

Understanding adolescent and young people's sexual health and development in a public health context: research studies and interventions

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Abstract

Sexual health risk-taking behaviour is typically initiated during adolescence and continues throughout teenage years and early adulthood at higher levels than at other life stages. For some groups (e.g. deprived and vulnerable populations) the risks can be greater still. Risk behaviours in early youth are related to increased rates of risk-taking and the adoption of multiple risk behaviours in early adulthood. Prevention interventions implemented early on are shown to be most effective at preventing or reducing the poor health outcomes associated with risk-behaviours. Policies and prevention interventions are informed by current data showing patterns of risk behaviour, identification of emerging behaviour, factors associated with these behaviours and evidence of intervention prevention effectiveness.

This submission presents a linking commentary which summarises and critiques a series of peer reviewed publications, supported by additional publications, all of which were carried out during my employment at Liverpool John Moores University. Studies have identified key factors affecting sexual development and associated behaviour; associations between sexual and other behaviours, such as alcohol behaviours; and the relationship between social and well-being factors and sexual behaviours in adolescents and young people. Studies also evaluate public health initiatives and review public health evidence of intervention effectiveness. These studies have contributed to understanding sexual development and its impact on behaviours during the life course; have highlighted the health service and education needs of young people; and have identified effective interventions and intervention components to inform national guidance, public health policy and intervention development.

Peer-reviewed articles submitted for PhD registration

Lead authored articles

1. Downing J, Jones L, Bates G, Bellis MA, Sumnall H. A systematic review of parent and family-targeted intervention effectiveness on sexual outcomes in young people. *Health Education Research* 2011;26(5):808-33.
2. Downing J, Hughes K, Bellis MA, Calafat A, Juan M, Blay N. Factors associated with risky sexual behaviour: a comparison of British, Spanish and German holidaymakers to the Balearics. *European Journal of Public Health* 2010a [Epub ahead of print: PMID: 20231212].
3. Downing J, Cook PA, Madden HCE, Phillips-Howard PA, Higgins S, Bellis MA. Management of cases testing positive for gonococcal infection in a community-based chlamydia screening programme. *Sexually Transmitted Infections* 2010b;86(6):474-477.
4. Downing J & Bellis MA. Early pubertal onset and its relationship with sexual risk-taking, substance use and anti-social behaviour: a preliminary cross-sectional study. *BMC Public Health* 2009;9:446.
5. Downing J, Jones L, Cook P, Bellis MA. *Prevention of sexually transmitted infections (STIs): a review of reviews into the effectiveness of non-clinical interventions. Evidence briefing update*. London: NICE, 2006a.
6. Downing J, Jones L, Cook P, Bellis MA. *HIV prevention: a review of reviews assessing the effectiveness of interventions to reduce the risk of sexual transmission. Evidence briefing update*. London: NICE, 2006b.

Co-authored articles

7. Phillips-Howard PA, Bellis MA, Briant L, Jones H, Downing J, Kelly I, Bird T, Cook PA. Wellbeing, alcohol use and sexual activity in young teenagers: findings from a cross-sectional survey in school children in North West England. *BMC Substance Abuse, Treatment and Prevention Policy* 2010a;5:27.
8. Bellis MA, Morleo M, Hughes K, Downing J, Wood S, Cook PA, Smallthwaite L. A cross-sectional survey of compliance with national guidance for alcohol consumption by children: measuring risk factors, protective factors and social norms for excessive and unsupervised drinking. *BMC Public Health* 2010;10:547.
9. Jones L, Bates G, Downing J, Sumnall H, Bellis MA. *A review of the effectiveness and cost-effectiveness of alcohol and sex and relationship education for all children and young people aged 5-19 years in community settings*. London: NICE, 2010.
10. Jones L, Bates G, Downing J, Sumnall H, Bellis MA. *A review of the effectiveness and cost-effectiveness of personal, social and health education in secondary school and further education focusing on sex and relationships and alcohol education for young people aged 11 to 19 years*. London: NICE, 2009b.
11. Jones L, Bates G, Downing J, Sumnall H, Bellis MA. *A review of the effectiveness and cost-effectiveness of personal, social and health education in primary schools focusing on sex and relationships and alcohol education for young people aged 5 to 11 years*. London: NICE, 2009a.

12. Hughes K, Downing J, Bellis MA, Dillon P, Copeland J. The sexual behaviour of British backpackers in Australia. *Sexually Transmitted Infections* 2009;85:477-482.

13. Bellis MA, Downing J, Ashton JR. Adults at 12? Trends in puberty and their public health consequences. *Journal of Epidemiology and Community Health* 2006;60(11):910-911.

Table 1: Contribution to submitted work

Article number	Author status*	Article Type**	Details of Contribution
1.	L	R	Designed and conceptualised the manuscript, conducted the review and wrote the manuscript. Overall responsibility for the manuscript.
2.	L	O	Contributed to the project design, collected and prepared the data, analysed the data and wrote the manuscript. Overall responsibility for the manuscript.
3.	L	O	Designed and conceptualised the manuscript, contributed to data preparation, conducted the analysis and wrote the manuscript. Overall responsibility for the manuscript.
4.	L	O	Designed, developed the study, analysed the data and wrote the manuscript. Overall responsibility for the manuscript
5.	L	EB	Study selection, data extraction and quality assessment. Contributed to the writing of all sections of the report. Management responsibility for the project and responsible for final report.
6.	L	EB	Study selection, data extraction and quality assessment. Contributed to the writing of all sections of the report. Management responsibility for the project and responsible for final report.
7.	C	O	Designed and managed the SRE study, edited the manuscript and contributed to the design of the analysis.
8.	C	O	Contributed to data preparation, analysis and manuscript production. Checked and approved the final manuscript.
9.	C	SR	Study selection, data extraction and quality assessment. Contributed to the writing of all sections of the report.
10.	C	SR	Study selection, data extraction and quality assessment. Contributed to the writing of all sections of the report.
11.	C	SR	Study selection, data extraction and quality assessment. Contributed to the writing of all sections of the report.
12.	C	O	Co-wrote the manuscript. Second author responsibility for the manuscript.
13.	C	E	Conducted background literature search, collected and collated data and designed the data presented. Co-wrote the editorial.

*L - Lead author, C - Co-author

**O - Original research; E - Editorial; R - Systematic review paper; SR - Systematic review report; EB - Evidence Briefing Review report

Supporting evidence - additional reviews and reports

Lead authored

Downing J, Madden HCE, Phillips-Howard PA, Daffin J, Cook PA. *Evaluation of the Greater Manchester RU Clear? Chlamydia and Gonorrhoea Screening Programme*. Liverpool: Centre for Public Health, Liverpool John Moores University, 2009.

Downing J & Cook PA. *Evaluation of young people's sexual health services in Knowsley*. Liverpool: Centre for Public Health, Liverpool John Moores University, 2006.

Co-authored reviews and reports

Bellis MA, Jarman I, Downing J, Perkins C, Beynon, C, Hughes K, Lisboa PI. Using clustering techniques to identify localities with multiple health and social needs. *Health and Place* 2012; 18:138-143.

Phillips-Howard PA, Jones H, Briant L, Downing J, Kelly I, Bird T, Bellis MA, Cook PA. *Summary report: findings from a sex and relationships education pilot programme in schools in North West England*. Liverpool: Centre for Public Health, Liverpool John Moores University, 2010b. ISBN: 978-1-907441-60-8

Jones L, Downing J, Hargreaves SC, Bennett A, Cook PA. *Rapid Needs Assessment: Liverpool Primary Care Trust*. Liverpool: Centre for Public Health, Liverpool John Moores University, 2008.

Hargreaves SC, Downing J, Jones L, Bennett A, Cook PA. *Rapid Needs Assessment: Knowsley Primary Care Trust*. Liverpool: Centre for Public Health, Liverpool John Moores University, 2008.

Bellis MA, Watson FLD, Hughes S, Cook P, Downing J, Clark P, Thompson R. Comparative views of the public, sex workers, businesses, and residents on establishing managed zones for prostitution: Analysis of a consultation in Liverpool. *Health and Place* 2007;13:603-616.

Cook PA, Corbett K, Downing J, Crossley M, Bellis MA. *A fieldwork evaluation of NICE guidance on sexual health interventions*. London: NICE, 2007.

Hughes S, Downing J, Jones A, Bellis MA. *Consultation on the establishment of a managed zone for prostitution in Liverpool*. Liverpool: Centre for public Health, Liverpool John Moores University, 2004.

All reports available from the Centre for Public Health website at www.cph.org.uk/publications, from the NICE website at www.nice.org.uk or alternatively from the authors.

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Abbreviation List

CMO	Chief Medical Officer
CPH	Centre for Public Health
GONW	Government Office North West
LST	Life skills training
NAAT	Nucleic Acid Amplification Test
NATSAL	National Survey of Sexual Attitudes and Lifestyles
NICE	National Institute for Health and Clinical Excellence
PSHE	Physical, Social, Health Education
SRE	Sex and Relationship Education
STI	Sexually Transmitted Infection

1. Introduction

Contemporary societal and physical changes influence young people's maturational development; the timing of which is associated with public health risk-behaviour. Adolescent development triggers a life stage which prepares children for adulthood. With children entering puberty increasingly early (*Bellis et al., 2006; Costello et al., 2007*) the social and normative attitudes and behaviours surrounding them may be ever more influential at this stage. The primary aim of the author's research work included in this submission is to understand more about the influence of puberty on young people's behaviour; to monitor and understand patterns of sexual behaviour and attitudes in young people (including sexual health seeking behaviours) and to determine how to effectively prevent or defer the onset of sexual risk behaviours in young people. Guidance supports early intervention (*NICE, 2007a*) yet this depends upon a full understanding of risk-behaviours, their associated factors, as well as an understanding of the age and developmentally appropriate time for initiating interventions. Evidence suggests that many negative health behaviours and outcomes are interconnected. The relationship between adolescent sexual behaviour and other health behaviours such as substance use has been highlighted (*Independent Advisory Group on Sexual Health and HIV, 2007; Downing & Bellis 2009*). Research shows that most youths have consumed alcohol by age 15 (*Henderson et al., 2013*), with a high proportion also experiencing drunkenness (*Unicef, 2007*). The relationship between alcohol use, teenage pregnancy and sexually transmitted infections (STIs) has been noted (*Bellis et al., 2009; Cook et al., 2011*). Binge drinking and early initiation of alcohol use has been associated with anti-social behaviour (*Spoth et al., 2008*) and whilst cross-sectional surveys indicate that the number of adolescents reporting drug use or smoking has declined, their use of alcohol at an early age has increased (*Gunning et al., 2010 Henderson et al., 2013*). These main risk-taking behaviours are interrelated and the odds of reporting multiple risk-behaviours increases with reports of one (*Gunning et al., 2010*). Furthermore, the number of risk-behaviours and the proportion reporting them increase with age as young people develop, become curious and experiment with new things (*Caffray & Schneider, 2000*). Very often research examining multiple risk-behaviours in young people focuses on the use of substances (including smoking and alcohol use) and does not always include sexual behaviours. In order to gain a greater understanding of sexual behaviour, research submitted here has tried to acknowledge the interconnected risk-behaviours but at times has also focused on specific ones (e.g. alcohol) where the relationship with sexual behaviour is more established. Furthermore, patterns of sexual behaviour are also

considered alongside the social determinants of health as well as the potential social influences (e.g. peers, parents), spatial influences (e.g. country where behaviour takes place) and physical influences (e.g. stage of development) on behaviour in order to inform public health policy and practice.

This submission constitutes a body of work, all of which was carried out at the Centre for Public Health, Liverpool John Moores University. The work I present in detail in this submission aims to:

- Identify levels of sexual risk-taking behaviour in groups of adolescents and young people; particularly school children, sexual health service users and high-risk groups such as UK youth travelling abroad.
- Identify adolescent and young people's public health service and education needs to inform provision.
- Evaluate and review research evidence to highlight areas of effectiveness in risk-taking interventions aimed at young people and adolescents. Findings from which contribute to the development of national guidance, future prevention interventions and academic knowledge-base.

2. Research studies examining young people's development, behaviour and associated interventions

2.1 Young people's development and public health issues

Submitted articles:

Downing J & Bellis MA. Early pubertal onset and its relationship with sexual risk-taking, substance use and anti-social behaviour: a preliminary cross-sectional study. *BMC Public Health* 2009;9:446. (See Appendix).

Bellis MA, Downing J, Ashton JR. Adults at 12? Trends in puberty and their public health consequences. *Journal of Epidemiology and Community Health* 2006;60(11);910-911. (Editorial) (See Appendix).

Background

Early risk-behaviour can be influential on health and wellbeing in future years. However, survey data on risk-taking behaviour and influencing factors often does not measure the full remit of public health issues on national samples under age 16 years, nor do they examine their impact on later risk-taking behaviours. A national survey of youth public health behaviours measures substance use in those aged 11-15 years (*Henderson et al., 2013*), yet limited information on sexual behaviour in young adolescents exists. The National Survey of Sexual Attitudes and Lifestyles (NATSAL) measures sexual behaviours in a sample of 16-25 year olds and reports menarche (females only) and socio-economic data for the population to provide greater detail (*Wellings et al., 2001*). However, in depth research on young people's early development, its association with early risk-taking behaviours and influencing factors is limited in the UK.

Summary

My research on young people's development aimed to find out if there were associations between timing of pubertal onset and early initiation of particular health behaviours in our sampled population. In *Downing & Bellis, 2009* I recruited a sample of 1,923 participants aged 16-45 years, with around half recruited from student venues and half recruited via an online questionnaire. This work was informed by an editorial written on the topic (*Bellis et al., 2006*). The literature in the editorial highlighted the potential factors associated with the increasing gap between physical puberty; when young people have reproductive capacity and are physically mature, and social puberty; when young people are psychologically, legally and educationally capable to behave as adults

(*Gluckman & Hanson, 2006*). Data collated and included in the editorial focused on menarche due to a lack of available data on male pubertal trends. Following on from the editorial *Downing & Bellis, 2009* was designed to elicit information on both male and female participants' pubertal onset age and potential associated factors such as demographics, sexuality, levels of childhood health and wellbeing including number of childhood illnesses, stays in hospital, time off school, adolescent experience of fighting, reactions to negative situations, experience of bullying and family structure in early teenage years. The study was designed specifically to explore the relationship between pubertal onset and public health behaviours. Thus questions were developed relating to age of first experiences of alcohol consumption, drunkenness, drugs, smoking, sex, unprotected sex, post-coital contraception, pregnancy and abortion. Existing evidence also suggests associations between early risk-taking behaviours and those later in life (*Bonomo et al., 2004; Costello et al., 2007*). Therefore to determine the longitudinal impact of early puberty on risk-taking behaviours survey respondents were asked to recall recent public health behaviours.

Findings from *Downing & Bellis, 2009* revealed a study median pubertal age of 13 years and a peri-pubertal male age of 11 years, both of which were consistent with existing literature of pubertal ages in developed countries (*De Muinick Keizer-Schrama & Mul, 2001; Whincup et al., 2001*). However, data on males represents the first estimate in the UK using retrospective data. Female pubertal age was determined using menarcheal onset age which is more likely to give a late pubertal age. Male pubertal age was derived from the earliest age of three markers (age at first sexual attraction, masturbation and nocturnal emission/spermarche), to provide an estimate peri-pubertal male age. Almost half the sample fell into our categorisations for early puberty (46% of females; 47% of males). After initial bivariate analysis of the online and paper datasets, conditional logistic regression analysis of the combined female data showed that earlier puberty was associated with being overweight, having more childhood illnesses and poorer parental socio-economic status during childhood. Results for males indicated that earlier puberty was more likely in those self-defined as gay/bisexual or, similar to females, reporting poorer parental socioeconomic status. Overall in the combined, stratified analysis and multinomial regression findings showed that both males and females with early puberty were more likely to report drinking alcohol, being drunk, taking drugs and smoking before age 14 years. In addition, earlier puberty was associated with having sex and unprotected sex before age 16. For females being a victim of bullying and having higher

rates of school absence were also associated with early menarche. This lends weight to the theory that early pubertal onset can be triggered by stressful experiences (*Parent et al., 2003*). Also, school absence can be due to a dislike of school and an indicator of poor child wellbeing; itself associated with risk-taking behaviour, poor mental health and poor academic achievement (*Bonell et al., 2005; Viner & Taylor, 2007; Bond et al., 2007*). For males aggressive emotional responses and higher rates of fighting during adolescence were also related to earlier reported puberty.

Considering childhood obesity levels, findings inform related public health policies particularly as the association between weight, sexual health and substance use had not previously been explored in this population. With increasing obesity rates, continuing deprivation and marginalisation, the impact of early pubertal development and its association with early risk-taking behaviour is a matter for policy attention has been raised in prevention evidence (*Downing et al., 2006a*). I suggested that its inclusion in early school-based education and the promotion of early parent-child communication may be seen as necessary.

2.2 Educational interventions and needs affecting young people's development

2.2.1 Policy driven interventions

Submitted article:

Bellis MA, Morleo M, Hughes K, Downing J, Wood S, Cook PA, Smallthwaite L. A cross-sectional survey of compliance with national guidance for alcohol consumption by children: measuring risk factors, protective factors and social norms for excessive and unsupervised drinking. *BMC Public Health* 2010;10:547. (See Appendix).

Background

The relationship between pubertal development and alcohol was one of the stronger identified in *Downing & Bellis, 2009*. This study builds on our previous findings by highlighting additional factors contributing to alcohol use risk-behaviour. Here using a school-based sample, biennial Trading Standards survey data were used to demonstrate current drinking norms in adolescents compared with current guidance for alcohol consumption in children along with the sources for obtaining alcohol and the associated consequences of alcohol consumption at a young, developmental age. *Bellis et al., 2010* utilised the 2009 survey results to determine the pattern of adolescent drinking behaviours prior to the release of the Chief Medical Officer's (CMO) national guidance for children's alcohol consumption. In addition, this work aimed to highlight the

characteristics of those whose drinking behaviours fell outside the recommendations set in the guidance (*Donaldson, 2009*).

The Trading Standards survey was disseminated throughout participating schools in North West Local Authorities. Sample data were from 11,879 adolescents aged 15-16 years. Questions had already been developed due to the repeat nature of the survey yet were suitable for investigation given the inclusion of demographic and alcohol consumption data. Questions also related to sources for obtaining alcohol and memory, which is particularly pertinent given the developing evidence on the effects of alcohol on adolescent brain development (*Guerri & Pascual, 2010*). More immediate consequences of alcohol consumption were examined e.g. violence/fighting and regretted sex. Furthermore, markers of general wellbeing were explored as potential factors relating to behaviour.

Summary

Findings from *Bellis et al., 2010* showed that most 15 year olds had already experienced alcohol consumption (81%), thus highlighting the scale of the challenge to change existing norms. Of those reporting drinking, 55% drank heavily (alcohol consumption exceeding recommended adult daily levels) and 22% drank frequently (more than once per week), indicating routine consumption behaviours outside those outlined in the CMO's guidance. Results further indicated that most adolescent drinkers consumed alcohol, unsupervised inside (57%), which represented the most common method of alcohol consumption and does not comply with the CMO's guidance. A further 30% reported unsupervised drinking outside in locations such as streets, representing risky drinking practices. Unsupervised inside drinking was more likely in females, those from less deprived areas and those with more expendable income (over £10 per week). Income was also associated with a greater likelihood of self-purchase and more frequent and heavy drinking. Those from deprived areas were more likely to get another person to purchase alcohol for them (proxy purchase) and report frequent drinking, whereas those in less deprived areas were more likely to take alcohol from parents without consent. Indicators of child wellbeing showed that those engaged in hobbies or sports were less likely to drink heavily or frequently. Those drinking through peer pressure were less likely to drink heavily once adjusted for all other factors. Conversely those drinking due to boredom had greater odds of drinking across all categories of unsupervised drinking, as well as both frequent and heavy drinking. Those whose parents provided alcohol

reported less unsupervised drinking practices and heavy or frequent drinking. Reports of regretted sex and memory recall were significantly greater across all categories of unsupervised drinking and frequent and heavy drinking; the highest for both being in those categorised as heavy drinkers and those who drank unsupervised inside.

I worked with the team to highlight the norms in drinking behaviours of adolescents within the age range referred to in the CMO's guidance (*Donaldson, 2009*). This enabled a timely examination of the challenges that need addressing in order to implement the guidance. It added further support to the existing body of evidence that informed the development of guidance. We suggested that in addition to a minimum price per unit of alcohol, as a means to make alcohol more difficult to afford for young people, future approaches ought to consider the value of parent-based interventions. Lower levels of consumption were seen in cases with a parental presence and although this work cannot attest to the reasons for this, the presence of a parent/guardian could be an effective method of communicating alcohol-related risks as a means of preventing or reducing the frequency and quantity of consumption further. Those accessing alcohol through their parents were less likely to be exposed to subsequent risks such as regretted sex or violence, although the damaging physical effects on brain development would not be avoided with this approach (*Guerra & Pascual, 2010*).

Conclusions support the recommended guidance and provide evidence to indicate that reduction or prevention of alcohol consumption in those not legally able to purchase alcohol would produce public health benefits and potentially prevent antisocial behaviour and damage caused to memory function in developing adolescents and regretted sex. The promotion of parental monitoring in particular in these circumstances also has potentially beneficial effects on reducing the negative sexual consequences of early alcohol consumption.

2.2.2 Education driven interventions

Submitted article:

Phillips-Howard PA, Bellis MA, Briant L, Jones H, Downing J, Kelly I, Bird T, Cook PA. Wellbeing, alcohol use and sexual activity in young teenagers: findings from a cross-sectional survey in school children in North West England. *BMC Substance Abuse, Treatment and Prevention Policy* 2010a;5:27. (See Appendix).

Background

Retrospective approaches to adolescent development and adolescent risk-taking behaviours do not fully reveal the impact of current social trends (e.g. family structure, school influences, level of bullying or attitudes relating to body image). Current surveys examine indicators of wellbeing and deprivation in association with risk-behaviours in adolescents (*Unicef, 2007*). However, they are often limited to older adolescents (15 years or over), particularly if related to sexual behaviour. Evidence supports intervention implementation prior to the onset of risk-behaviours (*NICE, 2007a*), yet the exact timing for different populations has not been clearly identified. School-based education can reach young people from an early pre-adolescent/adolescent age and evidence for young people's risk-prevention supports school-based physical, social, health and economic education (PSHE) including a focus on sex and relationship education (SRE) and alcohol education (*NICE, 2010; Jones et al., 2009b*).

Government Office North West (GONW) commissioned an evaluation of their pilot PSHE programme aimed at 11-14 year olds in high schools across North West England; working in collaboration with steering group members and PSHE pilot leads across the North West. Overall 15 schools, with a total of 3,641 students provided data for analysis (overall, 10% withdrew/were withdrawn, refused assent or returned spoilt/unused questionnaires). In addition to demographic and behavioural measures, questions elicited information on young people's views of school, wellbeing, levels of self-efficacy, hobbies/out of school activities, concerns, future aspirations and actual and preferred sources of information for SRE. Sexual health questions were included to examine their overall knowledge based upon the pilot programme design (age and PSHE programme content appropriate for each year group).

Summary

Findings indicated that 32% of young people had at least one experience of drinking alcohol by age 11, rising to 66% at age 14, with alcohol consumption significantly increasing in frequency with age. Alcohol consumption was associated with poor levels of wellbeing. Bivariate analysis showed that those reporting ever drinking were almost twice as likely to disagree that they could talk openly with their parents about problems, those drinking alcohol often were almost twice as likely to disagree that they had a happy home life. Associations between poor school wellbeing and alcohol consumption were also evident with those ever drinking alcohol and those drinking often more likely to report negative responses to all school wellbeing questions. These associations were upheld in multivariate analysis. Findings showed a strong association between reports of ever drinking alcohol and age, with those aged 14 almost four times more likely than those 11 years to have tried alcohol at least once. Subsequent findings examining any sexual activity (including kissing, deep kissing, petting, oral sex and sexual intercourse and sex) showed strong significant incremental associations with alcohol frequency. Of those participants reporting drinking frequently the vast majority (83%) also reported sexual activity and 30% reported having sex, indicating that their odds of having had sex were 11 times higher than their peers who did not drink alcohol. Additionally, those who drank only rarely or occasionally still had greater odds of reporting sexual activity and sex than those who reported never drinking. Importantly, findings here show the association between levels of wellbeing, alcohol use and sexual risk-behaviours. Furthermore, data on sexual behaviour in those aged 13 and 14 years are limited, therefore our findings provide a rare insight into current risk behaviours and associated indicators in the study population. These findings may not be generalisable to the whole population however they are valuable to the development of future research.

Further results from the associated report (*Phillips-Howard et al., 2010b*) examined the effectiveness of the pilot programme in year 9 participants (aged 13-14 years) (where detailed sexual health knowledge questions could be asked) on changing knowledge. Results showed significant improvements in sexual health-related knowledge including sexually transmitted infections and contraception. However, the lack of control group means that results must be interpreted with caution.

When designing the questionnaire tools I particularly wanted to gather data on sources of information used by adolescents as existing studies present only retrospective data (*Wellings et al., 2001*) which does not necessarily include all of the sources used by

youth at present. Findings showed that girls were more likely than boys to seek information about sex and relationships from schools or parents, siblings, friends or their general practitioner/doctor. However, boys were more likely than girls to seek information from a youth worker which is consistent with anecdotal evidence we have received from both youth workers and young people in focus groups and previous evaluations and needs assessments (*Downing & Cook, 2006; Hargreaves et al., 2008; Jones et al., 2008*). Overall, girls were more likely to talk to their mothers than their fathers (70% versus 18%) whereas boys could talk to either mother or father (50% and 47% respectively). Pornographic sources of information were reportedly accessed frequently by adolescents particularly via magazines, the internet and films. Boys were more likely to report accessing pornography for information and access increased with age. These findings indicate that developing adolescents have information needs that are not always addressed by existing educational provision. Furthermore, adolescent curiosities can lead young people to seek out inappropriate information sources to gain the knowledge they seek. These findings help to inform and target developing prevention interventions, educational material and future research. This study provided evidence that added to the argument that SRE and alcohol education should begin at an earlier stage in young people's lives. It further highlights concerns regarding the lack SRE and the move away from making it a statutory requirement in schools. Findings also add to the current UK evidence base for PSHE/SRE interventions which is particularly important as current review work (*Jones et al., 2009a; 2009b, 2010*) highlights the dearth of UK-based evidence.

2.3. Risk-taking behaviour of adolescents and young people abroad

Submitted article:

Hughes K, Downing J, Bellis MA, Dillon P, Copeland J. The sexual behaviour of British backpackers in Australia. *Sexually Transmitted Infections* 2009;85:477-482. (See Appendix).

Background

Research led by CPH has highlighted the risk behaviours in night-time environments and examined the behavioural trends in youth to inform public health interventions. Leisure activities and seasonal variations are associated with periods of increased risk (*Uitenbroek, 1996; Wellings et al., 1999*) and are occasions which may merit increased exposure to health or service promotion awareness campaigns. Risk behaviours, although

often initiated, and thus ideally prevented, during early adolescence also continue and potentially embed and expand in late adolescence and early adulthood. From late teenage years increased independence results in spending more time with friends and less with family. Finishing high school, going to university or taking a gap year can be associated with increased risks (*Apostolopoulos et al., 2002*). Similarly, travel for holidays or extended periods e.g. before, during or after, for example, university, also increase risky behaviours. Thus a study was set up to examine risk-taking behaviour of UK backpackers abroad. Previous publications from this study had examined the substance using behaviours of UK backpackers in details. However, very little work existed on the sexual practices and influencing factors on backpackers in general and no previous work examined this in relation to UK backpackers. I collaborated with Prof. Hughes to examine this issue in detail.

Summary

Using a validated questionnaire, trained researchers surveyed UK nationals from backpacker hostels in Sydney, Australia. A total of 1,012 participants were recruited and given AU\$10 for their time (there was a 9% refusal rate). 1,007 were included in analysis. The majority of participants were under 25 years of age (655 participants, 65%) All participants had been in Australia for a minimum of two weeks. To assess backpacker behaviour questions were designed to elicit full demographic details including relationship status, sexual behaviour including numbers of sexual partners pre- and post-travel, substance using behaviour and nightlife participation.

Analysis examined the sexual behaviour of backpackers utilising chi square, Wilcoxon Signed Ranks Test and logistic regression. The highest rates of sexual activity since travel began was among single backpackers (69%), with 41% reporting inconsistent condom use and 24% reporting unprotected sex with more than one partner. Wilcoxon signed ranks test showed increases in mean number of sexual partners across all participants, with number of partners per 4-week period increasing from 0.3 in the UK (in the 12-months prior to travelling) to 1.0 in Australia. After adjusting for confounding effects sexual activity was more likely for those arriving in Australia with a partner, consuming alcohol more frequently or using illicit drugs. Length of stay in Australia at the time of completing the survey also predicted reports of sexual activity as did report of higher numbers of sexual partners in the 12 months prior to travelling. Sex without a condom was greatest for those with a partner, those planning to stay longer and those

visiting bars more often per week. Increased number of sexual partners was over five times greater for single participants, those who had stayed longer and planned a longer stay, those visiting bars/nightclubs frequently, using illicit drugs and those reporting a greater number of sexual partners prior to their trip.

I suggested that sensation seekers are more likely to undertake a backpacking trip. Thus, findings potentially display the behaviour of a high risk population. Some participants reporting high risk behaviours were at the start of their trip, indicating that risk is present at the outset for some although more likely to increase with time. It further indicates that findings here under-represent the overall risks. Had people been surveyed at the end on their backpacking trip their overall experience of risk behaviours is likely to be far in excess of those that were reported.

Here substance use and visiting nightlife environments were associated with sexual risks. Thus, we recommended targeting prevention messages and interventions through a joint health promotion strategy between health services, relevant authorities, tourist and other relevant organisations aimed at backpackers prior to travel, in night-time environments and backpacker hostels. Although rates of STIs were not surveyed, unprotected sexual behaviour and reports of multiple partners in relatively short periods indicates a situation conducive to STI transmission. As such I suggested that prompt STI treatment, where a partner is known/strongly suspected to be positive for infection, may be achieved via a patient delivered partner therapy intervention. This approach could be supported by social networks, mobiles and internet sites.

Submitted article:

Downing J, Hughes K, Bellis MA, Calafat A, Juan M, Blay N. Factors associated with risky sexual behaviour: a comparison of British, Spanish and German holidaymakers to the Balearics. *European Journal of Public Health* 2010a [Epub ahead of print: PMID: 20231212]. (See Appendix).

Background

Backpackers are the minority in travelling populations and the vast majority of travel experienced by general population is to holiday locations abroad for one, two or more weeks in the year. Examination of only one nationality provides limited data about behaviour and subsequent prevention and studies examining all main nationalities travelling to areas are able to provide greater insight. In *Downing et al., 2010a* I worked

with Prof. Hughes and associates form a European funded research collaboration to thoroughly explore the sexual behaviour of UK, Spanish and German holidaymakers to the Spanish resort of Ibiza and Majorca. Utilising data from the 2007 survey I manipulated the data to create new variables, I analysed the data and I wrote the manuscript to provide greater insight into holidaymakers' behaviour and related factors.

Summary

Utilising an existing and validated tool from previous similar surveys researchers collected data in Majorca and Ibiza from 3,003 British, Spanish and German holidaymakers travelling on their return journey at international airports. Overall, 72% of the sample were aged 25 years or under. Participants were approached if they appeared to be in the target age group and travelling without relatives or dependents. Anonymous, self-completed questionnaires translated into each relevant language were designed to collect data relating to participants' demographics, alcohol, drug, nightlife and sexual behaviour. In *Downing et al., 2010a* I used Chi square, Anova, and backward conditional logistic regression including interactive terms to identify interrelationships between nationalities and holiday destinations. I found that single participants were most likely to report risky sexual behaviours. Those reporting more than five sexual partners in the 12 months prior to travelling showed significant positive associations with reporting a new sexual partner whilst on holiday. This corroborated the findings from *Hughes et al., 2009* indicating that risk-behaviours also occur during brief liminal periods. In addition to number of previous partners, greater odds of having sex with a new partner were present for Spanish holidaymakers staying in Majorca, those holidaying for longer periods (>15 days) and those reporting being drunk more than five times per week whilst on holiday.

Males, those in the youngest age group (16-19 years) and those reporting high numbers of sexual partners 12 months prior to their holiday showed higher odds of reporting more than one sexual partner on holiday. However, I also examined unprotected sexual behaviour to define high-risk groups surveyed. I found that German holidaymakers visiting Majorca were almost twice as likely to report unprotected sex than UK holidaymakers visiting Majorca. Those travelling with members of the opposite sex and reporting polydrug use were also more likely to engage in unprotected sex. Additionally, I sought to explore whether individuals engaging in particular risk behaviours were attracted to different types of night-time venues to inform existing knowledge of risk behaviours and to inform prevention development. I found that those having sex with

new partners abroad and those reporting more than one new partner were more likely to prefer bars that had opportunities for sex and drunkenness and were easy to travel to. Those reporting unprotected sex showed a greater preference for venues where people get drunk. Indicating that the greatest sexual risks were strongly associated with alcohol and drunkenness

Importantly my analysis also explored the behaviour observed by the surveyed population. I compared observations by sexual behaviour category to demonstrate the characteristics displayed by individuals patronising venues to determine differences between groups. I found that those reporting new partners witnessed drug use, arguments, fighting, vandalism and sexual activity. An even greater proportion of those with more than one new sexual partner reported witnessing drug use, fighting, vandalism, and sexual activity. Whereas those reporting unprotected sexual intercourse with new partners on holiday were more likely to have witnessed drug use compared to all others surveyed. This finding is supported by the logistic regression analysis and indicates that targeting drug users and establishments that tolerate drug use with substance misuse and sexual health promotion may be a useful mechanism for targeted interventions. Alternatively, prevention messages focusing on multiple health risks targeting this population prior to travel may also be effective. In addition to my recommendations for free condom distribution and policies to discourage cheap drinks promotion and overt sexual behaviour, I recommended a focus on increasing social skills to reduce individuals' reliance on alcohol for facilitating social situations. This approach might be most effective aimed at younger adolescents prior to their holiday experiences without parents, particularly considering that those aged 16-19 years in the surveyed population were most likely to report multiple new partners abroad, a risk factor in STI transmission (*Santelli et al., 1998*). This age group also displayed high risk behaviours prior to travel which adds to the evidence base for targeting young adolescents with early intervention programmes.

2.4. Service evaluation of a community-based intervention

Research encompassing hard-to-reach or vulnerable populations such as young people, BME groups, MSM and sex workers (*Bellis et al., 2007; Hughes et al., 2004*) is valuable particularly when populations are also suffering chronic conditions (e.g. HIV), addiction (Substance using sex workers) or treatable but asymptomatic infections (Chlamydia, gonorrhoea). Research and evaluations aimed at these groups can be examined in

conjunction with social factors (e.g. deprivation) which highlights service needs and adds to our knowledge of the relationship between deprivation and risk (*Bellis et al., 2012*). This is important given that evidence highlights the lack of available information on effective interventions for such populations (*Downing et al., 2006a, 2006b*).

Submitted article:

Downing J, Cook PA, Madden HCE, Phillips-Howard PA, Higgins S, Bellis MA. Management of cases testing positive for gonococcal infection in a community-based chlamydia screening programme. *Sexually Transmitted Infections* 2010b;86(6):474-477. (See Appendix).

Background

The sexual health team at the Centre for Public Health were commissioned to evaluate the Greater Manchester RU Clear Programme which targeted 15-25 year olds for community Chlamydia and gonorrhoea tests. It provided an opportunity to examine the demographics of infected populations diagnosed with Chlamydia and gonorrhoea in the community; essentially an asymptomatic population or a population not actively seeking investigative care elsewhere. It also enabled examination of the effectiveness of community-based urine test to identify both Chlamydia and gonorrhoea which was designed as an innovative approach to speedily target and test young people in a general population. It takes account of the changes in sexual practices and the increases of gonorrhoea in heterosexual populations and is a means of preventing the transmission of both asymptomatic Chlamydia and gonorrhoea and associated health risks of undiagnosed infection.

Summary

The evaluation of the effectiveness of dual testing for Chlamydia and gonorrhoea was the first conducted in a UK setting outside the arena of a clinic trial. Patients testing positive for gonorrhoea in the community were referred for retesting and treatment at genito-urinary medicine (GUM) clinics and I compared their results. I found a low positive predictive value (PPV) for gonorrhoea from the Nucleic Acid Amplification Tests (NAATs) used to test young people in the community. However, evidence of contact with a positive partner and poor retest swabbing practices supported the initial positive test result using NAATs in the community. Findings also indicated poor partner notification. I suggested that future practice should ensure partner notification wherever possible, particularly as partner notification practice has been identified as an effective means of identifying new infections (*Downing et al., 2006a*). I further recommended that

pharyngeal swabbing be routinely carried out and self-swabbing promoted as an option to prevent young people embarrassed about clinician-taken swabs refusing retests. Importantly, I suggested that tests of cure would be valuable particularly in those cases where retests, and thus sensitivity tests to identify resistant strains, have been refused. This practice would ensure that treatment resistance gonorrhoea was identified.

Additional analyses from this work (*Downing et al., 2009*) highlighted the relationship between the infected populations compared to others. My analysis showed a strong relationship between gonorrhoea and deprivation with those in the most deprived People and Places (*Beacon & Dodsworth, 2005*) categorisation having twice the proportion of gonorrhoea (2%) compared to the total overall proportion (1%). Additionally, my findings showed high rates of gonorrhoea in minority ethnic groups, particularly black African and black Caribbean groups.

3. Evidence for prevention interventions from systematic reviews and evidence briefings

Prevention intervention evidence is key to my work. Conducting research into adolescent and young people's behaviour aids our understanding and helps to reveal developing issues for prevention interventions. Evaluation of services and programmes locally and regionally also supports knowledge of effective interventions on target populations yet it is often small scale. Thus, examination of existing primary and secondary studies evaluating programme effectiveness enables a systematic, high quality exploration of effective programmes and their successful components, thus helping to inform the development of future interventions and research.

3.1 Evidence for educational interventions for adolescents

Submitted articles:

Jones L, Bates G, Downing J, Sumnall H, Bellis MA. *A review of the effectiveness and cost-effectiveness of personal, social and health education in primary schools focusing on sex and relationships and alcohol education for young people aged 5 to 11 years.* London: NICE, 2009a. (See Appendix).

Jones L, Bates G, Downing J, Sumnall H, Bellis MA. *A review of the effectiveness and cost-effectiveness of personal, social and health education in secondary school and further education focusing on sex and relationships and alcohol education for young people aged 11 to 19 years.* London: NICE, 2009b. (See Appendix).

Jones L, Bates G, Downing J, Sumnall H, Bellis MA. *A review of the effectiveness and cost-effectiveness of alcohol and sex and relationship education for all children and young people aged 5-19 years in community settings.* London: NICE, 2010. (See Appendix).

Background

In 2009 the National Institute for Health and Clinical Excellence (NICE) commissioned the Centre for Public Health to undertake a series of systematic reviews to support the development of their guidance aimed at PSHE with particular reference to sexual health behaviour and alcohol. The reviews sought to identify effective and cost-effective interventions and programmes, their components and policies and strategies that contribute to the 'Every Child Matters' outcomes for PSHE and alcohol. Thus, producing evidence on which to base future national PSHE and alcohol education plans in line with the 'Every Child Matters' aims (DfES, 2004).

Three distinct reviews conducted using rigorous methodology examined programmes in: primary school education for those aged 5-11 years; secondary schools and further

education for those aged 11-19 years; and in the community for all young people aged 5-19 years. The review methods adhered to NICE methods for NICE public health development (*NICE, 2009*). Once the reviews were written they were given to the NICE project team to comment on, results were presented and discussed with the Programme Development Group and comments addressed. The completed reviews were disseminated nationally to registered public health stakeholders, their comments were addressed in the final reviews which were submitted to NICE to inform the development of their guidance and subsequent parliamentary and national debate.

Summaries

In *Jones et al., 2009a* programmes in primary school education for 5-11 year olds were examined. Overall 7,629 studies were identified, after title and abstract screening 501 full text articles were assessed and examined for inclusion. A total of 75 articles were included for data extraction and reviewed. Key findings from *Jones et al., 2009a* showed that programmes targeting young children were less effective than those targeting young adolescents. Programmes aimed at young children would be more effective if they used multiple domains of delivery by, for example, combining both school and family components. Furthermore, SRE-focused programmes targeting communication between children and their parents showed moderate effectiveness. Key positive findings in relation to alcohol education indicated some benefits of programmes examining vehicle safety in relation to drink-driving, in addition to the effects of alcohol on development and the brain. Findings showed moderate evidence that programmes targeting social development may have positive effects on attachment to school and academic performance, on problem behaviours and social skills and long-term impact on alcohol behaviour. Programmes reporting effective interventions were more likely to combine both school and family-based components. One further programme (the good behaviour game) provided strong evidence to show that targeting negative classroom-based behaviour may achieve long-term preventative effects on alcohol abuse and dependence in later life.

In *Jones et al., 2009b* programmes in secondary schools and further education for those aged 11-19 years were examined. Overall 11,621 potentially relevant studies were found. Once title and abstracts had been examined and subsequent full texts retrieved where possible, a total of 203 studies were included in this review. In 119 cases they examined alcohol programmes, 75 focused on SRE and nine on general health education

programmes in secondary education settings. Summarised key findings emerging from this review revealed weak and inconsistent evidence of effectiveness. However key findings with moderate or strong positive evidence found that life skills training (LST) interventions can have long-term reductions in alcohol use, including positive effects on drinking frequency and binge drinking. Alcohol specific education based on harm reduction approaches may positively affect young people's drinking attitudes and alcohol-specific education may also have positive programme effects on frequency of alcohol consumption and drunkenness. Key positive findings for SRE with moderate or strong evidence indicated that programmes with a theoretical basis; those that use trained facilitators; and those with sexual risk-reduction content are effective. Comprehensive sex education content, including content that examines HIV, can be effective at improving young people's sexual health and HIV knowledge and have some limited impact on behavioural prevention skills, condom negotiation skills and condom use. Evidence from general health programmes also suggests that general health education programmes incorporating an intensive community intervention element in conjunction with a curriculum-base may have a positive effect on sexual behaviour and substance use.

Jones et al., 2010 examined community-based programmes for young people aged 5-19 years. Overall 12,108 potentially relevant studies were found. A total of 440 texts were quality assessed and 87 studies were included; 31 examining alcohol (alone or with other substances); 49 focused on sexual health; and seven on multiple behaviours in the community. Mixed and inconsistent findings were reported. However, key positive findings for alcohol indicate that programmes delivered to families had positive effects on alcohol attitudes and values, alcohol use and initiation. Programmes targeting families and parents improved parent-child communication. Overall, the strongest evidence supported the effectiveness of a family-based programme, Iowa Strengthening Families (ISFP), which produced reductions in alcohol use and heavy alcohol use for more than three years post-intervention. Key evidence for positive sexual health interventions indicated that community-based programmes, those in social and healthcare settings and those to families/parents may have positive effects on sexual health knowledge. These interventions also had some limited positive effects on sexual activity, including number of sexual partners. Interventions involving group-based or skills-based programmes in a community or healthcare setting increased condom use and reduced unprotected sex in some programmes. One youth development programme (CAS-Carrera) targeting

vulnerable groups showed positive effects on several sexual health outcomes in females. Findings also indicated that programmes targeting multiple health behaviours resulted in benefits to parents and families' communication (additional information in *Downing et al., 2011*).

Submitted article:

Downing J, Jones L, Bates G, Bellis MA, Sumnall H. A systematic review of parent and family-targeted intervention effectiveness on sexual outcomes in young people. *Health Education Research* 2011;26(5):808-33. (See Appendix).

I identified a gap in the existing academic knowledge-base for systematic review level evidence of parent and family-based sexual health programmes. Therefore in *Downing et al., 2011* I re-examined the community level articles which focused on parent or family-based sexual health interventions to highlight the evidence for international audiences interested or working in health education research. I included studies examining behaviour and communication but excluded those (which are in the wider report) only examining sexual attitudes or values.

Overall, 17 USA studies examining parent/family-based interventions were included. I aimed to identify the effectiveness of the programmes on: preventing or reducing poor sexual health outcomes; examining whether or not programmes increased communication about sex and relationships; comparing parent versus family interventions; and comparing those studies focusing only on sexual behaviour compared to those examining multiple risk behaviours (including sexual health).

Results were sometimes inconsistent, however, parent-based interventions showed greater levels of effectiveness than family-based interventions in improving young people's sexual behaviour outcomes. Findings indicated that in some cases parents can be as effective at delivering interventions as health experts and interventions delivered to parents could improve parent-child communication about sex. I examined sexual health specific interventions comparing them to those within a broader context. Those examining multiple health behaviours were more likely to improve parent-child communication and also show positive effects on young people's health outcomes. Although limited and short-term they represent the most effective findings from the articles reviewed. These findings have implications for existing interventions currently addressing substance and lifestyle risks but exclude sexual health. Further results

indicated that overall interventions were more consistently effective at improving the modifying factors relating to risk-taking, such as communication. Yet there was no evidence to suggest that improvements in sexual communication had any effect on related behavioural outcomes, which continues to reflect the findings relating to parent/child communication and its impact on subsequent behaviour stated in *Downing et al., 2006a*.

These findings add value for the future development of interventions aimed at adolescent sexual health and wellbeing. Importantly I suggested sexual health prevention could successfully be incorporated in existing and future intervention programmes addressing multiple risk-behaviours. Furthermore, my findings suggest involving parents as an alternative or as a complement to school-based interventions. Strong research recommendations were given on the conclusion of this work to highlight the lack of UK models. I further acknowledged the limitations of the outcomes currently measured in studies (e.g. sexual intercourse, unprotected sex) and suggested alternative measures of sexual behaviour (e.g. petting, oral sex) to capture the early onset behaviours in future studies. In addition I suggested the inclusion of measurements for access to sexual information (e.g. accessing pornography or other media for sex and relationship information).

3.2 Evidence briefing systematic reviews

Submitted articles:

Downing J, Jones L, Cook P, Bellis MA. *Prevention of sexually transmitted infections (STIs): a review of reviews into the effectiveness of non-clinical interventions. Evidence briefing update*. London: NICE, 2006a. (See Appendix).

Downing J, Jones L, Cook P, Bellis MA. *HIV prevention: a review of reviews assessing the effectiveness of interventions to reduce the risk of sexual transmission. Evidence briefing update*. London: NICE, 2006b. (See Appendix)

Background

I led on two NICE evidence briefing updates in 2006 commissioned to update previous versions and to contribute to the development of NICE's guidance on the prevention of sexually transmitted infections and under 18 conceptions (*Downing et al., 2006a; Downing et al., 2006b; NICE, 2007b*) along with the fieldwork aspect for their guidance

commissioned by NICE (*Cook et al., 2007*) which utilised the Delphi method to gather professional views on the developing guidance. The evidence briefings were reviewed by NICE public health experts, authors from the original evidence briefing provided detailed critique on the briefings, following which NICE undertook peer review of the documents. Both evidence briefing reviews utilised the standardised methodology developed by NICE and search strategies were updated and based upon the original reviews (*Ellis & Grey, 2004; Ellis et al., 2003*) to maintain consistency in identifying evidence of effectiveness in priority populations.

Summaries

3.2.1 Review-level evidence to inform effective interventions to prevent sexually transmitted infections

In *Downing et al. 2006a* I examined the types and features of effective interventions and found evidence to support multi-component approaches. Interventions were more effective if they were underpinned by theoretical models such as behavioural-skills, incorporating self-efficacy and risk-reduction. The provision of clear, unambiguous messages was seen as effective. Effective interventions were targeted and tailored using needs assessments and formative research. Furthermore, effective interventions were more likely to use trained facilitators, peers and community leaders and extend the time period of their delivery. Specifically, clinic-based interventions using individual risk-counselling and behavioural skills interventions were effective. I found that partner notification was an effective means of identifying new infections. Furthermore, evidence supported the effectiveness of school-based education at reducing sexual risk-behaviours, more so if it began prior to sexual initiation. Findings showed that small group work and detached or outreach education by professionals may also be effective at reducing sexual risks.

3.2.2 Review-level evidence to inform effective interventions to prevent HIV transmission

In *Downing et al. 2006b* I found evidence to indicate that theoretically-based interventions showed greater levels of effectiveness. Also, interventions using multi-components and group work were effective when aimed at men who have sex with men (MSM) and voluntary counselling and testing (VCT) was more effective if conducted in conjunction with another component. Interventions targeting MSM were effective using cognitive behavioural approaches on an individual level including risk-reduction and

counselling, or on a group level addressing, for example, relationships and communication skills. Findings for sex workers indicated that programmes incorporating peer-led community-based interventions were effective with female sex workers. For those living with HIV evidence supported partner notification practices and small group work to address stress management and coping strategies. Limited evidence supported the use of group interventions on the sexual risk-behaviours of BME heterosexual groups and community-based interventions for BME females, adolescents and heterosexual males.

4. Critical Summary - Methodological and research considerations

❖ Methodological limitations

Excluding service data (*Downing et al., 2010b*), the majority of the studies examine populations cross-sectionally. Some samples were large and collected regionally (e.g. *Bellis et al., 2010*); other studies collected samples from different groups and compared their consistency to provide confidence in the findings (*Downing & Bellis, 2009*). However, all samples were opportunistic and not representative at the population level, thus findings cannot be extrapolated. Due to the implementation of the survey-based studies only some were able to produce response rates (*Downing & Bellis, 2009; Downing et al., 2010a*) or non-response rates (*Phillips-Howard et al., 2010a; Hughes et al., 2009*). As with opportunistic samples participant self-selection may have biased the sample. Furthermore, retrospective data collection could be subject to recall bias and responses could be subject to exaggeration or editing.

❖ Sensitivity in sexuality research design

Surveys requesting sensitive information raise the practical issues of how to enable participation in private. *Downing & Bellis 2009* included questions on age of menarche for females. Although this is a fairly routine question some young girls may find it personal. However as this study was also aimed at males it focused on strong features of sexual development such as spermarche as used in other studies measuring pubertal onset in males retrospectively (*Edgardh, 2002*). To enable greater privacy and confidence to respond this study allowed participants to take the questionnaire away to complete in private and return in the post or to complete online whenever they chose. Other studies (*Phillips-Howard et al., 2010a; Bellis et al., 2010*) requested participating young people to complete sensitive questionnaires in a classroom setting; this approach may have caused some to withdraw, however it was necessary due to the study having participants under age 16 years and needing parental consent and informed assent. For those studies either completed in a classroom or setting requiring immediate questionnaire completion (e.g. airport) peer pressure or other influences could have affected responses.

❖ Gender

Research challenges to including males in sexual and reproductive health research have been highlighted (*Saewyc, 2012*). It is the case that often sexual health policies focus primarily on female sexual and reproductive health (e.g. teenage pregnancy) and the UK HPV vaccination programme is one example of females targeted in prevention

interventions (*Brabin et al., 2008*). However, all research studies in this submission have included both male and female populations as a matter of course. The only challenge to this approach came in the development of the retrospective study examining pubertal timing and public health behaviour (*Downing & Bellis, 2009*). Few retrospective studies of pubertal timing have included males and females, those that have included reasonable samples of both have typically been national studies (*Bogaert et al., 2002; Bogaert, 2005; Michaud et al., 2006*); the majority tend focus on one or the other, with a greater number examining females where the biological markers are clearer (*Kim & Smith, 1998; Moffitt et al., 1992; Parent et al., 2003*). Prospective studies are most likely to include both as they are able to use measurements such as Tanner staging, where five stages of pubertal development are defined and determined through medical observation and examination (e.g. *Herman-Giddens, 2006*). UK-focused retrospective studies examining pubertal timing prior to the publication of *Downing & Bellis 2009* focused solely on female populations (*Whincup et al., 2001*).

❖ **Socioeconomic status**

A further challenge to incorporating demographic variables into research was in the inclusion of socioeconomic status. In public health research the social determinants of health such as socioeconomic status are key to understanding patterns of behaviour and health outcomes, thus it is crucial to the questionnaire design, analysis and interpretation of findings. Where socioeconomic status has been shown in studies it is defined from participant postcode data. In some studies socioeconomic status has not been possible to include due to the nature of the datasets (e.g. service data (*Downing et al., 2010b*) poor reporting from respondents (*Phillips-Howard et al., 2010a*) or the applicability to the analysis (e.g. cross national analysis; *Downing et al., 2010a*). However, the retrospective approach applied in *Downing & Bellis 2009* meant that the calculation of socioeconomic status at puberty was the key information required. In this instance current postcode data would only have shown current socioeconomic status of participants instead of that at the time of pubertal onset. This was addressed by collecting data on parental occupation and cross-matching it to nationally defined classifications in order to determine childhood socioeconomic status of participants. Often in similar studies this social determinant has been overlooked, retrospective studies rarely examined socioeconomic status at pubertal onset and tended to collect current socioeconomic status (*Bogaert, 2005*), with only a few studies examining young people near the time of pubertal onset including socioeconomic status data (*Moffitt et al., 1992*). However, childhood and adolescent

socioeconomic status can be influential on adult health and socioeconomic status at sensitive times such as puberty may have a greater accumulative effect on later health (Cohen *et al.*, 2010). No UK studies published at the time of this study had examined pubertal onset and its relation with health behaviours and socioeconomic status.

❖ **Limitations**

Although one of the aims of the included work has been to examine key factors affecting young people's health behaviour, the variables included in the questionnaire design have been in no way exhaustive. Often the work featuring in this submission was the result of locally or regionally commissioned work. As such it is often evaluative, focused on assessing a need, or aimed at monitoring behavioural trends in specific groups of young people. With the nature of this work questionnaires are designed to be completed quickly and easily in various settings like schools or airports. Due to this pragmatic approach questions were not included that could have added further dimensions to the findings. Many key factors related to physical, emotional, social and psychological wellbeing have not featured e.g. religious affiliation, sexuality, questions to determine the context in which sexual behaviour has taken place (e.g. in relationship or not/ how long a relationship). Such questions are very often absent from research with young people; their inclusion would greatly add context to the data collected and although they are beyond the scope of the work submitted here, future research would benefit from adding these elements.

5. Overall Summary – contribution to knowledge

Research and reviews included in this submission have illustrated my original contribution to knowledge of adolescent and young people's sexual health behaviour; the associated social determinants of health such as deprivation; and evidence of effective prevention approaches to support the development of further interventions, evaluations and research. This work primarily contributed to the current body of knowledge relating to:

❖ 5.1 Early measures of sexual behaviour in young UK adolescents

National, routine datasets primarily examine the outcomes of early adolescent sexual behaviour via under 18 teenage conception rates, under 16 teenage conception rates (*ONS, 2014a*) and national STI data (*PHE, 2013*). In these national public health intelligence datasets the lowest age category findings are presented by are <18 years, <16 years and <15 years respectively. Furthermore, young people's health behaviour patterns at the lower-level sample age range for many UK studies, including the NATSAL and HBSC studies, are limited to 16 and 15 years respectively (*Mercer et al., 2013; Currie et al. eds., 2012*). Research or evaluations of education programmes focusing on adolescent's sexual behaviours tend to measure sexual intercourse and contraceptive behaviours (*Currie et al. eds. 2012; Parkes et al., 2011*). However, for young adolescents in particular, measuring sexual intercourse or number of sexual partners may not always be appropriate or helpful in determining young people's sexual involvement or the programme effectiveness of an intervention. Pre-cursors to sexual intercourse (e.g. oral sex) can be very valuable measurements and can indicate, for example, adolescents' likelihood of initiating sexual intercourse and their risk of teenage pregnancy (*Song & Halpern-Felsher, 2011; Reese et al., 2013*). More benign measurements of sexual behaviour (e.g. kissing, touching) show young people's emerging sexuality and may indicate the need for education programmes at or prior to the onset of this behaviour. Furthermore, sexual information-seeking behaviours, such as seeking pornographic materials, may suggest sexual curiosity and the need for greater knowledge of sexual issues.

Following systematic analyses of evidence to prevent STIs and poor sexual health outcomes *Downing et al., 2006a; 2011* both highlighted the need for UK studies to examine precursors to early sexual initiation in younger adolescent groups, such as use of pornographic material or engagement in kissing, petting or oral sex behaviours.

Submitted studies used school-based populations (*Bellis et al., 2010; Phillips-Howard et al., 2010a*) to measure a spectrum of early sexual behaviours from kissing to sexual intercourse. Data were collected from participants aged 13 and 14 in *Phillips-Howard et al., 2010a; 2010b* providing details of all sexual behaviours and condom use in both oral and penetrative sex, wellbeing indicators and alcohol use which enabled analysis of early associations between alcohol and sexual activity (see section 5.3 for more details).

Data for this study were originally collected from a school-based PSHE evaluation study. The submitted systematic review of PSHE intervention aged 5-19 years examined how well interventions affected sexual attitudes, behaviour and related modifying factors. This provided good evidence on which to base future UK research whilst clearly showing the lack of UK studies in this area. The A PAUSE, RIPPLE and SHARE programs were the evaluated sexual intervention programmes of note in the UK (*Henderson et al., 2007; Mellanby et al., 1995; 2001; Stephenson et al., 2004; 2008; Tucker et al., 2007; Wight et al., 2002*). Their samples included young people aged 13/14 to 15/16 years. In comparison *Phillips-Howard et al., 2010a; 2010b* provided data on sexual behaviour of those age 13 to 14, and was also able to provide insight into the effectiveness of school-based interventions on sexual knowledge and sexual information seeking behaviours of those from age 11 to 14 providing valuable information on education programme effectiveness and sexual education needs of young children where there is a dearth of UK-based data.

❖ **5.2 Early identifiers of, and contributing factors for, early exploratory behaviour in UK pre-adolescents and adolescents.**

Research examining young people's health behaviour aim to identify current behaviour, emerging trends, and characteristics associated with differing behaviours to help inform public health interventions. Typically demographic details and social factors are considered crucial however young people's decision-making and behaviour can also be influenced by physical factors such as their level of physical maturity and stage of cognitive development (*Steinberg 2005 & 2008*). Work in this submission has focused on puberty and associated factors and presented it in a public health context.

Bellis et al., 2006 initially examined the topic of puberty considering its potential contribution to young people's negative health behaviours. It also pointed to the successes of public health initiatives to improve nutrition as a contributor towards the

increasing gap between physical and social puberty and the difficulty facing early maturing youth as they try to define their role in society. A lack of UK data examining pubertal timing and key health behaviours identified in this editorial instigated further research. Although previous studies had examined relationships between risk behaviours and early puberty (e.g. alcohol use, *Costello et al., 2007*; Substance use, *Westling et al., 2008*; Sexual behaviour, *Goodson et al., 1997*; anti-social behaviour, *Felson & Haynie, 2002*) relatively little had been done in the UK. *Downing & Bellis 2009* measured pubertal timing and examined multiple behaviours (e.g. sexual health, smoking, drug use, alcohol use and anti-social behaviour) rather than focusing on one. Findings showed associations between early puberty and early initiation of sexual behaviour, alcohol consumption, drug use, smoking, and in males, aggressive behaviour. Findings from these publications raised puberty as an area for consideration in intervention design and formative research work, which is consistent with the recommendations from evidence reviews that highlight the role of puberty in research design and evaluation (*Downing et al., 2006*). In *Downing et al., 2006* authors recommended that future school-based evaluations ought to extend the length of programme delivery to measure the impact of important transitional events such as puberty. Recommendations went further to suggest that future evaluations ought to incorporate pubertal staging and that formative research with young people ought to focus not only on pubertal development but on cognitive functioning, future-time perspective and decision-making. This would ensure a greater insight into the effectiveness of interventions at different pubertal stages as well as at different demographic and socioeconomic statuses. Findings from *Downing et al., 2006*; *Bellis et al., 2006* and *Downing & Bellis 2009* contributed to the write up of the PSHE reviews (*Jones et al., 2009a, 2009b, 2010*) and as such informed the development of the NICE draft guidance which recommends ‘developmentally appropriate’ education and the provision of education focusing on physical and emotional development (*NICE, 2010*). Without an understanding of young people’s pubertal stage this would not be fully possible to achieve.

Considering the relationship between early onset puberty in girls (i.e. prior to age 13 years), peri-puberty in boys (i.e. prior to age 11 years) and greater engagement with early risk-taking behaviours; using pubertal timing as an early indicator could, at the very least, identify young people with education and health information needs over and above their less developed, same-age peers. This could provide one method of targeting information, services and education programmes.

Downing & Bellis 2009 also examined the relationship between original findings showed possible association between weight prior to pubertal onset, socioeconomic status and sexual, substance use and anti-social behaviours. Previous studies have shown the relationship between weight and early onset puberty (*Anderson et al., 2003; Anderson & Must, 2005; Bralić et al., 2012*) and pubertal timing has previously been linked to childhood nutrition (*Gluckman & Hanson, 2006*), yet the relationship had not previously been examined in the UK nor weight considered in a public health context as affecting adolescent sexual health and other risk behaviours. It also highlighted the relationship between poor socioeconomic status and early onset puberty (<13 girls; <11 boys). Considering that those in poorer socioeconomic circumstances have higher levels of obesity we hypothesise that weight may link socioeconomic status and early puberty. When considering early indicators for potential risk-behaviours being overweight could be an early indicator that can be addressed even prior to the onset of puberty. It also represents an early indicator which, once addressed, may alter the trajectory of young people's development. With further investigation to establish the relationship between socioeconomic status, weight and pubertal timing it is possible that interventions to promote healthy weight in young pre-adolescents could reduce negative effects from a deprived upbringing and increase the age young people initiate exploratory behaviours throughout their lives.

❖ 5.3 Developing associations between alcohol and sexual behaviours

Evidence suggests that young people's likelihood of engaging in multiple risk-behaviours increases with the initiation of one (*Gunning et al., 2010*). Furthermore, the number of risk-behaviours and the proportion reporting them increase with age as young people develop, become curious and experiment with new things (*Caffray & Schneider, 2000; Gunning et al., 2010*). At age 11 years 12% of young people report ever drinking alcohol this increases to 74% in 15 year olds. Alcohol use represents the most common early risk behaviour in the English adolescents. The average age of sexual initiation in the UK is 17, dropping to 16 in those aged 16-24 surveyed (*Mercer et al., 2013*). However we have limited knowledge of the relationship between the two behaviours in young adolescents. Evidence has found associations between alcohol use and early sexual initiation (*Choquet & Manfredi, 1992; Fergusson & Lynsky, 1996*), multiple partners (*Cook et al., 2002; Ramisetti-Mikler et al., 2004; Wells et al., 2004*) and pregnancy (*Miller et al., 2007*) however similar studies on UK populations are limited.

UK evidence has indicated a relationship between alcohol use and teenage pregnancy (*Bellis et al., 2009*), and alcohol use and sexually transmitted infections (*Cook et al., 2011*). Work the author submitted has contributed to the development of the hypothesis that early use of alcohol in UK adolescents may contribute to early onset of sexual activity and negative sexual experiences. *Downing & Bellis 2009* showed that those experiencing earlier puberty disproportionately reported early alcohol use, early sexual initiation and unprotected sex. Although no relationship can be established from this cross-sectional data these findings could be representative of the associations seen in international studies. Building on these data *Phillips-Howard et al., 2010a* showed a linear increase in the proportion of young people aged 11-14 years reporting alcohol use, with 32% of those aged 11 report use increasing to 65.8% in 14 year olds. Around 50% of both girls and boys aged 13-14 reported any sexual activity (including sexual intercourse). Both risk behaviours were significantly associated with school wellbeing. Findings showed incremental associations between level of alcohol use and sexual activity in children and is the first to show such strong associations. Further surveys of young school children aged 15-16 years (*Bellis et al., 2010*) showed an association between unsupervised, frequent or heavy drinking and regretted sex. Although peer pressure played some part in the behaviour, personal income and reports of boredom were much more highly associated with unsupervised consumption. Engaging with sports and other hobbies offered some protection against aspects of negative alcohol behaviours, however parental alcohol provision was a more protective measure. Such data show important established social norms in adolescents and highlight those factors that offer protection against negative outcomes. Original findings in *Bellis et al., 2010* showed that even relatively modest levels of consumption in young people can have harmful effects. Findings were considered alongside the CMO's guidance (*Donaldson, 2009*) and supported the CMO's view that an alcohol free childhood (prior to age 16) would be beneficial to children.

Overall levels of adolescent sexual activity were not examined in *Bellis et al., 2010* thus further conclusions relating to alcohol consumption and sex could not be drawn. However, *Hughes et al., 2009* and *Downing et al., 2010a* examined young people's behaviour abroad, and found that alcohol use was strongly correlated with an increased number of sexual partners and unprotected sex. Findings were also strongly associated with higher levels of both drinking and number of sexual partners in the year prior to travelling. However, the amplification of alcohol consumption and sexual activity during

travelling periods was likely to increase the levels of alcohol consumption, unprotected sex and therefore the possible negative consequences associated. This highlights the importance of early education prior to increases in young people's independence and autonomy when behaviours are more firmly established, when peer and other influences far outweigh those of schools or parents, and when behaviours are more difficult to effect. Greater understanding of the relationship between alcohol use and sex informs the development of guidance for education programmes which offer a greater joined up approach to addressing multiple risk behaviours. Work on systematic reviews for NICE guidance on PSHE emphasizing sex and relationship and alcohol education indicated that few programmes targeted both behaviours and that limited UK evidence of effectiveness existed but that international social interventions aimed at children (age 5-11 years) (*Jones et al., 2009a*) had positive impact on their attachment to school, academic performance, problem behaviours and social skills which had some long-term effects on alcohol and sexual behaviours.

❖ **5.4 Effective prevention and highlighting effective components**

Young people's health behaviours do not occur in isolation, they are both a product of and a response to their social environment. Young people are more likely to suffer negative health outcomes and engage with negative behaviours if they experience for example, a deprived upbringing. Often patterns of negative behaviour are repeated from generation to generation, however during their lives young people also accumulate protective factors that can neutralise harmful influences and help to break this recurring cycle.

The role of parents in shaping low risk-taking, resilient children cannot be underestimated. At an early age in young people's lives parents are the most important role models. Positive protective influences from parents are gained from having a two parent family with high parental education attainment and income; positive parental support and connectedness and sufficient parental monitoring; important positive role modelling from parents in the shape of conservative attitudes toward sex before marriage and positive attitudes towards contraception have shown to have protective measures against negative sexual outcomes for adolescents (*Kirby, 2001*). Studies in this submission have added to the current understanding of parental contribution to prevention by examining the roles of parents, family structure and wellbeing aspects of parental communication and home life.

Stressors in childhood, such as parents separating or divorcing have been associated with early onset puberty, as has the lack of a biological father presence (*Parent et al., 2003*). Considering the increasing trend for non-traditional families *Downing & Bellis 2009* examined family structure in relation to pubertal timing. No association between pubertal timing and family structure was shown however considering the recent UK divorce rates (*ONS, 2014b*) a prospective study on UK children may reveal a connection. Although not examining family structure, *Phillips-Howard et al., 2010a* showed that those young people reporting a happy home life and an ability to talk to their parents had the lowest odds of ever drinking alcohol. The same relationship with sexual activity was not seen yet this may highlight the importance of examining a broader set of related factors such as parental unity which has been highlighted as more important than some aspects of parental communication or monitoring in preventing sexual risk-behaviours (*Lenciauskiene & Zaborskis, 2008*).

Parental supervision examined in *Bellis et al., 2010* indicated that those young people whose parents provided alcohol for them and allowed them to consume it at home under their supervision were less likely to report negative effects of alcohol such as regretted sex. Although parental monitoring may help to reduce harms in existing behaviour does not prevent the onset of behaviours nor the physical harms associated with alcohol consumption (i.e. on brain development). Better connectedness with parents and improved communication may influence young people's attitudes and contribute to delayed onset of some risk behaviours (*Kirby, 2001*). In the United Kingdom, although young people (aged 16–19 years) report school as their primary sexual health information source (*MacDowall et al., 2006*), parents are reported to be girls' preferred information source and boy's second preference (33.3% compared with 34.4% preferring school) (*MacDowall et al., 2006*). Similar views have been expressed by young people in other European countries (*Lesta et al., 2008*). Parental difficulty discussing sensitive topics and limited parental communication skills have been cited as contributing factors to this disparity. However, some parental training interventions designed to improve parent's communication skills have reported positive findings (*Ramm & Coleman, 2008*). *Phillips-Howard et al., 2010b* surveyed a younger cohort (ages 11-14 years) and found that 70% of girls and 50% of boys could talk to their mothers about sexual matters compared to 17.6% and 47.1% respectively who could talk to their fathers. When *Downing et al., 2006a and 2011* closely examined prevention evidence relating to

communication programmes to address sexual health findings showed that there was a need for UK studies. In *Downing et al., 2011* parent and family-based programmes showed success at improving communication, however in the main this did not translate to adolescent behaviour change. Preliminary evidence suggests that effectiveness was greater in those studies aiming to affect multiple risk behaviours yet more evidence is needed to improve our understanding before firm conclusions can be drawn. These conclusions fed into NICE's draft guidance which strongly encourages a joined up approach to education that involves both schools and parents (*NICE, 2010*).

❖ **5.5 The effectiveness of clinic-based interventions in young people's sexual health**

Prevention programmes aim to avert or reduce harms associated with risk-behaviours through preventing or delaying the onset of behaviours until a time when individuals are cognitively mature enough to consider the consequences. However, when risk-behaviours, such as unprotected sex, are occurring and concerns are predominantly for the prevention of negative health outcomes, such as sexually transmitted infections, then interventions move from non-clinical to clinical. Testing and treatment services offer the first line in preventing onward transmission, repeat transmission and long-term complications, they also undertaking partner notification to prevent asymptomatic infections remaining undiagnosed. *Downing et al., 2009 and 2010b* represented the first detailed examination of the community-based test results compared to GUM retest results. The evaluation used pre-existing community and hospital data to determine, in a real-world setting with real-world medical practices, whether the NAATS test was effective at identifying gonorrhoea in the target group aged 15-24 years. Previous studies examining the effectiveness of the NAATS test for both Chlamydia and gonorrhoea used a clinical trial methodology to test result accuracy (*Lavelle et al., 2006; Lavelle, 2008*). *Downing et al., 2009 and 2010b* found that marginalized groups can be effectively reached and treated via community sexual health service testing and referral. However clinical practices were found to contribute to a low positive predictive value and findings highlighted possible future methods to improve successful treatment in these groups, through test of cure. Among others aspects, embarrassment regarding their infection and sexual health examinations can be barriers to young people accessing services (*Tilson et al., 2004*). Therefore, it is important that services are flexible to adolescent's needs and adapt wherever possible to their preferences (e.g. non-invasive; *Tebb et al., 2004*) whilst still achieving the desired clinical outcomes.

❖ 5.6 Contribution to the debate on the sexualisation of young people

The sexualisation of youth is not a new topic of investigation, yet a greater focus has been given to it in recent years since the government commissioned report (*Papadopoulos, 2010*). However, the approach taken in this report and similar public discussions on the topic fail to adequately and appropriately address the issue. Much of the discussions and cited studies on the topic focus predominantly upon findings relating to children's exposure to sexual content in television (*Chandra et al., 2008*), music (*Martino et al. 2006*), the internet (*Livingstone et al., 2005*) consumer products (*APA, 2004*) and the problems this may cause. Studies have shown that young people perceive sexual content as wide-spread in various media (*Haggstrom-Nordin et al. 2006*) and whilst there is limited data relating to young people's access to sexual material in the UK *Phillips-Howard et al., 2010b* revealed that young people reported accessing pornography as a source of sexual information. It therefore supports the view that current technology allows children increasing and easy access to constant multi-media input which may be concerning in today's society. Furthermore exposure to sexual content has been held responsible for contributing to an increase in cynical views of relationships and trust, the deterioration of emotional attachment and potentially an increase in exploitation, sexual coercion and sexual callousness (*Zillman, 2000*). Sexual media, especially pornographic content, has previously been associated with an increase in sexual debut and non-coital sexual practices (*Haggstrom-Nordin et al. 2005*). However, whilst there is value in examining the social influences on young people's sexual knowledge and attitudes responses to it the connotations in recent references to the sexualisation debate appear to consider media and marketing responsible for the attitudes, values and behaviour of young people. However, there is no firm evidence on which to base a causal relationship and it is over simplistic to attribute young people's changing sexual attitudes, values and norms to such influences. The focus has primarily been on rules to prevent young people's exposure to media rather than on a rigorous and realistic approach to educating young people about sexuality development, addressing emotional and cognitive development, and helping them make sense of their role in our society, including the roles they need to negotiate with their peers and families as well as their natural and growing curiosities to experiment and seek out information. Research often hesitates to view young people's sexuality development as a normal aspect of their life course experience which prevents it from endeavouring to investigate the nuances within it (*Halpern, 2010*). Thus our understanding of which groups may seek out or be

susceptible to sexual messages and information is limited. However, *Bellis et al., 2006* and *Downing & Bellis 2009* show that a significant proportion of young people are maturing early, as such they may be naturally more prone to engage with sexual information, media and merchandise due to their stage of development and interest in sex. This examination of pubertal timing and behaviour showed associations between early puberty and earlier than average sexual intercourse. These findings contribute a valid explanation, worthy of further investigation, for the apparent correlation between seeking out sexual information and greater engagement with coital and non-coital sex. Examination of a regional sample of school-aged children (*Phillips-Howard et al., 2010a*) indicated that sexual behaviour in its broadest sense (from kissing to sexual intercourse) begins much earlier for a small proportion of children. Therefore the need for sexuality education, self-efficacy, and emotional support may be great in this population. Increasing engagement in experimental behaviour may place early developing youth in a vulnerable position and evidence shows that they are more likely to associate with older, deviant peers (*Westling et al., 2008*). Without adequate, comprehensive PSHE provision young people are more likely to seek out sources of information (e.g. pornography) that do not fully address their information needs and may potentially provide inadequate information that can contribute to ill-informed views of sex and relationships. Previous research has found that young people see pornographic sources of information as knowledge (*Haggstrom-Nordin et al. 2006*). *Phillips-Howard et al., 2010b* found that young people sought out information in this way and the proportion of youth accessing pornographic information sources increased with age in those 11-14 years. Consequences of ill-informed sexual behaviour can be psychological issues relating to sex too early and regret. It is possible that some may rely on alcohol or drugs as a coping mechanism or to facilitate sexual encounters where self-efficacy and negotiation skills are lacking. Where alcohol is used in excess negative sexual outcomes could be compounded (*Bellis et al., 2010*).

Calls have been made to consider a public debate on reducing the age of consent thereby de-stigmatising sexual behaviour and ensuring access to sexual health services (*FPH, 2013*). The age of first sex in the UK is 17 for heterosexuals with data showing a reduction to age 16 (IQR 15-18 years) in the youngest participants surveyed (*Mercer et al., 2013*), thus it may indicate a need to adjust to changing norms in youth sexual behaviours and development. This could prompt further emphasis on sexuality education in schools at an early age, however, whilst adolescent's role in society remains undefined

reducing the age of sexual consent would necessitate a re-examination of other consent regulation such as, for example, age of marriage. Instead of engendering adolescents with a greater sense of independence, autonomy and responsibility, this action would likely be futile at a time when adolescents are in reality prevented from acting with greater independence overall in their lives prior to age 16 (e.g. living independently, working full time).

Since the focus in policy remains firmly on adolescent education findings here suggest that future approaches ought to focus upon developing effective sexuality education. Evidence from systematic review data (*Jones et al., 2009a; 2009b; 2010*), NICE draft guidance (*NICE, 2010*) and studies examining sexuality development (*Tolman & McClelland, 2011*) suggest that future education programmes ought to target young people and their parents prior to the onset of puberty, address emotional and cognitive development and media literacy as well as increasing knowledge, communication, negotiation skills and self-efficacy.

❖ **Future research**

The need is greater than ever to research younger populations and gather details of current and emerging normative sexual behaviours and associated physical, emotional and psychosocial factors. Research outcomes and measurement have slowly changed over recent years. The emphasis has moved from definitive sexual behaviours (i.e. protected/unprotected sexual intercourse) to include modifying factors affecting behaviours (e.g. self-efficacy). It is important to continue to monitor related data (e.g. STI data, service use data, contraception data, teenage pregnancy data) as this highlights the changing epidemiology of potentially negative associated outcomes. It also provides a means of informing future research design. Research topics need to move away from solely questioning sexual debut to more diverse questioning around various sexual practices and methods of condom use. Additionally, quantitative research needs to move beyond the obvious questions to include more detail about the context in which behaviours occur. Longitudinal studies are also required to add greater understanding about adolescent social relationships, sexual development and the impact of both throughout the life course (*Umberson et al., 2010*). Further qualitative research with young people is needed to help identify emerging attitudes and behaviours. The research questions and design in some of the submitted studies were influenced in part by qualitative work conducted previously with young people (e.g. oral sex behaviours and

uses of pornographic sources of material). However, there is a greater need for qualitative research with a wide variety of groups of young people, including very young adolescents, to gather data on emerging sexual trends and developing norms. More ought to be done in line with the emphasis on patient participation to involve young people whether they are service users or not in the design and development of research studies. This approach could potentially produce rewarding research that communicates more effectively with young people through, for example, the appearance of research tools, the language used, the flow of questioning and the method of delivery.

❖ **Conclusion**

My research focus on young people's sexuality development emerged from early evidence briefing work conducted for NICE; the gaps in addressing levels of cognitive and pubertal development of participants was deemed important particularly when considering the effectiveness of sexual health intervention programmes. Young people must be physically and cognitively developed enough and experienced enough to perceive sexual behaviours as relevant to them. If it is not relevant to their current behaviour they need to perceive it as potentially relevant to them in the near future or they will not see themselves as susceptible to the risks associated with it, nor engage with related health promotion messages. However, in order to deliver those messages effectively to young people it is necessary to understand the current and emerging sexual attitudes and norms within different populations and age groups so that health promotion messages can be developed and targeted more effectively.

Studies submitted here have shown some of the emerging relationships between early puberty and early exploratory behaviours; the inter-relationship between behaviours such as early drinking and early sexual behaviour; and the need for further UK-based interventions to educate young people and address their needs. Yet, little is currently being done to educate young people about healthy sexual relationships and choices. We understand that through exposure to sexualised media, through earlier puberty and through changing social norm for earlier sexual behaviour, that young people's needs for information and education are greater than ever before. Community interventions such as the RU Clear programme are effective at identifying and managing STI infections in young people, however the goal is to prevent infections and other negative outcomes from sexual behaviour. Unfortunately, as seen in the review evidence presented, there is a dearth of UK-based evidence of effective sexual health intervention programmes. In a

recent annual report by the Chief Medical Officer the importance of addressing adolescent health and implementing health promoting interventions during adolescence was highlighted (*Davies, 2013*). Prevention during adolescence represents a second and potentially, final opportunity to positively affect the health attitudes and behaviours of young people which will be instilled in them life-long. Submitted studies have aimed to contribute to the understanding and development of knowledge and interventions for young people. Without effective interventions to educate and support young people as they develop their sexuality it is possible that we will see greater levels of uninformed risk-behaviour in the future.

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Appendix

Lead authored articles

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9. Jones L, Bates G, Downing J, Sumnall H, Bellis MA. *A review of the effectiveness and cost-effectiveness of alcohol and sex and relationship education for all children and young people aged 5-19 years in community settings*. London: NICE, 2010. Review - <http://www.nice.org.uk/guidance/index.jsp?action=download&o=47613>

Evidence Tables - <http://www.nice.org.uk/guidance/index.jsp?action=download&o=47614>

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10. Jones L, Bates G, Downing J, Sumnall H, Bellis MA. *A review of the effectiveness and cost-effectiveness of personal, social and health education in secondary school and further education focusing on sex and relationships and alcohol education for young people aged 11 to 19 years*. London: NICE, 2009b.

Review - <http://www.nice.org.uk/guidance/index.jsp?action=download&o=47609>

Evidence Tables - <http://www.nice.org.uk/guidance/index.jsp?action=download&o=47610>

Forest plots (alcohol) -

<http://www.nice.org.uk/guidance/index.jsp?action=download&o=47611>

Forest plots (SRE) -

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