to be seen at the Dept of Genito Urinary Medicine. Give them details of the local clinics.

Target Group
If they have no symptoms, check that they are in the target group (16-20 years). If they are between 15 and 24 and are still anxious to be tested then the service can still be provided for them.

The Test
Explain how the chlamydia test is done.
Client receives sample pot from pharmacy. They need to provide a urine sample in the pot and return it to pharmacy on the same day they have provided the sample. Ensure the form is filled in correctly and make sure you put your pharmacy code in the Keep Clear box. The test kit will then be sent away by post and the result provided to the client by a health advisor from GUM.
If positive the advisor will offer a variety of locations for treatment and will discuss the best way to contact any other partners the client may have had in the last 6 months.

The Treatment
The treatment is usually a simple one off dose of antibiotic (Azithromycin 1g)
If the client choosing to receive this from a pharmacy they do no need to return to the pharmacy at which they were tested and if they pay for their prescriptions then the usual prescription charge will apply.
At the time of treatment discuss the importance of any partners also receiving a test and treatment. Ask the client to fill in a partner notification form, even if they don't wish to provide details of partners it helps GUM if they know an individual has been treated. This form is confidential and will be sent to GUM for the health advisor to contact the partners. The health advisor will never tell the partner who gave them their name, even if asked to do so.
Ask the patient how many partners they wish to contact themselves and provide enough trifold partner notification leaflets for each partner.

Courtesy: NHS Lothian

Appendix 14: Lothian Health Board patient information leaflets provided with postal testing kit

Chlamydia: What is it?

Chlamydia isn't a flower!... it isn't a girl's name... it isn't an exotic island... it is a 1 in 10 bug... and you might have it! ...read on to find out more... ...including how you can get tested.

Chlamydia is the most common, curable sexually transmitted infection in people under 25. What exactly does that mean?

How you get it: It is a sexually transmitted infection, sometimes called an STI, STD or sex infection. They all mean the same thing - an infection that is passed on during sexual contact. Basically, having vaginal intercourse, anal intercourse or oral sex (such as kissing or sucking the genital area, eg a blow job) without using a condom.

Lots of people have it. About 1 out of every 10 young people has it - it's really common.

Most people don't get any symptoms. This means you can't tell who has it by how they look or how they act. Because of this you should always use a condom - they help protect against pregnancy and other STIs too.

You can get rid of it. Chlamydia is treated easily with antibiotics. Normally this means taking only 4 tablets all at once. Sometimes you need to take a longer course of antibiotics. If taken properly the Chlamydia 'bug' is destroyed.

If Chlamydia is not treated it can lead to long term problems for the person who has it and the people they go on to have sex with. For guys this can mean the testicles can become really swollen, red and sore - this needs a course of strong antibiotics. Girls can get Pelvic Inflammatory Disease (PID) which can cause pain at the bottom part of the tummy and lead to problems getting pregnant (infertility). If they do get pregnant the pregnancy can grow in the fallopian tubes instead of the womb (ectopic pregnancy). This can be very dangerous.

It will not kill you. Chlamydia is not life threatening.

About the test

Testing for chlamydia is easy, only a sample of urine is needed. The urine is then analysed in a lab and the result is usually ready in 14 days.

The test is free and confidential.

Doing the test

In this pack you should have:

- small clear plastic bottle with a white top
- plastic transport pack
- pre-addressed plastic envelope
- pen

1. Write your name and the PTK reference number (from the lab form) on the clear plastic bottle.
2. Fill in the lab form below with your personal details (two sections). Please try and fill in all the information, as this will help us make sure that you get your test results. Place the form in the pre-addressed envelope.
3. You should pass the first bit of your urine into the clear plastic bottle. It is important to post your sample on the same day.
4. Make sure that the white screw cap is tightly closed, to stop any urine leaking.
5. Put the urine bottle into the plastic transport pack and snap shut tightly.
6. Place this pack (with the lab form) in the pre-addressed envelope and seal it.
7. Post the envelope in a Royal Mail post box which has a wide slot. You do not need to put a stamp on, as the postage has already been paid.

Checklist

- Lab form (two sections) completed with your personal details.
- Fresh sample of urine i.e. passed today.
- Ensure you have put your name and PTK reference number on the sample bottle.

1. read about Chlamydia: the 1 in 10 bug
2. follow the testing kit instructions
3. complete the Lab Form
4. mail the sample for testing in the envelope provided
5. keep your reference number

Postal Testing Kit

PTK

NHS Lothian

This Chlamydia Postal Testing Kit is distributed by:
GUM Clinic, NHS Lothian
www.nhslothian.scot.nhs.uk/ourservices/gum/gum.asp

PTK

Chlamydia PTK developed by
Healthy Respect @ NHS Lothian
www.healthyrespect.co.uk

Getting the results

It is really important that we have a way of getting your results to you, especially if we find out that you have Chlamydia and need treatment.

You have two choices:

- You phone us 14 days after making your test. You can phone Monday-Friday between 2.30 – 4pm, the number is 0131 536 2106
- We send you a letter in a hand written envelope.

Easy test

Because it is a urine test you do not need to be seen by a doctor or nurse to have a test. Simply follow the instructions and you could know in about 14 days whether you have the infection. If you do, we will arrange for you to be treated as soon as possible.

Help! If any of the contents are missing from this pack... or you need help filling out the form... or you are not sure whether to have the test... or you don't know if you want to fill in all the information we ask for... please phone us on 0131 536 2106

Think!

Before you decide to have this test you need to think about some issues:

- How you will feel if you have Chlamydia?
- How will it mean for your boyfriend/girlfriend?
- What will it mean for your boyfriend/girlfriend?
- Do you have someone you trust that you can speak to?
- You could have been at risk of getting other infections - remember your urine will only be tested for Chlamydia.

If your test is positive, we need to have some way of contacting you, so please remember to fill in your address and/or phone number on the Lab Form.

Appendix 15: Laboratory CT&T forms to be filled by the pharmacist or the client

For you to keep

Fill in the form. Keep the reference number below. You will need these details to get your results. Return the Lab Form (section 1 and 2) in the pre-addressed envelope with your urine bottle.

Keep your reference number: PTK 46296

If you select the "you phone us" option to receive your results, please call 0131 536 2106 Monday-Friday (between 2.30 – 4pm) at least 14 days after mailing your test.
Please complete all details - you need to give some information twice.

Getting the results

You have two choices:
- You phone us 14 days after mailing your test. You can phone Monday-Friday between 2.30 – 4pm, the number is 0131 536 2106
- We send you a letter in a hand written envelope.

If your test is positive and we are not able to give you the results by your chosen method within 4 weeks of your test we will write to you. Normally you should have your results within two weeks. If you do not hear from us within four weeks or you have any questions, please phone 0131 536 2106 to let us know that you have not received your results.

Lab Form
The Royal Infirmary of Edinburgh: Bacteriology
Section 1

Reference number: PTK 46296
Date of Test / / Time of Test
How would you like to receive your results? please number your preferred two options (1 = 1st choice 2 = 2nd choice):
you phone us letter by post
Date of Birth / / Sex Male Female
Name
Address
Postcode
Contact/Mobile Tel Number

KEEP CLEAR:
GUM – please return to Dr Scott
Please put PTK number on sample bottle
For lab use only

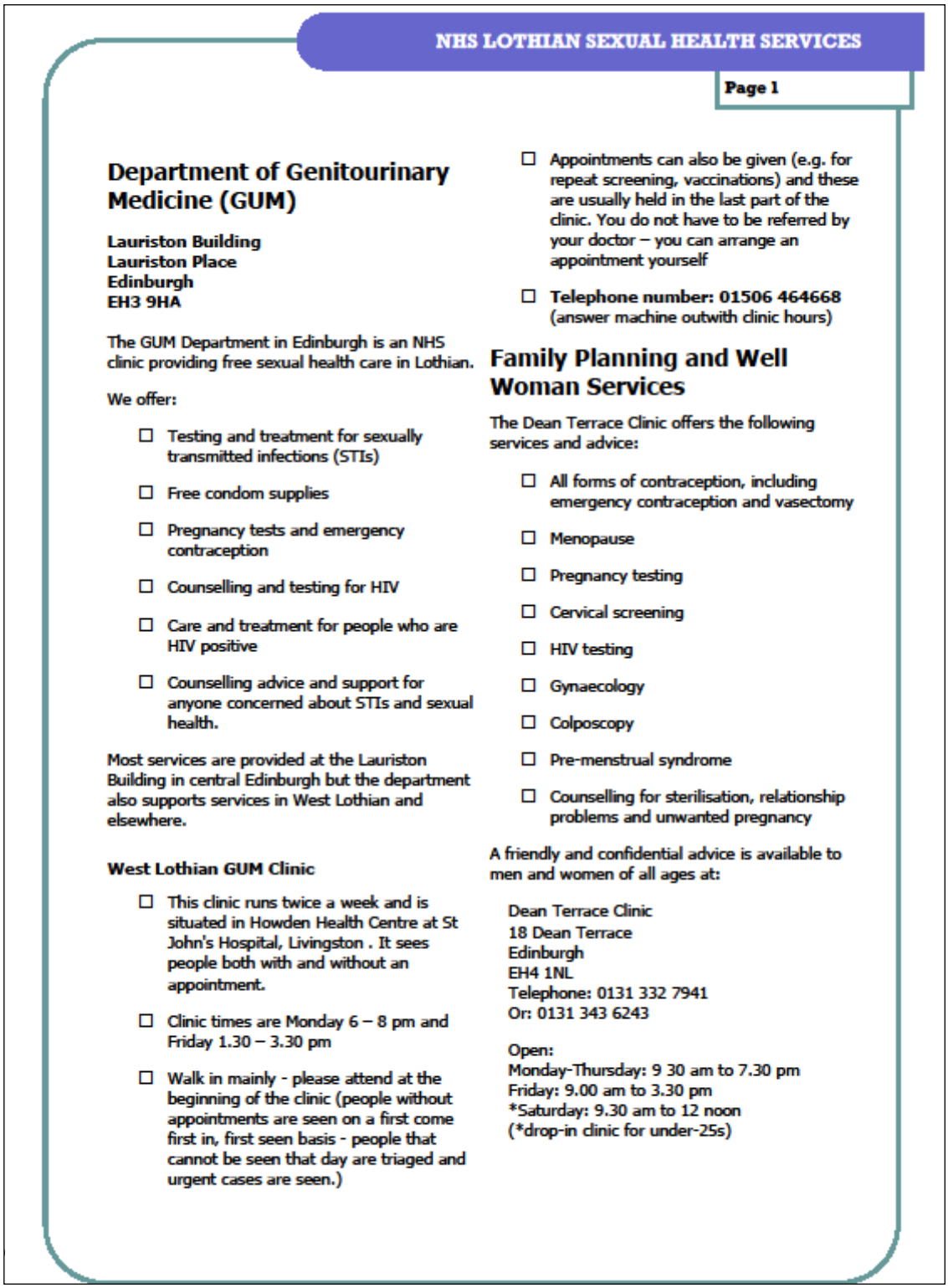
Lab Form
The Royal Infirmary of Edinburgh: Bacteriology
Section 2

Reference number: PTK 46296
Date of Test / / Time of Test
Date of Birth / / Sex Male Female

PTK

Courtesy: NHS Lothian

Appendix 16: Lothian Health Board information leaflet given out with the test kit, regarding sexual health clinics in Lothian



NHS LOTHIAN SEXUAL HEALTH SERVICES

Department of Genitourinary Medicine (GUM)

Lauriston Building
Lauriston Place
Edinburgh
EH3 9HA

The GUM Department in Edinburgh is an NHS clinic providing free sexual health care in Lothian.

We offer:

- ☐ Testing and treatment for sexually transmitted infections (STIs)
- ☐ Free condom supplies
- ☐ Pregnancy tests and emergency contraception
- ☐ Counselling and testing for HIV
- ☐ Care and treatment for people who are HIV positive
- ☐ Counselling advice and support for anyone concerned about STIs and sexual health.

Most services are provided at the Lauriston Building in central Edinburgh but the department also supports services in West Lothian and elsewhere.

West Lothian GUM Clinic

- ☐ This clinic runs twice a week and is situated in Howden Health Centre at St John's Hospital, Livingston . It sees people both with and without an appointment.
- ☐ Clinic times are Monday 6 – 8 pm and Friday 1.30 – 3.30 pm
- ☐ Walk in mainly - please attend at the beginning of the clinic (people without appointments are seen on a first come first in, first seen basis - people that cannot be seen that day are triaged and urgent cases are seen.)
- ☐ Appointments can also be given (e.g. for repeat screening, vaccinations) and these are usually held in the last part of the clinic. You do not have to be referred by your doctor – you can arrange an appointment yourself
- ☐ **Telephone number: 01506 464668** (answer machine outwith clinic hours)

Family Planning and Well Woman Services

The Dean Terrace Clinic offers the following services and advice:

- ☐ All forms of contraception, including emergency contraception and vasectomy
- ☐ Menopause
- ☐ Pregnancy testing
- ☐ Cervical screening
- ☐ HIV testing
- ☐ Gynaecology
- ☐ Colposcopy
- ☐ Pre-menstrual syndrome
- ☐ Counselling for sterilisation, relationship problems and unwanted pregnancy

A friendly and confidential advice is available to men and women of all ages at:

Dean Terrace Clinic
18 Dean Terrace
Edinburgh
EH4 1NL
Telephone: 0131 332 7941
Or: 0131 343 6243

Open:
Monday-Thursday: 9 30 am to 7.30 pm
Friday: 9.00 am to 3.30 pm
*Saturday: 9.30 am to 12 noon
(*drop-in clinic for under-25s)

Appendix 17: Lothian Health Board partner notification form to be handed out by pharmacists to clients receiving treatment for chlamydia from pharmacies

NHS Lothian

Partner Notification Form – Community Pharmacy Chlamydia Testing and Treatment Service

Why should I fill in this form?
It is important that your sexual contacts know that they have been exposed to chlamydia. Many people do not know that they have chlamydia until after they pass the infection on to others or develop serious health problems. Many of these problems can be avoided if people are told they are at risk – and get treated.

How do I fill the form in?
Please write down the details of any sexual contacts you have had in the LAST SIX MONTHS. Don't worry if you can't fill in all the information asked for; just fill in what you can. You can inform your contacts yourself or a health adviser can do this for you.

What do I do with it once it's filled in?
To ensure confidentiality, once you've filled in the form, put it into the envelope you have been given, and seal the envelope.
Then give the envelope back to the pharmacist.
The pharmacist will send this form to the NHS Lothian Genito Urinary Medicine (GUM) service for you.

What will GUM do with the information on this form?
A Health Adviser at GUM service will contact the people you have put on this form. GUM will NOT give your details to them, **even if the person asks.**
In 4 weeks time a Health Adviser will contact you on your mobile number to ensure you've had no problems with your treatment.

Your Details

Surname		**Forename**	
Address			
Postcode	**DOB**	**Age**	**Mobile**

Details of your sexual contacts in the last six months

			Contact Method (√)	
			I will contact	Adviser to contact
Contact 1 Name Address	Town Phone Number	Age Postcode		
Contact 2 Name Address	Town Phone Number	Age Postcode		
Contact 3 Name Address	Town Phone Number	Age Postcode		
Contact 4 Name Address	Town Phone Number	Age Postcode		
Contact 5 Name Address	Town Phone Number	Age Postcode		
Contact 6 Name Address	Town Phone Number	Age Postcode		

Courtesy: NHS Lothian.

Appendix 18: Lothian Health Board information leaflet for patients diagnosed with chlamydia to be handed out by the pharmacist to index patient and their partners

To avoid getting this infection in the future always use condoms with a new partner. Using a condom can protect you from Sexually Transmitted Infections. You can get free condoms through the C Card scheme. To find out your nearest Pick-Up point call the NHS helpline on 0800 22 454 88

Everyone who has had chlamydia is advised to have another test during the following year. This is especially important if you have a new sexual partner

Remember – new partner – new test!

NHS Lothian

Chlamydia

Treatment Advice Leaflet

Please give this leaflet to any patient diagnosed with Chlamydia

Department of Genito-Urinary Medicine
Level One – Lauriston Buildings
Lauriston Place
EDINBURGH
EH9 3HA
Tel. No. (0131) 536 2103

http://www.nhslothian.scot.nhs.uk/ourservices/GUM/gum.asp

Advice: I have Chlamydia

You have been told that you have Chlamydia. This is a common infection. It is sexually transmitted and most people do not have any symptoms. If Chlamydia is not treated, it can cause long-term health problems such as pain and infertility. It is important that:-

- Your infection is treated properly.
- You do not become infected again.
- You take the treatment given to you by your pharmacist.
- You contact them if you have any problems, for example if you were sick immediately after taking the treatment.
- You get a repeat Chlamydia test during the next year, especially if you have a new partner

If you have a sexual partner/partners it is important that they are also treated before you have sex again. You should tell any partners that you have had in the last 6 months that they should get tested and treated. Please give your partner(s) this leaflet and ask them to take it to their nearest GUM clinic, Family Planning Clinic, GP or pharmacist to ensure that they receive treatment for Chlamydia. Please do not have sex with them until any infection that they might have is treated.

Number PTK_____

Advice: My partner has Chlamydia

Your current or recent sexual partner has been found to have a sexually transmitted infection called Chlamydia.

- Most people with Chlamydia have no symptoms.
- Chlamydia can have serious complications.
- It is important that you are also treated. Please take this leaflet to your nearest GUM clinic, Family Planning Clinic, GP or pharmacist. If you are unsure about where would be the best place to go, please phone (0131) 536 2103 for advice.

Please avoid passing any infection on to others – do not have sex until at least 7 days after your treatment has finished.

- You should also be tested for Chlamydia
- If your test is positive, you will also need to contact anyone you have had sex with in the last 6 months
- If your test is positive you should get a repeat Chlamydia test during the next year, especially if you have a new partner

Advice: My patient has Chlamydia or is a contact of Chlamydia

This patient has been given this leaflet by their sexual partner who has been found to be Chlamydia positive. Please treat this patient for Chlamydia as per local formulary advice – typically 1g Azithromycin stat.

Ideally, this patient should be tested for Chlamydia in order to inform the need for further contact tracing. However, do not wait for the result before prescribing treatment unless the likelihood of a positive result is thought to be very low.

Please advise **NO sexual contact until 7 days after treatment is finished,** and ask the patient to contact you should they have vomiting or diarrhoea that might reduce drug absorption.

Website address
http://www.nhslothian.scot.nhs.uk/ourservices/GUM/gum.asp

RefHelp
http://refhelp/gum/gum_home.htm

Courtesy: NHS Lothian.

Appendix 19: Full transcript of attributable feedback by the Scottish Government representative on the pharmacy-based chlamydia service (April 2012)

'Boards had been slow to implement the Chlamydia testing and treatment service through community pharmacy. There were a number of likely reasons for this; pressures from pandemic flu had impacted on Board resources available to undertake the laboratory testing of Chlamydia samples; the two largest Boards, NHS Greater Glasgow & Clyde and NHS Lothian, had elected to pilot the service in a small number of pharmacies rather than implement the service in all pharmacies; and other Boards had reported difficulties with contact tracing arrangements. In addition, revised the SIGN guidelines of March 2009 on the management of genital Chlamydia infection recommended that resources for Chlamydia testing in women should be targeted firstly in those aged 15-19, then those aged 20-24; and in men at those aged under 25 and all patients attending GUM services. The guideline did not recommend more universal screening. Therefore changing the community pharmacy Chlamydia testing and treatment service to a locally negotiated service allowed NHS Boards to apply a more targeted approach, based on local needs, which fitted better with the SIGN guidelines.'

Appendix 20: Differentiating between research and evaluation

RESEARCH	SERVICE EVALUATION
The attempt to derive generalisable new knowledge including studies that aim to generate hypotheses as well as studies that aim to test them.	Designed and conducted solely to define or judge current care.
Quantitative research – designed to test a hypothesis. Qualitative research – identifies/explores themes following established methodology.	Designed to answer the question: "What standard does this service achieve?"
Addresses clearly defined questions, aims and objectives.	Measures current service without reference to a standard.
Quantitative research -may involve evaluating or comparing interventions, particularly new ones. Qualitative research – usually involves studying how interventions and relationships are experienced.	Involves an intervention in use ONLY. (The choice of treatment is that of the clinician and patient according to guidance, professional standards and/or patient preference.)
Usually involves collecting data that are additional to those for routine care but may include data collected routinely. May involve treatments, samples or investigations additional to routine care.	Usually involves analysis of existing data but may include administration of simple interview or questionnaire.
Quantitative research - study design may involve allocating patients to intervention groups. Qualitative research uses a clearly defined sampling framework underpinned by conceptual or theoretical justifications.	No allocation to intervention groups: the health care professional and patient have chosen intervention before service evaluation.
May involve randomisation	No randomisation
RESEARCH REQUIRES R.E.C. REVIEW	SERVICE EVALUATION DOES NOT REQUIRE R.E.C. REVIEW

(Adopted from National Research Ethics Service)

Appendix 21: Letter regarding South East Scotland Research Ethics Service advice for stakeholder survey and routine data analyses

South East Scotland Research Ethics Service

Deaconess House
148 Pleasance
Edinburgh
EH8 9RS
Tel: 0131 536 9067
Fax: 0131 536 9346

NHS Lothian

Name: Mufiza Zia Kapadia
Address: Public Health Sciences
Centre for Population Health Science
Medical School
Teviot Place
University of Edinburgh
EH8 9AG

Date: 15/03/2010
Your Ref:
Our Ref: NR/0911AB9
Enquiries to: Alex Bailey
Extension:
Direct Line: 0131 536 9050
Email: alex.bailey@nhslothian.scot.nhs.uk

DearMufiza ,

Full title of project: Evaluation of chlamydia testing and treatment service in community pharmacies of Lothian, Scotland

You have sought advice from the South East Scotland Research Ethics Service on the above project. This has been considered by the Scientific Officer and you are advised that, based on the submitted documentation (9 Nov_pharmacy director_manager information sheet_Evaluation of Pharmacy Chlamydia Testing and Treatment Service-1, proposal for ethical approval_pharmacy staff part, Appendices for ethical approval-1), it does not need NHS ethical review under the terms of the Governance Arrangements for Research Ethics Committees in the UK. The advice is based on the following:

- *The project is an audit using only data obtained as part of usual care, but note the requirement for Caldicott Guardian approval for the use or transfer of person-identifiable information within or from an organisation*

- *The project is an opinion survey seeking the views of NHS staff on service delivery.*

If this project is being conducted within NHS Lothian you should inform the relevant local Quality Improvement Team(s).

This letter should not be interpreted as giving a form of ethical approval or any endorsement of the project, but it may be provided to a journal or other body as evidence that ethical approval is not required under NHS research governance arrangements. However, if you, your sponsor/funder or any NHS organisation feels that the project should be managed as research and/or that ethical review by a NHS REC is essential, please write setting out your reasons and we will be pleased to consider further. Where NHS organisations have clarified that a project is not to be managed as research, the Research Governance Framework states that it should not be presented as research within the NHS.
You should retain a copy of this letter with your project file as evidence that you have sought advice from the South East Scotland Research Ethics Service.

Yours sincerely,

Alex Bailey
Scientific Officer
South East Scotland Research Ethics Service

Enclosure: NRES leaflet - "Defining Research"

Appendix 22: Letter regarding South East Scotland Research Ethics Service advise for undertaking potential service user's survey

South East Scotland Research Ethics Service

Deaconess House
148 Pleasance
Edinburgh
EH8 9RS
Tel: 0131 536 9067
Fax: 0131 536 9346

NHS Lothian

Name: Mufiza Zia Kapadia
Address: Centre for Population Health Science
Medical School
Teviot Place
University of Edinburgh
EH8 9AG

Date: 14/12/2010
Your Ref:
Our Ref: NR/0911AB9
Enquiries to: Alex Bailey
Extension:
Direct Line: 0131 536 9050
Email: alex.bailey@nhslothian.scot.nhs.uk

DearMufiza ,

Full title of project: Evaluation of chlamydia testing and treatment service in community pharmacies of Lothian, Scotland

You have sought advice from the South East Scotland Research Ethics Service on the above project. This has been considered by the Scientific Officer and you are advised that, based on the submitted documentation (9 Nov_pharmacy director_manager information sheet_Evaluation of Pharmacy Chlamydia Testing and Treatment Service-1, proposal for ethical approval_pharmacy staff part, Appendices for ethical approval-1, Kapadia_RecForm_091210.pdf), it does not need NHS ethical review under the terms of the Governance Arrangements for Research Ethics Committees in the UK. The advice is based on the following:

- *The project uses only data obtained as part of usual care, but note the requirement for Caldicott Guardian approval for the use or transfer of person-identifiable information within or from an organisation*
- *The project is an opinion survey seeking the views of NHS staff and patients on service delivery*

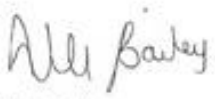
If this project is being conducted within NHS Lothian you should inform the relevant local Quality Improvement Team(s).

This letter should not be interpreted as giving a form of ethical approval or any endorsement of the project, but it may be provided to a journal or other body as evidence that ethical approval is not required under NHS research governance arrangements. However, if you, your sponsor/funder or any NHS organisation feels that the project should be managed as research and/or that ethical review by a NHS REC is essential, please write setting out your reasons and we will be pleased to consider further. Where NHS organisations have clarified that a project is not to be managed as research, the Research Governance Framework states that it should not be presented as research within the NHS.

You should retain a copy of this letter with your project file as evidence that you have sought advice from the South East Scotland Research Ethics Service.

South East Scotland Research Ethics Service

Yours sincerely,



Alex Bailey
Scientific Officer
South East Scotland Research Ethics Service

Enclosure: NRES leaflet - "Defining Research"

Appendix 23: Invitation letter to pharmacy director/manager about participation in the training needs survey

Dear Pharmacy Director / Manager, 1 April 2008

Chlamydia Testing and Treatment Service

NHS Lothian is in the process of implementing the national Chlamydia Pharmacy Testing and Treatment service in its community pharmacies. We wish to support this with training to enable staff development, and to facilitate smooth uptake by the community pharmacies, and quality delivery of this service.

We are therefore undertaking a **Training Needs Analysis** to determine the extent and content of training required. [This has been developed in collaboration with researchers at the Division of Community Health Sciences, University of Edinburgh.] The Training Needs Analysis will enable training to be prioritised and implemented as required, and will inform development of the structured training module to be offered. However, it can only do this effectively if we receive input from as many as possible of the pharmacy staff who will be involved in the new service.

Copies of **Training Needs Questionnaire** packs are enclosed, each comprising questionnaire, invitation letter and reply-paid envelope. **We would be grateful if a questionnaire pack could be given to *every member of staff who deals with customers*, including yourself.** [If you need more copies of the questionnaire pack, please do not hesitate to email us at M.Z.Kapadia@sms.ed.ac.uk]

Some information about the new service is given within the questionnaire and the invitation letter provides reassurance on anonymity. Stamped addressed envelopes are provided for replies. We believe completion of the questionnaire should take about 10 mins, and we request return of completed questionnaires by **Wednesday, 22 April 2009,** to enable timely action on design and delivery of training.

This research is an important and integral part of a process to plan training provision for pharmacy staff, so we hope that you will encourage your staff to complete and return the questionnaires. With the support of you and your staff we hope to facilitate pharmacy staff development, improve the client experience, increase the uptake of this service and contribute to the reduction of Chlamydia infection across Lothian.

Thank you in anticipation for your time.

Yours faithfully

Dr M.Z.Kapadia
Public Health Sciences
University of Edinburgh Medical School
Teviot Place, EH8 9AG

Aileen Muir
Associate Director for Pharmacy
Public Health

Appendix 24: Invitation letter to pharmacy staff about participation in the training needs survey

Dear Pharmacy Colleague, 1 April 2009

Training Needs Questionnaire

NHS Lothian is in the process of implementing the national **Chlamydia Pharmacy Testing and Treatment** service in its community pharmacies. We wish to support this with training to enable staff development and competency, and quality delivery of this programme.

We are therefore undertaking a **Training Needs Analysis** to determine the extent and content of training required. [This has been developed in collaboration with researchers at the Division of Community Health Sciences, University of Edinburgh.] The Training Needs Analysis will enable training to be prioritised and implemented as required, and will inform development of the structured training module to be offered. However, it can only do this effectively if we receive input from as many as possible of the pharmacy staff who will be involved in the new service.

We have asked the manager of the pharmacy to give this **Training Needs Questionnaire** pack to you. It comprises this invitation letter explaining what we ask, and why, a copy of the Questionnaire which includes some brief information about the programme, and a reply-paid envelope. The questionnaire includes both coded items and space for free-text responses, because your individual views are considered to be important. We would be very grateful if you could take the time to fill out this questionnaire and return it by **Wednesday, 22 April 2009**, to enable timely action on design and delivery of training.

Please note that responses to the questions are and will remain anonymous. All replies will be treated in strict confidence and will be seen only by the research team. [If you have any questions about this survey please email us at M.Z.Kapadia@sms.ed.ac.uk]

This research is an important and integral part of a process to plan training provision for pharmacy staff, so as to promote pharmacy staff development, improve the client experience, increase the uptake of this service and contribute to the reduction of Chlamydia infection across Lothian. Therefore we very much hope you will complete our questionnaire for us.

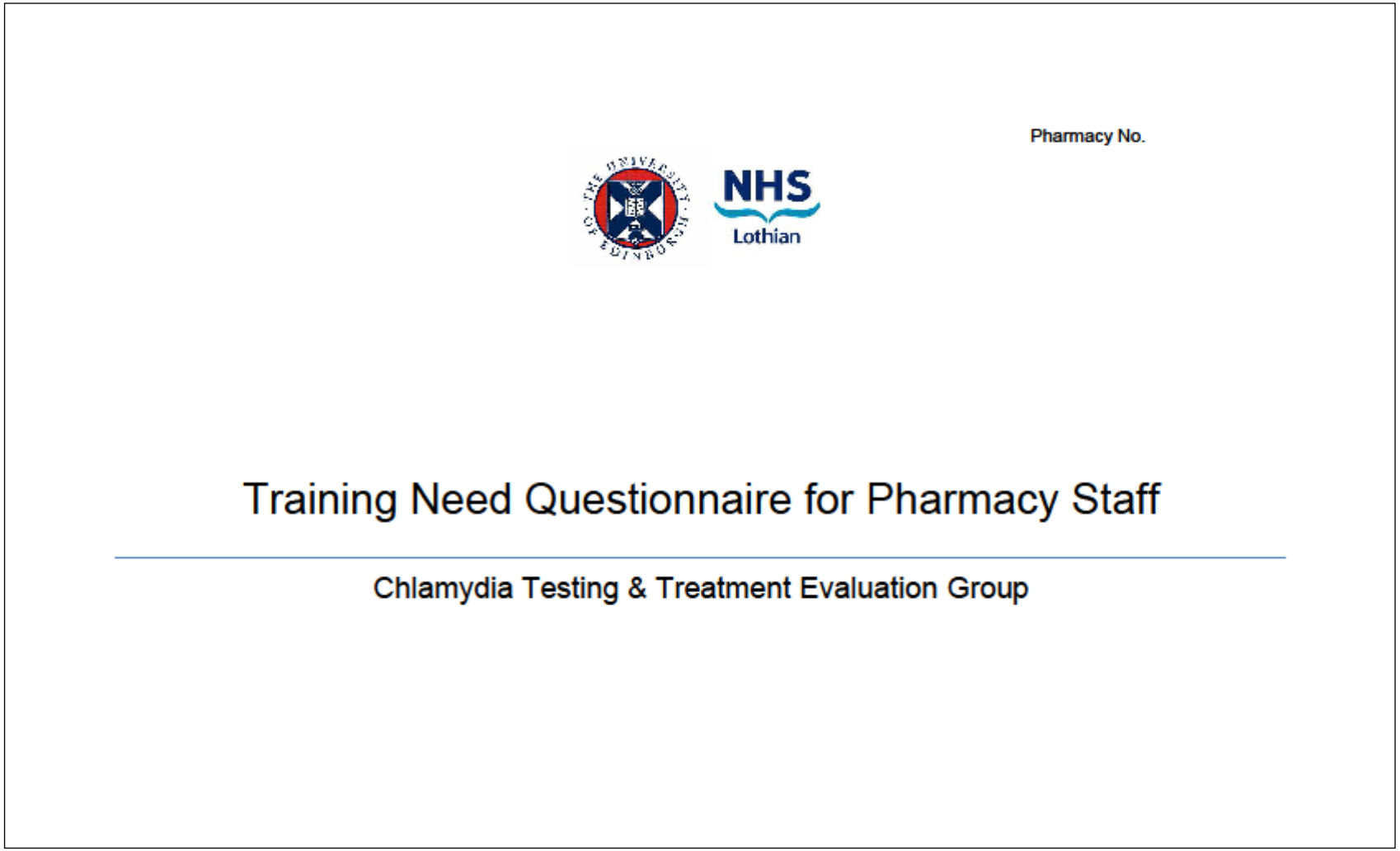
Thank you in anticipation for your time.

Yours faithfully

Dr M.Z.Kapadia
Public Health Sciences
University of Edinburgh Medical School
Teviot Place, EH8 9AG

Aileen Muir
Associate Director for Pharmacy
Public Health

Appendix 25: Training needs survey questionnaire



Pharmacy No.

NHS Lothian

Training Need Questionnaire for Pharmacy Staff

Chlamydia Testing & Treatment Evaluation Group

Brief background to Chlamydia Testing and Treatment service

This is a new national public health initiative aiming to improve the access of the Scottish population to sexual health care, by having community pharmacies provide both testing and treatment of Chlamydia. In NHS Lothian the two parts of the new services will be launched in separate phases.

There has been a successful pilot in NHS Lothian for partners of Chlamydia positive patients to access ***treatment*** *via* a community pharmacy using a voucher system (vouchers having been issued by GUM clinics). Following on from this, it has been decided to roll out, across all community pharmacies in Lothian, a pharmacy chlamydia ***treatment*** service, using a similar voucher system (in March/April). It is expected that, as part of this service, all community pharmacies will provide advice to clients about testing for Chlamydia and signpost them to places where testing services can be accessed.

In the second phase, a pilot Chlamydia ***testing*** service in community pharmacies will be set up in specified areas where there is a gap in the delivery of sexual health service. Once this is launched, other (non-pilot) pharmacies will be able to include in the information they provide to clients seeking sexual health advice, signposting to (pilot) community pharmacies that offer a testing service.

These new services therefore provide yet another great opportunity for community pharmacy to act as a link to specialist services at the same time as providing wider access to sexual health services.

ABOUT THIS QUESTIONNAIRE

- Your answers are anonymous and will be kept absolutely confidential. No one, except the research team will have access to the data. The answers from all the participants will be combined to get summary results.
- Page **4** is to be filled by pharmacists only

Instructions on how to complete the Questionnaire:

◯ ☑ Tick the answer that applies to you

5 2 Write in a number answer, or 0 if none

anything write an answer in words

Appendices

Today's Date ☐☐ ☐☐ ☐☐
d d m m y y

Please answer these questions about yourself so that we can describe training needs in relation to work force categories within community pharmacies of Lothian

1 How many of each of the following staff types work in this pharmacy *(question 1 to be filled by pharmacy manager only)*

Pharmacists ☐☐ Number Technicians ☐☐ Number Counter assistants ☐☐ Number

2 Which of these job titles most closely matches yours? *(Please tick ✓ one)*

Pharmacist ◯ 1 Technician ◯ 2 Counter Assistant ◯ 3 Other ◯ 4 *Please specify* .....

3 What is your gender?

Male ◯ 1 Female ◯ 2

4 How old are you?

< 25 years ◯ 1 25 to < 35 years ◯ 2 35 to < 50 years ◯ 3 ≥ 50 years ◯ 4

5 What is the highest qualifications do you hold?

BPharm ◯ 1 MPharm ◯ 2 SQQ level 3 ◯ 3 SVQ level 2 ◯ 4 NC in Pharmaceutical Care ◯ 5 Other ◯ 6 please specify .....

6 Have you received any sexual health training before?

No ◯ 1 Yes ◯ 2 (if 'No', please go to question **7**)

If yes, a) What was the broad focus/ content of training? .....

b) What was the duration of that training? .....

Appendices

7 Please read each statement and reflect:

i) How much the statement applies in your case?

ii) What your training need is in respect of the competency?

For each statement please tick ✓one response in each panel

		i) How much does the statement apply in your case?				ii) What is your training need in this respect?			
		Not at all	Somewhat	Fairly well	Very much so	None Needed	Refresher	Top-up	Full
A	I feel able to communicate with clients appropriately and sensitively	○	○	○	○	○	○	○	○
B	I know basic information about sexually transmitted infections	○	○	○	○	○	○	○	○
C	I feel able to respond to a request for sexual health information	○	○	○	○	○	○	○	○
D	I know the signs and symptoms of Chlamydia infection	○	○	○	○	○	○	○	○
E	I know the possible consequences of Chlamydia infection	○	○	○	○	○	○	○	○
F	I feel able to raise the issue of sexual health with a client	○	○	○	○	○	○	○	○
G	I feel able to give a client advice on safer sex	○	○	○	○	○	○	○	○
H	I understand the aims of Chlamydia screening	○	○	○	○	○	○	○	○
I	I feel able if requested to advise a client regarding screening	○	○	○	○	○	○	○	○
J	I feel able to make the offer of Chlamydia screening to eligible women	○	○	○	○	○	○	○	○
K	I feel able to make the offer of Chlamydia screening to eligible men	○	○	○	○	○	○	○	○
L	I feel able to give guidance/instructions on actual use of screening kit	○	○	○	○	○	○	○	○
M	I understand the importance of partner notification after a positive test result	○	○	○	○	○	○	○	○
N	I understand the aims of a Chlamydia treatment service	○	○	○	○	○	○	○	○
O	I feel able to explain the importance of partner notification to a client	○	○	○	○	○	○	○	○

8 Please give any further suggestions you have regarding training that would be helpful for delivery of the new **Chlamydia Testing & Treatment** service

.....

.....

.....

9 Have you received training before on any of the above topics?

No ◯ 1 Yes ◯ 2

a) If YES, which topics? Please give the relevant item numbers (from **A** to **O**).....

.....

If you are *not* a qualified pharmacist, please now skip to question 13 on the last page.
Pharmacists please first answer questions 10 to 12 on the next page.

Questions (10 - 12) on this page address competencies expected *only of qualified pharmacists*. Others please skip to Qu 13.

10 Please read each statement and reflect: i) How much the statement applies in your case? ii) What your training need is in respect of the competency? *For each statement please tick ✓one response in each panel*		i) How much does the statement apply in your case?				ii) What is your training need in this respect?			
		Not at all	Somewhat	Fairly well	Very much so	None Needed	Refresher	Top-up	Full
P	I feel able to counsel a client who has received a positive test result	○	○	○	○	○	○	○	○
Q	I feel able to advise on and prescribe treatment for Chlamydia Infection	○	○	○	○	○	○	○	○
R	I feel able to take a sexual history	○	○	○	○	○	○	○	○
S	I feel clear about the circumstances when I should ask for support and advice in dealing with a client	○	○	○	○	○	○	○	○
T	I feel clear what features of the sexual history indicate the client should be referred	○	○	○	○	○	○	○	○
U	I feel able to explain the process for partner notification to a client with a positive Chlamydia test result	○	○	○	○	○	○	○	○
V	I feel clear about the medico-legal aspects of Sexual Health Services provision (Fraser Guidelines)	○	○	○	○	○	○	○	○
W	I feel able to review my own and my staff's competencies against the newly specified role on Chlamydia screening	○	○	○	○	○	○	○	○

11 Please state any further suggestions you have in relation to training needs

.....

.....

12 Have you received training before on any of the above topics?

No ○ 1 Yes ○ 2 (if No, please go to question 13)

a) If YES, which topics? Please give the relevant item numbers (from P to W) .....

Remaining questions to be completed by everyone, please.

13 How often do you deal with someone asking for advice about sexual health?

Every day ◯1 Every week ◯2 Every month ◯3 Very seldom ◯4 Can not recall ◯5

14 How enthusiastic do you feel about this proposed pharmacy testing and treatment program?

Not at all ◯1 Somewhat ◯2 Moderately ◯3 Highly ◯4

15 Do you have any concerns about the proposed screening program?

No ◯1 Yes ◯2

a) If Yes, please specify your concerns here

.....

.....

.....

Thank you very much for your time in completing this questionnaire

Please return your completed questionnaire by **Tuesday, 26 May 2009** using the enclosed SAE or post to the address below

Dr M.Z.Kapadia, Public Health Sciences, University of Edinburgh Medical School, Teviot Place EH8 9AG

Appendix 26: A short questionnaire sent to pharmacy manager/director to ascertain the number of pharmacy staff having face-to-face dealings with clients

NHS Lothian

THE UNIVERSITY OF EDINBURGH

11th May 2009

Dear Pharmacy Manager;

Further to our survey of training needs of pharmacy staff for the Community Pharmacy Chlamydia Testing and Treatment Service, we would be grateful if you could provide the following information about your pharmacy.

Kind Regards,

Mufiza Zia Kapadia
Chlamydia Testing & Treatment Evaluation Group
Public Health Sciences
University of Edinburgh

Pharmacy Number

Assessment of pharmacy staff numbers relevant to Training Needs Survey

*In our survey Questionnaire we asked only **total** pharmacy staff counts. However, we also need an accurate count of the subset of pharmacy staff potentially in need of training for the planned new Community Pharmacy Chlamydia Testing and Treatment Service – i.e. those who have **face-to-face dealings with clients**.*

We would therefore be very grateful if you could provide the counts requested below.

1. How many of the staff in your pharmacy have face-to-face dealings with clients?

   Number ☐☐

2. For *these staff* (who deal with clients *directly*), please provide a breakdown into staff categories.

   Qualified pharmacists ☐☐ Number Technicians/ Dispensers ☐☐ Number Counter assistants and others ☐☐ Number

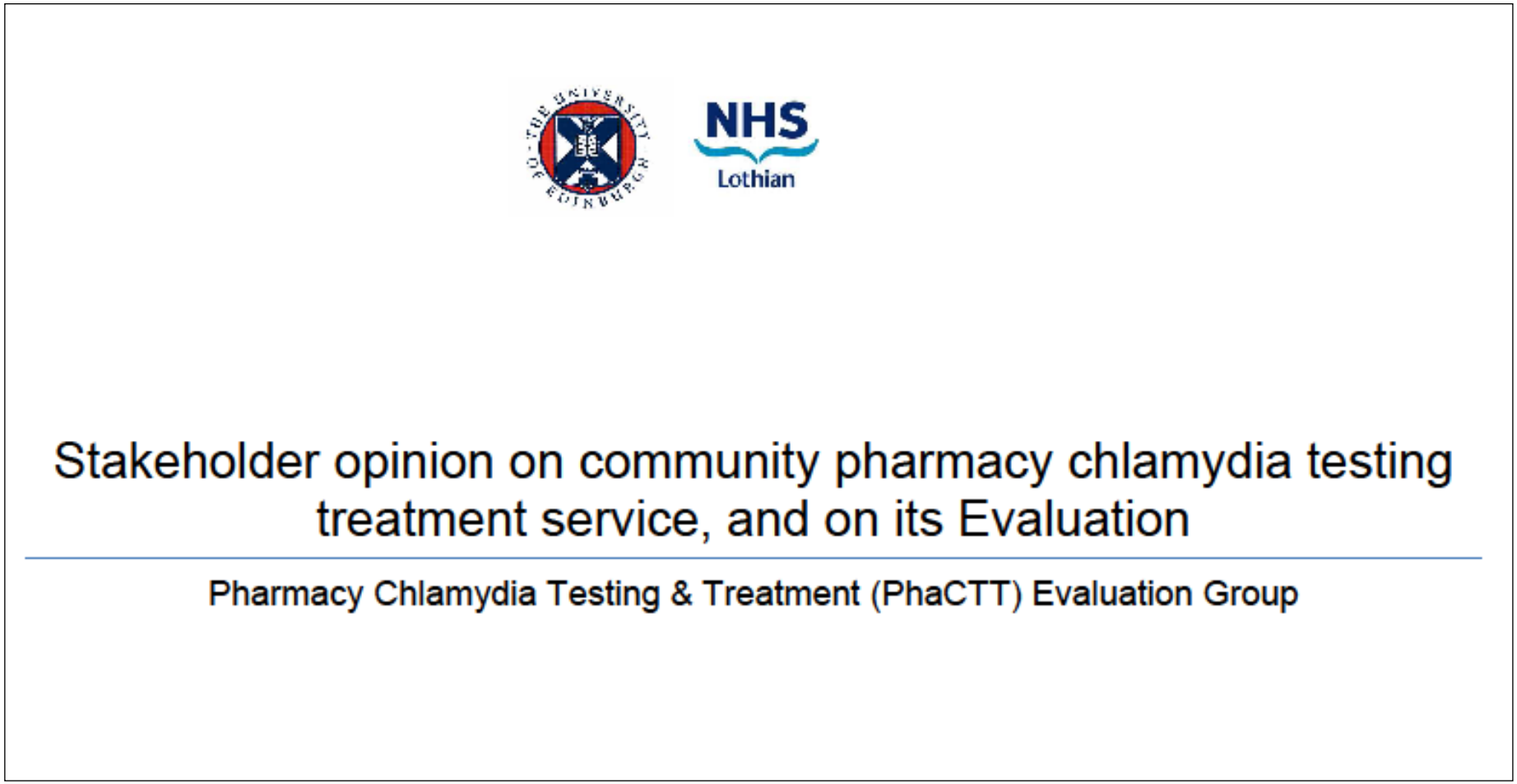
Thank you very much for your help. This will be of great value to the Training Needs Analysis, and to planning of training.

Please return completed form in the SAE provided to:

Dr Mufiza Zia Kapadia
Public Health Sciences
University of Edinburgh Medical School,
Teviot Place,
Edinburgh, EH8 9AG

Pharmacy Chlamydia Testing & Treatment Evaluation Group

Appendix 27: Stakeholder survey questionnaire



EVALUATION of Chlamydia Testing & Treatment Service based in Lothian Community Pharmacies

Thank you for taking part in the Stakeholder survey designed and disseminated by Pharmacy Chlamydia Testing and Treatment (PhaCTT) evaluation group. Your input to the evaluation will be invaluable.

Questionnaire structure

This questionnaire falls into **three short sections**:

A. Assessing your views on the aims and possible challenges of the CT&T service

B. Requesting your input to focus the ongoing evaluation of the CT&T service;

C. An optional opportunity for you to make suggestions to improve CT&T service in community pharmacies

While responding, you might want to take a little time to reflect on chlamydia, STIs, the clientele, sexual health services for young people, and this way of providing a Chlamydia Testing & Treatment service (**CT&T**). Please see more information about the chlamydia testing and treatment service given in the attached yellow sheet. This will give you details about the service and may help you while responding to Q.1 & Q.2.

It should take you no longer than 10 minutes to complete the survey.

Data Protection

Please be reassured that all responses will be kept anonymous, and if any responses are quoted in the evaluation report (or PhD thesis), they will be unattributable, and sufficiently précised/disguised/aggregated to avoid identification.

Your participation is highly appreciated.

Thank you.

SECTION A: The Lothian CT&T service

1. Regarding the delivery of the CT&T service in community pharmacies, please indicate whether you have concerns about the adequacy of any of the following?

(For more details about CT&T service specifications, see attached yellow information sheet)

I am concerned about the adequacy of....	The amount of concern I feel about this is: *Please select the most appropriate response for your feeling*				*If you have noted any 'moderate' or 'strong' concerns, please elaborate the nature of your concern in the free-text box below, alongside the item*
	None at all	A little	Moderate	Strong	
a ..training of pharmacist for CT&T service	○	○	○	○	
b ..training of pharmacy support staff for CT&T service	○	○	○	○	
c ..provision of private discussion area in pharmacy	○	○	○	○	
d ..privacy achieved by the pharmacist, for the CT&T consultation	○	○	○	○	
e ..advertising of CT&T service in the pharmacy	○	○	○	○	
f ..advertising of CT&T service elsewhere than in pharmacy	○	○	○	○	
g ..staffing of pharmacy for CT&T workload	○	○	○	○	

2. Is there any other logistical/organisational aspect of CT&T, which concerns you?

No ○ Yes ○

a. If Yes, what is that aspect ***(please specify)***.....

b. How much concern do you feel? A little ○ Moderate ○ Strong ○

3. **With respect to the sexual health care provision via community pharmacies, are you concerned about any of the following?**

(See attached info sheet for further details on sexual health counselling, partner notification and recruitment aspects of CT&T)

	The amount of concern I feel about this is:				*If you have noted any 'moderate' or 'strong' concerns, please elaborate the nature of your concern in the free-text box below, alongside the item*
	None at all	**A little**	**Moderate**	**Strong**	
a The CT&T pharmacy service might miss the opportunity that chlamydia testing can give in other settings, to provide adequate **sexual health counselling** to young people who need it	○	○	○	○	
b The CT&T pharmacy service might fail to motivate young people as well as testing in other settings, to provide details for **partner notification**	○	○	○	○	
c The fact that pharmacy consultations, for other types of sexual health care (e.g. emergency contraception), need not necessarily involve opportunistic offering of the pharmacy Chlamydia testing service, will be a missed opportunity to **recruit** young people who might well need Chlamydia screening	○	○	○	○	

4. Is there any other aspect of sexual health care through CT&T, which concerns you?

No ○ Yes ○

a. If Yes, what is that aspect? *(Please specify)* .....

.....

b. How much concern do you feel? A little ○ Moderate ○ Strong ○

5. With respect to the young people who are the intended clients of CT&T service in community pharmacies (aged less than 20 years), are you concerned about any of the following?

I am concerned about ...	The amount of concern I feel about this is: None at all	A little	Moderate	Strong	*If you have noted any 'moderate' or 'strong' concerns, please elaborate the nature of your concern in the free-text box below, alongside the item*
a ..their knowing the service exists	◯	◯	◯	◯	
c ..the degree of confidence they will have in the CT&T service offered by community pharmacies	◯	◯	◯	◯	
d ..their perception of the adequacy of arrangements within pharmacies regarding privacy & confidentiality	◯	◯	◯	◯	

6. Is there any other aspect of importance to young people, which concerns you?

No ◯ Yes ◯

6a. If Yes, what is that aspect? (Please specify) .....

6b. How much concern do you feel? A little ◯ Moderate ◯ Strong ◯

Q7. In your view, what are the key benefits the CT&T service could have for *YOUNG PEOPLE*, for *COMMUNITY PHARMACY* and for *PUBLIC HEALTH IN LOTHIAN*?

If you note more than one benefit in a category, then please list them in order of importance, with 'most important' first

YOUNG PEOPLE	COMMUNITY PHARMACY	PUBLIC HEALTH

SECTION B: Your suggestions about the Evaluation of the CT&T service in community pharmacies of Lothian

8. What in your view are the most important questions to be answered through this evaluation?

Potential questions for the evaluation	I feel this evaluation question is: Not important	Important	Very important	Please elaborate why you feel this question is **'NOT IMPORTANT'** in the free-text box below, alongside each question
a What are the challenges faced by community pharmacies in implementing CT&T service?	○	○	○	
b What do pharmacy staff perceive as factors contributing to the success or failure of the CT&T initiative? (facilitators & barriers)	○	○	○	
c What is the socio demographic profile of the population using the CT&T service in terms of age, sex and deprivation characteristics?	○	○	○	
d What is the proportion of infected clients in this age range treated in pharmacies? (compared to GP, clinic and GUM)	○	○	○	
e What is the proportion of partners of infected clients treated in pharmacies? (compared to GP, clinic and GUM)	○	○	○	
f What factors do potential clients perceive as affecting their access to the CT&T service? (facilitators & barriers)	○	○	○	

9. Is there any other additional question the evaluation should address?

No ○ Yes ○

a. If Yes, what question? .....

b. How important you feel your specified question is? Important ○ Very important ○

10. Please indicate the category of stakeholder which best describes you. (This will help in our analysis of responses)

General practitioner ○ Sexual health specialist ○ Health promotion group ○ Community outreach group ○ Pharmacist ○ Partners of CT&T service (GUM or Lab) ○ Other (specify)

SECTION C *(Optional)*: Your suggestions to improve CT&T service in community pharmacies

If you have additional comments/suggestions regarding the CT&T service in community pharmacies, then these can be entered in the free-text boxes below.

11. Do you have any suggestions for encouraging young people to make use of community pharmacies for chlamydia testing service?
12. Do you have any suggestions that would enhance the success of CT&T in community pharmacies?
13. Do you have any other comment?

Thank you very much for contributing stakeholder input to the evaluation

Please return your completed questionnaire using the enclosed SAE or post to the address below

Dr Mufiza Zia Kapadia, Public Health Sciences, University of Edinburgh Medical School, Teviot Place EH8 9AG

If you wish to receive the summary report of the evaluation, then please email me your request at; M.Z.Kapadia@sms.ed.ac.uk

Appendix 28: Information sheet providing extra detail regarding specific questions in the stakeholder survey questionnaire

Information Sheet for Stakeholders

What is Chlamydia testing and treatment service (CT&T) in community pharmacies?

The aim of CT&T service is to improve young people access to chlamydia testing and treatment especially in the pharmacy setting, and hence to improve population sexual health. In selected pharmacies in Lothian, a client can request free postal testing kit (PTK) for chlamydia. The test is quick, easy and free. Treatment for positives will also be provided, usually a one off dose of antibiotic, by any community pharmacy, or at GUM or GP surgery (as chosen by the patient). Partners of a patient testing positive can also get treatment for chlamydia from any community pharmacy across Lothian.

What is the purpose of chlamydia testing & treatment service evaluation?

I am a PhD student at the University of Edinburgh and, given my special interest in sexual health, I have taken on as my PhD research, the evaluation of various aspects of the community pharmacy chlamydia service, with oversight by my University PhD supervisors (Dr Pamela Warner, Dr Karen Fairhurst) and Prof. Anna Glasier (former NHS Sexual health Services lead) and Ms Aileen Muir (NHS Lothian Community Pharmacy lead).

The purpose of this evaluation is to undertake in-depth analysis of the process of implementation of this service in the pilot pharmacies. This evaluation has a range of objectives as follows:

1. To identify community pharmacy staff competencies and training need for the provision of CT&T service in NHS Lothian
2. To identify factors (facilitators & barriers) affecting the access of CT&T service as perceived by potential clients
3. To identify the challenges faced by community pharmacies in implementing CT&T service
4. To examine pharmacy staff perspectives on factors (facilitators & barriers) which contributed to the success or failure of CT&T initiatives
5. To describe the socio demographic profile of the population using the CT&T service in terms of age, sex and deprivation characteristics
6. To determine the proportion of infected clients treated in pharmacies vs. GP clinic vs. GUM and the proportion of partners of infected clients treated in pharmacies
7. To identify stakeholders interests, perceptions and concerns on CT&T service in community pharmacy

What we have done so far?

As a first step in the evaluation, a survey was undertaken to assess training needs of community pharmacy staff (objective 1). The findings of training need survey suggest a high level of training needs among pharmacy staff for the various competencies identified as needed for the delivery of this service, and differences between staff subgroups (pharmacists, technicians and counter assistants) in the specific aspects of training identified as most needed.

What do we request from you? As a next step of evaluation we invite you, as a key stakeholder to provide your views on CT&T service (objective 7).

[Please see the invitation letter / email for details]

More information for Question 1

The aim of CT&T service is to improve access by young persons to chlamydia testing and treatment.

Asking for Chlamydia test: Clients will ask for the test in pharmacy. The counter staff may be the point of first contact with the client, but will refer the client to the pharmacist.

Assessing symptoms: Pharmacist will move the client to a private area. Ask the client if they are requesting a test because they are experiencing any symptoms. If the client has symptoms of an STI they should be referred to Dept of Genito-Urinary Medicine (GUM).

Target Group: If they have no symptoms, check that they are in the target group (16-20 years). If they are between 15 and 24 and are still anxious to be tested then the service can still be provided for them.

The Test: Explain how the chlamydia test is done, that they need to provide a urine sample in the pot and return it to pharmacy on the same day they have produced the sample. The result will be provided to the client by their preferred method-email, mobile phone or SMS or post- by the health advisor at GUM. If positive the advisor will offer a variety of locations for treatment and will discuss the best way to contact any other partners the client may have had in the last 6 months.

The Treatment: The treatment is usually a simple one-off dose of antibiotic (Azithromycin 1g). If the client chooses to receive this from a pharmacy they do no need to return to the pharmacy at which they were tested, and if they pay for their prescriptions then the usual prescription charge will apply.

Partner notification: At the time of treatment, discuss the importance of any partners also receiving a test and treatment. Ask the client to fill in a partner notification form. This form is confidential and will be sent to GUM for the health advisor to contact the partners. The health advisor will never tell the partner who gave them their name, even if asked to do so. If the patient prefers to contact their partners themself, ask how many partners they will be contacting and provide that number of trifold partner notification leaflets to the patient.

More information for Question 3

Sexual Health counselling: The pharmacist will get two opportunities to provide sexual health counselling to a client, once at test request, once at treatment (this only in the case of positives, or 'notified partners'). The first opportunity will be at the time when a client asks for the chlamydia test. The pharmacist will move the client to a private area or counselling room and ascertain details of her sexual history and any STI symptoms. At this time, the pharmacist is also instructed to ascertain the age of the client and provide counselling on other sexual health matters and related topics. The other opportunity will be when a client who has received a positive result (which may or may not result for a test requested form that same pharmacy), or a notified partner, requests treatment.

Partner notification: If the client requests treatment from the pharmacy on account of a positive Chlamydia test result, the pharmacist will provide appropriate treatment. At the same time, the pharmacist will discuss the importance of any partners also receiving a test and treatment and will ask the client to fill in a partner notification form. This form is confidential and will be sent to GUM for the health advisor to contact the partners. The health advisor at GUM will never tell the partner who gave them their name, even if asked to do so. If the patient wishes to contact their partners themselves, the pharmacist should provide enough trifold partner notification leaflets for each partner.

Recruitment of client: The CT&T service is intended for clients who ask for a chlamydia test at the counter. The pharmacists are not instructed to actively recruit potential clients which they think are eligible and in need of the service e.g. while offering counselling for emergency contraceptive or to young people coming to the pharmacy to buy other products.

Appendix 29: Email inviting participation in the stakeholder survey, sent to strategic stakeholders other than General Practitioners

Dear Stakeholder (Name of the Stakeholder)

Evaluation of Chlamydia testing and treatment service (CT&T) in community pharmacies of Lothian, Scotland

As you may be aware, NHS Lothian has rolled out a chlamydia treatment service in Community Pharmacies, and is in the process of rolling out a Chlamydia testing service in a selected subset of community pharmacies. I am a PhD student at the University of Edinburgh evaluating various aspects of this service, towards my PhD studies. [For more information about the aims of the service, aims of the evaluation and what we have done so far, please see the attached information sheet].

Why are we writing to you?

You have been identified as a leader/expert within the wider sexual health services arena of Lothian, so your input to the evaluation would be invaluable. In order to inform the next stage of the evaluation, we therefore ask that you are kind enough to provide us feedback on the proposed evaluation questions and your views and concerns about the CT&T service. Such feedback is often elicited by interview, but in order to avoid making excessive demands on your time/diary, we have decided to offer an anonymous online mode of input. However, if you would prefer to reply to a paper version of the survey or a face-to-face or telephone interview, please reply to this effect and I will get back to you.

Please be reassured that all responses will be kept anonymous, and if cited in the evaluation report (or PhD thesis), will be unattributable, and sufficiently précised/disguised/aggregated to avoid identification.

The electronic link to the online survey can be found below;

https://www.survey.ed.ac.uk/stakeholderfinal/

It should take you no longer than 10 minutes to complete the survey. Your participation is highly appreciated.

Yours faithfully,

Mufiza Zia Kapadia

Pharmacy Chlamydia Testing & Treatment Evaluation Group

Centre for Population Health Sciences

University of Edinburgh

EH8 9AG, Edinburgh, Scotland

Appendix 30: Invitation letter to General Practitioner strategic stakeholders for participation in the stakeholder survey

Dear Sir / Madam

REQUEST TO KEY STAKEHOLDERS TO PROVIDE INPUT TO:

Evaluation of Chlamydia testing and treatment service (CT&T) in community pharmacies of Lothian, Scotland

As you may be aware, NHS Lothian has rolled out a chlamydia testing and treatment service in a selected subset of community pharmacies. I am a PhD student at the University of Edinburgh evaluating various aspects of this service, towards my PhD studies.
[For more information about the aims of the service, aims of the evaluation and what we have done so far, please see the attached information sheet].

Why are we writing to you?

You might know that one of the pharmacies near to your GP surgery is participating in the pilot CT&T service. As a general practitioner you might also have dealt with chlamydia testing and treatment of young people in your surgery. We are therefore interested in knowing your views and concerns about the CT&T service in community pharmacies and the proposed evaluation questions.

We would like to elicit your views through an anonymous survey. Please find enclosed paper version of the survey. Please return your completed questionnaire using the enclosed reply paid envelope. You can also chose to reply through the following electronic link to the online survey;

https://www.survey.ed.ac.uk/stakeholderfinal/

It should take you no longer than 5 minutes to complete the survey. Your participation is highly appreciated. Please be reassured that all responses will be kept anonymous, and if cited in the evaluation report (or PhD thesis), will be unattributable, and sufficiently aggregated to avoid identification.

Yours faithfully

Mufiza Zia Kapadia
Pharmacy Chlamydia Testing & Treatment (PhaCTT) Evaluation Group
PhD Candidate, Centre for Population Health Sciences
University of Edinburgh
Edinburgh, EH8 9AG

Appendix 31: Invitation letter to potential service users about participation in a survey

Invitition to take part in a Survey

Survey of Lothian young people's views about
The new pharmacy-based Chlamydia testing and treatment service

We want to learn about your views on getting chlamydia testing and treatment from pharmacies in Lothian. By answering the enclosed questionnaire, you can help us develop a better service for young people like you.

What is chlamydia?

Chlamydia is an infection spread through sexual intercourse. It affects almost 1 in 10 young people in the UK, but most of them will have no symptoms. However, if left untreated it can cause infertility (not being able to have children), or long term pain. There is a simple urine test to detect Chlamydia. If the test result is 'positive', treatment is usually simple and quick (one dose of oral antibiotic). It is recommended that all sexually active young people should be tested for chlamydia at least once a year.

What is the CT&T Service in Pharmacies? [CT&T = Chlamydia Testing and Treatment]

This is a new NHS service for young people, to make it easier for them to get ***tested*** for Chlamydia. Free test kits, and advice on using them, are available from selected pharmacies across Lothian. The new service also aims to make it easy for young people to get ***treatment*** for Chlamydia, if needed, by going into any pharmacy in Lothian.

What are we asking you to do?

Whilst the service is new, and at the moment available in just a few pharmacies, we want to find out from young people what they feel about the service - things they like - what might put them off using the service, and any suggestions to make the service better. There are *no right or wrong answers;* we simply want to know your views.

We would like all young people to complete our questionnaire, regardless of whether they have ever used the pharmacy-based Chlamydia service, or think they might ever do so.

When you have filled in the questionnaire, please **post it back to us in a reply paid envelope provided with this questionnaire**.

What we will do with your questionnaire?

We don't ask for your name or any personal details, so your answers are anonymous and confidential, and so the answers **will not** be able to be identified as yours. In addition, no one, except the research team will be able to look at the completed questionnaires. We will combine the answers from all questionnaires to make a summary report of the views of young people.

Who are we?

We are an evaluation group of the University of Edinburgh, comprised of a PhD student and her academic supervisors. If you have any questions before you fill this survey, please do get in touch, we're happy to talk to you.

Mufiza Zia Kapadia
PhD Student, Medical School, Teviot place
Public Health Sciences, University of Edinburgh
EH8 9AG, Edinburgh
Email: M.Z.Kapadia@sms.ed.ac.uk
Mobile: 07405480606

Appendix 32: Questionnaire for the survey of potential service users

Young people's views about the new pharmacy-based Chlamydia testing and treatment service

We want to learn about your views on getting chlamydia testing and treatment from pharmacies in Lothian. Please help us improve the pharmacy chlamydia service for young people in Lothian by completing this questionnaire. The questionnaire will take approximately 5-10 minutes to complete.

All answers will remain anonymous and confidential. The answer you give will not be passed on to your GP, GUM clinic or added to your medical record.

Instructions on how to complete the Questionnaire;

Yes **No**

☑ ○ Tick the answer that applies to you

Chlamydia write an answer in words

To help you think about the new service, you will find below shaded boxes

These give brief details about how the service is going to work.

D D M M Y Y Y Y

Please write today's date here: ☐☐ ☐☐ 2 0 1 1

1. Before you were given this questionnaire, did you already know about the CT&T (Chlamydia Testing and Treatment) service for young people, available in PHARMACIES in Lothian?

○ No ○ Yes *(if you answered 'yes' to this question, then please answer question 2. also)*

2. How did you come to know about this service? (Please tick one or more boxes)

- ○ On radio/TV/newspapers etc
- ○ Told by a pharmacist or counter assistant in a pharmacy
- ○ From posters / leaflets seen in a pharmacy
- ○ Told by other Health Care Professionals, e.g. GPs
- ○ I learned about it from friends/family
- ○ Other, specify.....

About CT&T: Getting a Chlamydia test kit from the pharmacy

Girls or boys between the ages of 15-24 years can ask for a free chlamydia test **kit** from the pharmacist. The pharmacist will explain how the chlamydia test is done and provide the young person with an instruction leaflet and a plastic pot to part-fill with urine. The young person would need to return the filled urine sample pot to the pharmacy. The pharmacist will then ask the young person to complete a request form for the test and post the urine sample to the lab.

3. Which of the following ways would be OK for you to get a testing kit from the pharmacy?

(✓ one answer in each row)

	Definitely Not	Probably Not	Probably Yes	Definitely Yes
I ask the pharmacist for the test	○	○	○	○
I can pick up a free testing kit from the shelf without asking anyone	○	○	○	○
The test is offered to me by a **pharmacist** during a consultation for emergency contraception	○	○	○	○
Pharmacy **staff** offers it to me at the counter when I buy / collect other products or medicine	○	○	○	○
Pharmacy **staff** offers it to me at the counter when I buy/collect condoms	○	○	○	○

Any other, please specify.....

4. Sending your urine sample bottle to the laboratory (✓only one)

- O I would prefer to post it myself to the laboratory
- O I would prefer to give it to the pharmacy for them to post it to the laboratory

About CT&T: Getting the result of Chlamydia test

5. How would you prefer to be told about your test results? *(✓only one)*

O By email O phone call O text O letter O Face to face consultation

About CT&T: Getting treatment, if test result for Chlamydia is positive:

If the Chlamydia test is 'positive' (meaning Chlamydia infection), the treatment is usually a single dose of an antibiotic tablet (taken with water). The young person can go to a number of places to get this treatment – for example: genitourinary medicine (GUM) clinic, family planning clinic, Sexual Health Drop-in e.g. MYPAS or CY, or their GP where the doctor there will give them a prescription for the treatment, which they can collect from any pharmacy.

However, the new CT&T service means that there is now another option for treatment – the young person can decide to go **directly to any pharmacy** in Lothian, ***without a prescription***, to ask for treatment. The pharmacist will give him/her the medicine there and then, in the pharmacy.

6. If you found you had Chlamydia, where might you go to get your treatment?
(✓one answer in each row)

From....	Definitely Not	Probably Not	Probably Yes	Definitely Yes
a pharmacy	O	O	O	O
a GUM clinic	O	O	O	O
a family planning clinic	O	O	O	O
my GP	O	O	O	O
a Sexual Health Drop-in (e.g MYPAS or CY)	O	O	O	O

Other, specify.....

About CT&T: Treating partner/s:

If a young person with a positive result decides to get treatment from a pharmacy, the pharmacist will ask him/her to fill in contact information of his/her sexual partner(s) on a **confidential** contact details form, which they returned to the pharmacist in a sealed envelope. The pharmacist will post it to the GUM clinic. A nurse at the GUM clinic will then contact the partners to advise them they are at risk of having been infected with Chlamydia. [Note: The health advisor will never tell any of the 'partners' on the form who supplied their name and details, even if asked to do so.] 'Partners' can then get the treatment from any pharmacy with no need to get a test. Or, partners may choose to be tested first, and then take treatment only if the test result is positive.

7. How OK would you feel about filling out in a pharmacy a contact details form?
(that is, stating your recent sexual partner(s) / partner notification) *(✓only one)*

O Very comfortable O Fairly comfortable O Fairly uncomfortable O Very uncomfortable

8. How would you like your partner(s) to be contacted, so that they can get treatment for chlamydia? *(✓one answer in each row)*

	Definitely Not	Probably Not	Probably Yes	Definitely Yes
By the nurse at GUM clinic	O	O	O	O
By myself, by telling him/her	O	O	O	O
By me giving him/her information leaflet	O	O	O	O
By an advisor at sexual health 'drop-in'	O	O	O	O

Any other method, specify..... or O I would **not** like my partner to be contacted

Choosing where to get chlamydia service

9. If in the future you wanted to be tested for Chlamydia infection, where would you prefer to be tested for chlamydia? *(✓only one)*

O Pharmacy O GUM clinic O Family planning clinic O GP clinic

O Sexual Health drop-in e.g. MYPAS or Caledonian Youth O Other, *specify*.....

10. If you did in the future use pharmacy CT&T service, how important are the following factors for you, in selecting one pharmacy store over another, for chlamydia testing?

(✓one answer in each row)	Very important	Moderately important	Of little importance	Of no importance
Pharmacy is an easy place for me to get to	O	O	O	O
A Pharmacy where I know the pharmacist	O	O	O	O
A Pharmacy where staff do not know me	O	O	O	O
A pharmacy that has in-store toilet to fill the urine sample pot	O	O	O	O
A pharmacy that is open at the weekend, or after 6 P.M on weekdays	O	O	O	O
A pharmacy that has a private area / consultation room	O	O	O	O
A less busy pharmacy	O	O	O	O

Other reason, *specify*.....

11. If you wish to receive chlamydia testing from a pharmacy, how likely are you to choose to attend the following kind of pharmacy? *(✓one answer in each row)*

	Doesn't Apply	Definitely Not	Probably Not	Probably Yes	Definitely Yes
A pharmacy local to where I live		O	O	O	O
A pharmacy near to where I work	O	O	O	O	O
A pharmacy near to where I study	O	O	O	O	O
A pharmacy in a shopping centre/high street		O	O	O	O

Other locations, *specify*.....

12. What time would you be most likely to visit a pharmacy to get chlamydia testing or treatment?
(✓only one)

O Early Morning O Office Hours (9 am to 5 pm) O Early evening (between 5 pm & 8 pm)

O Saturday O Sunday

Your views and advice to improve the service

13. Where should we put information about the CT&T service so that all young people who might want to use the service will see the information? *(✓one or more boxes)*

O GP practices & health centre O Sexual health clinics O Pharmacies

O Social networking sites on internet O Web based information O Sexual health Drop-in eg MYPAS or Caledonian Youth

O Pubs & Clubs O Other, Specify .....

14. Are you confident that pharmacy testing and treatment service would have:
(✓one answer in each row)

	Definitely not	Probably not	Probably Yes	Definitely Yes
Less waiting time for test as compared to GUM or GP or sexual health 'drop-in'	O	O	O	O
Knowledgeable staff to provide testing/treatment	O	O	O	O
Complete confidentiality of my testing	O	O	O	O
Reliable test results	O	O	O	O

Other sexual health services offered in pharmacies

15. Do you know that community pharmacies also offer free emergency contraceptives (the Morning-after Pill) for young people?

O No O Yes

16. If Yes, Have you ever got emergency contraception from the pharmacy?

O No O Yes

Chlamydia Infection in past 12 Months

17. Have you been tested for chlamydia infection in the past 12 months?

O No O Yes

18. If yes, where were you tested? *(✓ one or more boxes)*

O GP O GUM O Well Women Clinic

O Family planning clinic O Sexual Health drop-in e.g. MYPAS or Caledonian Youth O Other, specify.....

19. If you tested for chlamydia in the past 12 months, what were the results of the test?

(If you prefer not to answer this question, please move to next section)

O I was diagnosed with chlamydia infection O I was free from chlamydia infection

Yourself: The following questions are equal opportunity questions and are asked to make sure we are involving young people from all sections of the community in Lothian

20. What age are you? *(✓only one)*

O 15 O 16 O 17 O 18 O 19 O 20 O 21 O 22 O 23 O 24 years

Other age, please specify.....

21. How would you describe your ethnic origin? *(✓only one)*

O White UK O White others O Black African/Caribbean

O Asian-Pakistani O Asian-Bangladeshi O Asian-Indian

O Asian-Chinese O Asian-Other, Specify..... O Mixed, Specify.....

22. What age did you leave secondary school? *(✓only one)*

O Not yet finished O 15 or under O 16 O 17 O 18 O 19 or over

23. If you have left school, have you undertaken any further education or training since leaving?

O No O Yes → *If Yes, please specify what* .....

24. Which of the following describes your current situation? (✓ *one or more boxes)*

O Working full time O Working part time O Unemployed

O Studying Full time O Studying part time

25. What is your residential postcode district (*not your full post code, only up to the first number of the 2nd part* e.g. **EH8 7** or **EH13 4** etc.) .....

26. Are you..... O Male O Female

Thank you very much for completing this questionnaire. It is greatly appreciated.

Please seal your completed questionnaire in the reply-paid envelope provided in the pack, and post in any Royal mail letterbox.

Appendix 33: Spearman correlations in respect of respondent's preferences for treatment venue and for partner notification methods, with age, previous testing for chlamydia and previous access to EC from a pharmacy

	Age category			Tested for chlamydia in the past 12 months			Accessed EC from a pharmacy		
	r_s	p-value	SE	r_s	p-value	SE	r_s	p-value	SE
Preference for the venue of treatment for chlamydia (Figure 9-1)									
a Sexual Health Drop-in (such as MYPAS or CY)	0.062	0.696	0.142	0.055	0.728	0.152	0.369	**0.032**	0.089
a GUM clinic	0.524	**0.000**	0.089	0.192	0.106	0.115	0.071	0.588	0.125
my GP	0.168	0.150	0.113	0.123	0.292	0.115	0.073	0.570	0.124
a pharmacy	0.258	**0.028**	0.111	-0.008	0.945	0.119	0.211	0.100	0.121
a family planning clinic	0.175	0.139	0.114	0.079	0.507	0.117	0.113	0.383	0.125
Preference for the method of partner notification (Figure 9-2)									
By myself, by telling him/her	0.222	0.054	0.109	-0.086	0.458	0.114	0.272	**0.029**	0.113
By the nurse at GUM clinic	0.086	0.477	0.119	0.194	0.105	0.115	0.020	0.877	0.127
By an advisor at sexual health 'drop-in'	0.075	0.645	0.156	0.015	0.927	0.153	-0.025	0.892	0.180
By me giving him/her information leaflet	-0.089	0.459	0.118	-0.077	0.523	0.121	-0.047	0.721	0.127

Appendix 34: Spearman correlation in respect of respondent's acceptability for different approaches for getting testing kit and for their confidence in a pharmacy service, with age, previous testing for chlamydia and previous access to EC from a pharmacy

	Age category			Tested for chlamydia in the past 12 months			Accessed EC from a pharmacy		
	r_s	p-value	SE	r_s	p-value	SE	r_s	p-value	SE
Acceptable approaches for getting chlamydia testing kits from the pharmacy (Figure 9-3)									
I ask the pharmacist for the test	0.231	**0.049**	0.114	-0.044	0.711	0.117	-0.147	0.253	0.126
The test is offered to me by a pharmacist during a consultation for emergency contraception	0.335	**0.004**	0.106	0.035	0.768	0.117	0.223	0.081	0.121
I can pick up a free testing kit from the shelf without asking anyone	0.421	**0.000**	0.101	0.224	0.055	0.114	0.101	0.431	0.125
Pharmacy staff offers it to me at the counter when I buy/collect condoms	0.231	**0.048**	0.111	0.050	0.673	0.118	-0.044	0.731	0.128
Pharmacy staff offers it to me at the counter when I buy / collect other products or medicine	0.022	0.850	0.114	-0.044	0.702	0.114	-0.014	0.913	0.125
Confidence of the respondents that CT&T would be able to provide the following objectives (Figure 9-4)									
Complete confidentiality of my testing	-0.011	0.922	0.115	0.134	0.247	0.114	-0.112	0.378	0.124
Reliable test results	-0.012	0.917	0.115	0.015	0.899	0.115	-0.120	0.346	0.125
Knowledgeable staff to provide testing/treatment	0.024	0.834	0.114	0.153	0.188	0.113	-0.026	0.835	0.122
Less waiting time for test compared to GUM or GP or SH 'drop-in'	0.008	0.946	0.115	0.119	0.307	0.114	0.097	0.447	0.121

Appendix 35: Spearman correlation in respect of respondent's indicated importance of store facilities and of location, with age, previous testing for chlamydia and previous access to EC from a pharmacy

	Age category			Tested for chlamydia in the past 12 months			Accessed EC from a pharmacy		
Importance of various aspects in selecting one pharmacy store over another for chlamydia test (Figure 9-5)	r_s	p-value	SE	r_s	p-value	SE	r_s	p-value	SE
Pharmacy is an easy place for me to get to	0.138	0.241	0.116	-0.028	0.812	0.116	0.003	0.981	0.127
A pharmacy that has a private area / consultation room	-0.068	0.558	0.115	-0.142	0.218	0.115	0.203	0.105	0.119
A pharmacy that is open at the weekend, or after 6 P.M on weekdays	-0.005	0.968	0.117	-0.047	0.688	0.116	0.236	0.065	0.118
A pharmacy that has in-store toilet to fill the urine sample pot	-0.037	0.756	0.117	-0.231	**0.049**	0.114	0.219	0.088	0.118
A less busy pharmacy	-0.358	**0.002**	0.105	-0.142	0.228	0.114	0.073	0.567	0.128
A Pharmacy where staff do not know me	-0.132	0.261	0.115	0.057	0.629	0.117	0.155	0.228	0.124
A Pharmacy where I know the pharmacist	-0.206	0.081	0.114	-0.197	0.094	0.114	0.087	0.501	0.127

Appendix 36: Invitation letter to pharmacists about participation in interview study

NHS Lothian

Dear Pharmacy Director/Manager,

REQUEST TO PARTICIPATE IN AN EVALUATION STUDY:

Evaluation of Chlamydia Testing and Treatment service (CT&T) in community pharmacies of Lothian, Scotland

I am writing in reference to the Chlamydia Testing and Treatment service in community pharmacies of Lothian, and the Evaluation of this service which I am carrying out as part of my PhD studies (with oversight by my University PhD supervisors - Dr Pamela Warner, Dr Karen Fairhurst and Prof. Anna Glasier).

Evaluation so far

So far the evaluation has included:

- a questionnaire survey of pharmacy staff to understand their competencies and training needs to deliver the CT&T service (undertaken in **April 2009**);
- a survey of stakeholder and policymaker views on the service, and the questions that they wish our evaluation to address (in **May 2010**);
- a survey of young people regarding their views and preferences with respect to pharmacy CT&T service (on-going);
- in-depth interviews with pharmacists to elicit their views about the service (so far interviews have been completed only with non-volunteering pharmacies)

What Next?

Despite the fact that NHS Lothian has decided to *discontinue* the pharmacy CT&T service from next month, we wish to complete the final element of the evaluation, interviews with a range of pharmacies who volunteered to pilot the scheme, to elicit their views about the CT&T service. We believe this is important because it will provide insights to policy-makers considering such a service in other areas, and indeed also in Lothian in the future, if this decision is ever re-considered. It will also be of considerable interest to community pharmacists throughout UK, and further afield.

Why are we writing to you?

We understand that your pharmacy took part in delivering the CT&T service. Therefore we would very much like to speak with you. The interview will cover such aspects as your views on the pharmacy CT&T service, (potential) issues around delivering it, reasons for uptake or not of the service by young people, etc. Given the recent announcement about the service, we would also be interested in your views on the withdrawal of the service.

We know that the uptake of the service has been very low. However, please note that we would be very interested to speak with you whether *or not* your pharmacy has handed out any chlamydia testing kits.

What is involved?

This email is to invite you to participate in a brief 15-30 minute interview. Please be reassured that both the identities of interviewees, and whatever is discussed in the interviews, will be kept anonymous. The views of all the interviewees will be sufficiently précised/disguised/aggregated to be sure to avoid identification of the individual interviewee.

I would be very grateful if you would return the enclosed reply/consent form in the reply-paid envelope provided.

As explained above, your participation in a brief interview would be highly appreciated by the evaluation team, and will contribute to an important body of knowledge about community pharmacy provision of public health services.

Yours faithfully

Mufiza Zia Kapadia
Pharmacy CT&T Evaluation Group
Centre for Population Health Sciences
Medical School, Teviot place
The University of Edinburgh
Edinburgh EH8 9AG
Email M.Z.Kapadia@sms.ed.ac.uk

Reply / Consent Form

Pharmacy Name _____

If Pharmacy name is not correct, please alter

Response regarding request for Interview for the Evaluation of Lothian Chlamydia Testing and Treatment Service

Your name (capitals please) | |

Please ✓ one

☐ I am willing to be interviewed for the CT&T evaluation.

☐ I do **not** wish to be interviewed for the CT&T evaluation.

If you <u>are</u> willing to be interviewed as part of the study (maximum 30 minutes), thank you *very much*. Please provide your email and/or telephone contact <u>details</u> here, and I will follow up by email or telephone to set an interview date and time.

<u>Contact Details:</u>

Mobile and/or Telephone number | |

Email Address | |

Is there a particular time/day of week that would be more convenient than others, for you to receive a call from us?
(completion of this section optional) | |

Thank you very much for taking the time to complete this reply/consent form. Please return it using the enclosed SAE, to the address below.

Mufiza Zia Kapadia
Pharmacy CT&T Evaluation Group
Public Health Sciences
Medical School Teviot Place
University of Edinburgh
Edinburgh, EH8 9AG

Appendix 37: Interview guide for qualitative interviews with pharmacists

Final Interview Guide participating pharmacies 6 April 2011

- Self introduction
- Purpose of this research to elicit the range of views about this scheme, among pharmacies invited, whether or not they have agreed to provide a Chlamydia testing service.
- This interview will take nearly 20-30 minutes
- I would like to ensure you about the confidentiality of the interview. The identities of interviewees and pharmacy, and whatever is discussed in the interviews, will be kept anonymous. If any particular view is cited in my PhD thesis, it will be unattributable, and sufficiently précised/disguised/aggregated to be sure to avoid identification of the individual interviewee.
- In order to correctly record the information, I would like to tape record the interview. This recording will be transferred to my university password operated computer. It will be transcribed and given a unique identifier for analysis purpose. The recording will be destroyed at the end of the research.
- So I would like to take your permission to record the interview: Yes/No
- Do you have any question before we start the interview?
- Give CT&T document or explain (Patients who indicate they wish to be tested should be supplied with a urine sample bottle. Patients will be expected to take the urine sample bottle home, obtain a urine sample and return the sample to the pharmacy. Pharmacists will complete the paperwork in the kit accurately, package the sample and post the completed kit to the Laboratory.)

Final Interview Guide participating pharmacies 6 April 2011

Your background

Tell me about your background in relation to this pharmacy?

Your role within the pharmacy, main duties, experience/years in the position,

How many staff work in this pharmacy and in what job categories?

Decision to take part in the scheme & Facilitator & Barriers to Pharmacy

Last year in July, selected community pharmacies were invited to take part in chlamydia screening initiative for young people-What was your pharmacy decision about taking part in the scheme?

Who took that decision? (Pharmacy manager, owner, employee pharmacist)

What was your experience with the service?

Did you provide the service to anyone and their experience of doing so?

Why does your pharmacy decided to take part in the scheme? Or What factors encouraged your pharmacy to take part in the service? (**Perceived facilitators**)

Do you see any other positive impact of a scheme like this on a pharmacy?

What might have deterred you from doing it? (**Perceived barriers**)

Were you concerned about any other **negative impact** the CT&T service would have on your pharmacy?

Probes for facilitators and barriers: *workload, toilet, consultation room, incentives, paper work.*

In the current CT&T in Lothian, pharmacies were given the choice to take part in the scheme, whereas the contract requirement meant that all pharmacies in Lothian could be asked to provide the service. Would that make any difference to your pharmacy response to the service?

Young people

What do you think overall about CT&T initiative for young people?

What factors would **facilitate** young people to take a test from the pharmacy which offer CT&T service?

If you think of certain elements of the scheme, what do you think would **discourage** young people to take a test for chlamydia from a pharmacy?

Probes for facilitators and barriers: *Convenience & Access (e.g. opening hours, no need of appointment), privacy, anonymity, confidentiality, service promotion, socio-demographic profile of the client and provider*

Different aspects of the service

What do you think about the **recruitment approach** of this scheme? i.e. active recruitment of a pharmacist versus client asking for the service

What approaches can be taken to **facilitate recruitment** of young people for this scheme?

What measures should be taken to **promote** CT&T service in pharmacies?

Do you think that **16-20 year age group targeted for this service** was appropriate?

> Would it make any difference to your decision if this had been a different age group, and what that age group should be?

Toilet facility --- Returning sample

Perceived level of **privacy / confidentiality** achieved in a pharmacy setting?

What are your views about the **partner notification** element of this scheme?

What do you think about the **treatment aspect** of this scheme which is infact in practice since last year?

> Do you have any concerns regarding antibiotic provision for chlamydia **without doctor's prescription**?

After **deregulation of Azithromycin**, chlamydia testing and treatment is also offered by some pharmacies as a pay to use service? Do you think this would have any impact on CT&T scheme by NHS Lothian?

Public Health role of pharmacy

Community pharmacies have now been involved to play a key role in provision of public health. Do you think that by offering CT&T service, the **public health role** of pharmacy is fulfiled?

How could the CT&T service fit with other elements of pharmacy daily practice? e.g. Signposting, other SH service

Normative belief

What did you expect your pharmacy staff such as **technicians and CA** would think about this scheme?

How do you think other professionals (such as **GP**, pharmacy colleagues) would perceive your involvement in this scheme?

What did you expect your **client** would think about this service provided in the pharmacy?

Where do you think is the most suitable location to set up CT&T service (healthcare vs. non healthcare)

Training and Information for pharmacies

Have you been in training for CT&T offered by NHS? Was it useful to prepare the pharmacy staff for a service like this?

Do you remember the written information you were provided when you were invited for CT&T? Was that information relevant / adequate?

Suggestions

What are your thoughts about the discontinuation of the scheme?

Final Interview Guide participating pharmacies 6 April 2011

Do you think this service should be provided in future?

What overall impact do you think the service could have?

Do you suggest any improvement for the proposed service?

Is there any thing further that you feel is important?

Some Basic information

When did you earn your undergraduate pharmacy degree?.....

What is your highest qualification?.....

Since how long you have been working in the current pharmacy?.....

Age…….. Gender……..

Appendix 38: Nodes and sub-nodes developed during qualitative analysis of interviews

Nodes	Subnodes_Level 1	Subnodes_Level 2	Subnodes_Level 3
Administrative aspect of the scheme			
	Mandatory involvement in the		
	Training		
		Availability of trained staff	
		Gap between training and	
		Not involved in CT&T so didnt	
		Ongoing and refresher training	
		Staff type trained	
		Time and location	
	Written information		
Background			
	Job role		
	Staff count and role		
	Years of experience		
Barriers and Facilitators for pharmacy			
	Awareness of staff about CT&T		
	Incentives	*Public Health role*	
		Business	
		Footfall	
	Experience of providing service		
	Structural facilities		
		Consultation room	
			Area dedicated to service
			Physical layout
		Health hazzard and handling	Space in the pharmacy
		Toilet	
	Work load	*More staff*	
		Paper work	
		Protocol	
Barriers and Facilitators for young people			
	Access and Convinience	*No need for appointment*	
		Locality of the pharmacy	
		One stop shop	
		Opening hours	
	Anonymity and Confidentiality	*Anonymous*	
		Busy pharmacy	
		Embarassement	
		Private area or consultation room	
	Attitude of a pharmacist		
	Aware of the service and promotion		
	Choices		
	Not tested for other STI		
	Releiving anxiety		
	Socio-demographic of YP	*Discussing sexual health*	
			Age of YP
			Gender of the pharmacist
			Gender of YP
			Motivation for testing
			Multiple partners
		Knowledge about chlamydia	
			Health conscious
	Toilet facility		

Nodes	Subnodes_Level 1	Subnodes_Level 2	Subnodes_Level 3
CT&T invitition			
	Decision autonomy		
	Initial response to CT&T invitition		
		Forward looking pharmacy	
	Reasons for non-participation	*Communication and response from CT&T (NHS)*	
		Never been approached by NHS	Invitation sent in holidays
		Past experience	
		Toilet facility_misunderstanding	
	Reasons for participation	*Deprived Area _ Need*	
		Good uptake of EC	
		High proportion of young people	
		Incentive	
		Pilot	
Discontinuation of the scheme			
	Disappointment		
	Funding again is inappropriate		
	No experience		
Experience of PILOT pharmacies			
	Delays in starting the pilot		
	Insufficient advertising		
	Low uptake		
Outcome evaluation			
	Cost effectiveness		
	Feasible		
	More chance of councelling		
	Negative image		
	Overall views		
	Prevalence reduction		
	Previous experience	*Involved in previous CT pilot*	
	Referal option		
	Uptake of the service	*Clientale-demographics*	
	Views on public health role of a pharmacist or pharmacy		
Perspective on different aspects of the scheme			
	Age group targeted	*Fraser competency assesement*	
	Comprehensive vs limited service		
	Partner notification	*Confidence of YP on pharmacist*	
	Pay to use clamelle kit		
	Promotion strategy		
	Recruitment approach	*EC provision*	
		Proactive Vs. Reactive	
	Sample return		
	Treatment	*Antibiotic provision by pharmacists-concerns*	
Subjective Norm			
	Confidence in delivering service		
	Forward looking pharmacy	*Role of a community pharmacist*	
	GP and other professionals	*Age of the GP*	
		Altruistic	
		Confidence on pharmacist	
		GP Buissness	
		GP workload	
	People's perception of pharmacy public health service		
	Pharmacy staff		
	Wide spread service		
Suggestions			
	Age		
	Backup and referral		
	Other		
	Pharmacies sites suitable for CT&T		
	Promotion and Advertisement	*Leaflets*	
		Schools	
	Raising awareness of chlamydia		
	Venues suggested for CT&T		
	Training		

Appendix 39: Estimation of the number of chlamydia tests expected from community pharmacies in Lothian, using data from the survey of the potential service users, estimates obtained from other sources and using hypothetical scenarios

Introduction:

The following table presents a scenario analysis of the number of tests expected from pilot community pharmacies in Lothian in a year. It uses data from the survey of potential service users (chapter 9). In addition, population estimates for 2010 for Lothian population aged 15-24 year old is obtained from GROS and is equal to 116734. Furthermore, this scenario analysis also uses an assumption that 35% of the 15-24 years old population needed to be screened, as per vital sign indicator set by NCSP for the year 2010. This will equate to a Lothian population of n=40857 needed to be screened in the year 2010. The scenario analysis is presented as follows:

Scenario percentages of young people who would prefer pharmacy for testing as compared to GP or SH clinics	Scenario 1	Scenario 2
Proportion of young people preferring testing in pharmacies	11%[$]	16[$$]
Number of young people preferring testing in pharmacies (using population figure of GROS (out of 40857))	4494	6537
Assuming each young person has a test every 1.5 years		
Estimated number of tests per year using pharmacy (number/1.5)	2996	4358
Estimated number of tests per year per pharmacy (given12 pilot Lothian pharmacies)	250	363
Estimated number of tests per month in 12 pilot Lothian pharmacies	21	30

[$] derived directly from potential service users survey (chapter 9)

[$$] derived from potential service users survey, but inflated to better represent likely percentage in entire population of young people, since the survey was of current users of GUM/youth sexual health clinic services

Appendix 40: Dissemination of thesis research

CONFERENCE PRESENTATIONS

Development of a conceptual framework of pharmacy provision of chlamydia testing and treatment service: A structured review of international evidence. World Congress of Epidemiology, Edinburgh, United Kingdom, 7-11th August 2011

Screening for Genital Chlamydia for young people in Community Pharmacies: A structured literature review of international evidence. Poster presentation at XI International HIA conference; Granada Spain 14 – 15 April 2011. A travel grant was awarded by Commonwealth Scholarship Commission.

Screening for Genital Chlamydia for young people in Community Pharmacies: A Meta-Analysis of chlamydia prevalence. Poster presentation at XI International HIA conference; Granada Spain 14 – 15 April 2011

Training needs analysis of pharmacy staff for the provision of chlamydia testing and treatment service. Oral presentation at European Public Health Association Conference Amsterdam 10-13 November 2010. £450 travel grant was secured by winning Centre for Population Health Sciences, University of Edinburgh Travel Grant Competition for 2010.

Community pharmacy provision of Chlamydia testing and treatment service in Scotland: A survey in Lothian of pharmacy staff competencies and training need; Oral presentation at Annual Conference of the faculty of Public Health, Peebles, Scotland 12-13th November 2009. Registration bursary was awarded by NHS, Scotland.