The development and pilot evaluation of an interactive computer-based program to help inform young people's contraceptive decision making: MyWay

This work is presented by Rebecca Sophia French as a thesis for the degree of Doctor of Philosophy in Sexually Transmitted Diseases at the Division of Biomedical Science

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Declaration

I, Rebecca Sophia French, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.
Abstract

This thesis focuses on the development of a contraceptive decision-analysis tool *(My Way)* for young people and exploratory research to examine its application in a clinical setting. Decision analysis is essentially a method for breaking down complex problems or questions into manageable components, and then combining them quantitatively and logically to show the best course of action. The rationale for this work is that taking young people's current lifestyles and values into account when selecting and initiating a contraceptive method will increase user effectiveness and acceptability of the method, which will ultimately lead to a reduction in unplanned pregnancies and other negative outcomes, such as acquisition of sexually transmitted infections (STIs).

*My Way* works by combining the best available scientific evidence on the outcomes and effectiveness of available contraceptive options, such as probability of pregnancy while on the pill, with quantitative assessments of the user's own preferences and values, such as how they feel about the consequences of pregnancy. The under-lying decision-analysis model provides a ranking and rating of the various available options for each user, based on both scientific evidence and their own personal values. Best available evidence on each contraceptive method was collected on the following attributes (i.e. characteristics):

- effectiveness in preventing pregnancy,
- risk of STI acquisition,
- other outcomes and factors affecting attractiveness including possible side effects (e.g. weight gain) and 'bother' considerations (e.g. having to go to a health service to obtain a contraceptive method).

For the pilot study young people (10 men and 15 women) aged 13-21 years were to be introduced to the program during their consultation with the contraceptive nurse or doctor in a young people's sexual health clinic. The aim of the pilot was to assess the feasibility, acceptability and potential effectiveness of the *My Way* program.
Contents

Abstract 3

Acknowledgements 11

List of Abbreviations 13

Chapter 1. Background and overview 15

1.1. Introduction 15
1.2. The sexual health of young people in the UK 16
1.3. Contraceptive behaviour amongst young people 17
1.4. Does intervening work? 20
1.5. Contraceptive decision-making 21
1.6. Need for interventions that address decision-making 28
1.7. Aims of this work 29
1.8. Key points 31

Chapter 2. Decision-making theory and decision aids: rationale

for MyWay 33

2.1. Introduction 33
2.2. Decision-making theory 35
2.3. Decision aids 44
2.4. Rationale for MyWay 58
2.5. Key points 59
Chapter 3. Establishing the setting for the intervention: Where do young people go to get contraceptive advice and supplies?

3.1. Introduction 61
3.2. The Teenage Pregnancy Strategy Evaluation tracking survey and methods 62
3.3. Young people’s knowledge and use of contraceptive services 65
3.4. How do the TPSE findings compare with other data sources and surveys? 69
3.5. Identifying the setting for the MyWay intervention 73
3.6. Conclusions 76
3.7. Key points 76

Chapter 4. The development of the MyWay program 78

4.1. Introduction 78
4.2. Collection of the epidemiological evidence 79
4.3. Site structure and design 103
4.4. How the program works 106
4.5. Key points 111

Chapter 5. The pilot 113

5.1. Introduction 113
5.2. Pilot methods 113
5.3. Results 122
5.4. Key points 143
Table 3.2. Use of different contraceptives services for supplies by gender

Table 3.3. Characteristics of respondents reporting having accessed different types of service for supplies

Table 4.1. Probability of unintended pregnancy in one year by contraceptive method: typical and perfect use

Table 4.2. Using Natsal-2000 survey data to estimate median episodes of vaginal intercourse, with lower and upper quartiles presented

Table 4.3. Calculated risk ratio for acquisition of chlamydial infection for each contraceptive method

Table 4.4. Ratings matrix: Probability of ‘friends’ having defined characteristics

Table 4.5. How a score is calculated

Table 5.1. Research methods used to collect process and outcome data

Table 5.2. Demographic characteristics of MyWay Users

Table 5.3. Sexual Behavioural Characteristics of MyWay Users

Table 5.4. Participant contraceptive choices pre and post-intervention and MyWay recommended choice

Table 5.5. Young people’s selected contraceptive options in the MyWay program

Table 5.6. Selection of attributes and their average weighting

Table 5.7. Summary of strengths and weaknesses identified through the pilot

Table 7.1. Gant chart for proposed phase II study

Table A2.1. Probability of STI acquisition in one year: Men

Table A2.2. Probability of STI acquisition in one year: Women

Table A2.3. Probability of acquiring gonorrhoea in one year by contraceptive Method
Table A2.4. Probability of acquiring chlamydial infection in one year by contraceptive method

Table A2.5. Probability of acquiring syphilis in one year by contraceptive method

Table A2.6. Probability of acquiring trichomoniasis in one year by contraceptive method

Table A2.7. Probability of acquiring herpes simplex virus in one year by contraceptive method

Table A2.8. Probability of acquiring HPV in one year by contraceptive method

Table A2.9. Probability of acquiring HIV in one year by contraceptive method

A2.10. Probability of side effects whilst using different contraceptive methods:

Weight gain

A2.11. Probability of side effects whilst using different contraceptive methods:

Heavy/ prolonged bleeding

A2.12. Probability of side effects whilst using different contraceptive methods: No periods

A2.13. Probability of side effects whilst using different contraceptive methods:

Nausea

A2.14. Probability of side effects whilst using different contraceptive methods:

Acne

A2.15. Probability of side effects whilst using different contraceptive methods: Thrombosis

A2.16. Bother factor probabilities
Figures

Figure 1.1 Framework for the development and evaluation of complex interventions and illustration of thesis structure 30

Figure 2.1. A decision tree examining treatment and outcome options in women with microinvasive cancer of the cervix 53

Figure 2.2. WHO Decision-Making Tool: Client Sheet 56

Figure 2.3. WHO Decision-Making Tool: Provider Sheet 57

Figure 3.1 Knowledge of contraceptive services and contraceptive availability 67

Figure 4.1. Probability of acquiring chlamydial infection if partner infected 87

Figure 4.2. Probability of acquiring herpes simplex virus type 2 if partner infected 88

Figure 4.3. MyWay logo image 103

Figure 4.4. Weighting box for Boyfriend/Girlfriend Demo 108

Figure 4.5. Example of assigned weights for Boyfriend/Girlfriend Demo 108

Figure 4.6. Score Bar Chart 109

Figure 4.7. Score breakdown 109

Figure 5.1. Young person’s pathway through the MyWay intervention and the research process 117

Figure 5.2. Michael’s selected attributes and weights 130

Figure 5.3. Michael’s score bar chart 131

Figure 5.4. Anna’s selected attributes and weights 133

Figure 5.5. Anna’s score bar chart 134

Figure 7.1. Pupil pathway through the MyWay intervention and the research process 171
Boxes

Box 2.1. Decision analysis glossary box 35
Box 2.2. Basic decision-making processes 38
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**List of Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>BMRB</td>
<td>British Market Research Bureau</td>
</tr>
<tr>
<td>CAPI</td>
<td>Computer-assisted personal interview</td>
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<tr>
<td>CI</td>
<td>Confidence interval</td>
</tr>
<tr>
<td>CONSORT</td>
<td>Consolidated Standards of Reporting Trials</td>
</tr>
<tr>
<td>DMPA</td>
<td>Depot Medroxyprogesterone Acetate</td>
</tr>
<tr>
<td>FAQs</td>
<td>Frequently asked questions</td>
</tr>
<tr>
<td>FFPRHC</td>
<td>Faculty of Family Planning and Reproductive Health Care</td>
</tr>
<tr>
<td>fpa</td>
<td>Family Planning Association</td>
</tr>
<tr>
<td>GP</td>
<td>General Practitioner</td>
</tr>
<tr>
<td>GUM</td>
<td>Genitourinary medicine</td>
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<tr>
<td>HIV</td>
<td>Human immunodeficiency virus</td>
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<tr>
<td>HPA</td>
<td>Health Protection Agency</td>
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<tr>
<td>HSV-2</td>
<td>Herpes simplex virus Type 2</td>
</tr>
<tr>
<td>HPV</td>
<td>Human papilloma virus</td>
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<tr>
<td>ID</td>
<td>Identification</td>
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<tr>
<td>IP</td>
<td>Internet protocol</td>
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<tr>
<td>IT</td>
<td>Information technology</td>
</tr>
<tr>
<td>IUD</td>
<td>Intrauterine device</td>
</tr>
<tr>
<td>IUS</td>
<td>Intrauterine system</td>
</tr>
<tr>
<td>LARC</td>
<td>Long-acting reversible contraception</td>
</tr>
<tr>
<td>LCR</td>
<td>Ligase chain reaction</td>
</tr>
<tr>
<td>LSHTM</td>
<td>London School of Hygiene and Tropical Medicine</td>
</tr>
<tr>
<td>MRC</td>
<td>Medical Research Council</td>
</tr>
<tr>
<td>Natsal 2000</td>
<td>National survey of sexual attitudes and lifestyles (second survey conducted in 2000)</td>
</tr>
<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>NICE</td>
<td>National Institute for Health and Clinical Excellence</td>
</tr>
<tr>
<td>NoCTeN</td>
<td>North Central Thames Primary Care Research Network</td>
</tr>
<tr>
<td>OR</td>
<td>Odds ratio</td>
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<tr>
<td>PSHE</td>
<td>Personal Social and Health Education</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised controlled trial</td>
</tr>
<tr>
<td>RIPPLE</td>
<td>Randomised Intervention trial of Peer (Pupil)-Led sex Education</td>
</tr>
<tr>
<td>RR</td>
<td>Relative risk</td>
</tr>
<tr>
<td>SEU</td>
<td>Subjective expected utility</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>---------</td>
<td>--------------------------------------------------</td>
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<tr>
<td>SHARE</td>
<td>Sexual Health and Relationships programme</td>
</tr>
<tr>
<td>SRE</td>
<td>Sex and relationship education</td>
</tr>
<tr>
<td>STD</td>
<td>Sexually transmitted disease</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually transmitted infection</td>
</tr>
<tr>
<td>TPSE</td>
<td>Teenage Pregnancy Strategy Evaluation</td>
</tr>
<tr>
<td>UCL</td>
<td>University College London</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>UKMEC</td>
<td>UK Medical Eligibility Criteria for Contraceptive Use</td>
</tr>
<tr>
<td>US</td>
<td>United States</td>
</tr>
<tr>
<td>VTE</td>
<td>Venous thromboembolism</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Chapter 1. Background and overview

1.1. Introduction
My interest in young people's contraceptive decision making first developed after conducting an assessment of young people's contraceptive needs, with an evaluation of sexual health service provision in two London local authorities in 2000.(1) Part of this work involved observing consultations with health care workers and conducting in-depth interviews with young people. One key finding was that the context of young people's contraceptive use and factors that influence their choices were often not explored at the time they were seeking contraceptive supplies. One interview that made a great impression on me was with a young woman who had been prescribed the oral contraceptive pill. This was a method that most of her friends were using and she found the method acceptable. Over the course of the interview she explained that she did not want her parents to know that she was sexually active, and therefore did not keep her pills at home. Her boyfriend kept her pills and they generally met two or three times a week, when she would take her pills. She had no idea that she was putting herself at risk of pregnancy.

These findings led to discussions with my supervisor (Dr. Frances Cowan) about the appropriateness of using decision analysis to help young people understand their contraceptive choices. The rationale was that if young people's current lifestyles and values were taken into account when selecting and initiating a contraceptive method, user effectiveness and acceptability of the method would increase. This thesis focuses on the development of a contraceptive decision-analysis tool for young people and exploratory research to examine its application in a clinical setting.

The objectives of this introductory chapter are:

- to describe the sexual health of young people in the United Kingdom (UK)
- to examine young people’s contraceptive behaviour
- to summarise what we have learnt from behavioural interventions and policy programmes that aim to increase young people’s use of contraception
- to investigate the research literature to understand what we know about the factors that influence young people’s contraceptive decision-making
1.2. The sexual health of young people in the UK

The sexual and reproductive health of young people living in the UK remains a public health concern. In response to the UK having the highest teenage pregnancy rate in Western Europe and a desire to tackle social exclusion related to teenage pregnancy, the Teenage Pregnancy Strategy was launched in 1999. (2) In 1998, there were 46.6 pregnancies per 1000 young women aged 15-17 years. By 2004, this rate had declined to 41.5 per 1000 young women. (3) Although this represents an annual decline of 2% since the introduction of the Strategy, the decline is below that needed to meet the government's target of a 50% reduction by 2010. (4) Concerns about the high rates of sexually transmitted infections (STIs) amongst young people led to them being identified as a target group in the National Strategy for Sexual Health and HIV. (5) The diagnosis of STIs amongst young people, particularly chlamydial infection, is rising. (6) In 2006, young women aged 16-24 years accounted for 74% of all chlamydial infection and 70% of all gonorrhoea diagnoses identified in females attending genitourinary medicine (GUM) clinics. Young men aged 16-24 years contributed to 56% of chlamydial infection and 39% of gonorrhoea diagnosed amongst male attendees.

Young people who commence sexual activity at an early age and those with multiple partners put themselves at risk of poor sexual health. Data from the second National Survey of Sexual Attitudes and Lifestyles (Natsal 2000) show that the median age at first sexual intercourse for both men and women is 16 years. (7) Twenty-six percent of young women and 30% of young men aged 16-19 years report first sexual intercourse before the age of 16 years. The median age of first sexual intercourse has been fairly stable over the last decade, but prior to this time a sharp decline in age at first intercourse was observed. For example, the median age at first intercourse for women born in the 1930s was 21 years and for men was 20 years. (8) Stuart-Smith, in a BMJ editorial, argued that while age at first intercourse had decreased, the duration of adolescence in Western cultures had increased. (9) This phenomenon has led to a widening gap between sexual and social maturity. Wellings and colleagues looked at sexual competence at first intercourse amongst Natsal 2000 respondents. (7) Four criteria were used to measure sexual competence: regret, autonomy, willingness and contraceptive use at first intercourse. The data suggest greater sexual competence amongst young men in comparison to young women, 56% of young men aged 16-19 years compared to 43% of young women the same age. Natsal 2000 also provides data...
on young people’s number of sexual partners. The median number of lifetime partners for men and women aged between 16-24 years is three; however 20% of men and 15% of women in this age group report 10 or more lifetime partners and similar proportions report concurrent sexual partnerships in the last year. (10)

Changes in sexual risk behaviour, which are consistent with the increases in STIs, can be explained by demographic shifts in the UK. For example, the gap between first sexual intercourse and first birth has widened, resulting in greater numbers of heterosexual partnerships in this period. The mean age at first birth for women born in the late 1970s is projected to be over 29 years. (11) This represents an increase of over five years when compared to mean age of 23.8 years at first birth of women born in the early 1940s. This rise is, in part, explained by greater uptake of education, particularly amongst women, and increased availability of effective contraception. (12) However, despite the trend towards older age at first birth, under 18 year old pregnancy rates have remained fairly constant in recent decades. Teenage pregnancy does have negative social, economic and health consequences to both mother and child, as well as costs to the wider community. (13-17) Economic analyses have suggested that compared with use of no contraception, contraceptive methods of all types result in substantial cost savings, in both financial and health terms. (18) Improving young people’s access to and use of contraception is one way of reducing the consequences of unplanned pregnancy and other poor sexual health outcomes.

1.3. Contraceptive behaviour amongst young people

1.3.1. Contraceptive users and non-users

Contraceptive use is generally high amongst women in the UK. (19) Over half of all women aged 16-17 years are using at least one method of contraception. The majority of young people (over 90%) report using contraception, predominantly the condom, at first intercourse. (7)

Reasons sexually experienced women give for contraceptive non-use include that they are trying to get pregnant or are pregnant, they currently have no heterosexual partner, or they believe themselves to be infertile. (20) The Omnibus Survey (a national population survey carried out at regular intervals by the Office for National Statistics [ONS]) found that the reason the 43% of young women aged between 16-17 years who
were not using contraception gave for their non-use was that they were not in a heterosexual relationship.(19)

1.3.2. Use of different contraceptive methods

Table 1.1 shows that the male condom and the contraceptive pill are the methods most commonly used by young women. These data refer to all women, including those not yet sexually active. If the denominator includes only sexually active women, the prevalence of condom use is highest amongst 16-17 year olds. Condom users (both male and female) have been found to be significantly younger than non-users,(21) although those young people that report first sexual intercourse at 13 years or below are less likely to report condom use compared to those having first sexual intercourse at an older age.(22) Pill use peaks amongst women aged between 18 and 24 years. Use of long-acting reversible contraceptive (LARC) methods is low in the UK, despite the fact that these are very effective methods of pregnancy prevention.

Table 1.1. Current use of contraception by age (adapted from O'Sullivan et al, 2005(19))

<table>
<thead>
<tr>
<th>Women aged 16-49</th>
<th>Great Britain:2004/05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current use of contraception</td>
<td>Age</td>
</tr>
<tr>
<td></td>
<td>16-17</td>
</tr>
<tr>
<td>Pill</td>
<td>%</td>
</tr>
<tr>
<td>Minipill</td>
<td>4</td>
</tr>
<tr>
<td>Combined pill</td>
<td>21</td>
</tr>
<tr>
<td>Male condom</td>
<td>33</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>-</td>
</tr>
<tr>
<td>Intrauterine device</td>
<td>2</td>
</tr>
<tr>
<td>Injection/implant</td>
<td>3</td>
</tr>
<tr>
<td>Safe period/rhythm method/Persona</td>
<td>-</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>2</td>
</tr>
<tr>
<td>Hormonal intrauterine system</td>
<td>-</td>
</tr>
<tr>
<td>Female condom</td>
<td>1</td>
</tr>
<tr>
<td>Emergency contraception</td>
<td>3</td>
</tr>
<tr>
<td>Total using at least one method</td>
<td>57</td>
</tr>
</tbody>
</table>

Notes:
1 Includes women who did not know the type of pill used
2 Includes surgical procedures and sterilisation

1.3.3. Contraceptive failure

Women can be ‘at risk’ of pregnancy for nearly 40 years, around half of their average lifespan.(23) Unfortunately, data on the proportion of conceptions leading to abortion amongst young people show they are putting themselves at disproportionate risk of
'unwanted' pregnancy. The proportion of under 18 year-old conceptions leading to abortion is 45.6%, compared to 22.4% for all women. The proportion of those opting for abortion peaks at 14 years, at 63.0% of all conceptions within this age group, and declines with age until 35 years, where it increases. Studies have suggested that half of young people become pregnant because they were not using any contraception. If withdrawal and cycle awareness are included as contraceptive methods this proportion increases even more. The main reason that young people give for not using contraception is the belief that they cannot get pregnant. It has been shown that young women often inaccurately report fertile times of the month. However, this still leaves a large proportion of young people who become pregnant whilst using contraception, predominantly the pill and condoms. A paper by Churchill and colleagues examined the extent to which pregnant teenagers had utilised general practice prior to their pregnancy. They examined 240 cases of women registered in their practice who had experienced a pregnancy before their 20th birthday. The majority of these women (93%) had consulted a health professional within the practice in the last year, 71% had discussed contraception with their general practitioner (GP) in the last year and half (50%) had been prescribed the pill. It therefore appears that health professionals are missing opportunities for discussing contraception with young women, but even when contraception has been addressed, information and the supply of contraception does not necessarily impact on behaviour.

The fact that an individual reports contraceptive use does not necessarily mean that they are protecting themselves from pregnancy. Contraceptive failure is highest amongst young women. Young women are more likely to be sporadic contraceptive users in comparison to older women. Table 1.1. illustrates the methods young people are most likely to use are the condom and the pill, methods reliant on consistent and correct use. Qualitative interviews with 30 women aged 16-25 years on factors influencing use and non-use of emergency contraception showed how some women felt less vulnerable to pregnancy and were less stringent in their contraceptive use as they became established on a method. The failure rate for the pill at one-year is 0.3% if it has been used consistently and correctly (described as method failure or perfect-use failure). With typical use, which takes account of user error, such as missed pills, this increases to 8% at one year of use. It has been suggested that imperfect use of the pill can lead to failure rates of up to 30%. A US study which monitored 103 pill users aged 18 years and above over a three-month
period, found nearly two-thirds reported missed pills and around half missed enough doses to put themselves at risk of pregnancy.(35;36) Users appear to be at greatest risk of pregnancy around the time when the method is initiated and just prior to discontinuation.(37) It has been reported that one in five women seeking an abortion had changed their contraceptive method in the last month.(25) Over half of women using the pill or injectables will discontinue these methods within one year of use.(38)

1.4. Does intervening work?

In recent decades, trends in teenage conception rates appear to have coincided with periods in which there have been numerous influences, both environmental and intervention-related, on teenage conception. Dramatic falls in the rate of under 18 pregnancies were observed in the early to mid-1970s. This was a decade of extensive public health activity surrounding the issue of teenage sexual activity and fertility, including the greater availability of free contraception irrespective of marital status.(39;40) However, while rates in other Western European countries continued to decline, the momentum was not sustained in the UK.(41) The high rates in the UK have been attributed to deprivation and poverty, and widespread inequalities.(2) Yet it has been suggested that other factors more amenable to public health intervention may also contribute to the lower rates in other European countries, including a more positive attitude towards sex education and better access to sexual health services.(42) The Netherlands has seen an increase in its teenage pregnancy rates coinciding with some dismantling of sex education and sexual health services.(41) There is some evidence that young people compare unfavourably with peers from other Western European countries in terms of use of contraception at first sex and use at the last episode of intercourse.(43) There are grounds, therefore, for believing that interventions based on education and provision of services are likely to impact upon the prevalence of teenage pregnancy.

However, reviews of targeted behavioural interventions aiming to reduce poor sexual health outcomes amongst young people, including unplanned pregnancy, have made for some depressing reading.(44-47) There have been some benefits identified, such as increased knowledge about sexual health or positive evaluation, but interventions to date appear to have had little sustained impact on sexual behaviour, contraceptive use or rates of unintended pregnancy.
A criticism of both prevention programmes and the research literature is that although there may be the common aim in the reduction of both teenage pregnancy and STIs, they do not address the differences in young people's risk perceptions or behaviours related to these outcomes. So, for example, a couple in an established sexual relationship may decide to stop using condoms and use a more effective contraceptive method to protect against pregnancy, but this action may increase their risk of acquiring an STI. Some have even argued that greater provision of designated young people's contraceptive services is associated with an increase in teenage STI rates because more young people will be sexually active. There are also problems generalising such programmes and interventions across different populations; populations that are going to be defined by different demographic characteristics and cultural influences. Individual beliefs and values surrounding sexual health are varied. As discussed in greater detail in the following section, contraceptive use and adherence is influenced by a multitude of factors, including age, relationship status, attitude towards pregnancy, partner's attitude, side effects, and choice of services. Therefore, designing an intervention to change sexual behaviour without taking account of young people's individual values is going to be challenging, at the very least.

1.5. Contraceptive decision-making

Studies conducted over the last decade illustrate that the factors influencing young people's decision-making around the avoidance of pregnancy and the use of contraceptive methods are complex. Two broad themes emerge from examining the literature: values relating to sexual behaviour and pregnancy, and contraceptive method attributes.

1.5.1. Values

In the context of this work, values are defined as principles or standards that shape behaviour. These values can be influenced at both individual and external levels. The research evidence on how values can affect young people's contraceptive decision-making is outlined below.

Research suggests young people do make independent decisions on the contraceptive method of choice based on their individual circumstances and beliefs. One of the
strongest factors that appears to be related to the contraceptive method of ‘choice’ is the type and stage of sexual relationships.(51-55) Condoms are more commonly used in casual relationships or in the early stages of subsequently more stable relationships. As a relationship progresses and frequency of sexual intercourse increases, condom use declines and use of other contraceptive methods, most commonly the pill, increases.(56;57) However, over the course of a relationship, consistency in method use declines. A number of reasons have been given as explanation for these shifts. Young people’s perceived risk of STI acquisition is lower with regular sexual partners than with casual partners.(53) It has been suggested that women stop using condoms to obtain more intimacy and greater trust with their partner.(58;59) Wanting to give sexual pleasure to your partner and avoidance of embarrassment and conflict, and thus maintaining the sexual relationship, are also reasons women have given for not using condoms with their regular partner.(27) Young women who describe relationships as ‘romantic’ are less likely to report always using condoms compared to those who do not.(58) Young women are more likely to describe relationships as romantic in comparison to young men. For men, other individual characteristics not directly related to the sexual partnership, such as higher cognitive test scores and greater religiosity, and family influences are more associated with contraceptive use and consistency. Other relationship dynamics that have been found to positively influence contraceptive use include partner’s approval of contraception, communication about contraception prior to first sexual intercourse, previous sexual experience, and having a relationship with someone of similar age and level of education.(31;54;60-63)

Most young people report that they want to be a parent at some point, but those with specific educational and career aspirations usually wish to defer pregnancy until after these goals have been established and they have enjoyed the freedom of their youth. Free and colleagues found that women’s attitudes to risk were linked to their aspirations.(27) Women with higher aspirations were more risk adverse with respects to pregnancy and tended to choose the pill over the condom. Those disengaged from education are more likely to be at risk of pregnancy. For example, non-use of contraception is higher amongst those who are truant from school compared to those who are not.(45;64)

Contraceptive use is associated with having a positive sexual identity, responsibility, and being ‘sensible’. (27) Young people with poor negotiation skills and lower
emotional well-being are less likely to use contraception. The extent to which other risk behaviours, such as alcohol use, have on contraceptive use is inconclusive. A study of 4,255 French students aged 11-20 years selected randomly from 42 secondary schools found an association between smoking, alcohol and illicit drug use and sexually activity, but no association was found between these 'risks' and contraceptive use.

Cultural influences, such as ethnic background and religious beliefs, have been shown to have an influence on contraceptive behaviour. For example, in the UK contraceptive use amongst Black-Caribbean people is significantly lower than use amongst the general population. Young Asian men and women are significantly more likely than non-Asians to report religious beliefs as the reason for their sexual abstinence.

Decisions around contraceptive use may be based on the individual's own moral codes. However, the extent to which young people feel attached to structures within their community, such as schools, ethnic groups and religious organisations, has been shown to influence their sexual risk-taking including contraceptive use.

Contraceptive use amongst young people, as well as early initiation of sexual activity and teenage pregnancy, are directly associated with factors relating to family structure and dynamics. For example, young people are more likely to use contraception when they report greater connection with their parents, there is greater family supervision and parents have a positive view of contraception. Contraceptive use is lower amongst young people of single-parent families and amongst young people from families with low levels of education and income.

Extra-familial circumstances also influence the values young people place on contraceptive use. For example, employment and income levels at a community level affect adolescent risk-taking, including contraceptive use. Within communities where the social costs of teenage pregnancy are perceived to be less, the young person's motivation or desire to use contraception may not be so great. As well as being influenced by the wider social norms within a community, young people's contraceptive use is influenced by peer norms. Relatively sexually inexperienced young people tend to use what their friends are using. Sheeran and colleagues found that young people's condom use was strongly influenced by believing their friends and peer group were using condoms. This association was even stronger
than the influence of their partner’s attitude towards condoms and perceived social pressures. The lack of the subdermal implant’s popularity has in part been explained by the fact that it is not accepted and used by peers, and is viewed as a method used by ‘other’ older women or ‘other’ younger women who are considered promiscuous. (71)

Change of social norms and greater awareness of STIs over the last decade years has coincided with an increase in overall condom use. (19) However, knowledge by itself may not be a marker for safer sex practices. (72;73) A Swedish study by Andersson-Ellstrom that followed up 16-year old women in a teen clinic for two years showed young women with more sexual partners had better knowledge, but were also more likely to have had unprotected sexual intercourse. (72) Nor does having knowledge always lead to young people seeking contraceptive advice and supplies when required. Sørensen and colleagues found that despite younger women having greater knowledge of emergency contraception, users of emergency contraception tended to be older. (74) In their study of 217 women aged 16-45 years seeking abortion in Denmark, they found that 64% had known of their pregnancy risk. Forty-two percent of this group had sufficient knowledge of emergency contraception, and of these only 15% had used it. However, ‘knowledge’ may not necessarily always have positive effects. For example, pregnancy rates have been shown to increase after media attention to pill scares. (8) Therefore how information is delivered and linked to appropriate support are going to affect contraceptive decisions.

The attitudes and behaviours of health care providers can also influence the contraceptive options young people are presented with. (54) Unfortunately, young people are often not presented with sufficient information to make choices and are not always confident enough to ask health professionals for further details. (75;76) Young women report less satisfaction with the amount of information received from health care workers in comparison to older women. (77) Young men receive even less information about contraception, and are far less likely to access sexual health services than women. (21) The fact that they perceive services to be female-orientated and not relevant to their needs are reasons given for not attending services

1.5.2. Attributes

An attribute is a characteristic or outcome of a contraceptive option. These can be desired characteristics or outcomes as well as undesired. Attributes can be broadly
divided into three categories: 1) method effectiveness in preventing pregnancy, STIs or both; 2) side effects and health risk; and 3) situational factors.

The desired attributes of a contraceptive method will be influenced by young people’s values, including past experience and (correct or incorrect) knowledge. As described above, past experience may not only be influenced at the individual level, but also by the experiences of partners, peers and family.

Effectiveness

Free and colleagues have suggested young people’s perceptions of their vulnerability ‘are partly socially mediated’. (27) It has been argued that health providers need to address young people’s perception of risk to pregnancy and STIs whilst taking account of current circumstances, such as relationship status. (21) A key factor in the decision to use contraception will be that the chosen method used is effective in preventing pregnancy. Yet, there appears to be very little literature of young people’s perception of the pregnancy risk for different contraceptive methods, and how this judgement affects their decision-making. Studies of young women’s use of emergency contraception illustrate that those who use the condom and experience problems, such as a condom split, are more likely to use emergency contraception than those who have had a pill ‘problem’, such as missed pills. (78;79) Pill problems are perceived to be lower risk. Past contraceptive failure has been shown to influence subsequent use of methods. (54) Women’s motivation to use contraception is greater than men’s as they are more affected by the consequences of pregnancy. (80) However, as discussed in Section 1.3.2., use of the more effective contraceptive methods (i.e. LARC) is low amongst young women in the UK. Young people may be willing to trade-off relatively less pregnancy protection offered by condoms and oral contraceptives in comparison to LARC for other attributes, such as convenience or not having to have an invasive procedure.

Perceived risk of chlamydial infection and gonorrhoea has been found to be low amongst young people, even amongst those engaging in more high-risk behaviour. (81) However, Sheeran and colleagues, in their meta-analysis of 121 studies to quantify the correlation between psychosocial variables and self-reported condom use, found that young people tended to over-estimate the risk of acquiring human immunodeficiency virus (HIV) infection during unprotected sexual intercourse. (57) Interestingly they
found that perceived susceptibility to HIV infection was only weakly correlated with condom use. Small associations were also found for condom use and greater concern or worry about HIV, and condom use and perceived efficacy of condoms in protecting against HIV infection.

Young people appear to use condoms more so for pregnancy prevention than for the prevention of STIs or HIV infection. However, once young people’s perceived risk of STIs declines, the main driver in their choice of method is greater pregnancy prevention and hence the desire to move to a more effective contraceptive. Most young people use only one contraceptive method, and once young people start using methods other than condoms, condom use declines. The more effective the other contraceptive method is in preventing pregnancy the less likely young people are to use condoms. Sayegh and colleagues conducted a prospective study of 176 14-17 year old women recruited from United States (US) adolescent clinics and found that condom non-use was higher amongst users of the Depot Medroxyprogesterone Acetate (DMPA) injection in comparison with users of oral contraceptives.

Given that when used consistently and correctly the majority of contraceptive methods are highly effective in preventing pregnancy, other attributes often affect user satisfaction. Walsh comments that it is difficult “to value an outcome which is a non-event” (i.e. a hypothetical pregnancy). Therefore individual experiences can focus on the negative, and choices are often made on which contraceptive method is the least worst option in terms of side effects and convenience.

1.5.3. Side effects and health risks
Concerns about side effects and health risks are a major cause for discontinuation, despite the risks of pregnancy being far greater than the risks associated with contraceptive use. Qualitative research has found that women tend to over-estimate the risks of adverse side effects, while underestimating the effectiveness of hormonal contraception. Concerns relating to weight gain, nausea and headaches with pill use are cited as the most common reasons for its discontinuation, while the most common reasons for discontinuation of implants and injectables are changes to bleeding patterns.
Socio-demographic factors can affect how side effects and health risk are perceived. For example, some young women report that one of the benefits of the pill is menstrual regulation and the importance of having a regular menstrual cycle to know that they are not pregnant.\textsuperscript{(27;54)} Therefore methods, such as implants and the hormonal intrauterine system (IUS), where there are higher chances of amenorrhea, may be less acceptable to some younger women. The health risks associated with contraceptive use seem to become more important to women as they become older.\textsuperscript{(54)}

Most women are ignorant of the non-contraceptive benefits associated with different methods, and it appears these benefits have little influence in decision-making. Bryden and Fletcher found that 40\% of 215 female university students they interviewed thought pill users had an increased rather than decreased risk of ovarian cancer.\textsuperscript{(86)} There was no notable difference between pill users and non-users who believed this.

\textbf{1.5.4. Situational factors}

Young people tend to use contraceptive methods they can obtain easily with minimal embarrassment. Condoms are popular because of their wide availability and the fact that they require little planning; this being particularly pertinent to casual relationships.\textsuperscript{(21;22)} Although most young people are aware that condoms are freely available from sexual health clinics,\textsuperscript{(41)} other factors, such as having to travel to a clinic, may outweigh this benefit. There is also the embarrassment of having to ask for condoms. Young men are significantly more likely than young women to report that contraception is expensive, is a hassle to use, involves too much planning and adversely affects sexual pleasure.\textsuperscript{(21)} The main barriers to use of condoms, and other barrier methods, are the interrupted spontaneity of sex, reduced sexual pleasure and intimacy, and the difficulty in using them properly.\textsuperscript{(27;57;77)} There is also concern that one’s partner will be offended by the suggestion of using a condom.

Young people have also described practical barriers to the use of other methods of contraception.\textsuperscript{(75)} A lack of routine can make correct pill use difficult. Home environment, such as living with one’s parents, can present problems with storing contraception. LARC methods overcome some of these barriers. Reasons women give for choosing injectables and implants over the pill are because they do not have to remember to take them each day and the LARC methods have a longer duration of protection.\textsuperscript{(38)} However, there are also situational factors that limit their uptake. One
explanation for the low uptake of LARC is that the invasive procedures involved with these methods are a deterrent. The lack of availability of these methods may also affect choice. For example, general practices, the main contraceptive provider in the UK, are less likely to provide a comprehensive range of contraceptive services and methods than community contraceptive services. An audit undertaken by the Teenage Pregnancy Unit found that while over 90% of general practices provided oral contraceptives and emergency contraception, less than a third provided implants. It is generally easier for GPs to prescribe the pill in comparison to other contraceptive methods, as it is less time consuming, more financially rewarding and does not require any specialist family planning training. Designated young people's services have been found to be less likely to provide a wide variety of contraceptive methods in comparison to mainstream contraceptive services. Therefore, availability may also play a part in young people's decision making. However, it has been argued that even young women who are established on the pill have problems returning to health services for repeat prescriptions, which puts them as risk of pregnancy.

1.6. Need for interventions that address decision-making

There is the assumption that young people have contraceptive choices. However, personal factors that affect decision-making are often not explored when contraceptive advice and supplies are sought. Observations of consultations within sexual health services have shown that young people's lifestyles and the context in which they use (or do not use) contraception are often not discussed. Trussell argues in *The Essentials of Contraception; Efficacy, Safety and Personal Consideration* that contraception is often perceived as a medicine and that the sexual aspects of contraception are sometimes ignored: "it's a long way from the exam room to the bedroom". It should be the potential user who makes the decision on the best method for them based on the importance they attach to method effectiveness and other characteristics. Unfortunately, choice is not usually based on information on the entire range of methods available and attempts to categorise people's contraceptive needs are often too simplistic.

Research into contraceptive acceptability has been criticised because it has not looked at the context of contraceptive use. Contraceptive behaviour is often defined as use and non-use. The use of cross-sectional surveys often means that
information is gathered at a single point in time, for example, current contraceptive use, or for a particular event, such as whether contraception was used at first intercourse. This information does not provide a picture on patterns of method use over time.

Although there is much literature on young people’s sexual risk taking behaviour, there is little understanding of their perception of risk, and how this affects their contraceptive decision-making. Research into the weight young people place on contraceptive attributes, the relative trade-offs they make, either consciously or subconsciously, and how this is affected by socio-demographic characteristics is lacking. In addition, contraceptive use will be dependent on life circumstances and current values, which are certainly not constant. Teenagers are in transition from child to adult. Therefore comparing adolescent sexual health outcomes with those for older age groups is not necessarily useful. Adolescence can be a time of conflicts, such as the moving away from accepting parents’ beliefs and values to norms more determined by peers, and major life events, such as puberty, exams and leaving home. The complex interplay between the individual and their current circumstances, contraceptive method attributes and external factors, such as availability of sexual health services, will contribute to the decision-making process. Again our knowledge of what influences individual decisions over time is limited. The same person may make different choices at different points in their life.

1.7. Aims of this work
The aims of this thesis are to describe the development of a tool (MyWay) which uses decision-analysis to help young people understand their contraceptive choices and to conduct an exploratory pilot to investigate its feasibility, acceptability and potential effectiveness when used in clinical consultations with young people.

The application of the MyWay program within a clinical setting fits the criteria for the development and evaluation of a “complex intervention”. The Medical Research Council (MRC) in their guidebook A Framework for Development of RCTs for Complex Interventions to Improve Health Care, explain that complex interventions “are built up from a number of components, which may act independently and inter-
In relationship to sexual health, complex interventions can range from health promotion activities targeting individuals at risk of STI to the delivery and organisation of sexual health services across primary and secondary care. The MRC describes five phases in the development and evaluation of complex interventions. Figure 1.1. provides the MRC’s schematic representation of these phases and the structure for my thesis.

Figure 1.1 Framework for the development and evaluation of complex interventions and illustration of thesis structure

Source: Adapted from MRC Guidelines

The initial phase is to identify the theoretical basis for the effects that would be expected from the intervention (Chapter 2). In this phase the population and context
should be established (Chapters 1. and 3.). The modelling Phase I stage identifies the components of the intervention and the underlying mechanisms that influence outcomes (Chapter 4 to 6.). Phase II involves the development of the pilot study to inform the main Phase III randomised controlled trial (RCT) (Chapter 7.). Phase IV is the long-term implementation of the intervention and surveillance.

In this work I will:

■ examine the theory behind decision analysis and assess its potential application as a new approach in helping young people understand contraceptive choices (Chapter 2)
■ use national population-based survey data to investigate where young people go for contraceptive advice and supplies to help inform the appropriate setting for an intervention (Chapter 3)
■ describe the development of a computer-based intervention based on the principles of decision analysis, MyWay, to be used by young people in consultations with health care professionals (Chapter 4)
■ determine the feasibility, acceptability and potential effectiveness of the MyWay program when used in a designated young person’s sexual health clinic through a phase I pilot study (Chapter 5)
■ discuss the implications of the phase I study and explore further development and application of the intervention in light of the pilot findings (Chapter 6).
■ propose a phase II study of MyWay’s application in a school setting to inform a definitive RCT (Chapter 7.).

1.8. Key points

• Rates of pregnancy and STIs amongst young people living in the UK continue to be of public health concern.
• Young people’s use of contraceptive methods other than the pill and condom is low.
• Contraceptive failure is highest amongst young women.
• Targeted interventions aiming to reduce poor sexual health outcomes amongst young people have had little sustained impact on sexual behaviour, contraceptive use or rates of unintended pregnancy.
• The values we place on sexual behaviour and pregnancy influence our contraceptive decision-making. These values are shaped by individual circumstances and social norms.

• The desired characteristics (or attributes) of contraceptive methods also affect our decision-making. These attributes include 1) method effectiveness in preventing pregnancy, STIs or both; 2) side effects and health risk and 3) situational factors.

• Health services often adopt a medical approach when delivering contraceptive care. Young people's lifestyles and the context in which they use (or do not use) contraception are often not discussed in consultations.

• The aims of this thesis are to describe the development of a tool (MyWay) which uses decision-analysis to help young people understand their contraceptive choices and to conduct an exploratory pilot to investigate its feasibility, acceptability and potential effectiveness when used in clinical consultations with young people.
Chapter 2. Decision-making theory and decision aids: rationale for *MyWay*

2.1. Introduction

Decision-making is an activity we are all involved in each day; from the more mundane decisions around which toothpaste to purchase to the more exciting, where to go on holiday. Making the ‘wrong’ decision is highly unlikely to have life threatening consequences in either of these examples and the outcomes in both are likely to be fairly reversible. However, there are decisions we all face that have a greater impact or longer term consequences.

Decision theory is not a modern concept. An examination of the early decision theorists provides an understanding how the concept first developed and subsequently evolved. Bernstein in his history of risk, *Against the Gods: The Remarkable Story of Risk*, identifies two key players in decision theory.(93) The first is the French mathematician Blaise Pascal. In the mid-seventeenth century Pascal argued that the value placed on an outcome and the likelihood that the outcome will occur will differ because the consequences of the two are not the same. He illustrated this argument by examining the consequences of believing God exists versus the consequences of believing God does not exist. The decision to be made is whether or not to lead a pious life. If an individual leads a pious life and God exists, Pascal argues there is the possibility of salvation. While if an individual leads a sinful life and God exists there is the risk of eternal damnation. If God does not exist, whether an individual lives a pious or sinful life is immaterial. Based on the value that salvation is a more preferable outcome than damnation, Pascal decides the best course of action is to lead your life assuming that God exists. Around 80 years on, the Swiss mathematician Daniel Bernoulli was to explore the relationship between measurement and gut feeling in terms of human behaviour. This was the first time the idea of utility of an outcome (or object), that is its usefulness, desirability or satisfaction, was formally recognised as determining worth rather than just its price (or probability of occurrence). Bernoulli assumed while individuals may have the same probability of an event happening, people value anticipated risk differently. Therefore, subjective considerations needed to be borne in mind when making decisions that have uncertain outcomes. The concept of utility did not penetrate other disciplines until it was “rediscovered” by the early philosopher-economists. This movement was started by the English philosopher...
Jeremy Bentham in the late eighteenth century. Bentham maintained that what is good is pleasure and what is bad is pain. The goal of human action is to seek pleasure and avoid pain. Therefore the optimum state to be in is where there is a greater balance of pleasure (positive utility) over pain (negative utility).

Following on from the utilitarian philosophers, the research literature on decision-making theory boomed, particularly within the economic and psychology disciplines. Over the last two decades, there has also been increasing interest in applying decision-making theory to clinical decisions. The application of decision theory to health care and management, and the development of tools to help with decision-making has grown alongside the greater focus on evidence-based medicine, the adoption of a more consumer approach to healthcare and increased opportunities offered by advancements in technology. There are also more ‘treatment’ options available to people. This may not only make reaching a decision a more complicated process for the decision-maker, but may also have cost implications for the provider.

The focus of this thesis is the development and application of a computer-based program that uses decision analysis to help young people with their contraceptive choices. The outcomes of interest were very much public health focused, that is if young people are using a contraceptive method that is acceptable to their needs (and values), consistent and correct use of contraceptive methods will increase. More effective use of contraception will result in a reduction of unplanned pregnancies and other negative sexual health outcomes, such as STIs. Therefore it is not my intention to provide a detailed review of decision theory. I use this chapter to provide a broad overview of the theoretical literature and how decision theory forms the basis of the intervention we developed. My objectives in this chapter are:

- to describe how we make decisions.
- to examine the role of decision-making in theoretical models of behaviour change, and to investigate how decision theory can be applied to contraceptive decision-making and interventions.
- to look at the role of decision aids in health care, and more specifically the role of decision analysis.
- to provide the rationale for the development of an intervention that uses decision analysis to help young people with their contraceptive choices.
Terms associated with decision theory and decision analysis are defined as they are introduced in the chapter. A glossary of these terms is also provided below in Box 2.1.

**Box 2.1. Decision analysis glossary box**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attribute</strong></td>
<td>A characteristic or outcome of a contraceptive option (e.g. the possibility of getting pregnant or experiencing a side effect when using a particular contraceptive method).</td>
</tr>
<tr>
<td><strong>Rating</strong></td>
<td>The degree to which a contraceptive option possesses a specified attribute (e.g. the need to visit a clinic to get a coil fitted) or the chance that an option will produce a specified outcome (e.g. the chance of getting pregnant on the pill). The rating of the option on each attribute must be a number in the range of 0 to 1.</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>The relative desirability or undesirability attached to an attribute or outcome. The weight given to each selected attribute must be a number in the range of 0 to 1.</td>
</tr>
<tr>
<td><strong>Score (or utility)</strong></td>
<td>A summary measure of how well an option performs in relation to the other selected options, given the evidence reflected in the ratings of the options on the selected attributes, and the weightings of those attributes by the user. The score is calculated by combining these ratings and weightings.</td>
</tr>
</tbody>
</table>

### 2.2. Decision-making theory

#### 2.2.1. How do we make decisions?

The Oxford English dictionary defines a decision as “a conclusion or resolution reached after consideration”.(96) Decision-making is the process by which we weigh up the pros and cons of different choices available to us, and then decide which choice is the most attractive. This is not necessarily a conscious process. By definition an action that requires a decision to be made must have at least two possible courses of action and there is some degree of uncertainty.

Bekker and colleagues in their review of decision aids describe three broad decision-making theories: 1) normative theory, 2) description theory, and 3) prescriptive theory.(97) Normative theory assumes that the decision-maker has all the information required to make a decision, including knowledge of all the alternative options, and is aware of their values and preferences with regard each of these options. The decision is rational and is based on the most benefits and the least costs to the decision-maker. This forms the basis of subjective expected utility (SEU) theory. Most psychological
models of decision-making behaviour have the roots in SEU theory. In 1954, Ward Edwards wrote a seminal review drawing together the psychological and economic literature around decision-making. (98) In this paper he describes how in order to be rational the decision maker must first be able to weakly order preferences and second, choices must be made to maximise something, where there is some risk involved in the choice it is assumed to want to maximise expected utility. He explains that “expected value of a bet is found by multiplying the value of each possible outcome by its probability of occurrence and summing these products across all possible outcomes. In symbols:

\[
EU = p_1s_1 + p_2s_2 + \ldots + p_ns_n
\]

where \( p \) stands for probability, \( s \) stands for the value of an outcome, and \( p_1 + p_2 + \ldots + p_n = 1 \).” (p.391). The driver behind the economic theory of decision-making was to improve prediction of decisions, rather than to facilitate individual decision-making.

The descriptive theory of decision-making describes the process of how people make decisions. Unlike normative theory, descriptive theory assumes that decision-making is a more ‘simplistic’ process and is rarely rational. (97) The American psychologist Valerie Reyna argues that rather than individual decision-making being a logical computation of information, where precision is seen as the ‘hallmark of good reasoning’, it is a qualitative process, which she refers to as ‘fuzzy-tracing’. She provides the example of how most people chose a definite win of $100, 000 over a gamble of a one-third chance of winning £300,000 (and a two-thirds chance of winning nothing). (99) This is based on the qualitative assessment that it is better to win something rather than nothing. It is not a decision based on the weighing up of probabilities, outcomes and expected values. Gist-based reasoning is valuable when data on the probability of an outcome are not known.

Finally, there is prescriptive theory, which believes that we are generally poor decision-makers, and we need assistance with our decision-making as heuristic ways of thinking can lead to misperceptions of risk and poor decisions. (97) With prescriptive theory, decision aids are developed and include individual user values and beliefs. These aids are described in more detail later in the chapter (section 2.5.4.)
There are a number of reasons that can explain poor decision-making (and therefore illustrate the need for decision aids).

1. **Lack of knowledge**: People may have insufficient knowledge or information available to them to make an informed decision.\(^{(100)}\) For example, it will be difficult for a potential contraceptive user to find out what the probability is of acquiring chlamydial infection when using condoms in comparison to when using the cap. It has also been argued that too much information can also confuse our decision-making.\(^{(97)}\)

2. **Failure to retrieve known information in context**: Sometimes people need cues to help them retrieve knowledge or on how best to implement the knowledge they already have.\(^{(99)}\)

3. **Difficulties in estimating and interpreting levels of risk**: In the main, people tend to be ‘optimistic’.\(^{(101)}\) This is not just limited to patients or the general public. A US study that asked health professionals to estimate an adolescent girl’s risks after unprotected sexual intercourse found that the professionals tended to under-estimate the risk of pregnancy and infection compared to the evidence available from studies. They also tended to over-estimate the effectiveness of condoms.\(^{(99)}\) Professionals with greater knowledge were more likely to give more accurate estimates. The authors argue that knowledge deficits are the simplest source of risk estimation errors. While we generally tend to under-estimate risk, small risks are often over-estimated (such as risk from terrorism or airplane crashes), because of denominator neglect. Presentation of risk also affects which course of action is more likely to taken.\(^{(101)}\) For example, people tend to choose options that involve taking a risk when the potential outcome is presented as a loss, such as there is a 2/3 chance that 100 people will die, but will avoid risks when the outcomes are described as gains, such as a chance that 1 in 3 people will be saved.

4. **Difficulties in understanding different measurements of risk**: Many different measurements are used to express risk, even within the same health areas. Unsurprisingly, some people find the different ways of expressing contraceptive effectiveness difficult to interpret and trading off different dimensions challenging.\(^{(102)}\)

5. **Difficulties in interpreting overlapping categories of risk**: For example, amongst the general population the risk of acquiring human papilloma virus (HPV) is fairly high, while the risk of HIV acquisition is small. If you asked
someone what there risk of STI acquisition is, which would include both of these infections, the risk would have to be high.(99)

6. **Difficulties in understanding the lack of precision around the estimates of risk:** For example, understanding that the risk of $x$ is not $y$, but $y +/- z$.

Bekker and colleagues conclude that informed decision-making probably involves a combination of all three theories described above.(97) They describe their definition of informed decision-making as a form of compromise, “an informed decision is one where a reasoned choice is made by a reasoned individual, using relevant information about the advantages and disadvantages of all the possible courses of action, in accord with the individual’s beliefs.” (p.1) Box 2.2. illustrates the broad range of decision-making processes. While we all use instinct, intuition and verbal reasoning (‘taking into account the pros and cons’) everyday to make decisions about which course of action to take, the use of decision analysis is somewhat alien (as the quote in Box 2.2. suggests).

**Box 2.2. Basic decision-making processes**

<table>
<thead>
<tr>
<th>Instinct</th>
</tr>
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<tbody>
<tr>
<td>“I couldn’t help myself.”</td>
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<tr>
<td>“I acted without thinking.”</td>
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<table>
<thead>
<tr>
<th>Intuition</th>
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</thead>
<tbody>
<tr>
<td>“I simply felt I could trust him/her.”</td>
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<table>
<thead>
<tr>
<th>Verbal reasoning</th>
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<tbody>
<tr>
<td>“I took into account my friend’s experiences.”</td>
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<tr>
<td>“I considered the pros and cons.”</td>
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</table>

<table>
<thead>
<tr>
<th>Decision analysis</th>
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</thead>
<tbody>
<tr>
<td>“I assessed the probabilities and utilities for the outcomes of each course of action and maximised expected net benefit.”</td>
</tr>
</tbody>
</table>

The literature comparing the differences in how adolescents and adults make decisions suggest that decision-making is a learnt process.(101) Children and adolescents are more likely to quantify risk and benefit trade-offs than adults. Adults, on the other hand, are more likely to make decisions in a more qualitative manner and this explains
how we move towards making more intuitive decisions as we become more efficient in our decision-making with experience.

Reyna and Farley are critical of models of deliberative decision-making for use with adolescents that result in behavioural intentions and planned behaviour as these models fail to take account of how much of their risk-taking is “spontaneous, reactive and impulsive”.(103) It is difficult for young people to anticipate future goals or outcomes associated with current decision-making. The perceived benefits of behaviour, such as the pleasure of sexual activity, may outweigh the perceived risks or long-term consequences. Interestingly, few studies focus on the potential benefits of risky behaviour amongst adolescents.(104) Young people continue to take risks when they “get away with it”,(103) such as those who continue to have unprotected sex when they have managed to avoid pregnancy or STI acquisition in the past. This may be because they do not know how to interpret the evidence; for example they may not understand that STIs can be asymptomatic or that young women are more fertile at some times than others. Reyna and Farley comment that much of adolescent risk-taking could be seen as rational, given the information and experience they use to inform their decisions and behaviour.(103) They maintain that providing young people with rational reasoning skills will not be sufficient to reduce unhealthy risk-taking behaviour.

The context in which we make decisions can affect the decision process and the outcome. This will include the type of decision to be made, the seriousness and consequences of the outcome, familiarity with the decision, the level of certainty, where the decision is being made, and who the recipient is.(97) There is still little understanding of the demographic and social influences on decision-making.(105)

2.2.2. Decision-making and models of behaviour change

Theories of behaviour change identify factors that affect our behaviour.(106) The theories identify cognitions (beliefs, attitudes and intentions) and, sometimes, skills that influence or explain behaviour. It is assumed that cognitions and skills can be changed to reach a better outcome, such as improved health. Theories of behaviour change are therefore used to both develop and evaluate behavioural interventions.
Decisional balance, the weighing up of the perceived costs and benefits of a given behaviour, is a crucial component of most theories of behavioural change. Reyna and Farley explain how these models incorporate “mechanisms to explain how people actually make decisions (a descriptive focus) and, to varying degrees, implications of these mechanisms for improving decision making (a prescriptive focus)” (p.16).(103) The Health Belief Model, for example, focuses on the role of attitude in the decision-making process, including the perceived susceptibility and severity of an outcome associated with a target behaviour, and the relative gains and losses associated with that behaviour.(107) The Theoretical Model for Change identifies five stages of change: pre-contemplation, contemplation, ready for action, action and maintenance.(108) The perceived costs and benefits associated with a behaviour can change as an individual progresses through each of these stages.(109) Another widely used model of behaviour change is the Theory of Reasoned Action (or Theory of Planned Behaviour).(110) In this model it is proposed that intentions are the best predictors of future behaviour. Intentions are influenced by 1) an individual’s attitude or beliefs towards a behaviour, including judgment on the probability or improbability that a given behaviour will lead to certain consequences and 2) the subjective norm, that is what an individual feels other people expect them to do or the desire to do what other people feel they should do. However, examination of the effectiveness of sexual behavioural interventions shows that while these interventions may have a positive effect on people’s intentions, such as the intention to use condoms and oral contraceptives, there is very little evidence of their effect on actual behaviour.(27) Many prevention programmes are based on the belief that knowledge of the negative consequences will deter risk-taking behaviour. Parson and colleagues examined the perceived risks and benefits, behavioural intentions and reported involvement in 18 risk-taking behaviours over a three-month period amongst US college students.(104) Behaviours were identified as low (such as taking prescription drugs) to high-risk (such as having sex without a condom). The authors found the perceived benefits to the individual were more predictive of involvement in risk taking behaviours than the perceived risks.

Models, such as the Theory of Planned Behaviour, assume that people make decisions based on the information they have accumulated, and the decision is therefore rational.(110;111) This adoption of a rational approach has been criticised as it assumes that by providing people with information and correcting misconceptions that
any ‘rational’ person will be able to change their behaviour in the ‘desired’
direction.(100) However, this is not necessarily the case, for example, increased
knowledge of how HIV is transmitted does not necessarily equate with the adoption of
safer sex practices. Perceived invulnerability, dependence on others and positive
reasons for non-rational behaviour can act as ‘impediments to rationality’.

In reality those involved in the development and application of behavioural
interventions appear to adopt more than one theoretical approach. A review of
behavioural interventions aiming to reduce STIs, HIV and pregnancy amongst
adolescents found that interventions were based on a combination of theories rather
than a single theoretical model of behaviour change.(112) As explored in Chapter 1
(see 1.5.), the influences on contraceptive use and adherence are complex. Our
understanding of how people weigh up the costs and benefits of different contraceptive
methods (or even use of no method) and the effect this process has on subsequent
behaviour is still limited. This limited understanding of the decision-making process
has been cited as one of the reasons we have not developed effective interventions that
reduce unplanned pregnancy and the spread of STIs.(113) There can also be problems
generalising behavioural interventions across different populations; populations that
are going to be defined by different demographic characteristics and cultural
influences. Individual beliefs and values surrounding sexual health vary enormously.

2.2.3. Application of Decision Theory to Contraceptive Decision-Making
Contraceptive decision-making is a complex process. An individual has to decide
whether or not to have sexual intercourse, and if yes, whether to continue, whether to
use contraception and then what method to use.(114) There are also decisions to be
made around the consequences of sexual activity. These can be biological
consequences, such as if they or their partner become pregnant would they opt to
continue with the pregnancy or have an abortion, or social and emotional
consequences, such as maintaining a relationship by agreeing to have sex. Deptula and
colleagues looked at young people’s sexual behaviour using a cost and benefit
approach.(109) They found that young people who have not yet had sex report more
costs and less benefits compared to those who are already sexually active. Amongst
those who were sexually active, young men are more likely to report greater benefits
associated with sexual activity in comparison to young women.
Using the Health Belief Model and the Theory of Planned Behaviour as frameworks, predictors for decisions around sexual activity and contraceptive use would be:

1) consideration of costs and benefits of contraceptive behaviour;
2) assessment of the risks, such as unplanned pregnancy or STI acquisition;
3) perceived norms towards contraceptive use and sexual health outcomes, such as teenage pregnancy, held by significant others, such as family, peers and partners;
4) willingness of young people to conform to wishes of significant others; and
5) self-efficacy around contraceptive use, such as confidence in putting on a condom or accessing a health service to obtain contraceptive supplies.

The reason an individual chooses a particular contraceptive method is not usually based on a rational act of weighing up its pros and cons. Young people often have insufficient knowledge to make an informed decision and are unaware of or have not thought through the consequences of their actions. Some feel that the application of 'rational' models of decision-making and behaviour change to contraceptive choice is therefore somewhat limited. For example, Heise provides a number of limitations of the Theory of Planned Behaviour: “First, such models have mostly been used to estimate the expected value of a particular target (e.g. using the pill), without considering how a woman integrates this assessment with her assessment of the alternative options. They assume women make an affirmative choice to adopt a particular contraceptive method: yet qualitative research suggests that women opt for the least worst option. Finally, they assume that individuals give equal weight to potentially negative and positive consequences, whereas studies suggest that when choosing contraception, women tend to weigh possible negative consequences more heavily than positive ones.” (p. 12)(54) Another criticism is that research and interventions have tended to focus on the benefits of contraceptive use and the costs of non-use, and therefore ignore the costs of use and benefits of non-use.(116) Parsons and colleagues found that among US students the perceived benefits or consequences of not using condoms during sexual intercourse were better predictors of sexual risk-taking behaviour than were the perceived costs (which in this study were STI or HIV).(117) More people experience the benefits of risky sexual behaviour, such as unprotected sexual intercourse, than the costs associated with this behaviour, such as unplanned pregnancy and STIs. This is further exacerbated by the fact that the benefits of risky sexual behaviour are more immediate than the potential costs. At an individual
level, we rarely know the "true" probabilities of outcomes associated with sexual behaviour, such as the chance of getting pregnant during one episode of unprotected vaginal intercourse. We generally tend to under-estimate our susceptibility to adverse outcomes. Young people who do not use condoms have been found to under-estimate their risk of acquiring an STI.(4) The less likely they are to use condoms the less they perceive themselves to be at risk from STIs. Much sexual behaviour is habitual, that is, it is automatic or instinctive having being acted out many times previously, rather than intentional. Whether or not people have used condoms in the past is a strong predictor of future condom use.(57)

Approaches to understanding our contraceptive decision-making, particularly through health decision-making models, have been criticised for not acknowledging the contextual nature of contraceptive use and for making the assumption that contraceptive use is static.(27;115) The context of contraceptive behaviour needs to be borne in mind when applying decision theory. This will apply to contraceptive decision-making within as well as between individuals. People’s beliefs and values around contraception and the consequence of use and non-use will vary depending on current circumstances, as well as past experience. The relative importance placed on these beliefs and values will also vary. For example, in Chapter 1, the role of relationship status and patterns of contraceptive use was discussed. O’Campo and colleagues surveyed 291 young single women with a current unplanned pregnancy about partner influences on contraceptive decision-making.(113) They found that around half of the 72 women who reported more than one sexual partner reported inconsistent contraceptive use or use of different methods with each partner. One in five of these women reported differences by partner in the decision-making responsibilities about method choice. Young women with only one partner were more likely to report taking sole responsibility for contraceptive decision-making, explained by the fact that most women in more stable relationships were using oral contraceptives. When condoms were used, women were more likely to report that the male partners were ‘involved’ in the decision. This study is in line with findings from a systematic review of 268 qualitative studies to identify factors that shape young people’s sexual behaviour.(119) This review found that women are generally responsible for pregnancy prevention, despite the stigmatising effect for women in carrying condoms and using other contraception. One of the major barriers to young people’s communication about sex and contraceptive use identified was the fear of loss
of face, hurting other's feelings or damage to one's reputation by appearing to be too forward. The authors conclude: "This makes safer sex difficult to plan if the possibility of sexual intercourse is not acknowledged, contraception is unlikely to be discussed." (p.1584).

Whitley Jr. and Schofield describe two models of contraceptive behaviour in their meta-analysis of studies of adolescent contraceptive use: the career model and the decision model.(80) In the career model, an individual moves through different stages in their use of contraceptive techniques, that is the focus of the model is on the longitudinal process of being a contraceptive user. The decision model focuses on factors that influence contraceptive use at one point in time and the weighing up of the advantages and disadvantages as seen by the decision-maker. In their analysis both the career and decision models applied well to women's use of contraception, but not so well to men's. For example, the career model emphasises the importance of social support in influencing contraceptive use. Social support was correlated with reported contraceptive use for women, but not for men. With regards the decision model, the authors comment that a prerequisite for contraceptive decision-making is the perception that a decision needs to be made and young women were more likely than young men to have a positive attitude towards contraception, reflecting the lower perceived costs and the greater perceived benefits. The authors argue that the career and decision models are not mutually exclusive, in fact they compliment one another, and a comprehensive model of the contraceptive process would combine both theoretical approaches.

2.3. Decision aids

2.3.1. Definition

Decisions in healthcare can be difficult because there is no one best option as people's values and circumstances vary. Advances in technology and more available treatment choices have added further complications to decision-making. Decision aids are broadly described as tools that provide a structured framework to systematically analyse the available options and their possible outcomes to help the decision maker select the option that best takes account of their individual needs and values.(120;121) They are different from health education material, as the latter's aim is to provide broad understanding of the health topic through the provision of information.(122)
well as providing information required to assist a decision, decision aids identify the risks and benefits attached to the decision and ask the decision maker, either on their own or with the assistance of, for example, a doctor, to implicitly or explicitly consider their values associated with the risks and benefits. Decision aids can take a number of formats, including written, visual, oral presentation in conjunction with written and visual, computer-based and programmed with interpersonal counselling. Aids can adopt different approaches, from scenario planning to more structured approaches, such as decision analysis. Decision analysis is described more fully in Section 2.3.4.

The information required to facilitate decision-making in decision aids needs to be "relevant, accurate and complete." It is important that those who will be doing the decision-making are involved in identifying the categories that need to be addressed in the decision. The information contained within the decision aids should, where possible, be scientifically reliable, for example based on evidence from good quality studies.

Most decision aids have been developed to help with decisions connected to acute or chronic medical conditions. Fewer have been developed to help with screening or preventative options.

**2.3.2. Who is the decision-maker?**

Who the decision-maker is should be defined by the decision in question. For example, decision aids can be used to inform policy, such as should patients routinely offered a specific treatment or should a screening programme be introduced? This can allow clinicians or policy makers to compare the expected outcomes of different strategies. Decision aids can also be used to inform the most appropriate healthcare and management for individuals. In this scenario the decision-maker could be the consumer/patient, the clinician or both.

There has been much debate in the medical literature over the last decade around the shift from the doctor taking complete responsibility for health care decisions to greater
consumer participation. This has led to changes in how the doctor-patient relationship is perceived and acted out. Emanuel and Emanuel describe four models of physician-patient relationship: the paternalistic model, the deliberative model, the interpretative model and the informative model. The paternalistic model assumes that the doctor is the "guardian" and expert with the patient playing a passive role. The doctor uses their skills to diagnosis, treat and manage medical conditions. This model is generally regarded as outdated as it assumes that the patient and the doctor have the same values.

Patients' values are open to development and revision in the deliberative model. In this approach the doctor adopts the role of "teacher" and helps the patient choose the best health-related values in a given clinical situation. A criticism of this approach is that the patient has come to see the doctor for health reasons and not to have their values judged or changed.

The interpretative model assumes that the doctor takes on the role of the adviser or counsellor and helps the patient identify and clarify their values. The doctor does not lead on the decision-making in terms of clinical management, but instead guides the patient to apply their values to a medical context. A criticism of this approach is that it is time-consuming and there is no attempt to explore the patient values or make any attempts to revise them.

In the informative model, the patient decides on the most appropriate course of action based on their own values and the information that the doctor has given them, such as risks and benefits of possible interventions. It is the role of the doctor to ensure that they are up to date and to consult others as required. A criticism of this approach is that the doctor does not attempt to understand the patient's values. The use of this approach may leave the patient feeling unsupported.

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1 All the reviewed papers on shared decision-making in health care settings used the word "patient". I use also the word "patient" in this section to be consistent in the reporting of findings or observations from these papers.
Doctors may use different approaches for different circumstances. For example, in an emergency situation a paternalistic approach may be the most appropriate while a deliberative approach may be most appropriate with a young person who reports unsafe sex with multiple partners. Whatever the circumstances, most patients express a desire for more information about their condition and the options available to them. (127) However, many do not ask for further information or greater involvement in the decision-making, and health care workers do not necessarily seek patients' views.

Shared decision-making has been put forward as the method that is appropriate for most clinical situations as it is somewhere in-between the paternalistic and informative approaches. (128;129) Montgomery and Fahey in their paper looking at shared decision-making, describe how the clinician and patient should exchange relevant personal and medical information, share treatment preferences and then agree on the way forward. (130) The authors argue the goal should be consensus between clinician and patient. Although shared decision-making focuses on the active partnership between the doctor and patient, it can also bring in others, such as family and partners, into the process. (131) Some critics of the shared decision-making approach still feel it is too 'middle ground' and it is still clinician-led. (132)

By involving the user in the decision-making process, it is hoped knowledge is increased, more appropriate treatment is given, and outcome measures, such as clinical outcomes, adherence and patient satisfaction, are improved. (131;133) All these factors hopefully lead to a better use of health service resources. However, decision aids have been criticised, as their use in the 'real world' may not be very effective. Patients may appear to comply with expected norms, particularly if health service providers do not actively support their decision, but in reality will not comply. In order to be effective, health care workers need to be able to properly elicit the patient's true values or beliefs so they can be appropriately incorporated into the decision making process. As described above, a goal of shared decision-making is consensus, but consensus is hard to reach when the physician and patient (and the general public) have different preferences, values or norms. (130) Adequate training and experience in using this approach is also lacking, in particular the ability of physicians to elicit values from their patients. In a qualitative study, GP registrars described how they tended to bias their presentation of the available information and consciously steer patients towards a
particular decision. Some of the registrars felt that patients did not have the expertise to make informed decisions (‘they had not gone to medical school’) and that patients could become over-burdened by the amount of information and responsibility. Clinician’s motivation is a facilitator to shared-decision making. However, there are also practical reasons that can provide barriers. The time allocated for consultations for shared decision-making may be too limited and clinicians may lack the time or skills to seek out robust data. Data about the risks and benefits associated with different treatments are often lacking and patients may not like clinician uncertainty.

The popularity of decision aids has risen alongside the move away from paternalistic medicine and a more consumer focused approach to health care. The need for an individual focus is recognised as outcomes are likely to be valued differently by different people. However, much of the literature still focuses on decision support systems (i.e. systems that provide information) rather than the application of decision aids that are completely user-led and take account of values. We still need greater understanding of how decisions are made within clinicians and patient relationships. In order to develop, implement and evaluate decision aids in health care we need to be clear who the decision-maker is or should be.

2.3.3. Do decision aids work?
The proposed benefits of decision aids provide a strong case for their use in clinical settings. They include:

- improvement of patient/user knowledge
- better communication between the health care provider and the patient/user
- promotion of shared decision making – i.e. joint negotiation and decision making between patient/user and clinician
- developing decisions based on individual values which take account of the probability of a range of outcomes and the relative weight that the patient/user puts on these outcomes
- developing the ability to communicate risk data to patients/users in a meaningful and non-technical way
- a decision making process that is transparent
- a dynamic tool that can be updated to incorporate new research
- the potential to be made easily accessible to users, e.g. via the Internet
- increased patient/user satisfaction with the information, process of care and management
- improved patient/user adherence to treatment.

However, the evidence from systematic reviews on whether or not decision aids work remains inconclusive.(97;121;122;138) The three reviews that have focussed on decision aids include:

- Bekker and Colleagues(97): The aim of this review was to provide an annotated bibliography of controlled studies that may inform patient health care decision-making. A variety of study designs were included in the review: 114 RCTs, 114 non-randomised concurrent studies, 34 retrospective studies and 63 'before and after' same sample studies.

- Estabrooks and colleagues(121): The aim of this work was to identify outcomes influenced by decision aids targeting the consumer and the particular effects of aids on these outcomes. There was no restriction on study design. Twelve studies were included (eight RCTs and four observational studies).

- O'Connor and colleagues(122;138): Their aim was to review RCTs of decision aids, aimed at people having to make treatment or screening decisions, to improve decision-making and the outcome. Thirty-four RCTs of 31 decision aids were included in their review.

All three of the systematic reviews of decision aids included studies of individuals who were making real, rather than hypothetical, health decisions. Studies of university students or studies assessing health professional decision-making were excluded. Decision support tools, such as counselling, or tools that did not support a specific decision were excluded.

One of the criticisms of the research into decision aids to date is the lack of underlying theory and limited use of decision-making process measures.(97;120) Bekker and colleagues found that less than 20% of the studies in their review were informed by any underlying theory and had used measurements associated with decision-making.(97) Another criticism of the development and study of decision aids is that users are not involved when deciding what information should be included in the decision aid. A systematic review of information provided in decision aids found that while most aids contained information or data that had been identified through some
form of external consultation, patients were rarely involved in this process. This could influence the effectiveness, relevance and acceptability of decision aids as patient/consumer priorities may differ from those of the clinician/provider.

In terms of impact, O'Connor and colleagues found that users of decision aids had greater knowledge, more realistic expectations, less decisional conflict, greater participation in the decision-making process, were less likely to remain undecided post-intervention, and had improved agreement between values and choice compared to individuals who are provided with 'usual' care. The systematic review conducted by Estabrooks and colleagues also found a significant increase in the knowledge scores amongst users of decision aids, but changes in other outcomes, such as user satisfaction and treatment choice, were negligible.

There are too few studies to assess impact decision aids have on continuation of treatment, effect on health outcomes and cost. In 1999, Bekker and colleagues concluded in their systematic review of interventions that may affect patient decision-making, "Given the small number of high-quality studies and the relatively slow increase in research in this area there is no need for the NHS to revisit this topic as a review for 5 years. Resources should be concentrated on better primary research." (p. iv) There is no evidence from examination of the more recent literature on decision aids that the situation is any different. We have little understanding of decision aids’ impact in the short-term, and impact in the long-term has not been investigated.

We still do not know what the “essential ingredients” are and how best the decision aid should be delivered. More process evaluations of decision aids are needed to address these questions. For example, in a clinical situation is it best to introduce decision aids prior to the consultation or should the aid be used with a clinician as part of the consultation? What is the best format, how should the information to help inform the decision be presented? We do know that just providing people with information and education is not the most effective way to help informed decision-making, and that the context and social influences on individual decision-making are important. Few studies have looked at differences between users of decision aids, such as whether socio-demographic characteristics have an effect on the decision-making process. We do know that the highly numerate tend to draw more affective meaning from
probabilities and numerical comparisons than do the less numerate.(139;140) More visual approaches to present data may be a way to overcome this. Most research on decision aids has focused on English-speaking, white, adults, most of whom have been middle-class and relatively well-educated.(121) There is certainly a need to look at how these aids can be introduced to other groups, such as young people, and how best to develop decision aids and/or translate findings across different populations.

2.3.4. Decision analysis

Decision analysis is essentially a method for breaking down complex problems or questions into manageable components, and then combining them quantitatively and logically to show the best course of action.(141) It is the only decision technology in which the belief judgements and value judgements needed to make decisions are made separately and then integrated in a transparent fashion.(137) The decision takes account of 1) the probability of a range of outcomes or attributes and 2) the value that user puts on these outcomes.(137;142;143)

1) **Probabilities**: The probability of the occurrence of a particular event or outcome equals the proportion of times that the outcome would (or does) occur in a large number of repeated trials. It has a value between 0 (the outcome can never occur) and 1 (it is certain to occur). A probability can also be expressed as a percentage, taking a value from 0% to 100%. The sum of probabilities for each outcome must add up to 1 (i.e. the probability of an outcome occurring and the probability of it not occurring).(141) For example, the sum of the probability of getting pregnant on the pill will be 1 minus the probability of not getting pregnant. Ideally data used to provide probabilities for the decision analysis come from well-designed studies.(144;145) In reality, data may have to be drawn from other sources such as field experts. For this reason, decision analysis is not just a tool that is based on rationality, but it also encompasses intuition. As Dowie explains, “decision analysis is an approach which by definition is more systematic than less analytical approaches, but it still involves substantial use of intuition, especially in the form of judgements concerning those aspects of most decisions for which ‘hard’ and relevant data are unavailable.” (p.176)(132)

2) **Values**: The relative weight placed on values, or utility, represents the decision-maker’s preference for one outcome over others. Utilities are a quantified
measurement, usually on a scale of 0 to 1. (143-145) It is up to the decision-maker to assign these weights. Emotional, social and developmental factors will be considerations when the decision-maker weighs up the costs and benefits. (103) Therefore, although decision analysis is a logical process it does not ignore the factors that influence our values.

The scores produced by combining the probabilities and the quantified weighting of values result in a recommendation based on the underlying decision analytic principle of maximising the person's expected utility.

The use of decision analysis is not appropriate for all clinical situations. For example, if the administration of a treatment means survival for a patient who wants to live and no administration means death, there is no decision to be made about the appropriate course of action. Decision analysis is appropriate when the decision-maker is faced with two or more choices, there is some uncertainty about the most appropriate course of action to take, and a meaningful trade-off can be made. (146) The key factors in the risk-benefit trade-off need to be identified, otherwise the model will be unable to help the decision-maker understand the trade-offs. The time-frame also needs to be explicit, and this will be dependent on the nature of the problem being addressed.

A number of benefits of decision analysis over other decision aids have been described. First, not only can decision analysis incorporate different outcomes, it can also incorporate different levels of risk depending on either individual or population characteristics and preferences, such as age and gender. (132; 146)

Second, the framework for decision analysis and the data that are contained within this framework are explicit and transparent. (143) This allows the user to criticise and improve the model as required, and new data can be incorporated when they become available. Data and the formulae for combining probabilities and utilities can be incorporated into spreadsheets. Decision trees are a pictorial way of displaying data. (144; 147) These trees are basically flow diagrams that provide an order of decisions and events, with decision nodes represented by square nodes and points where outcomes occur represented by round nodes. They can also be a means of identifying gaps in knowledge, and therefore act as a means of generating research questions. Figure 2.1. shows the decision tree designed for a modelling exercise which
compared radical hysterectomy versus no treatment for microinvasive cancer of the cervix. (148) Observational data suggest that women opting for surgery would have a lower expected mortality in comparison to women opting for no treatment (1.5% versus 2%, respectively). However, those opting for surgery will be infertile following a hysterectomy. A woman may be willing to trade-off a slight increase in death when having no treatment for a chance of a fertile life.

**Figure 2.1. A decision tree examining treatment and outcome options in women with microinvasive cancer of the cervix**

No further treatment

- Cancer death

  - Death from cancer
  - Survival (uterus intact) → Fertile life

Radical surgery

- Surgical death

  - Death from surgery

  - Survive surgery → Cancer death
    - Death from cancer
    - Survival after hysterectomy → Life but infertile

*Source: Johnson et al, 1992 (148)*

Finally, sensitivity analyses can (and some argue, should) be used within decision analysis models to explore the effect of changing probabilities or values, and the consequence this has on the subjective expected utility. (125; 141) For example, where there is uncertainty in the data used, such as where there are wide confidence intervals around an estimate, a sensitivity analysis can be conducted using the lower and upper limits. A similar process can be done by getting the user of the decision analysis model to see the effect changing their values has on the result. If the result changes through sensitivity analysis it is said to be “sensitive” to that variable. The result is described as
"robust" if changing probabilities or values through their plausible ranges does not alter the findings.

2.3.5. Examples of the application of contraceptive and fertility control-related decision aids

There are few examples of decision aids having been developed to assist with contraceptive decision-making. A database search (Medline, Embase and The Cochrane Library) conducted in April, 2007 to identify contraceptive-related decision aid interventions only found two decision analysis studies.(149;150) One further paper on contraceptive-related decision analysis was identified through a search of reference lists.(151) There were a few more studies relating to STIs and HIV, predominantly decision analyses to inform screening strategies.(152-154)

The earliest example of a contraceptive/fertility-related decision aid identified was a study conducted in the late 1970s. Beach and colleagues used decision analysis as an academic exercise to calculate the SEU for having a(nother) child amongst American married couples.(151) All couples were actively considering whether to have a(nother) child and were using contraception at the time of recruitment. Study participants were predominantly white and middle-class, and just under a third had not yet had children. The aim of this study was to assess whether or not subsequent birth planning decisions could be predicted from the calculated couple SEUs. The SEUs were calculated by asking couples to assign subjective probabilities and weights to a set of value categories, such as those centred around their own personal identity and around parenthood. The authors hypothesised that if the SEU favours having a child then this should be in line with their behavioural intent to have another child, and their findings suggest SEU and intent are related. Although they find that asking couples what they intend provides the best prediction to subsequent family size, this alone provides little understanding of why they make the decisions they do. SEUs were obtained for each couple and then they were followed up at one and two years to see if they had had a child or had stopped using contraception.

Another study conducted around the same time used decision analysis to assess the impact (i.e the costs and benefits) of a sterilisation program in Bangladesh.(149) National survey data were used in the decision analysis model to estimate the number of pregnancies and deaths amongst women who had been sterilised compared with the
number of deaths in the same group if they had not been sterilised. This exercise suggested that sterilisation was the optimal choice, this mainly being driven by the reduction of deaths associated with maternity.

The final paper identified described the use of decision analysis to describe the health consequences for women using different contraceptive methods in comparison to the health consequences amongst women using no method. The authors used data from the literature to calculate the numbers of unintended pregnancies, live births, induced abortions, spontaneous abortions, ectopic pregnancies, upper genital tract infection and cases of infertility that would occur in a hypothetical cohort of 100,000 American women within a specified time-period and given a set of probabilities for each outcome. They found the use of any method prevents more deaths than are associated with method use. The authors’ work differs from other studies looking at the costs and benefits associated with contraceptive use in that it takes account of the fact that different contraceptive methods offer different combinations of risks and benefits at different stages of women’s reproductive life stages. The implications of contraceptive behaviour on current and subsequent health were examined. For example, in their modelling they found that among 100,000 women aged 15-19 using barrier or spermicidal methods there would be nearly four fewer pregnancy-related deaths than if these women had been using no method. In the more long-term, for every 100,000 who use these methods at ages 15-19 around 60 deaths from cervical cancer before the age of 45 years are prevented.

These three applications of decision analysis have a public health rather than individual perspective. They are interested in predictions of desired family size, or morbidity and mortality associated different methods for preventing pregnancy in comparison to use of no method. Factors that may affect individual decision-making (and therefore will also impact on outcomes such as pregnancy), including side effects associated with contraceptive use were not addressed. The only decision aids I identified that had been developed to help women with contraceptive decision-making were a computerised intervention aimed at young women attending family planning clinics in the US and a tool produced by the World Health Organization (WHO). The WHO tool is a 100-page flipchart that uses a decision-making algorithm and can be used by clients and providers during contraceptive counselling consultations. An introduction is provided and then evidence-based information
is provided for 14 contraceptive methods. This information includes medical eligibility for methods, side effects, when to start, and how to use the method. Corresponding sheets are presented for the provider and the client (see Figures 2.2. and 2.3.). It can be downloaded from the WHO website. An evaluation was conducted in hospital and community settings in Mexico to assess the effect the aid had on the counselling and decision-making process, and to evaluate the flipchart’s acceptability with providers and clients(157). A two and a half day training course on use of the flip chart was run for the providers. Evaluation methods included the videoing of consultations three months prior to the training and implementation of the tool in consultations, and then again one month after implementation. Decision-making behaviours were assessed as well as modes of communication between provider and client. In-depth interviews and focus groups were conducted with providers and clients to investigate acceptability. The evaluation found that clients received more information after implementation of the decision aid and there was more shared decision-making with clients having a greater involvement in decisions. Providers did raise some concerns about the additional time required in consultations. The impact that this tool has on contraceptive use and health outcomes has not been evaluated.

Figure 2.2. WHO Decision-Making Tool: Client Sheet

You can find a method right for you

No method in mind? We can discuss:

- Your experiences with family planning
- What you have heard about family planning methods
- Your plans for having children
- Protection from sexually transmitted infections (STIs) or HIV/AIDS
- Your partner’s or family’s attitudes
- Other needs and concerns

Now let’s discuss how a method can meet your needs
You can find a method right for you

No method in mind? We can discuss:

- Your experiences with family planning
- What you have heard about family planning methods
- Your plans for having children
- Protection from sexually transmitted infections (STIs) or HIV/AIDS
- Your partner’s or family’s attitudes
- Other needs and concerns

Helping client with no method in mind to make a decision:

- Use this page to help client think about her/his situation and life and what seems most important about a method.
- Discussing some of the topics at left can help the client consider different methods. You can say: “Here are some things to consider when choosing a family planning method.”
- “What is most important to you?”
- “The choice is yours. I want you to be happy with your choice.”

Next Move:

Go to next page to discuss what methods could suit the client’s needs.

The aim of the second identified computerised decision aid, developed by Chewning and colleagues in the US, was to promote the effective selection and use of contraception amongst young people aged 20 and under attending family planning clinics. This aid was to be used alongside usual care and accessed by young women in the waiting room prior to their consultation with the clinician. The aid was divided into five broad sections: 1) a demonstration of how different contraceptive methods work and are used, 2) a graphical illustration of the effectiveness of different methods, 3) a series to questions to help the user identify personal characteristics and circumstances that may affect their use of different methods, 4) the relative costs and benefits of different methods, 5) advice and feedback regarding the user’s disclosed potential barriers to effective use, and 6) provision of a personalised printout, which included steps on how to use methods effectively, questions that the user had wanted answering and their individualised feedback. The aid was evaluated through use of a longitudinal experimental design. In the intervention group young women were allocated the decision aid plus usual care and the control group received usual care. Recruitment took place in two family planning clinics. It was not deemed possible by the investigators to randomly allocate women to the two groups because of the clinic set-up, but a pseudo randomisation approach was adopted, where women were
alternatively allocated to the intervention or to the control group as they came into the clinic. Participants were interviewed prior to using the computer program and then again immediately after their consultation with the clinician. These interviews collected data on the participants' demographic characteristics, contraceptive knowledge, contraceptive intentions and method prescribed at the clinic visit. Participants were interviewed for a third time a year later where information was collected about contraceptive use and, where appropriate, reasons for discontinuation of methods. The authors report that the characteristics of those in the intervention and the control arms were similar, although the numbers recruited into the intervention group were less than the number in the control group, 456 and 493, respectively. A large proportion of the total sample (82.6%) was included in the 12 month follow up. The young women who had used the decision aid had greater short-term contraceptive knowledge (i.e. at the second interview immediately after using the aid) than the women in the control group. In the long-term (i.e. at 12 months) there was no overall significant difference between the intervention and control groups in terms of knowledge, length of time using contraceptive (nearly all the women were prescribed the pill) and pregnancies.

2.4. Rationale for MyWay
Based on what we know from the literature (identified in this chapter and the introduction), the rationale for the development of a tool based on decision analysis to help young people with contraceptive choices includes:

1. Most people are faced with decisions around fertility control and STI avoidance at periods during their life.
2. At an individual level the repercussions of 'poor' contraceptive decisions can be long-lasting and can have negative consequences on both health and social outcomes. At a societal level, 'poor' contraception decisions can have public health and cost implications.
3. There are continuing concerns around young people's poor sexual health. Traditional ways of delivering contraceptive care and behavioural interventions have had limited success in reducing poor sexual outcomes in young people.
4. People, in particular young people, may have insufficient knowledge about different contraceptive methods and the risks (and benefits) associated with these methods to make an informed decision.
5. There are over ten different contraceptive methods currently available in the UK. All these methods have different belief judgments and values attached to them, making decisions about which method to choose complex. These beliefs and values will be shaped by a number of internal and external influences. A decision analysis tool will allow the user to break down the decisions into more manageable components.

6. Systematic reviews of decision aids have shown them to be popular with users and to encourage shared-decision-making. People seeking contraception are generally ‘healthy’ and therefore a personal and social approach to care is more appropriate than adoption of a purely medical model.

7. There has been no research identified that has involved the development and evaluation of a decision analysis tool that helps individuals with their contraceptive choice.

The assumption is that a computer program that uses decision analytical principles can help young people choose contraceptive methods that are more acceptable to them, and are therefore more effective in preventing unplanned pregnancy.

2.5. Key points

- Decision-making is the process by which we weigh up the pros and cons of different choices available to us, and then decide which choice is the most attractive. This process is a crucial component of most theories of behavioural change.
- However, good decision-making is often limited for various reasons, including lack of accessible information and difficulties in estimating and interpreting levels of risk. Therefore decision aids have been developed to assist with the decision-making process.
- Approaches to understanding our contraceptive decision-making have been criticised for not acknowledging the contextual nature of contraceptive use and how our values affect uptake and use of contraceptive methods.
- The popularity of decision aids has risen alongside the shift from paternalistic medicine to a more consumer-focused approach to health care, however the evidence from systematic reviews on whether or not they work remains inconclusive.
• Decision analysis, one form of decision aid, is essentially a method for breaking down complex problems or questions into manageable components, and then combining them quantitatively and logically to show the best course of action.

• There are few examples of decision aids having been developed to assist with contraceptive decision-making.
Chapter 3. Establishing the setting for the intervention: Where do young people go to get contraceptive advice and supplies?

3.1 Introduction
The uniqueness of contraceptive services is that first, they are generally for ‘well people’, and second, a choice of venue is available.(158) Two primary provision outlets exist side-by-side, community contraceptive clinics (including mainstream family planning and designated young people’s clinics) and general practice. In addition, retail outlets, such as pharmacies, play a crucial role in the delivery of contraceptive supplies, in particular condoms and, more recently, emergency contraception. Over the last few years, the availability of contraception in other settings, including school-based services and GUM clinics, is becoming more widespread.

The first clinic to offer contraceptive services to women in the UK was opened by Marie Stopes in 1921. The early birth control campaigners of the 1920s focused their attentions on poorer, married women who up until this time had been little affected by the fertility decline more apparent amongst upper and middle class women.(159) It was during the inter-war period that the concept of “family planning” was developed, with its emphasis on birth spacing, which it was hoped would lead to healthier children. However, it was not until the late 1960s and early 1970s that contraceptive service provision was to become widely available to the majority of people in the UK.

The first major factor that led to this change was the general availability of the contraceptive pill, and increasingly women were approaching their GP wanting the pill.(160) It was this ‘decisive factor (that) brought the medical profession into family planning’ (p. 104).(161) Another important event was the opening of the first centre for young unmarried people by Helen Brook in 1964. By 1972, there were 11 Brook Advisory Centres in Great Britain. The third factor to influence contraceptive provision was legislation, with the 1967 Abortion Act and the National Health Service (Family Planning) Act of the same year. The main purpose of the Family Planning Act was to enable local authorities in England and Wales to provide contraceptive advice and supplies to all women as part of the National Health Service (NHS), although charges could be made at the discretion of the authority. In the early 1970s, lobby
groups increased pressure for the provision of a free, comprehensive family planning service and such a service was announced in 1974. Whilst overall attendance of family planning clinics has declined in the UK, since the mid-1970s numbers of women aged under 20 years accessing these services have increased. (40)

The objectives of this chapter are to:

- report on young people's knowledge of contraceptive availability, describe where young people go for advice and supplies and examine factors associated with use of different services.
- use these data to help inform the most appropriate setting for the MyWay intervention.

Data from the national Teenage Pregnancy Strategy Evaluation (TPSE) tracking survey, alongside other relevant literature, are used to address these aims.

3.2. The Teenage Pregnancy Strategy Evaluation tracking survey and methods

3.2.1. Background

As described in Chapter 1, in 1999, England embarked upon a 10-year Teenage Pregnancy Strategy. (2) There are two broad aims to the Strategy:

1) To halve the under 18 conception rate in England by 2010 (with an interim reduction target of 15% by 2004); and
2) To increase the participation of teenage mothers in education, training or work to 60% by 2010 to reduce the risk of long-term social exclusion.

The component of the Strategy that aimed to prevent the causes of teenage pregnancy included better sex and relationship education (SRE) both in and outside of school settings; a national information campaign that targeted young people and provided support for their parents; improved access to contraception and the targeting of ‘at-risk’ groups.

An independent evaluation of the strategy was carried out by a consortium of researchers at the London School of Hygiene & Tropical Medicine (LSHTM), University College London (UCL) and the British Market Research Bureau (BMRB).
One of the aims of this evaluation was to assess progress made towards achieving the Teenage Pregnancy Strategy goals in relation to reduction of teenage pregnancies and social support. Details of the evaluation methods and findings are available elsewhere.(41) In this chapter, data collected from this evaluation are used to describe young people's knowledge and use of contraceptive services over the initial stages of the Teenage Pregnancy Strategy (2000-2004), and to investigate factors that are associated with young people's use of different types of service.

3.2.2. Methods

As part of TPSE, a national tracking survey was conducted. A random location sample of young people aged 13-21 years was interviewed in twelve waves at four-monthly intervals between October 2000 and June 2004. Young people living in the randomly selected geographical areas (enumeration districts with on average 150 households) rather than the same individuals, were interviewed at each wave. Fieldwork was spread across 200 sampling points in England, and to increase fieldwork efficiency, areas were chosen with a higher representation of 13-44 year olds. Screening interviews were conducted on the doorstep to ensure that young people were eligible with regards age group. The sample included only young people living in a family home or those who were living independently. Where a young person was aged 17 years or younger and not living independently, written permission was sought from a parent or guardian. Face-to-face multi-media computer-assisted personal interviews (CAPI) were conducted by trained interviewers at the young person's home. The more sensitive questions, relating to sexual experience and experience of pregnancy, were contained within a self-completion section in the questionnaire, to afford privacy. As well as collecting information about young people's awareness of Strategy media campaigns, the survey monitored changes in knowledge, attitudes and behaviour over time at an individual level. This included data on their knowledge and use of contraception and contraceptive services. With regards to knowledge of contraceptive availability, young people were asked, "can you think of a clinic or place in your area you could visit if you wanted advice about sex? (for example, advice on contraception or infections passed on by sex)." They also were asked to report whether the following statements were true or false (or that they did not know):

- Contraceptives are available to everyone, free of charge.
- People of any age can get free condoms from a Family Planning Clinic
- A girl under 16 can be prescribed contraceptives without her parents knowing.

The young people were provided with a list of services and sources, and asked 1) if they had ever accessed any of the places for contraceptive advice and 2) if they had ever accessed any of these places for contraceptive supplies. Young people could tick as many responses as applicable. The questions with all the possible responses are provided in Appendix A.1. For the purpose of this analysis, the aim of which was to focus on the main contraceptive providers for young people, the following responses or categories were examined:
- School-based services
- General practice (either GP or practice nurse)
- Community contraceptive services (family planning clinics or youth advisory centres / Brook Advisory centres)
- Retail (pharmacies or vending machines)

In order to focus on factors that may be associated with use of different services the young person’s age at interview was examined, as well as whether or not they lived in a deprived area and whether or not they had experienced sexual intercourse before their 16th birthday (analysis was limited to those 16 years and older for this last outcome). The distance young people had to travel to local services was calculated to provide information on availability. Individual surveys were linked with routine data on deprivation scores(162) and availability of sexual health services in a merged dataset (this was done by colleagues at LSHTM). The postcodes of contraceptive services identified from the 2004 Sexwise database (a source which provides information on sexual health services for young people, excluding general practice, in the UK), were used to calculate how far individuals lived from their nearest contraceptive service. The distance from services was calculated as a population weighted average of the road distance (in kilometres) from ward centroids to the nearest service (for sexual health services and also specifically young person specific-services).

Analysis was conducted in SPSS (Version 12.0).(163) The survey data were weighted by social grade. Statistical significance is considered at $p<0.05$ for all analyses.
3.3. Young people's knowledge and use of contraceptive services

3.3.1. Characteristics of respondents

Interviews were achieved with 8879 young people across the 12 waves of the tracking survey. The summary characteristics of respondents are presented in Table 3.1., including data on the distance young people were from any sexual health service and from a designated young people's service. There were no significant variations in these characteristics over the 12 waves of the evaluation.

Table 3.1. Characteristics of all TSPE survey respondents

<table>
<thead>
<tr>
<th></th>
<th>Men n(%)</th>
<th>Women n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>4418 (49.8)</td>
<td>4461 (50.2)</td>
</tr>
<tr>
<td><strong>Age at interview, years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-15</td>
<td>1497 (33.9)</td>
<td>1531 (34.3)</td>
</tr>
<tr>
<td>16-17</td>
<td>1400 (31.7)</td>
<td>1369 (30.7)</td>
</tr>
<tr>
<td>18-21</td>
<td>1520 (34.4)</td>
<td>1561 (35.0)</td>
</tr>
<tr>
<td><strong>Living in most deprived quintile</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1000 (22.7)</td>
<td>1158 (26.0)</td>
</tr>
<tr>
<td><strong>Had heterosexual intercourse before 16</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>778 (27.1)</td>
<td>846 (29.1)</td>
</tr>
<tr>
<td><strong>Distance to any sexual health service</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1km</td>
<td>1276 (29.0)</td>
<td>1339 (30.1)</td>
</tr>
<tr>
<td>1-&lt;2km</td>
<td>1510 (34.3)</td>
<td>1540 (34.6)</td>
</tr>
<tr>
<td>2-5km</td>
<td>1226 (27.8)</td>
<td>1187 (26.7)</td>
</tr>
<tr>
<td>&gt;5km</td>
<td>391 (8.9)</td>
<td>387 (8.7)</td>
</tr>
<tr>
<td><strong>Distance to designated young people's sexual health service</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1km</td>
<td>827 (18.8)</td>
<td>879 (19.7)</td>
</tr>
<tr>
<td>1-&lt;2km</td>
<td>1218 (27.7)</td>
<td>1275 (28.6)</td>
</tr>
<tr>
<td>2-5km</td>
<td>1634 (37.1)</td>
<td>1604 (36.0)</td>
</tr>
<tr>
<td>&gt;5km</td>
<td>724 (16.4)</td>
<td>695 (15.6)</td>
</tr>
</tbody>
</table>

Notes

* Denominator = respondents aged 16 or over
† Includes mainstream sexual health services and designated young people's services, but excludes general practice. Services identified through the Sexwise database

Less than half of the total sample reported that they had had heterosexual intercourse, 44.2% of all the young women and 42.4% of the young men. Sixteen percent of the sexually experienced young women and 17.0% of the sexually experienced young men reported that they did not use any contraception at first sexual intercourse. Those having sexual intercourse before their 16th birthday were less likely to have used contraception at first intercourse compared to those who waited until they were 16 years or older, 20.9% versus 10.7%, p>0.001 for women, and 22.3% versus 11.1%,
p>0.001 for men. Those living in the more deprived areas were less likely to use contraception at first intercourse compared to those living in more affluent areas, 22.2% versus 13.6%, p>0.001 for women and 26.2% versus 13.7%, p>0.001 for young men. Just under one in five of the young people (17.9% of young men and 18.4% young women) reported unprotected sexual intercourse (i.e. had not used any contraception) in the last week. The proportion of women living in the more deprived areas who reported unprotected sex in the last four weeks was 22.9% and amongst men it was 26.4%.

3.3.2. Young people’s knowledge of contraceptive availability and services
Analysis of the TPSE tracking survey data showed that 77.4% of all young women and 65.0% of all young men knew of a clinic or place they could visit if they wanted information about sex (Figure 3.1.). Sexually experienced young women and men were more likely to know of a place (88.9% and 75.3%, respectively). Young people aged under 16 years had poorer knowledge of contraceptive availability compared to those aged 16 and over. For example, 47.0% of young women under 16 were aware that contraceptives were available free of charge, compared to 69.8% of those 16 and over (p<0.001) and 40.0% of young men under 16 were aware, compared to 61.1% of those 16 and over (p<0.001). This association remained after controlling for whether or not respondents had experienced heterosexual intercourse.

Two-thirds (64.3%) of all young women and nearly half (45.3%) of all young men (including those who had not yet experienced sexual intercourse) reported that they had accessed a service to obtain contraceptive advice (data not shown). The most frequently cited service accessed for advice by young women was general practice (34.4%) and for young men was school, which included teachers, school nurses and school-based clinics (24.6%).

Overall young men and women who reported sex before 16 years of age were less likely to have obtained contraceptive advice prior to first sexual intercourse than were those who had experienced first sex at 16 years or above (for women: 35.6% versus 54.4%, p<0.001, and for men: 48.8% versus 63.8%, p<0.001, respectively). Young men living in more deprived areas were less likely to seek advice before first intercourse compared to those from more affluent areas (49.8% versus 58.3%, p=0.015). No association with deprivation was observed for young women.
3.3.3. Where do young people go for contraceptive supplies?

The majority of young women and men who had experienced sexual intercourse reported accessing a health or commercial service to obtain contraceptive supplies at some time (91.5% and 78.5% respectively, Table 3.2.). The proportions of women reporting that they had at some point accessed community contraceptive services or general practice for contraceptive supplies were similar, 54.5% and 54.0%, respectively. Commercial venues (either pharmacies or vending machines) were the most common source for young men (54.3%), followed by community contraceptive services (31.7%). Use of designated young people’s clinics amongst young women and men contributed a relatively small amount to overall community contraceptive service use, 15.9% of the female community contraceptive service users and 20.8% of the male users.
### Table 3.2. Use of different contraceptives services¹ for supplies by gender

(Denominator – respondents reporting heterosexual intercourse)

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n(%)</td>
<td>n(%)</td>
</tr>
<tr>
<td>Any service</td>
<td>1648 (91.5)</td>
<td>1344 (78.5)</td>
</tr>
<tr>
<td>School-based services</td>
<td>357 (19.8)</td>
<td>398 (23.2)</td>
</tr>
<tr>
<td>General practice</td>
<td>972 (54.0)</td>
<td>183 (10.7)</td>
</tr>
<tr>
<td>Community contraceptive service</td>
<td>982 (54.5)</td>
<td>543 (31.7)</td>
</tr>
<tr>
<td>Commercial</td>
<td>704 (39.1)</td>
<td>930 (54.3)</td>
</tr>
</tbody>
</table>

**Notes**

1 Use of different services is not mutually exclusive, therefore the proportion reporting use of specific services is greater than the proportion reporting use of any service.

### 3.3.4. Factors influencing young people’s use of services

Data on type of service accessed and age at interview, age at first intercourse and living in a deprived area are presented in Table 3.3. Young people who reported having first sexual intercourse prior to 16 years and those living in more deprived areas were significantly more likely to use community contraceptive clinics than those who reported first sexual intercourse at 16 years or over and those living in more affluent areas. Increased use of general practice was significantly associated with increased age at interview. No significant association was found between age at interview and use of community contraceptive services. However when family planning clinics and designated young people’s clinics were examined separately, both young women and men’s use of family planning clinics increased with age at interview. The proportion reporting use of designated young people’s clinics was highest amongst the under 16 year olds (13.4% of all sexually active women under 16 years and 9.8% of all sexually men under 16 years). The decrease in use with age at interview was significant amongst young men (p=0.006, decreasing to 5.3% of sexually active young men 18 years and over).
### Table 3.3. Characteristics of respondents reporting having accessed different types of service for supplies [%] (Denominator – respondents reporting heterosexual intercourse)

<table>
<thead>
<tr>
<th>Any service</th>
<th>School-based clinic</th>
<th>General practice</th>
<th>Community contraceptive services</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOMEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at interview</td>
<td>p&lt;0.001</td>
<td>p=0.001</td>
<td>p&lt;0.001</td>
<td>p=0.528</td>
</tr>
<tr>
<td>&lt;16 (n=157)</td>
<td>83.4</td>
<td>40.1</td>
<td>30.6</td>
<td>51.5</td>
</tr>
<tr>
<td>16-17 (n=615)</td>
<td>89.9</td>
<td>25.2</td>
<td>45.9</td>
<td>53.5</td>
</tr>
<tr>
<td>&gt;=18 (n=1029)</td>
<td>93.7</td>
<td>19.8</td>
<td>62.4</td>
<td>57.2</td>
</tr>
<tr>
<td>Age at first intercourse1</td>
<td>p=0.011</td>
<td>p=0.05</td>
<td>p=0.416</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>&lt;16 (n=771)</td>
<td>94.2</td>
<td>19.6</td>
<td>57.6</td>
<td>62.6</td>
</tr>
<tr>
<td>16 and above (n=851)</td>
<td>90.8</td>
<td>15.9</td>
<td>55.6</td>
<td>47.5</td>
</tr>
<tr>
<td>Deprivation2</td>
<td>p=0.136</td>
<td>p=0.326</td>
<td>p=0.385</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Least deprived (n=1292)</td>
<td>92.1</td>
<td>20.4</td>
<td>54.6</td>
<td>52.3</td>
</tr>
<tr>
<td>Most deprived (n=506)</td>
<td>89.9</td>
<td>18.4</td>
<td>52.4</td>
<td>60.1</td>
</tr>
<tr>
<td>MEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at interview</td>
<td>p=0.001</td>
<td>p=0.001</td>
<td>p=0.012</td>
<td>p=0.518</td>
</tr>
<tr>
<td>&lt;16 (n=132)</td>
<td>70.5</td>
<td>37.1</td>
<td>8.3</td>
<td>31.1</td>
</tr>
<tr>
<td>16-17 (n=554)</td>
<td>75.8</td>
<td>28.9</td>
<td>8.1</td>
<td>30.0</td>
</tr>
<tr>
<td>&gt;18 (n=1026)</td>
<td>81.0</td>
<td>18.4</td>
<td>12.4</td>
<td>32.7</td>
</tr>
<tr>
<td>Age at first intercourse1</td>
<td>p=0.966</td>
<td>p=0.543</td>
<td>p=0.372</td>
<td>p&lt;0.002</td>
</tr>
<tr>
<td>&lt;16 (n=710)</td>
<td>79.7</td>
<td>22.8</td>
<td>11.8</td>
<td>35.9</td>
</tr>
<tr>
<td>16 and above (n=827)</td>
<td>79.8</td>
<td>21.5</td>
<td>10.4</td>
<td>28.5</td>
</tr>
<tr>
<td>Deprivation2</td>
<td>p=0.056</td>
<td>p=0.699</td>
<td>p=0.495</td>
<td>p&lt;0.004</td>
</tr>
<tr>
<td>Least deprived (n=1273)</td>
<td>79.5</td>
<td>23.6</td>
<td>10.4</td>
<td>29.8</td>
</tr>
<tr>
<td>Most deprived (n=430)</td>
<td>75.1</td>
<td>22.6</td>
<td>11.6</td>
<td>37.4</td>
</tr>
</tbody>
</table>

Notes
1 denominator = sexually active respondents aged 16 years or more
2 Least deprived = Upper three quintiles of the Indices of Multiple Deprivation scores. Most deprived = Lower two quintiles of the Indices of Multiple Deprivation score

### 3.4. How do the TPSE findings compare with other data sources and surveys?

The first aim of this chapter is to examine survey data on young people’s knowledge and access of services. The TPSE data showed that over three-quarters of sexually active young people knew of a place from which they could obtain information about sex, including contraception. However, awareness was lower amongst those who had not yet had sex and amongst young people under 16 years, irrespective of whether or not they had had sexual intercourse. TPSE data showed that overall community
contraceptive clinics and general practice were the main providers of contraceptive supplies to young women and commercial sites were the main providers to young men.

Routine data sources monitoring use of contraceptive services are available, although there is much variation between health authorities and clinics in terms of the data collected.(164) Data are only consistently available from NHS family planning clinics and from Brook Advisory Centres. Both of these services provide KT31 returns, which give national data on the number of attendees, the age and sex of attendees, and the contraceptive method provided. The KT31 returns show a slight increase over the last decade in the number of first contacts at community contraceptive clinics amongst under 16 year olds, 7.2 per 100 of the female resident population aged under 16 years in 1995-6 to 8.7 in 2005-6.(165) The highest rate was observed amongst the 16-19 age group, with 21.5 per 100 of the resident female population aged 16-19 years accessing community contraceptive clinics in 2005-6. Again a slight increase was observed over the last decade. Amongst older age groups of women (i.e. aged 20 years and over) either no increase or a slight decrease in use observed. Data has only recently become available for men by age. In 2005-6, 2.0 per 100 of the male resident population under 16 years and 2.6 per 100 of the male resident population aged 16-19 year attended community contraceptive clinics. A criticism of KT31 data is that their validity has never been independently assessed.(164) In addition, there is no information on other demographic and behavioural characteristics of the users of these services.

A limitation of routine data and of much of the research on contraceptive service provision is that the information is collected within health services. This has meant that knowledge of contraceptive use at a population level was lacking. People who were going to places other than general practice or community clinics, such as those obtaining their supplies from pharmacies, or those who were not accessing any form of contraceptive provider were being excluded from research. Selection bias has therefore been an important limitation of much research to date. Population surveys have allowed a better understanding of the demographic and sexual behavioural characteristics of the users of different types of contraceptive service.

Population surveys consistently show that general practice is the main provider of contraceptive services for women in the UK. The Natsal-2000 survey asked women and men aged between 16-44 years about the services used in the last year to obtain
contraceptive supplies. General practice was the most commonly reported service by sexually active women, used by 59%.(166) Commercial sites were used by 23% of the women and community contraceptive clinics by 15%. Around one in five of the women reported that they had not accessed a service in the last year (although it is not possible to determine how many of this group were trying to get pregnant as this question was not asked). The survey found that women’s use of general practice peaked between the ages of 18-24 years (73% had used this source for supplies in the last year). Use of community contraceptive services (i.e. family planning and designated young people’s services) peaked between the ages of 16-17 years (34%), although general practice was still the main provider in this age group (54% of sexually active 16-17 year olds had used this service). Other recent population surveys have also found that general practice is the most used contraceptive service by women to obtain supplies,(167;168) although the Omnibus Survey ii did find that women aged 16-19 years were more likely to report using family planning clinics in comparison to general practice.(167)

Another benefit of population surveys over routine statistics is that they give us a better understanding of men’s use (or non-use) of contraceptive services. Nearly half (45%) of all the sexually active men responding to Natsal-2000 reported that they had not accessed a service for contraceptive supplies in the last year.(168) The most common source of supplies was commercial sites, with 43% having accessed this type of service. General practice was cited by 12% of male respondents and community contraceptive clinics by 8%. The prevalence of use of general practice and community contraceptive services by men was highest for the 18-19 year group, 16% and 20% respectively.

TPSE respondents were selected through random-location sampling, therefore at each wave people living in the selected geographical areas were interviewed rather than the same individuals. However, we noted no difference in the characteristics of interviewees over time. A random probability sample, the method of sampling in

ii The Omnibus Survey is carried out in Great Britain by the Office for National Statistics. It is a multi-purpose survey and is used to obtain results on key topics quickly. A wide range of subjects have been included in the survey, including contraception, family income, transport, Internet access and fire safety. Each month around 1800 adults are surveyed, with only one adult selected per household.
Natsal-2000, was excluded on grounds of cost and time as it was calculated some 25 addresses would need to be screened to identify each within-scope contact. Random-location sampling has been shown to perform as well as random probability sampling in most circumstances, (169) and this methodology was viewed to be beneficial due to the compatibility of the survey data with the area-level data collected. Another major benefit of our survey was that both male and female respondents between the ages of 13-21 years were interviewed. Other large-scale UK population-based surveys, such as Natsal-2000 and the Omnibus Surveys, looking at contraceptive service use have interviewed people aged 16 years and above. (10;167;170) Therefore patterns of service use amongst some of the most vulnerable young people were not examined.

It was not possible to produce the number of non-responders, either due to young people or their parent/guardian declining participation, because of the random location sampling approach. Another factor that needs to be considered when interpreting results is that those young people not living at home or not living independently, such as those living in care homes, were not approached to take part in the survey.

Population survey data enables us to look at overall characteristics of users of the different contraceptive services, rather than being limited by surveys of specific service users. Use of specific services is not mutually exclusive, since some people use more than one service in a given time period. However, the purpose of the analysis presented in this chapter was to look at characteristics of all users in each type of service rather than compare the characteristics of users across each separate service. The population surveys described (i.e. the TPSE tracking survey, Natsal-2000 and the Omnibus Survey) are not able to describe individual changes in patterns of contraceptive use or if people have used different services for different contraceptive needs, for example obtaining condoms from pharmacies, oral contraception from general practice and implants from community contraceptive clinics. Nor is it possible to distinguish whether use is by choice or necessity. For example a young person may have to attend general practice for contraceptive supplies if community contraceptive service provision is limited in their locality. People’s actual and preferred use of different services was analysed from data collected from a population survey that formed part of a national evaluation of one-stop shop models of sexual health provision. (168) Survey respondents were aged between 16-44 years and identified
through the registers of general practices that were either in the close proximity of sexual health services taking part in the evaluation or were themselves general practices taking part in the evaluation. Findings from the survey showed that the characteristics of those reporting use of a specific sexual health service for identified sexual needs (including STI testing and obtaining condoms and other contraceptive methods) were similar to the characteristics those reporting preference of the same service, thus suggesting most people (at least those aged 16 years or above) are accessing their service of choice.

3.5. Identifying the setting for the MyWay intervention

The second aim of this chapter is to use the TPSE data and other relevant literature to help inform what would be the most appropriate setting to introduce the MyWay intervention. Four categories of contraceptive service were examined in the TPSE analysis: general practice, community contraceptive clinics, school-based services and commercial sites. School-based services and commercial sites, such as pharmacies, were ruled out as these sites are limited in the range of contraceptive methods provided. There may be some potential in using decision-aids in these settings to inform young people about their contraceptive options. However, as the aim of this particular piece of work was to develop an intervention within a contraceptive consultation and assess its impact on decision-making, services that offered a wider range of methods were felt to be more appropriate. The strengths and weaknesses of general practice versus community contraceptive clinics are examined within three broad themes: the service users' characteristics, the services' impact, and environmental and organisational factors.

3.5.1. Service user characteristics

The TPSE tracking survey showed that the proportions of sexually active young women attending general practice and community contraceptive clinics were fairly similar. Although overall young men were more likely to report using commercial sites, such as pharmacies, a greater proportion report accessing community contraceptive services in comparison to general practice for contraceptive supplies. Lack of contraceptive choice for men and limited availability of condoms in some health services will influence men's use of services. For example, condoms are often not distributed in general practice. An audit of general practices in 2002 found that
only around a half of practices provided condoms. Women are more likely to attend health services than men as, with the exception of condoms which are the only method available for men, women are most often responsible for obtaining contraceptive supplies. Even when young men do access sexual health services, health care workers are less likely to raise the issue of contraception with them in comparison to women and qualitative work with young men has shown that they still view contraceptive services as female orientated. However, other data from TPSE show that young men’s use of general practice and community contraceptive services is increasing. Men, also, appear to be more likely to access contraceptive services when other sexual health care, such as STI screening, is available.

The TPSE tracking survey showed that young people reporting sex before age 16 and those living in more deprived areas were more likely to use community contraceptive clinics than those reporting sex aged 16 years or above and those living in more affluent areas. Younger age at first sexual intercourse and social deprivation are associated with a higher risk of teenage pregnancy. The TPSE data therefore suggests that community contraceptive clinics are seeing young people who are at ‘higher risk’ of teenage pregnancy. The Natsal-2000 survey and data from the One-Stop Shop Evaluation also indicate that users of community contraceptive clinics are a ‘higher risk’ group, with use of these services associated with greater number of partners, previous unplanned pregnancy and previous STI diagnosis. This highlights the fact that some attendees of these services may be at risk of poor sexual health outcomes, and may not just be in need of contraceptive supplies. Other research has shown that users of community contraceptive clinics are a different group from those who use general practice. Women who use general practice tend to be older, married, parous, spacing their pregnancies more widely and using the pill. Users of community contraceptive clinics tend to be younger, single, and wanting to either delay their first pregnancy or wanting no further pregnancies.

3.5.2. Services’ impact
The TPSE data showed that around two-thirds of young people lived within two kilometres of a sexual health clinic (i.e. a community contraceptive, GUM or designated young people’s clinic) and just under half were within two kilometres of a designated young people’s clinic. For some young people, a visit to their general practice may be the only option, particularly those living in more rural areas. Proximity
and ease of getting to clinics have been cited as prominent reasons for choosing a particular service. Allaby found that districts with more family planning clinics appear to be more effective than those where GPs were the main source of contraceptive provision, particularly in providing contraceptive services to under 16 year olds. The number of local health authority areas in which there was at least one sexual health service dedicated to young people has increased steadily from 68% at the beginning of 2000 to 84% by the end of 2001. There is some evidence from ecological data that these types of services do have a greater impact on teenage pregnancy at a population level. Ingham and colleagues compared 20 health authorities in England and Wales with the largest increases in under 16 year old pregnancy rates with 20 health authorities with the largest decreases [1992-1996]. They found that all the selected health authorities in the latter category had introduced a specialist young person’s clinic compared to only 55% of health authorities in the former category.

3.5.3. Environmental and organisational factors

From a user perspective, a number of environmental and organisational factors can affect service preference. For example, the advantages of community contraceptive clinics in comparison to general practice that have been cited include: the contraceptive expertise of staff, greater chance of being able to see a female doctor, more contraceptive methods available, a less disease-orientated approach, more consultation time available, and evening clinics. In addition, clinics are more likely to offer other related services, such as pregnancy testing, STI screening and psychosexual counselling. Young people’s concerns about confidentiality in general practice continue to act as a barrier to their use of this service. The TPSE survey found that a third of young women and just under half of young men remain unaware that they can obtain contraceptives without their parents’ knowledge. There is also confusion amongst some working in general practice about confidentiality relating to provision of contraception to young people under 16 years of age in particular.

Community contraceptive clinics are not without their disadvantages. Disadvantages that have been cited included their limited opening times and the limited range of contraceptive methods in some designated young people’s services. General
practice is preferred by some people as they feel there is greater continuity of care, less stigma associated with its use and the reason for the visit is not apparent.(168)

The data show that young people most at risk of unplanned pregnancy (and STIs) are more likely to access community contraceptive services. There are also environmental and organisational factors that suggest that community contraceptive services would be the most appropriate setting for an intervention aiming to improve young people’s contraceptive understanding and choices. From a logistical perspective it would be more feasible to conduct an evaluation of the intervention in a community contraceptive setting as it would be easier to identify those attending for contraceptive reasons in comparison to general practice. Also, the numbers of young people attending general practice for contraceptive reasons would contribute a small proportion of the overall attendance.

3.6. Conclusions
The proportion of sexually active women reporting use of services for contraceptive supplies is high at over 90%. However, ensuring good access to services is only part of the equation in reducing unplanned pregnancy amongst under 18 year olds. Ways of improving young people’s contraceptive choices and increasing correct use of methods also need to be addressed. In terms of developing an intervention to improve young people’s contraceptive decision-making it is appropriate to target those young people who are at greatest risk of unplanned pregnancy. The data from the TPSE tracking survey and other research literature suggests that community contraceptive services are attracting young people who are more vulnerable to poor sexual health. In the next chapter I describe how the *MyWay* intervention was developed for use in a community contraceptive clinic.

3.7. Key points
- In the UK, a number of different services provide contraceptive advice and supplies.
- Data from the Teenage Pregnancy Strategy Evaluation tracking survey were used to examine young people’s knowledge and use of contraceptive services.
• Interviews were achieved with 8879 young people aged 13-21 years. Young people were identified by random location sampling.

• Two-thirds of all young women and nearly half of all young men (including those who had not yet experienced sexual intercourse) reported that they had accessed a service to obtain contraceptive advice. The most frequently cited service accessed for advice by young women was general practice and for young men was school.

• Less than half of the total sample reported that they had had heterosexual intercourse, 44% of all the young women and 42% of the young men.

• The proportions of young women, who reported heterosexual intercourse, attending general practice and community contraceptive clinics were fairly similar, 55% and 54%, respectively. Commercial venues were the most common source for young men who had reported heterosexual intercourse (54%).

• Young people who reported having first sexual intercourse prior to 16 years and those living in more deprived areas were significantly more likely to use community contraceptive clinics than those who reported first sexual intercourse at 16 years or over and those living in more affluent areas.
Chapter 4. The development of the *MyWay* program

4.1. Introduction

The development (and subsequent piloting) of the *MyWay* program was a collaborative project between a team of researchers, clinicians and information technology (IT) specialists (see Acknowledgements for the full details). Preliminary development work started in the summer of 2000, and the program was ready for piloting by Spring 2003. Some funding to help with the development phase was received from the Margaret Pyke Memorial Trust and from the former Camden & Islington Health Authority\textsuperscript{iii}.

The computer-based program was developed to be used by young people during their consultation with doctors or nurses in a health service setting, but ultimately it was hoped that the program could be accessed in other settings or directly by young people via the Internet. The program was aimed at young people who were interested in understanding their contraceptive choices with respect to preventing unplanned pregnancy (either currently or in the future). Therefore the target group were young people who were having (or planning at some stage to have) vaginal sexual intercourse. It was not an aim to address other sexual behaviours or practices that may be adopted to prevent pregnancy within the program, such as abstinence or oral and anal sex.

The objectives of this chapter are to:

- describe how the epidemiological evidence for the identified options and attributes used within the underlying decision analysis program was collected and applied.
- outline the program’s structure and design.
- explain how the program works.

\textsuperscript{iii} Around £60K was received from these two organisations. This money essentially went towards salary and consultancy costs, and for some program software costs.
4.2. Collection of the epidemiological evidence

4.2.1. Introduction

Eleven contraceptive options were included as the available choices in the program. These included: condoms (male and female), spermicides alone, withdrawal, oral contraceptive pill, Double Dutch (male condom and pill used together), cycle awareness, intrauterine device (IUD), cap, subdermal implants, and DMPA injections. In addition to these contraceptive methods, use of nothing was included in the list of options.

Research with young people had been previously conducted (by myself) which identified the factors and outcomes that 'mattered' to them when they are choosing (or not choosing) a contraceptive method or that might affect their continuation of a method. The work was conducted as part of a contraceptive service needs assessment in Camden and Islington, London. Although this was a small piece of work and the young people participating were not necessarily representative of all young people, it was a useful exercise in identifying key themes and many of the concerns identified were consistent with themes reported in other research literature (as described in Chapter 1.). In brief, the research included a survey of 263 people aged 16-21 years in a variety of community settings, including schools, general practice, sexual health services and youth projects. In the survey young people were asked, taking account of their current personal circumstances, to identify how concerned they would be about factors that may influence their decision when choosing a new method of contraception. In addition to pregnancy and STIs, side effects and 'bother' factors were listed in the questionnaire. Focus groups involving 28 young people and in-depth interviews with 30 young people were conducted to explore factors that influenced contraceptive choice. Again these participants were recruited from community settings. This work found that as well as young people being concerned about pregnancy and STIs (although the young people often commented that they did not personally feel at risk of STIs), side effects and 'bother' factors associated with contraceptive methods did influence both initial uptake and continuation of methods. The side effects that the young people identified as being of concern included: weight gain, acne, nausea, heavy periods, no periods and thrombosis. The 'bother' factors associated with different contraceptive methods included having to remember to take a method (for example having to remember to take the pill each day), the effect on sex (such as having to put a condom on ruining the spontaneity of sex), having to have an invasive procedure (for
example, having an implant fitted or having an injection), and having to go to a health clinic to obtain contraceptive supplies. Interestingly most young people reported in the survey that views of friends, partners and parents had little bearing on contraceptive concerns and choices. This did contradict findings from the qualitative work.

Data were sought on the probability of these events happening for each of the contraceptive options to be included in the program. The best available evidence was collected on:

♦ the effectiveness of each contraceptive method in preventing conception,
♦ the risk of STI acquisition for each contraception method,
♦ the other outcomes and factors affecting the attractiveness of each method including possible side effects (e.g. weight gain) and ‘bother’ considerations (e.g. having to go to a health service to obtain a contraceptive method).

Evidence was selected in terms of study methodology and its appropriateness to the target group. The levels of evidence used to determine study quality were identified for each outcome (and are presented further on in this chapter). Levels of evidence used to ‘grade’ quality would depend on the outcome in question. For example, the risk of nausea when using oral contraceptives could be determined in an RCT of oral contraceptives versus a placebo, but it would be inappropriate to conduct a similar trial to determine the risk of pregnancy. Where possible, data from studies with young people and from studies conducted in the UK were collected to try and increase the generalisability of findings to young people who would be using the MyWay program. When calculating the prevalence of STIs (see p. 89) it was more appropriate to focus on UK data even if there were ‘higher quality’ data from other countries. For STI prevalence, the highest quality UK data were used, when available. It was not an aim of this exercise to conduct a systematic review of the evidence relating to outcomes amongst young people using different contraceptive method. The approach adopted was more pragmatic rather than systematic. Searches of Medline and Embase (using each of the identified contraceptive options and outcomes as keywords) were conducted in 2002 to identify literature and data of interest, alongside searches on relevant sites, such as WHO and the Health Protection Agency (HPA), and reference lists. Where no evidence was found, expert opinion was sought from within the team or from those working in the sexual health/contraceptive field.
Where possible, the target time period for each of the outcomes was one year (for example, the chance of pregnancy occurring during one year’s use of the pill). A benefit of using a pre-determined time period rather than focusing on risks per sexual act is that with the former, behaviour is averaged out. Contraceptive users are more likely to have a contraceptive failure in the early stages of method use, so focusing on the first few months of use may over-estimate the failure rates. The rationale for choosing a one year time period was that it was felt that most people who were likely to experience an outcome of interest would have experienced it within a year if they were going to experience it at all. A description of how data on outcomes were collected is provided below.

4.2.2. Pregnancy

Levels of evidence

In order to measure true contraceptive efficacy you would need to have a double-blind RCT comparing different contraceptive methods against one another and against no method. The women participating in the trial would be contraceptive naïves. Information on whether the allocated methods had been taken consistently and correctly would need to be recorded. However, adopting such a design would be impossible. It would be unethical to randomise women who did not want to get pregnant to no method or a method they did not wish to use.

Selection bias, usually a greater problem in non-RCTs, is a limitation that needs to be considered when making an assessment on the effectiveness of a method in preventing pregnancy. Women choose methods depending on personal circumstances and factors such as their motivation to avoid pregnancy. Women who agree to take part in contraceptive studies may not be representative of the general female population of reproductive age.

Another problem is that studies of contraceptive effectiveness often exclude women with known fertility problems or only include women (and partners) with proven fertility. Therefore there may be more pregnancies observed amongst women in these studies than would be observed within the general female population. However, there may also be higher contraceptive failure rates in population-based surveys in comparison to those reported in clinical trials because women in the latter have agreed to take part in a contraceptive trial and therefore may be more motivated to take the
methods correctly compared to those responding to a population-based survey. Population surveys may be more representative, but they also have their limitations, such as the validity of responses and problems with recall.

Data

Data on the probability of pregnancy in a one-year period when not using contraception and for each contraceptive method were obtained from Trussell. These estimates come from different types of studies, including national surveys and clinical trials. Nearly all the studies were conducted in the US. Trussell provides both probabilities for method failure, which assumes the method was used consistently and correctly, and user failure, which takes account of user ‘error’. In the MyWay program we used the user failure probabilities.

Table 4.1. Probability of unintended pregnancy in one year by contraceptive method: typical and perfect use (Adapted from Trussell, 1998)

<table>
<thead>
<tr>
<th>Unintended pregnancy</th>
<th>Typical use</th>
<th>Unintended pregnancy</th>
<th>Perfect use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chance</td>
<td>0.85</td>
<td></td>
<td>0.85</td>
</tr>
<tr>
<td>Spermicides alone</td>
<td>0.29</td>
<td></td>
<td>0.15</td>
</tr>
<tr>
<td>Fertility awareness (calendar)</td>
<td>0.09</td>
<td></td>
<td>0.09</td>
</tr>
<tr>
<td>Cap (nulliparous)</td>
<td>0.16</td>
<td></td>
<td>0.06</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>0.27</td>
<td></td>
<td>0.04</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.15</td>
<td></td>
<td>0.02</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>0.21</td>
<td></td>
<td>0.05</td>
</tr>
<tr>
<td>Pill (combined and minipill)</td>
<td>0.08</td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td>IUD</td>
<td>0.008</td>
<td></td>
<td>0.006</td>
</tr>
<tr>
<td>Injectable</td>
<td>0.03</td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>0.0005</td>
<td></td>
<td>0.0005</td>
</tr>
</tbody>
</table>

There were no estimates provided for Double Dutch. For the purpose of MyWay Double Dutch was defined as condom and pill use together. Estimates for the most effective method of the two were used in the program. With regards pregnancy, the probability of pregnancy whilst using the pill was entered into the matrix, as the probability of pregnancy whilst using the pill is lower than that whilst using condoms. The principle of using the most effective of the two methods in preventing STIs and side effects, and the method least likely to cause ‘bother’ was also applied.

Assumptions and limitations

In order to measure true risk of pregnancy during perfect (or imperfect) use it needs to be established that a contraceptive method has been used consistently and correctly (or
inconsistently or incorrectly) during a specified time period, ideally measured within each menstrual cycle to limit factors such as recall bias. (33;183) This level of follow-up is rarely achieved.

For the most part, the pregnancy data from Trussell presented above, apply to American women, and we can assume the reported probabilities of unplanned pregnancy for the different contraceptive methods would be fairly similar for women living in the UK. These probabilities may provide poorer estimates for individual woman because they do not take account of factors, such as partner’s fertility, STI history or age, and history of genital tract infections.

These probabilities may not apply as well to young women as a whole and may underestimate a young women’s risk of unplanned pregnancy when using different contraceptive methods. As discussed in the introductory chapter (see Section 1.3.3.) young people’s contraceptive use is likely to be more chaotic and less consistent than older women’s use. The more times you have sex, the increased likelihood of conception. Natsal 2000 data shows that women aged between 16-19 years report more episodes of sexual intercourse when compared to the whole sample surveyed, women aged between 16-44 years (See Section 4.2.3, Table 4.2.). As Trussell notes “Intrinsic to the definition of exposure (to pregnancy) is coital activity by fecund couples”. (181) Wilcox and colleagues followed up 221 women aged between 21-42 years, who were planning pregnancy and had no known fertility problems, to determine the chance of pregnancy with a single act of sexual intercourse. (184;185) They found that with one completely random act of sexual intercourse the chance of pregnancy was 3.1%. The chance of pregnancy ranged from being negligible at day three of the menstrual cycle and peaked at day 13 with 9% of women becoming pregnant. There are biological reasons why young women in their early teens may not be as fecund as slightly older women and therefore in this group the probabilities presented in Table 4.1. may be an overestimate. Women in their early teens often have irregular menstrual cycles and more irregular ovulation or anovulatory cycles, and therefore reduced fertility. (186)

4.2.3. Sexually transmitted infections
The following STIs were examined for inclusion in the MyWay program: Chlamydia Trachomatis, Neisseria gonorrhoea, Herpes simplex virus, HPV, syphilis, trichomoniasis and HIV. Each STI was examined separately, rather than looking at the
general risk of STI acquisition, because of the differences in transmission probability, prevalence and whether or not use of different contraceptive methods were associated with an increased or decreased risk of acquisition. The studies examined investigated heterosexual transmission and acquisition of STIs.

In order to calculate the annual risk of STI acquisition for each contraceptive method it was necessary to calculate:

1. **Transmission** – i.e. the chance that if you have vaginal sexual intercourse with a person with an STI it will be transmitted to you.
2. **Prevalence** – i.e. the chance of having vaginal intercourse with someone who has an STI.
3. The **risk increase or reduction** of STI acquisition associated with different contraceptive options.

Details of the studies that formed the basis for these calculations are detailed in Appendix 2. In order to illustrate how the probabilities were derived I use the evidence collected for acquisition of chlamydial infection as an example in the equations. The Natsal 2000 survey is used to provide any data on sexual behaviour required in the equations.

1. **Transmission - Probability of STI acquisition if sexual intercourse occurs with an infected partner**

   **Levels of evidence**

   In order to assess the probability of STI acquisition, we would want to know what the probability is of someone without infection acquiring an STI after having sexual intercourse with an individual who is infected.\(^{187}\) Therefore the ‘ideal’ design would be a prospective cohort of monogamous discordant couples having unprotected sexual intercourse. There is one example of such a study that examined the transmission of gonorrhoea amongst US navy men on shore leave.\(^{188}\) This study was conducted in the mid 1970s and therefore prior the safer sex era. The study investigators assumed that the prevalence of gonorrhoea amongst women in the bars on shore was the same as the prevalence of infection amongst the sexual partners of the men. They were subsequently able to calculate that over 30% of the men who had had sexual intercourse with an infected woman acquired gonococcal infection. Obviously, such a study today would be unethical and in studies of non-treatable STIs, such as HIV, it
would be unethical not to recommend safer sex. The other problem with STI transmission studies is when the uninfected individual is aware of their partner’s infection: the transmission risk is likely to be reduced with this knowledge. Wald and colleagues comment that both partners participating in their clinical trial of a vaccine for HSV-2 knew that one partner had genital herpes and that the other was at risk. (189) This knowledge, and the concern about possible transmission being a reason to enrol in such a study, was likely to be associated with a lower risk of transmission. Another factor that may lead to underestimating transmission risk in prospective cohort studies is that those couples recruited in these studies are likely to be in fairly established partnerships or at least to have had sexual intercourse prior to enrolment. One of the eligibility criteria for Wald and colleagues study was that couples had been together for at least six months. Therefore the period of highest transmission risk (see Assumptions and Limitations on p. 87) will have already passed. Retrospective cohort studies on the other hand tend to overestimate the probably of transmission. In these types of design it is often difficult to predict the direction of transmission. Studies that identify the index patient as they are seeking care are problematic as it could have been the contact who originally infected the index patient rather than the other way round. (187) With infections, such as *Chlamydia trachomatis*, which have short incubation periods and are often asymptomatic, it is not possible to use the time symptoms first appear as a way of determining who is the source of the infection. (190)

Therefore because of these problems with partnership studies we often have to rely on modelling to provide estimates of transmission risk. (187) The levels of evidence in terms of collecting evidence on transmission risk for *MyWay* were as follows:

1. Prospective cohort of discordant couples
2. Retrospective study of infected couples
3. Modelling
4. Expert opinion

*Calculating probability of transmission*

The majority of the evidence for the transmission calculations came for hypothetical modelling exercises (see Appendix A.2.1. and A.2.2.).
In order to calculate the risk of acquiring chlamydial infection (or any STI) per partnership \((\beta_{ptr})\) we need to know the probability of acquisition per sexual act \((\beta_{act})\) and the average number of acts per partnership \((n)\).\(^{(190)}\) The risk per partnership is calculated as follows:

\[
\beta_{ptr}=1-(1-\beta_{act})^n
\]

Natsal 2000 data tell us that the median number of heterosexual partners reported in the last year for 16-19 year olds is one for both men and women (see Table 4.2.). The median rather than mean was used in the program as the mean's distribution is highly skewed. The median number of episodes of vaginal sexual intercourse in the last four weeks reported by men aged 16-19 years is four and for women aged 16-19 years is six. This allows us to estimate that within a year (and one sexual partnership) young women will have 59 episodes of vaginal intercourse and young men will have 26. This difference between young men and women is explained by the fact that the young men were more likely to have shorter relationships (median of two months compared to seven months for women), and women tend to have older partners. The young people were more likely to report a new partner in the last year compared to the general sample (median 1 vs. 0, respectively).

### Table 4.2. Using Natsal-2000 survey data to estimate median episodes of vaginal intercourse, with lower and upper quartiles presented\(^{1}\)

<table>
<thead>
<tr>
<th></th>
<th>Episodes of vaginal intercourse in last four weeks</th>
<th>Heterosexual partners in the last year</th>
<th>Estimated number of sexual acts per partnership(^{2})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25%, 50%, 75%</td>
<td>25%, 50%, 75%</td>
<td>25%, 50%, 75%</td>
</tr>
<tr>
<td><strong>Women</strong> Aged 16-19</td>
<td>2, 6, 11</td>
<td>1, 1, 2</td>
<td>22, 59, 104</td>
</tr>
<tr>
<td>Aged 16-44</td>
<td>2, 5, 9</td>
<td>1, 1, 1</td>
<td>26, 52, 104</td>
</tr>
<tr>
<td><strong>Men</strong> Aged 16-19</td>
<td>1, 4, 9</td>
<td>1, 1, 3</td>
<td>10, 26, 78</td>
</tr>
<tr>
<td>Aged 16-44</td>
<td>2, 5, 9</td>
<td>1, 1, 1</td>
<td>25, 52, 104</td>
</tr>
</tbody>
</table>

**Notes**
1 Base= Those who reported at least one episode of vaginal sexual intercourse in the last four weeks
2 Calculated as number of sex acts in the last four weeks*13/number of sexual partners

A study by Katz and colleagues estimated the probability for transmission of chlamydial infection per sexual act from male to female is 0.395 and from female to male is 0.323.\(^{(190)}\) Therefore the chances of transmission in a year if you have one
partner for young men is $1-(1-0.323)^{26}=1.0$ and for young women is $1-(1-0.395)^{59}=1.0$. Thus illustrating that the estimates suggest if your regular partner is infected you will also get chlamydial infection.

For some infections, such as trichomonaisis, transmission per partnership rather than transmission per act of sexual intercourse was obtained from the literature. For all the infections the risk of male to female transmission was higher than the risk of female to male transmission.

Assumptions and Limitations
Transmission within a single partnership is going to be influenced by the type of sexual behaviour and frequency of sexual intercourse. Based on the Natsal 2000 data it was assumed a typical person aged between 16-19 years would have one new partnership in a year and the median episodes of vaginal intercourse was 59 for young women and for men was 26. The effect of lowering and increasing a person’s risk of STI acquisition is further explored in the section on sensitivity analysis (see p. 97). Figure 4.1. shows that the chance of acquiring chlamydial infection is over 90% for women after five episodes of vaginal intercourse and for men after six episodes. Therefore although *Chlamydia trachomatis* has a fairly short incubation period it does not take many episodes of sexual intercourse before having a high chance of acquiring the infection.

Figure 4.1. Probability of acquiring chlamydial infection if partner infected
Applying the same calculations for an infection that the data suggests has a much lower probability of transmission per sexual act, such as HSV-2 (0.00015 for female to male transmission and 0.00089 for male to female transmission),(189) the chances of acquiring the infection within a partnership are greatly reduced (see Figure 4.2.). Based on the calculations above, the chance of a woman acquiring HSV-2 infection over a partnership is 5%.

**Figure 4.2. Probability of acquiring herpes simplex virus type 2 if partner infected**

![Graph showing probability of acquiring HSV-2](image)

A number of limitations need to be borne in mind when interpreting these calculations and the data that informed them. In terms of the calculations, the level of infection is constant, that is one's risk of acquiring an infection is the same for each subsequent act of sexual intercourse. This assumes that both the infectivity of the index patient and the susceptibility of the contact are constant. The duration of infectiousness is an important consideration as the stage of infection is a strong predictor of infectiousness. The peak transmissibility of HIV infection is soon after seroconversion of the index patient.(191) It is difficult to measure the duration of infectiousness of bacterial STIs because as soon as individuals become identified they should be treated.(187) Estimates for the infectiousness of untreated gonorrhoea and *Chlamydia trachomatis*
range from around two to six months. Other factors that can influence the infectivity of the index patient include whether or not they have any other STIs, symptomatic versus asymptomatic infection and viral load. Different subtypes may vary in their infectiousness. HIV subtypes have distinct geographical distributions, and the subtype most common in Thailand, for example, has a higher per contact transmission rate compared to subtypes found in other parts of the world. The study used to provide HIV transmission data for MyWay was from the prospective follow-up of discordant couples in Uganda.

Examples of factors that can influence the susceptibility of the contact include whether or not they have any other STIs, and age. Younger women may be more biologically susceptible to STIs in comparison to older women because of, for example, lack of acquired immunity from past exposure, larger cervical ectopy and greater permeability of cervical mucus.

As the aim of this work is the prevention of unplanned pregnancy, only studies looking at STI transmission amongst heterosexual couples were included. In reality, it is impossible to ascertain from the data collected if those who acquired an STI did so through vaginal rather than other forms of sexual activity, such as oral or anal intercourse. Other considerations that need to be borne in mind when examining the data, are the sensitivity and specificity of tests used to diagnose infection, and how samples are transported. How regular follow up is will also affect detection of STIs in contacts. Ho and colleagues, in their study of HPV infection in female college students in the US, describe how follow-up to test for HPV infection was conducted at six monthly intervals and therefore it is possible women could have acquired and lost the infection in this time. This problem with follow-up would under-estimate the incidence of HPV infection and over-estimate the duration of infection.

2. Prevalence – Probability of having vaginal sexual intercourse with an infected partner

Levels of evidence

The ideal way to ascertain the prevalence of infection within the general population is through the use of a random probability sample. The prevalence amongst specific target groups can then be compared to that within the general population. In reality
because of the cost and time taken to obtain information through this type of study design, surveillance data is the more usual way of obtaining prevalence estimates. However, the limitations of surveillance data include the dependence on the population under surveillance which may not be representative of the general population or the target group under investigation (such as young people with respect to MyWay). For example, in England STI surveillance is conducted by the collection of KC60 returns. These represent STIs diagnosed within GUM clinics and therefore there are limitations. First, many people with asymptomatic infection not attending services for screening would not be detected and therefore remain undiagnosed. Second, STIs diagnosed in other settings, such as within community contraceptive services and general practice would not be included. For infections such as chlamydial infection, these two factors would mean that prevalence is greatly underestimated. However, other infections such as gonorrhoea, which are more often symptomatic, are more likely to be picked up in GUM clinics. Data from Natsal-2000 suggested that GUM attendance was highest amongst those with a history of gonorrhoea in comparison to other STI diagnoses, with over 90% of all men and women diagnosed with gonorrhoea reporting they had attended a GUM clinic in the past. Data from cohort studies can also provide information on prevalence; however these data may be limited to the population under investigation and are not necessarily generalisable to the general population or other target populations.

For the purposes of data extraction for MyWay the evidence for STI prevalence was graded as the following:

1. Random probability sample
2. Surveillance data
3. Cohort
4. Expert opinion

Calculating probability of STI acquisition within one year

In order to calculate the probability of STI acquisition we need to know the number of sexual partners an individual has within a year (nptr) and the chances of having sexual intercourse with an individual who has an STI. To do this we need to know the
prevalence of infection within a given community (STI prevalence). The probability of STI acquisition within a one year ($\beta_{STI}$) is therefore calculated as:

$$\beta_{STI}=1-(1-(\beta_{ptr}\times STI\ prevalence))^{nptr}$$

The best available evidence on the prevalence of chlamydial infection in the UK again comes from Natsal 2000.(187) Survey participants were asked to provide a urine sample, which was tested for genital *Chlamydia trachomatis* using urinary ligase chain reaction (LCR). The prevalence of undiagnosed chlamydial infection amongst 18-44 year olds who reported at least one sexual partner was 1.5% (95% confidence interval [CI] 1.1-2.1) for women and 2.2% (95% CI 1.5-3.2) for men. The prevalence amongst women and men aged 18-24 was higher, 3.0% (95% CI 1.7-5.0) and 2.7% (95% CI 1.2-5.8), respectively. Therefore the probability of acquiring chlamydial infection in one year for young men would be would be $1-(1-(1.0\times0.03))^{1}=0.03$ (i.e. 3%) and for young women would be $1-(1-(1.0\times0.027))^{1}=0.027$ (i.e. 2.7%). This is based on the assumption that an individual has a median number of partners of one in a year and the probability of transmission within a partnership is 1.0 ($\beta_{ptr}$). The probability of acquisition for each STI is provided in Appendix A.2. The data show that although an infection like gonorrhoea is highly infectious the chances of acquiring it are relatively small because prevalence is low, while the chances of acquiring HPV infection are relatively high as both the probability of transmission per partnership and prevalence are high.

**Assumptions and Limitations**

Nearly all the evidence to ascertain levels of prevalence came from UK studies or surveillance data. The one exception was with regard HPV infection, which used data from the United States.(197) STI prevalence data from other countries would be very much-affected by different cultural norms with regards sexual behaviour and how health services were delivered, including prevention and control interventions. Even by trying to limit the data used to that from the UK will not take account of the heterogeneity within the population. Where possible the data used were limited to those relating to young heterosexual people (various age ranges), although this was not always possible (see Appendix A.2.1. and A.2.2.). Generally STI prevalence is higher amongst young people in comparison to the general population, predominantly due to young people’s sexual behaviour and networks, and their poorer access to health
By trying to use prevalence data from young people to calculate the probability of STI acquisition within one year, we were assuming that young people were having sexual intercourse with partners within a similar age range. Prevalence of STIs does vary between different age categories. Therefore, risk of STI acquisition will vary depending on partner difference age. Data from Natsal 2000 suggests that most men report first heterosexual sexual intercourse with a partner of similar age, while women report a mean age difference of 2.6 years older for their partners. The other assumption made for calculating STI risk was that sexual partners are selected at random rather than through networks. There is increasing recognition of the importance of sexual networks and mixing in STI acquisition and transmission.

Prevalence studies, like transmission studies, can be limited by detection problems. For example, our understanding of the epidemiology of HPV has been fairly limited because most infections are subclinical, there has been a lack of routine clinical tests for diagnosis and different studies have used different testing methods.

3. The effect contraceptives have on STI acquisition

Levels of evidence

For reasons already discussed, it would be unethical to randomly assign individuals to different contraceptive methods to assess the effect on STI acquisition and it would be difficult to get an appropriate control group. Prospective cohorts of monogamous discordant couples are likely to be the best level of evidence to assess the effect of contraception. The benefits and limitations of these types of study have again already been discussed. For example, in any prospective study, the investigators should counsel women on how to limit their risk of STI, and therefore the number of STIs diagnosed should be reduced. Prospective studies may also be prohibitively expensive, because in a relatively low risk population, large numbers of participants may need to be followed up for a long period of time to observe any difference between contraceptive methods.

Case-control studies may be more feasible to address the question of the effect of contraception on STI, but these studies also have their limitations that must be considered when interpreting results. For most STIs, it is not possible to determine the
correct temporal association between contraceptive use and the time that STI acquisition occurred. This problem should be reduced as the duration of contraceptive use increases. Caution should be paid to cross-sectional surveys for the same reason.

The levels of evidence to determine the effect different contraceptive methods have on STI acquisition were identified as follows:

1. Systematic review of prospective discordant couple cohort studies
2. Prospective discordant couple cohort studies
3. Case-control studies
4. Cross-sectional studies
5. Expert opinion

Increase or reduction in risk of STI acquisition by contraceptive method

The literature was searched to identify studies that investigated the effect use of different contraceptive methods have on the acquisition of STIs. Details of these studies are provided in Appendix A.2. Table 4.3. shows the risk ratios for acquiring chlamydial infection for each contraceptive method based on available literature or expert opinion. The risk ratios were then used to calculate the proportion of women who would acquire chlamydial infection within a year for each contraceptive method. This exercise found the method that the evidence suggested as the most effective in reducing the risk of chlamydia infection was the cap, which reduced the risk of acquisition by about 70%. Therefore 0.8% of young women using the cap would acquire chlamydia infection within one year. The evidence suggested that users of the pill may in fact have a slightly increased risk of chlamydial infection.

Assumptions and limitations

Studies that have investigated the effect of use of contraceptive methods on STI acquisition often report conflicting results. For example, Stephenson, in her systematic review on hormonal contraception and the risk of HIV transmission reported that the sparse data available from the methodologically strongest prospective cohort studies varied from a 90% reduction in the risk of seroconversion associated with oral contraceptive use to a 100% increase. There are a number of methodological considerations that should be borne in mind when interpreting data on studies looking
at the effect of contraception on STI acquisition and these may help to explain some of
the variations observed across different studies.

Table 4.3. Calculated risk ratio (RR) for acquisition of chlamydial infection for
each contraceptive method

<table>
<thead>
<tr>
<th>Contraceptive method</th>
<th>RR for STI acquisition</th>
<th>Evidence for RR</th>
<th>Proportion acquiring an STI within one year</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>-</td>
<td>-</td>
<td>2.7</td>
</tr>
<tr>
<td>Spermicides</td>
<td>0.88</td>
<td>Meta-analysis (WHO, 2001)(203)</td>
<td>2.4</td>
</tr>
<tr>
<td>Fertility awareness</td>
<td>1.0</td>
<td>Expert opinion</td>
<td>2.7</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.29</td>
<td>STI clinic attendees, US – Cross-sectional study (Rosenberg et al, 1992)(204)</td>
<td>0.8</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Expert opinion</td>
<td>2.7</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.97</td>
<td>STI clinic attendees, US – Cross-sectional study (Rosenberg et al, 1992)(204)</td>
<td>2.6</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>0.87</td>
<td>Expert opinion</td>
<td>2.4</td>
</tr>
<tr>
<td>Pill</td>
<td>1.04</td>
<td>STI clinic attendees, US – Cross-sectional study (Magder et al, 1988)(205)</td>
<td>2.8</td>
</tr>
<tr>
<td>IUD</td>
<td>0.8</td>
<td>STI clinic attendees, US – Cross-sectional study (Magder et al, 1988)(205)</td>
<td>2.2</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Expert opinion</td>
<td>2.7</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Expert opinion</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Notes
1 Calculated by multiplying the RR of STI acquisition for each contraceptive with the chance of STI acquisition if
no method was used.

As seen with pregnancy, the measurement of contraceptive use, in particular condom
use, is often inconsistent and can therefore lead to an underestimate of their
effectiveness in preventing STI transmission. There are even problems with some of
the meta-analyses that have attempted to assess the effect of condom use of HIV
transmission, such as comparing ‘some’ condom use with ‘no’ condom use.(207) This
will underestimate the effect of condoms (as also observed for the relative risk of
condom users acquiring chlamydial infection shown in Table 4.3.). In the meta-
analysis of condom effectiveness in reducing heterosexual transmission of HIV that
provided the estimates for MyWay three categories of condom usage were compared:
always-use (100% usage during vaginal intercourse), sometimes use (1-99% usage)
and never-use (0%).(208) Condom effectiveness was measured by comparing always-
use with never-use. There are some infections where condoms offer less protection
even if they are used consistently and correctly. For example, it has been observed that
condoms have a greater protective effect against HSV infection in women than men. (189) This may be explained by the location of the lesions. In men, lesions are typically on the shaft on the penis and therefore would be covered by a condom. In women lesions are more commonly found in the vulval or perianal areas. The evidence used for MyWay to determine the association between condom use and the viral infections HSV and HPV in women came from a random population-based cross-sectional survey conducted in Denmark and Greenland. (209) A slight decrease in risk of HSV infection was observed amongst women whose used barrier methods (i.e. condoms and the cap), but the association was non-significant (odds ratio [OR] 0.8, 95% CI 0.6-1.2). No association was found between users of barrier methods and HPV infection (OR 1.0, 95% CI 0.7-1.5). However, a lack of observed association does not necessarily equate with no health benefit. Barrier methods, such as the condom and cap, may not be able to offer protection to 'exposed' areas that are not directly protected by the method itself, but they may offer protection for women in areas that are protected, such as the cervix. This may help to prevent the development of cervical neoplasia, and subsequent cervical cancer, associated with HPV.(210)

The under and over-reporting of contraceptive use will affect estimates of their effectiveness in reducing and increasing risk of STI acquisition. For example, Zenilman and colleagues comment how people's perceptions of what health care workers or researchers expect or want to hear in terms of condom use may lead to over-estimates in the reporting of correct and consistent usage. (211)

Another problem with measurement is the length of time a contraceptive method has been used. For the MyWay program data from a case-control study of female STI clinic attendees were used to provide the relative risk of gonorrhoea, Chlamydia trachomatis and trichomonaisis in users of condoms and the diaphragm. (204) In this study women were asked about the single most used method over the last month. Not only may use have been inconsistent, but the female cases may have been infected prior to use of the contraceptive method. Another problem is that people often use more than one method over a period of time or during an episode of sexual intercourse. Therefore, it is difficult to attribute a risk increase or reduction to any one particular method. There has also been suggestion of a synergetic effect of using more than one method. Austin and colleagues conducted a case-control study to examine factors associated with gonorrhoea infection in female GUM clinic attendees. (212) The use of spermicides
alone reduced the risk of gonorrhoea by 10% and the use of condoms alone reduced the risk by 13%. However, amongst women who used both condoms and spermicides, there was a reduced risk of gonorrhoea of 59%.

The confounding between sexual behaviour and contraceptive choice can cause difficulties when trying to understand the relationship between STIs and contraceptive use. It is an individual's behaviour, rather than the contraceptive method they are using, that is the risk factor. Stephenson observed in her systematic review of HIV infection and hormonal contraception that residual confounding may have been responsible for much of the association as studies with more extensive statistical adjustment for other risk factors tended to report lower odds ratios than studies with little or no adjustment.(206)

There are potential problems translating findings of studies from different countries with regards the effect contraceptive methods have on STI acquisition. For example, some of the evidence collected for use in the MyWay program came from studies conducted in Africa. Factors other than contraceptive method used may put some groups at increased risk of STI infection, such as impaired immunity in areas with high HIV prevalence and high levels of genital ulceration.

Despite these limitations, there are biological changes due to contraceptive use that may increase susceptibility to STI infection, particularly amongst the hormonal methods. Pill use is associated with cervical ectopy thought to be caused by higher levels of oestrogen.(202) Cervical ectopy is the extension of sensitive columnar cells from the cervix. These cells are more vascular than the squamous epithelium, and therefore may be more easily traumatised and vulnerable to STIs. An association has been found between cervical ectopy and chlamydial infection, although not with HIV-1 infection.(202;210) What is unclear is which came first: the ectopy or the infection, that is the ectopy through pill use leading to infection or the infection (confounded by pill use) leading to the ectopy. It has also been suggested that the ectopy may in fact make it easier to detect infections.(213;214) Expert opinion within the MyWay research team was that men whose female partners used the hormonal methods were at neither increased nor decreased risk of STIs. However, there has been some speculation that HIV infected users of hormonal contraception are more likely to
infect their partners than other HIV-infected women as HIV DNA is more likely to be found in their cervical and vaginal secretions. (215)

Biological factors can also explain how some methods may (certainly in theory) protect against STI acquisition. Progesterone-releasing methods, either the combined pill or LARC methods, such as subdermal implants, IUSs and injectables, help prevent sperm penetration through the thickening of the cervical mucosa. This mechanism may also inhibit STI transmission. There was minimal evidence available to examine the effect of LARC use on STI transmission. Only one study was identified. This was a prospective study that followed up a cohort of HIV-negative sex workers to investigate risk factors associated with HIV seroconversion. (216) This study reported the use of DMPA injections was significantly associated with seroconversion (OR 3.7, CI 1.4-3.4). However, these results should be treated with caution. This same study reported that there was also an association between pill use and seroconversion (OR 2.6, CI 1.0-6.8), while the meta-analysis of the methodically strongest studies suggest that use of the pill has a protective effect, although this was not statistically significant (OR 0.3, 95% CI 0.05-2.1). (206)

There is some suggestion that women may be more at risk of HIV infection during menstruation. (191) An increased risk has also been reported for men whose HIV infected partners are menstruating. It could be assumed therefore that methods that can increase the volume of blood loss, such as the IUD, or the frequency of blood loss, such as subdermal implants, could increase an individual’s risk of STI acquisition. Mati and colleagues found in their case control study comparing HIV seropositive women with HIV seronegative women that the former group of women had a slightly increased odds of being past IUD users, although this association was not statistically significant, (OR 1.2, 95% CI 0.8-1.7). (202) Contrary to this was the cross-sectional survey of 1031 female STI clinic users in the US that found that there was a decreased odds of chlamydial infection amongst IUD users. (205) No evidence was found in terms of risk amongst men whose partners were using the IUD. Expert judgment within the research team was that we should assume the risk was the same as chance.

**Sensitivity analysis**

For the purposes of the initial development of *MyWay* we tried to obtain data that would represent outcomes in a typical young person. In the case of STI acquisition we
assumed that the level of risk for MyWay users would be ‘average’. However, it would be possible to identify young people who were ‘low’ or ‘high’ and then link them to a matrix with data that are more applicable to their risk behaviour or environment (such as if they were having sex with an individual from a target group where the prevalence of STI infection was high). Sensitivity analysis was conducted to assess the difference identifying an individual as low or high risk would have on the estimates of STI acquisition in one year. Data on from Natsal 2000 and studies relating to chlamydial transmission were again used to illustrate this process.

In order to investigate the effect of lowering or increasing the risk of STI within a partnership, the lower and upper ranges of transmission per sexual act of chlamydial infection provided by Katz were applied to the formulae \( \beta_{ptr} = 1 - (1 - \beta_{act})^n \). (190) The probability of male to female transmission per sexual act was 0.395 (range 0.234 to 0.402) and 0.323 for female to male transmission (range 0.203 to 0.331). The lower and upper quartiles for number of sexual acts per partnership from Natsal 2000 data were applied (see Table 4.2.). Therefore the probability of acquiring chlamydial infection from an infected partner is estimated as:

**Male to female**

Lower risk transmission \( \beta_{ptr} = 1 - (1 - 0.234)^{22} = 1.0 \)  
Higher risk transmission \( \beta_{ptr} = 1 - (1 - 0.402)^{104} = 1.0 \)

**Female to male**

Lower risk transmission \( \beta_{ptr} = 1 - (1 - 0.203)^{10} = 0.90 \)  
Higher risk transmission \( \beta_{ptr} = 1 - (1 - 0.331)^{104} = 1.0 \)

Reducing or increasing risk of transmission per sexual act or the frequency of sexual activity within a partnership has little impact on transmission within a partnership as the chances of infection with *Chlamydia trachomatis* are already high. Transmission of this infection is likely to happen in the early stages of a sexual relationship. However, impact of the sensitivity analysis will vary between infections and a difference will be more notable with infections that have a lower chance of being transmitted during one sexual act, such as HSV.
The sensitivity analysis had greater impact when the focus was risk of acquiring chlamydial infection in one year. Low and high scenarios were applied to the formula: 

\[ \beta_{STI} = 1 - (1 - (\beta_{ptr} \times STI \text{ prevalence})^{n_{ptr}}) \]

Fenton and colleagues provide 95% confidence intervals around the prevalence estimates of chlamydial infection amongst 18-24 years in the UK: 3.0% (95% CI 1.7 – 5.0) amongst women aged 18-24 years and 2.7% (95% CI 1.2-5.8) amongst men aged 18-24 years.(196) The lower confidence limits were used to represent a low-risk scenario (i.e. low prevalence) and the upper limits a high-risk scenario (i.e. high prevalence). Natsal 2000 data provided the lower and upper quartiles for number of sexual partners in the last year (denominator those who had had vaginal sexual intercourse in the last year). The effect of condom use was applied to these estimates. Again the confidence intervals around the relative risk of infection obtained from the literature were applied. Estimates from the case-control study conducted by Rosenberg and colleagues were used for women.(204) As no estimates were obtained for the effect condoms have on men’s risk of chlamydial infection, it was assumed the risk would be the same as that for gonorrhoea (See Appendix A.2).

**Male to female**

Low risk \( \beta_{STI} = 1 - (1 - (1.0 \times 1.2)) \) = 0.012

Low risk \( \beta_{STI} \) with lower 95% CI of condom relative risk = 0.6 \times 0.012 = 0.0072

High risk \( \beta_{STI} = 1 - (1 - (1.0 \times 5.8)) \) = 0.113

High risk \( \beta_{STI} \) with upper 95% CI of condom relative risk = 1.57 \times 0.113 = 0.177

**Female to male**

Low risk \( \beta_{STI} = 1 - (1 - (0.9 \times 1.7)) \) = 0.015

Low risk \( \beta_{STI} \) with lower 95% CI of condom relative risk = 0.1 \times 0.015 = 0.0015

High risk \( \beta_{STI} = 1 - (1 - (1.0 \times 5.0)) \) = 0.143

High risk \( \beta_{STI} \) with upper 95% CI of condom relative risk = 1.13 \times 0.143 = 0.162

The sensitivity analysis illustrates that changing the prevalence within a community and number of sexual partners does impact on an individual’s chances of acquiring an STI. In a low risk scenario a woman using condoms has a 0.7% chance of acquiring chlamydial infection in one year. For men using condoms it is 0.2%. In a high risk scenario the chance of acquiring chlamydial infection for a woman using condoms is
17.7% and for a man it is 16.2%. The increased risk associated with condom use is likely to be confounded by other risks such as increased number of partners. As number of partners is already included in the modelling this risk is likely to be an overestimate. In the high-risk scenario, it has also been assumed that there is the same number of sexual acts within each partnership. Garnet and Andersson have noted that as people increase their number of partners, there is a reduction in the number of sexual acts per partnership. As described above this is unlikely to have a great impact on the transmission of chlamydial infection due to the high probability of transmission, but this may have an impact on acquisition of other STIs.

4.2.4. Side effects

Levels of evidence

RCTs are the gold standard in measuring 'treatment' effect. In non-RCT studies it is difficult to attribute any side effects to the contraceptive methods themselves. For example, weight gain in women may be due to lifestyle changes rather due to use of contraception.

The levels of evidence used to identify studies that investigated the side effects associated with contraceptive methods were:

1. Systematic reviews
2. Randomised or clinically controlled trials
3. Prospective cohorts
4. Case control studies
5. Cross-sectional surveys
6. Expert opinion

Data

Data from the literature were collected for the following potential side effects for contraceptive methods: weight gain, acne, nausea, no periods, heavy periods and thrombosis. These outcomes had been identified by young people in qualitative work (previously conducted by RF) as side effects that would be likely to influence a young person's adoption and continuation of a method. As side effects are subjective, where possible, definitions were set. For example, no periods or amenorrhoea is defined as no menstrual bleeding lasting for more than 90 days. Belsey and colleagues analysed the menstrual histories of over a 1000 healthy, normally menstruating women aged 15-49
years (contributing to 6375 women years) to provide baseline data with which the menstrual patterns of women using contraception could be compared.(218)

Attributable probability of experiencing the identified side effects, rather than overall probability, was entered into the matrix. So for example, the probability of weight gain was obtained from a US study women aged 15-49 years with moderate acne where participants were randomly allocated to receive either the oral contraceptive or placebo.(219) The probability of self-reported weight gain at six months was 0.022 amongst the pill users and was 0.021 amongst those taking the placebo, so the attributable risk was estimated to be 0.001. For some side effects, this meant there were negative values. The estimate used for acne amongst pill users (p=0.05) was less than the estimate of acne for amongst 16 year-old women in general (p=0.03).(220;221) As the MyWay program was designed for all values in the matrix to be 0 to 1.0 the program would not accept negative values. Therefore, 0 was entered for any minus values. This was something that the team realised would have to be addressed in the future refinement of the program, but it was felt this would be acceptable for the pilot. Acne was the only side effect where some contraceptive users had a reduced risk attributable to the method they were using.

Assumptions and limitations
Nearly all of the side effects related to the hormonal methods. Therefore, for the most part, the chance of having the identified side effects whilst using any of the non-hormonal methods was assumed to be none. The exception was that menstrual changes were also investigated for IUD users.

Most of the evidence came from studies of women of reproductive age. Morbidity outcomes may be very different in young people, such as their reduced risk of thrombosis relative to older women.(222) Weight gain will be different amongst young women. It is important that young women realise that it is normal to gain some weight and percent body fat during their teens.(223) Young women are also likely to experience great variability in there menstrual cycle between menarche and the age of 19 years, in particular episodes of infrequent bleeding, which is completely normal.(218)
The extent to which some side effects are ‘bad’ enough to lead to discontinuation of a method will be subjective. There are, for example, cultural variations in how bleeding patterns are viewed. A systematic review of implantable contraceptives found that women in developing countries were far less likely to report discontinuation because of menstrual changes in comparison to women in developed countries.(224,225) Little is understood about young people’s views on changes in bleeding patterns caused by some contraceptive methods and how this affects method acceptability and continuation of use. Other factors, such as the influence of population programs and whether or not women have to pay for contraception, may influence the ‘acceptability’ of methods used. It is viewed as good practice that women should be counselled about possible side effects, although interestingly a systematic review found that there was little evidence to suggest that enhanced counselling improved contraceptive adherence or continuation.(226)

Many of the studies followed women up for less than one year. For some side effects, such as nausea, which normally settles after two to three months,(227) shorter follow-up will not be too much of a limiting factor. However, other contraceptive side effects, particularly bleeding patterns, can take a much longer time to settle.(224)

4.3.5. Bother factors

The ‘bother’ factors associated with contraceptive methods that young people had identified in the earlier qualitative work included:

1) having to go to a clinic to obtain supplies,
2) having to remember when to take or use the method,
3) having to have an invasive procedure,
4) the effect on sexual intercourse.

‘Bother’ factors are even more subjective than side effects. For the pilot, probabilities for each of these factors were estimated by the research team. For example, for the attribute “bother getting” we assumed that this would be 100% (i.e. 1.0) for the cap as a user would definitely have to access a health service to obtain the cap, while for male condoms it would be 25% (i.e. 0.25) as these are more widely available and a user does not necessarily need an appointment at a health service and for withdrawal there would be ‘no bother’. Other probabilities were even more arbitrary, for example the ‘bother’ of not using any contraception during sexual intercourse was estimated at 0.25 as it
was felt there may be some anxiety in relation to the risk being taken. Details of the probabilities assigned to bother factors for each method are provided in Appendix A.2 (See Table A2.16).

A limitation is obviously what the research team constitutes to be or not to be a bother may be very different from what young people feel is or is not a bother. There is also likely to be wide variation between young people and bother may be influenced by external factors, such as accessibility of local sexual health services.

### 4.3. Site structure and design

The team at LSHTM led by Prof. Jack Dowie, in collaboration with Lorenzo Gordon from the UK web programming company Orange Ideas, led on the development of the underlying decision analysis model and its presentation through a purpose-built website that functions as an interface for the model. The whole team contributed to the text for the site. Other websites about sexual health targeted at young people were reviewed by members of the UCL team to inform style and layout. A designer was employed to create a site that would appeal to young people using information collected from the website review. The logo image chosen to identify the *MyWay* site is illustrated below.

**Figure 4.3. MyWay logo image**
There were four main sections to the site that were presented to users:

- **Questionnaire** (for research purposes, See Chapter 5. Section 5.2.5.)*

- **Demo** (Choice of two demonstrations: 1) choosing a friend to go on holiday with or 2) choosing a boyfriend/girlfriend)

- **Using the software**
  - Options
  - Attributes
  - Importance: The weighting box
  - Results

- **Documentations**
  - FAQs (Frequently asked questions)*
  - How Tos*
  - Glossary*
  - Credits (i.e. research team details)

Documents marked with an asterisk are shown in Appendix 3.

*MyWay* program was web-based. This gave it the future potential of being accessed from any location in the country, or indeed world. Using an Internet-based program did cause problems in the early stages as the NHS system did not allow access to sites outside the NHS network and the *MyWay* was hosted on a commercial server. This problem was solved by organising access to the IP (Internet Protocol) address of the commercial server on some of the clinic computers.

The *MyWay* software used a variety of computer technologies to achieve its objective. The software needed to be web enabled. Data entered by users had to be captured via a central database, irrespective of the location of the user. A web-capable relational database package was used to build and maintain data storage, which was stored on the commercial web server hired specifically for this purpose. It had to work with existing software. The *MyWay* team leased some Java software*iv*, which provided the weighting

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*iv The original "Rator Box" software was developed by Michael Kirschner.
box and the decision analysis calculation code. The graph software was purchased from a commercial company (CORDA). Orange Ideas then substantially modified the working of the Java software in order to create something sufficiently dynamic for *MyWay* use.

The questionnaire and the option/attribute decisions made by the user were captured using a combination of web programming. This code had to correctly capture the data, and ensure that though a user could move freely about the system, they could not accidentally overwrite their data. In addition, because it was important to capture the data at a specific time, a login system had to be written to prevent unauthorised access contaminating the data set. The data were stored on relational database on the web server.

Whilst maintaining the user's anonymity, we had to link the questionnaire with the recorded software data, and at the same time allow the user to change rooms between answering the questionnaire and using the software, or taking a break if necessary. We used a User identification (ID) number, which was an anonymous number, but allowed a returning young person who had not completed their software use to enter their ID and resume from the point where they had left off.

Terminology relating to the decision analysis process, such as 'weighting' and 'scores', and the options and attributes were defined in pop-up boxes. These came up when the cursor was placed across the word the user wished to look up.

A site map was also included to help users navigate the non-software sections of the site, and get an overview of the information available.

An underlying matrix contained the probabilities collected for each option and attribute. The *MyWay* program was designed so that a library of alternative rating matrices (i.e. tables of probabilities), reflecting the different probabilities for the various outcomes and attributes that were likely to apply in different locations or population groups, could be installed and selected for use. An important feature of *MyWay* was the control 'administrators' could have over the data used within the program. It was felt that, ultimately, different sites, such as clinics, could have their own matrices, which could include local data. The only proviso would be that
justification would have to be given as to why data were changed. Matrices could also be easily updated as new research results became available, ensuring that *MyWay* need never be out of date. Users were given the option to access the matrix data being used to generate their scores after they received their score.

An important consideration in relation to the matrix is the focus adopted in relation to outcomes. If a particular outcome is experienced by only one party in a sexual partnership, such as women in the case of heavy periods, then her rating for this event may be different from that of men. (Indeed men may be less likely to select it as a relevant attribute.) Conceptually a matrix may therefore be female focused, male focused or dual focused, the latter being one in which it is assumed that an outcome experienced by either is experienced by both. For the purposes of the pilot the outcomes were rated from either partner's perspective (i.e. a 'dual' focus). Therefore the bother of getting the cap would still be 100% for a male *MyWay* user. In situations where data were applicable to both women and men, the highest probability was selected. For example, a young man's risk of obtaining chlamydial infection was estimated to be higher than the risk for a woman if no contraception was used. Therefore the risk for men was entered into the dual matrix.

### 4.4. How the program works

#### 4.4.1. How to use the program?

Young people were to be introduced to the program during their consultation with the contraceptive nurse or doctor. Demos were designed to be a simple introduction to the concepts behind the *MyWay* program. There were two demos to choose from. The first was “Boyfriend/Girlfriend” where users were asked to weight attributes they would look for in a potential partner. These attributes were being well-off, faithful, kind, outgoing and sexy. The second was “Holiday friend”, which asked the user to weight the attributes lively, adventurous, independent, funny and reliable to select a friend to go on holiday with. Young people were presented with a list of fictitious names. The gender of the first names used for the options were purposively ambiguous so that they would be applicable to both young women and men. Each name had probabilities assigned to each of their attributes, for example the probability that Gerry would be faithful was 0.2, but the probability s/he would be well-off was 0.8. Unlike the data used in the underlying matrix for the main contraceptive element of the program, the
data on the attribute probabilities for the demonstrations were made up by the LSHTM team as this was purely as 'academic' exercise to help young people understand how the program worked.

The user was presented with a box made up of segments each labelled with an attribute. Using a cursor, the user could then increase or decrease the relative areas inside the box to assign their individual values to each of these attributes. These values were then quantified for use in the underlying decision analysis model by calculating the proportion of the total area each attribute is given. The values would always equal 100% and the weights are all relative to one another. Therefore, if the user increases the size of one area within the box the software automatically adjusts the size and assigned weight of the other attribute areas. A bar chart showed the ranking and rating of fictitious boyfriends/girlfriends or holiday friends, by combining the user’s weight given to each attribute with the rating of the friend for that attribute. Details on how the scores are calculated are provided in the next section.

Once the young person had gone through the demos, they were then to move onto the section on contraceptive methods. The same principles as seen in the demos applied. Instead of the fictitious friends, the user was presented with a list of contraceptive options. These included: none, cycle awareness, withdrawal, condom (male), condom (female), cap/diaphragm, spermicides, the pill, IUD, injectables, subdermal implants and Double Dutch (condom and pill). They could choose up to eight options. It was felt that selection of more than eight options would be too complicated for the underlying decision analysis calculations. Once they had done this, they were presented with a list of attributes, which included pregnancy, and different STIs, side effects and ‘bother’ factors. Again they could select up to eight attributes. They assigned weights to each of the attributes and a bar chart then showed the ranking and rating for each of the contraceptive options chosen by the user, with the highest bar showing the option most consonant with the best available evidence and the user’s value weights.

The MyWay program also positively encouraged users to carry out ‘what if’ explorations by manipulating the weighting box to see how changing the weights placed on the different attributes affects the scores given to each contraceptive method. This exploration was not intended to be used to manipulate the program in order to see
how a pre-preferred option could emerge as the recommended one. It was only available after the user has confirmed that they were satisfied with their weights and had been provided with the recommendation based on these weights.

4.4.2. How is a score calculated?
The Boyfriend/Girlfriend demo is used to provide further explanation on how a score is calculated. Figure 4.4. shows the attributes someone may consider when choosing a boyfriend or girlfriend. This box was presented and the respondent was instructed to use the cursor to move the borders and so increase or decrease the areas within the weighting box to represent the importance they placed on each of the attributes. Figure 4.5. shows an example of assigned weights given to each of the attributes. In this example, being well-off was given the greatest relative importance at 46%.

Figure 4.4. Weighting box for Boyfriend/Girlfriend Demo

Figure 4.5. Example of assigned weights for Boyfriend/Girlfriend Demo
In the Score Bar Chart below (Figure 4.6.) we can see that Gerry scored best when the user entered the weights above and these were combined with the supplied ratings for each friend and each attribute (see Table 4.4). The tallest bar (i.e. the one with the highest score) identified the ‘best’ option based on the evidence and the user’s values. This bar was always identified in yellow.

**Figure 4.6. Score Bar Chart**

![Score Bar Chart](image)

If the user were to click on the Show Score Breakdown button, they could see that Gerry scored 0.64 (Figure 4.7.).

**Figure 4.7. Score breakdown**

![Score Breakdown](image)
To see why Gerry scored 0.64 we need to refer to the matrix for Boyfriend/Girlfriend (Table 4.4.). The ratings for the friends' characteristics were assigned by the team, for example Gerry had the highest rating for being well-off at 80%.

**Table 4.4. Ratings matrix: Probability of 'friends' having defined characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Kind</th>
<th>Outgoing</th>
<th>Sexy</th>
<th>Well-off</th>
<th>Faithful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sam</td>
<td>0.8</td>
<td>0.2</td>
<td>0.5</td>
<td>0.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Chris</td>
<td>0.2</td>
<td>0.8</td>
<td>0.2</td>
<td>0.6</td>
<td>0.4</td>
</tr>
<tr>
<td>Pat</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Gerry</td>
<td>0.5</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>0.2</td>
</tr>
<tr>
<td>Joss</td>
<td>0.6</td>
<td>0.5</td>
<td>0.4</td>
<td>0.5</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Each option (friend) was scored in the way illustrated for Gerry in Table 4.5. The ratings for each attribute appear in the first row. In the second row the attribute weights from the Weighting Box are entered. The attribute weights and ratings are then multiplied to get the figures in the final row. Adding sideways across all the attributes provides Gerry’s score of 0.63 (a slight difference to score in the bar chart due to rounding up). All other options (friends) are scored the same way. This way of calculating a score differs from the decision trees described in Chapter 2 (Section 2.3.4.), but the same decision analysis principles apply.

**Table 4.5. How a score is calculated**

<table>
<thead>
<tr>
<th></th>
<th>Kind</th>
<th>Outgoing</th>
<th>Sexy</th>
<th>Well-off</th>
<th>Faithful</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>0.5</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>0.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Weighting</td>
<td>0.12</td>
<td>0.08</td>
<td>0.27</td>
<td>0.45</td>
<td>0.06</td>
<td>1.0</td>
</tr>
<tr>
<td>Rating x Weight</td>
<td>0.06</td>
<td>0.032</td>
<td>0.162</td>
<td>0.368</td>
<td>0.012</td>
<td>0.634</td>
</tr>
</tbody>
</table>

When calculating the scores for the contraceptive options, we had to take account of the fact that the attributes were negative or undesired characteristics (unlike the Demo’s positive attributes). Because we wanted a higher score to be better, we entered the complement of the rating for each attribute. For example, instead of using the probability of getting pregnant whilst using the pill when calculating scores, we used the probability of not getting pregnant whilst using the pill. The program can function
with either positively or negatively orientated attributes, but all attributes must be orientated the same way.

The phase I pilot was an opportunity for both young people and providers to give feedback on the structure and design of the program, as well as for investigating the feasibility of using the program in a clinical setting. The pilot's design and findings are described in the next chapter.

4.5. Key points

- The computer-based program, *MyWay*, was developed to help young people with their contraceptive decision-making and was to be used during their consultation with doctors or nurses in a sexual health clinic.

- Data on the effectiveness of different contraceptive methods in preventing conception, the risk of STI acquisition for each contraceptive method, and other outcomes and factors affecting the attractiveness of each method, i.e. possible side effects (e.g. weight gain) and 'bother' considerations (e.g. having to remember to take method) were collected from available scientific evidence for the program's underlying decision analysis model. Data collected referred to the probability of an event occurring within one year (e.g. the probability of weight gain in a year when using injections).

- Evidence was selected in terms of study methodology and its appropriateness to the target group. Where evidence was not available from the published literature, opinion was sought from experts in the sexual health field.

- The *MyWay* program was presented through a purpose-built website that functioned as an interface for the model.

- Young people were first given some demonstration exercises (e.g. choosing a friend to go on holiday with), designed to be a simple introduction to the concepts behind the program.

- They were then presented with a list of contraceptive options and attributes to select. They were asked graphically to weight how concerned they were about each of their selected attributes. The program then provided a ranking and rating for each of the contraceptive options chosen by the user. The scores for each method were calculated by combining the probability of events occurring from the
scientific evidence with the weight young people placed on their selected attributes.
Chapter 5. The pilot: *MyWay* in a clinical setting

5.1. Introduction

The ultimate goal was to conduct an RCT comparing the *MyWay* program to usual contraceptive care within clinical consultations to assess its effect on selection and continuation of contraceptive methods (a measure of acceptability) and on subsequent rates of pregnancy and STI diagnosis (a measure of effectiveness). Distinguishing which components within a complex intervention are responsible for its effectiveness, or lack of it, can be challenging. In trials of complex interventions simply focusing on primary trial endpoints, such as biological outcomes, will provide little understanding of how the intervention is working.\(^{228,229}\) In order to understand the process, multi-method evaluations need to be adopted. In behavioural interventions the mechanisms are social and psychological, unlike clinical trials where they are biological, which can make measuring effect more complicated. Understanding the context and how stakeholders interact with the intervention needs to be examined.\(^{230}\) Before an RCT could be undertaken exploratory work was needed to give young people and health care staff an opportunity to provide feedback on both the program and the research tools designed to measure effect. The phase I pilot provides the opportunity to assess the feasibility of using the *MyWay* program within consultations in a young person’s sexual health clinic, its acceptability amongst young people and staff, and its potential in helping young people make contraceptive decisions. It also helped to identify methodological factors that would have to be addressed when designing an RCT.

The objectives of this chapter are:
- to describe the methodology used in the phase I pilot study of the *MyWay* program
- to report the pilot findings

5.2. Pilot methods

5.2.1. Aim and research questions

The aim of the phase I pilot was to assess the feasibility, acceptability and potential effectiveness of the *MyWay* program in a young person’s sexual health clinic.
The following questions were to be addressed in this exploratory stage:

1. Can the MyWay intervention be introduced during young people’s consultations with doctors or nurses in a sexual health clinic – from a technological perspective and a health service delivery perspective?
2. Is the MyWay program presented in a way that is acceptable to young people, in terms of language and visual presentation, and is the program easy to use?
3. Is the use of the program within consultations acceptable to the health care providers?
4. Are the data collection instruments designed in a way that they collect data on the process and outcome measures of interest?
5. Does a decision aid based on expected utility theory have the potential to improve contraceptive uptake and continuation, i.e. how acceptable is the method recommended by the MyWay program to young people? How do they feel it informed their choice of contraception?
6. To what extent is there agreement between the young people, the health care workers and the MyWay program as to what is considered the ‘best suited’ contraceptive method?

In the anticipated RCT the MyWay intervention would be compared to usual contraceptive care and management delivered to young people in a sexual health clinic. It was deemed unnecessary to have a control group in this exploratory phase I stage.

5.2.2. Study population and setting

The target group was young men (n=10) and women (n=15) attending the designated young people’s service and the contraceptive clinic at a London sexual health clinic. Twenty-five was thought to be a sufficient number of young people to include in a feasibility study, and a number possible to recruit in the timeframe available.

Young people were eligible for inclusion in the study if they were:

❖ aged 13 – 21 years (initially it was intended to limit the age group to 13-17 years, but staff explained that the men seen at the young people’s clinic tended to be slightly older than the young women).
❖ having or planning to have vaginal intercourse
not wanting to get pregnant (or their partners to become pregnant) at the time of consultation or in the near future

5.2.3. Recruitment
Recruitment started at mid-January, 2005 and finished mid-May, 2005. The designated young people’s clinic and the contraceptive clinic each ran sessions once a week. These sessions were a combination of appointment slots and drop-in. Not all sessions were covered by members of the research team\(^v\) and during March there was no recruitment because the clinic contraceptive nurse was away.

Posters advertising the study were placed in the waiting rooms and information sheets about the study were handed out at reception when young people booked in. When young people were initially seen by the doctor or nurse the reason for their visit was established. Any young woman and man who met the selection criteria were invited to take part in the pilot by the doctor or nurse they were seeing. Information was collected on the number of people approached, the numbers eligible, and the numbers declining to take part. The reasons young people were not invited to take part or the reason they declined was also noted. Those agreeing to participate were asked to see the researcher before continuing with the consultation. Some of the young men invited to participate were attending the clinic for reasons not directly relating to contraception (for example they wanted an STI screen). In these cases the reason they were attending the clinic was dealt with first, and then they were to come and see the researcher for consenting.

Written consent was sought from the young people. This also applied to young people under 16 years, as it would not be appropriate to request additional parental consent for this age group, as this would be in breach of their confidentiality attending a sexual health service. Whether or not young people had the maturity to understand the nature, purpose and likely outcome of the work was assessed by the researcher. A list of relevant helplines and websites, such as Childline and the fpa (Family Planning Association), was also provided.

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\(^v\) Two researchers were involved in the fieldwork: Rebecca French and Makeda Gerressu
The information sheet, consent form and the list of helplines and websites are all shown in Appendix A.3.

5.2.4. Intervention process
The consultation process and the use of the intervention amongst those young people who agreed to participate is outlined below:

1. Sexual history taken by the doctor or nurse
2. Young person uses the MyWay program on their own (although the doctor or nurse could go through the program with the young person if the young person preferred this).
3. Doctor or nurse discusses the program outputs with the young person.
4. Continue with consultation and contraception provided as required

5.2.5. Research process
How the pathway through the clinic and the intervention process for those eligible young people who agreed to take part was integrated with the research process is illustrated Figure 5.1. (see over). Boxes in blue highlight the parts of the consultation that were observed by the researcher. The outcomes measures and the research instruments used to obtain the data are discussed in Section 5.2.7.

5.2.6. Pilot process and outcome measures and research instruments
Decision-making, itself, can be measured in a number of ways, including collecting data on attitudes, preferences, intention, motivation and perception of risk.(97) In order to assess all aspects of decision-making on which the MyWay program was to act upon, the pilot was designed to measure impact on utilities (i.e. the measurements of individual values and attitudes towards choices available rather than the outcome of the decision) and affect (e.g. increased satisfaction or reduced anxiety with the decision made). As we were not following up the young people it was not possible to collect measures on the impact that MyWay had on health behaviours (e.g. the use of chosen contraceptive methods).
Figure 5.1. Young person’s pathway through the MyWay intervention and the research process

Young person’s pathway through the clinic and the intervention process

- Young person books in at reception
- Consultation: reason for their visit established by the doctor or nurse
- Sexual history taken by the doctor or nurse
- Young person uses MyWay program
- Doctor or nurse discusses MyWay output. Continue with consultation. Contraception provided as required

Research process

- Young people eligible for the study sent to the researcher for recruitment and consent
- Health care worker documents contraceptive method they think would be best suited based on the risk assessment
- Young person self-completes CAPI questionnaire
- Data on selected options, attributes and assigned weights collected within program
- Health care worker completes Facilitator Sheet on how they viewed the consultation process
- Young person’s exit interview with researcher
Studies of interventions that look at decision-making need to include a range of process and outcome measures. Therefore when assessing the effect of MyWay in this pilot study a number of factors needed to be studied, such as the effect the program has on the relationship between the health care worker and the young person, how best to present the intervention, the expectations of the young person (and their partner), what factors influenced choice, how incorporating user values altered decision-making, the impact the program has on the delivery of health care, and the outcome of the care provided.

Table 5.1. Research methods used to collect process and outcome data

<table>
<thead>
<tr>
<th>Research Instrument</th>
<th>Process measures</th>
<th>Outcomes measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-completed CAPI questionnaire for young people</td>
<td>• Impact of intervention on staff/young person interaction</td>
<td>• Effect of program on staff assessment of young people’s contraceptive needs: pre and post-intervention method of choice</td>
</tr>
</tbody>
</table>
| Facilitator (staff) sheet | • Time taken to use program and participate in the research  
• Usability of the program  
• Impact of intervention on staff/young person relationship  
• Feasibility of introducing MyWay within consultations – benefits and barriers | • Effect of program on staff assessment of young people’s contraceptive needs: pre and post-intervention method of choice |
| Observation | • Usability of the program  
• Impact of intervention on staff/young person relationship  
• Feasibility of introducing MyWay within consultations – benefits and barriers | • Selected contraceptive options  
• Selected contraceptive attributes  
• Contraceptive option scores (and ‘best’ method) |
| Individual program outputs | • Usability of the program  
• Impact of intervention on staff/young person relationship  
• Feasibility of introducing MyWay within consultations – benefits and barriers  
• Intervention acceptability | • Effect of program on young people’s contraceptive choices: post-intervention method of choice |
| Exit interview with young people | • Usability of the program  
• Impact of intervention on staff/young person relationship  
• Feasibility of introducing MyWay within consultations – benefits and barriers  
• Intervention acceptability | • Effect of program on young people’s contraceptive choices: post-intervention method of choice |
| Staff feedback | • Feasibility of introducing MyWay within consultations – benefits and barriers  
• Intervention acceptability | |

118
A variety of research tools were used to collect data from the young people. All of the research instruments cited below are provided in Appendix 4. Table 5.1 identifies how research methods and instruments were used to obtain the pilot's process and outcome measures.

**Questionnaire**

A self-completed questionnaire was designed to collect data from the young people in the following areas:

- demographic characteristics
- reason for their current visit to the sexual health service
- attitudes towards contraception
- sexual and contraceptive history
- individual perception of pregnancy and STI risk
- individual level of concern with regards pregnancy, STIs, and side effects and 'bother' factors associated with contraceptive use

Validated questions were used where appropriate, for example questions on sexual behaviour were taken from Natsal 2000 and questions on attitudes towards contraception were from the TPSE tracking survey. Skips were used to ensure that young people did not have to answer sections that were irrelevant, for example young people who had not yet had vaginal sexual intercourse were not presented with questions about experience of pregnancy.

The anonymous and confidential questionnaire was computer-based and part of the *MyWay* program. A combination of text boxes and radio buttons were used for young people to report or indicate their responses. Each young person using the program was allocated an ID number. This made it possible to link up data provided in the questionnaire with other program-related data (such as data on the user's selected attributes, the assigned weights and outputs), while at the same time protecting user anonymity. Young people were asked to complete the questionnaire after the doctor or nurse had taken a sexual history. After they had completed the questionnaire they went straight into the *MyWay* demo and contraceptive program.

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There are gaps between participant ID numbers (see Table 5.5) because each time a member of the research team accessed the program they were allocated an ID number.
**Program data**
The following output data for each user were obtained from the program: the contraceptive options they selected, the attributes they selected, the relative weightings they placed on their selected attributes and the scores for each option.

**Facilitator sheet**
A facilitator sheet was designed for completion by the nurse or doctor doing the consultation. It asked:

- what was their favoured contraceptive option after their initial risk assessment, but prior to the young person’s use of the program;
- what was their favoured contraceptive option once they had discussed the MyWay outputs with the young person; i.e. to see if the MyWay output was consistent with their assessment or had changed it.
- how the young person’s use of MyWay affected the consultation.

**Researcher observation**
Researchers (MG and RF) observed the consultations. Notes were documented on pre-designed observation sheets. Areas covered included the young person’s understanding of the program and its output, ease of use, and interaction with the facilitator. The time it took to complete the questionnaire, go through the program and do the exit-interviews were recorded.

**Exit interviews**
A topic guide was developed for brief semi-structured exit interviews with young people after they had finished their consultation. Information was collected on what individuals thought of the program in terms of ease of use, language and usefulness as well as information about the program’s effect on the consultation and its outcome. A combination of note-taking, and taping and transcription of interviews was undertaken.

**Staff training and feedback**
Two doctors and two contraceptive nurses were trained to use and interpret MyWay. The training was completed in one session and lasted three hours. Topics covered included:

- The rationale behind MyWay
An explanation of intermediate decision technology

The research process, i.e. pilot methodology and its application in the clinic

MyWay Simulation: Demo and program

Site map-Description of website pages and locations, e.g. glossary

Role play exercises were used as a way describing how the program would be used during the consultation. Each member of staff participating in the training was given a manual which contained all of the text within the program (such as the FAQs and the glossary of terms), details of how a score was calculated within the program and all the research documentation.

The initial findings from the pilot were reported back to clinic staff at a team meeting. Staff were asked to comment on the research process and pilot findings. Specifically, they were asked their views on the most appropriate setting and target group for MyWay, and how the MyWay process compares to the way they make decisions about what is the most appropriate contraceptive method for young people they see. This session was taped so that the discussions could be transcribed.

5.2.6. Analysis

Quantitative data analysis was conducted to assess the appropriateness of the survey questions and to assess the practicalities of linking up individual survey data with individual outputs from use of the MyWay program. For the purposes of the pilot the analysis was limited to descriptive statistics, such as frequencies. The analysis was conducted in SPSS Version 12.0.(163)

Analysis of process data allowed an initial assessment of the program from three perspectives. These included:

1. The user: e.g. whether young people found it to be a useful tool, whether it addressed their concerns when choosing a method of contraception and whether it made a difference to their previous attitudes and beliefs.

2. The health care worker: e.g. whether providers found it a useful tool, whether it assisted with the contraceptive consultation

3. The service: e.g. space and time required
Using the first stages of ‘Framework’, a thematic analysis was conducted allowing the classification and interpretation of the qualitative data. Data from each participant was coded with the MyWay ID number and data from transcripts and field notes were entered into Excel spreadsheets. Qualitative and quantitative data were linked to allow further exploration.

5.2.7. Funding and Ethics

A grant of £20,052 was received from the North Central Thames Primary Care Research Network (NoCTeN) to conduct the pilot study. The award covered the some salary costs towards a research fellow (Makeda Gerrussu), the consultancy fee for Orange Ideas Ltd and consumable costs, such as printing. Ethics committee approval for the pilot was granted from the Joint UCL/UCLH Committees on the Ethics of Human Research.

5.3. Results

In this section, the characteristics of the young people participating in the study are described, followed by presentation of data on their selected options and attributes, the program weightings and the level of agreement between the young people, staff and the program. Vignettes of two users are then provided to illustrate in more detail how the program worked. Findings focusing on the process are presented in the final part of this section (5.3.4.)

5.3.1. Characteristics of young people

Twenty-five young people participated in the pilot (15 young women and 10 young men). During the recruitment period 56 young women and 74 young men were eligible and were invited to participate in the pilot. The most common reasons given by young people who declined were insufficient time, lack of interest and lack of remuneration. Many of the young people had friends with them who were not keen to hang around.

The demographic and behavioural characteristics of the sample that were reported in the computer-based questionnaire are presented in Tables 5.2. and 5.3., respectively.
Table 5.2. Demographic characteristics of *MyWay* Users (n=25)

<table>
<thead>
<tr>
<th>Age in years, mean and range</th>
<th>18 (15-22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment status, n</td>
<td></td>
</tr>
<tr>
<td>At school</td>
<td>1</td>
</tr>
<tr>
<td>At college/university</td>
<td>15</td>
</tr>
<tr>
<td>Paid employment</td>
<td>3</td>
</tr>
<tr>
<td>Unemployed</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
</tr>
<tr>
<td>Ethnicity, n</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>8</td>
</tr>
<tr>
<td>Black-Caribbean</td>
<td>9</td>
</tr>
<tr>
<td>Black-African</td>
<td>2</td>
</tr>
<tr>
<td>Black-Other</td>
<td>1</td>
</tr>
<tr>
<td>Indian, Pakistani, Bangladeshi</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
</tr>
<tr>
<td>Religion, n</td>
<td></td>
</tr>
<tr>
<td>Catholic</td>
<td>5</td>
</tr>
<tr>
<td>C of E, Other Protestant</td>
<td>4</td>
</tr>
<tr>
<td>Muslim</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
</tr>
<tr>
<td>None of these</td>
<td>8</td>
</tr>
</tbody>
</table>

All of the young people, with the exception of one young woman, reported that they had had vaginal intercourse.

Table 5.3. Sexual Behavioural Characteristics of *MyWay* Users

<table>
<thead>
<tr>
<th>Age at first intercourse, median (range)</th>
<th>Male (n=10)</th>
<th>Female (n=14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of contraception at first sex, n</td>
<td>15.7 (14-18)</td>
<td>15.8 (14-18)</td>
</tr>
<tr>
<td>Number of sexual partners in last year, n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3 or more</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Not answered</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Unprotected sex in the last 4 weeks, n</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Current regular partner, n</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Past pregnancy (or known pregnancy with partner), n</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Ever STI, n</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Twenty-two young people reported that they (or their partner) had used condoms in the past, 15 reported pill use, nine withdrawal, three injectables, one implants and one the patch. Ten of the young women and three of the young men reported that they or their girlfriend had used emergency contraception in the past.
Table 5.4. Participant contraceptive choices pre and post-intervention and MyWay recommended choice

<table>
<thead>
<tr>
<th>ID</th>
<th>Demographic characteristics</th>
<th>Contraceptive method pre-intervention</th>
<th>MyWay ‘Best’ Choice</th>
<th>Contraceptive method post-intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gender, Age, Relationship status,¹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Young person’s method of choice¹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health care worker³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>Female, 18, Regular partner</td>
<td>Pill</td>
<td>Double Dutch</td>
<td>Double Dutch</td>
</tr>
<tr>
<td>104</td>
<td>Female, 17, Regular partner</td>
<td>Pill</td>
<td>Condoms</td>
<td>Condoms</td>
</tr>
<tr>
<td>105</td>
<td>Female, 22, Regular partner</td>
<td>Pill</td>
<td>Pill</td>
<td>Pill</td>
</tr>
<tr>
<td>106</td>
<td>Male, 18, No current partner</td>
<td>Condoms</td>
<td>N/A</td>
<td>Condoms</td>
</tr>
<tr>
<td>107</td>
<td>Female, 17, Regular partner</td>
<td>Patch</td>
<td>Pill</td>
<td>Pill</td>
</tr>
<tr>
<td>108</td>
<td>Female, 17, Regular partner</td>
<td>Spermicidesc</td>
<td>N/A</td>
<td>Double Dutch</td>
</tr>
<tr>
<td>109</td>
<td>Female, 17, No current partner</td>
<td>Pill</td>
<td>Double Dutch</td>
<td>Pill &amp; condoms</td>
</tr>
<tr>
<td>115</td>
<td>Female, 18, Regular partner</td>
<td>Implant</td>
<td>Patch</td>
<td>Program error</td>
</tr>
<tr>
<td>119</td>
<td>Female, 15, No current partner</td>
<td>Pill</td>
<td>Pill</td>
<td>Pill</td>
</tr>
<tr>
<td>120</td>
<td>Female, 17, Not reported</td>
<td>Pill</td>
<td>Double Dutch</td>
<td>Pill</td>
</tr>
<tr>
<td>124</td>
<td>Female, 17, Regular partner</td>
<td>Implant</td>
<td>Implant</td>
<td>Implant</td>
</tr>
<tr>
<td>125</td>
<td>Male, 16, No current partner</td>
<td>Condom</td>
<td>N/A</td>
<td>Double Dutch</td>
</tr>
<tr>
<td>126</td>
<td>Male, 19, Regular partner</td>
<td>Condom</td>
<td>Double Dutch</td>
<td>Condom or nothing</td>
</tr>
<tr>
<td>127</td>
<td>Female, 17, Regular partner</td>
<td>Pill</td>
<td>Double Dutch</td>
<td>Pill</td>
</tr>
<tr>
<td>128</td>
<td>Male, 16, Regular partner</td>
<td>Condom</td>
<td>Double Dutch</td>
<td>Double Dutch</td>
</tr>
<tr>
<td>129</td>
<td>Female, 16, Regular partner</td>
<td>Injection</td>
<td>Double Dutch</td>
<td>Injection</td>
</tr>
<tr>
<td>136</td>
<td>Male, 20, Regular partner</td>
<td>Pill</td>
<td>Pill</td>
<td>Pill</td>
</tr>
<tr>
<td>143</td>
<td>Female, Regular partner</td>
<td>Pill</td>
<td>Double Dutch</td>
<td>Double Dutch</td>
</tr>
<tr>
<td>144</td>
<td>Female, 19, Regular partner</td>
<td>Injection</td>
<td>Pill</td>
<td>Double Dutch</td>
</tr>
<tr>
<td>145</td>
<td>Male, 22, Regular partner</td>
<td>Condom</td>
<td>Double Dutch</td>
<td>Pill</td>
</tr>
<tr>
<td>146</td>
<td>Male, 19, Regular partner</td>
<td>Condom</td>
<td>Double Dutch</td>
<td>Pill</td>
</tr>
<tr>
<td>147</td>
<td>Female, 16, Regular partner</td>
<td>Patch</td>
<td>Pill</td>
<td>Pill</td>
</tr>
<tr>
<td>152</td>
<td>Male, 20, No current partner</td>
<td>Condoms</td>
<td>Double Dutch</td>
<td>Condoms</td>
</tr>
<tr>
<td>153</td>
<td>Male, 18, Regular partner</td>
<td>Condoms</td>
<td>Condoms</td>
<td>Pill</td>
</tr>
<tr>
<td>155</td>
<td>Male, 19, No current partner</td>
<td>Condoms</td>
<td>Condoms</td>
<td>Condoms</td>
</tr>
</tbody>
</table>

Notes
1 Source: Questionnaire data 2 Source: Observation data 3 Source: Facilitator sheet data 4 Source: Program data
Reasons for attendance at the clinic are listed below. Some people had more than one reason for attending.

- STI screening or treatment (8 male, 2 female)
- HIV test (2 male, 0 female)
- Contraceptive advice (2 male, 4 female)
- Starting a new method or needing a repeat prescription (1 male, 8 female)
- Picking up condoms (3 male, 2 female)
- Emergency contraception (2 female)
- Pregnancy test (5 female)

5.3.2. Selection of contraceptive options and attributes and program output

Options

Only two young people reported in the questionnaire that they were currently not using any contraception. Young people were asked which method they would use if they were thinking of starting or changing a contraceptive method. Most reported the condom (n=10), followed by the pill (n=9) (see Table 5.4)

Table 5.5. illustrates that the male condom and the pill were the most frequently selected contraception options in the program. None of the young people were interested in the IUD. A few young people expressed interest in the patch, but this option was not available on the list within the program.

Table 5.5. Young people’s selected contraceptive options in the MyWay program

<table>
<thead>
<tr>
<th>Selected Methods</th>
<th>Female n=15</th>
<th>Male n=10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Spermicides</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Pill</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Injectables</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>IUD</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Subdermal implants</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Double Dutch (condom &amp; pill)</td>
<td>12</td>
<td>7</td>
</tr>
</tbody>
</table>

Notes

1 Each young person could select up to eight contraceptive options.
Many of the young people explained during the exit interviews that knowledge of methods other than the pill and condoms was often poor. They explained that decisions about contraception were often based on their friends’ experiences and peer norms.

**Attributes**

In the questionnaire, young people were asked, if they were changing to a new contraceptive method today how concerned would they be about pregnancy, STIs, side effects and ‘bother’ factors. Pregnancy (identified by 12 young women and 7 young men) and STIs (identified by 10 young women and 9 young men) were outcomes of concern for many of the young people. Only two of the young women and one of the young men felt they were at risk of pregnancy, and one of the young women and four of the young men felt at risk of STI acquisition. Most of the young people were concerned about potential short-term side effects (13 young women and 9 young men) and long-term effects (9 and 12, respectively). The women were asked in the questionnaire to report how likely they would be to discontinue a method if they experienced any of the pre-defined short-term side effects. The numbers of women who would be very likely or likely to discontinue for the following side-effects were 13 for acne, 11 for weight gain, 10 for nausea, seven for headaches, seven for heavy periods and five for no periods.

When the young people were presented with the list of attributes to chose from in the *MyWay* program, nearly all selected pregnancy as something they would be concerned about when thinking about contraception (n=24) (See Table 5.6.). Data collected from the relative weightings young people assigned to the selected attributes showed the mean weight women placed on pregnancy was higher that the men’s mean weight, 49.2% versus 38.7%, respectively. Table 5.6. illustrates that HIV was the most commonly selected STI in the list of possible attributes to select. In terms of ‘bother factors’, half of the women selected having to have an invasive procedure or having to remember to take contraception, while the most frequently selected ‘bother factor’ for men was the effect on sex. Weight gain was the most frequently selected side effect for women, although the side effect given the most weight by women was heavy periods.

In the exit interviews, many of the young people thought that their risk of STIs or pregnancy was low, particularly those in a regular relationship. However, despite perceptions of low risk, many expressed great concern about STIs and pregnancy. Some
of the men commented that they had found it interesting to think about the attributes from their girlfriend's perspective. One of the young men explained that he had selected no period as a concern because, if his girlfriend had no periods, it might mean she was pregnant.

Table 5.6. Selection of attributes and their average weighting

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th></th>
<th>Male</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean weighting % (range)</td>
<td>n</td>
<td>Mean weighting % (range)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnancy</td>
<td>14</td>
<td>49.2 (18.4-93.9)</td>
<td>10</td>
<td>38.7 (8.6-58.7)</td>
</tr>
<tr>
<td>STIs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gonorrhoea</td>
<td>12</td>
<td>10.5 (1.0-44.1)</td>
<td>4</td>
<td>6.6 (1.9-12.5)</td>
</tr>
<tr>
<td>Syphilis</td>
<td>5</td>
<td>8.5 (5.3-17.7)</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>10</td>
<td>8.8 (0.8-16.0)</td>
<td>4</td>
<td>9.6 (3.8-12.7)</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>2</td>
<td>8.0 (8.0)</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Genital warts</td>
<td>3</td>
<td>3.7 (0-5.7)</td>
<td>3</td>
<td>5.4 (1.1-13.2)</td>
</tr>
<tr>
<td>Genital herpes</td>
<td>7</td>
<td>5.0 (0.9-9.0)</td>
<td>3</td>
<td>19.6 (11.3-40.3)</td>
</tr>
<tr>
<td>HIV</td>
<td>13</td>
<td><strong>13.2 (6.0-26.7)</strong></td>
<td>10</td>
<td>16.1 (7.3-33.2)</td>
</tr>
<tr>
<td>Bother</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bother getting</td>
<td>2</td>
<td>2.8 (0.9-4.7)</td>
<td>4</td>
<td>7.1 (0-10.7)</td>
</tr>
<tr>
<td>Invasive procedure</td>
<td></td>
<td>4.8 (0-8.6)</td>
<td>2</td>
<td>9.0 (8.1-10.0)</td>
</tr>
<tr>
<td>Bother remembering</td>
<td>5</td>
<td>9.1 (1.1-17.4)</td>
<td>5</td>
<td>7.1 (2.2-9.0)</td>
</tr>
<tr>
<td>Effect on sex</td>
<td>4</td>
<td>6.3 (0.6-10.6)</td>
<td>8</td>
<td><strong>10.2 (7.3-19.7)</strong></td>
</tr>
<tr>
<td>Side effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight gain</td>
<td>12</td>
<td>8.7 (0.9-19.4)</td>
<td>4</td>
<td><strong>13.4 (7.2-19.4)</strong></td>
</tr>
<tr>
<td>No periods</td>
<td>3</td>
<td>6.9 (1.2-10.7)</td>
<td>2</td>
<td>5.4 (3.6-7.3)</td>
</tr>
<tr>
<td>Heavy periods</td>
<td>4</td>
<td>9.7 (1.1-16.6)</td>
<td>6</td>
<td>8.1 (3.1-11.1)</td>
</tr>
<tr>
<td>Acne</td>
<td>5</td>
<td>5.8 (3.2-12.4)</td>
<td>4</td>
<td>5.5 (1.3-12.4)</td>
</tr>
<tr>
<td>Nausea</td>
<td>6</td>
<td>8.7 (3.8-13.3)</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Thrombosis</td>
<td>7</td>
<td>7.1 (1.3-13.2)</td>
<td>5</td>
<td>8.8 (1.3-25.0)</td>
</tr>
</tbody>
</table>

Notes
The numbers and percentages in bold are the highest for each category.

**Methods recommended by MyWay**

The contraceptive method recommended for each individual, based on the weights they assigned to their selected attributes, is shown in Table 5.4. Overall the pill was the method recommended the most (9 times), followed by Double Dutch (7), implants (4) and condoms (4). One user did not have a recommended method as the program crashed before she reached this point.
Levels of agreement

One of the objectives of the research was to assess the level of agreement between the method young people said they would be most likely to use, the method the facilitator thought to be the most appropriate based on the young people’s risk assessment and history, and the method which came out as the best option in *MyWay*. In the questionnaire, the methods young people reported that they would currently be most interested in using were: pill (n=10), condoms (8), subdermal implant (2), injectables (2), Evra patch (2) and spermicides (1). We were then able to compare the young people’s preferred choice before use of *MyWay* with the best option based on their selected options and attributes. We excluded the two women who chose the Evra patch as this method was not available on *MyWay*. The computer crashed before one young person was presented with *MyWay*’s ‘best choice’. Therefore of the remaining 22 participants, there was agreement with *MyWay*’s option on six occasions and disagreement on 16 occasions (See Table 5.5.). None of the young people said they would want to use Double Dutch (pill and condom) and this method was recommended on seven occasions by the program. Other discrepancies can be explained by young people’s lack of knowledge of all methods prior to using the program, and methods that are more effective in preventing pregnancy, such as subdermal implants, were more likely to come up best in the program in those who had placed greater weight on pregnancy being a concern. Unfortunately we were unable to investigate the difference between the facilitator’s choice of most appropriate method with the young person’s and *MyWay*’s ‘best’ choices as none of the consultations were with regular clinic staff. Although staff recruited young people onto the study and provided the usual contraceptive care and management, they did not have the time to go through and discuss the *MyWay* program with the young people participating in the study (this problem is further discussed Section 5.3.4. Process). The nurse (DG) who was part of the research team went through the program with the young people, took sexual histories and made an assessment on the ‘best suited’ method (which she identified on the Facilitator Sheet) when she conducted the consultation. Three of the young men did not have a risk assessment taken as they were seen by only one of the researchers (they had either come into the clinic to collect condoms or had already seen the doctor). The most frequent method recommended by DG for the young people was Double Dutch. Agreement between DG and the *MyWay* program occurred for seven of the twenty young people she assessed.
During the presentation of findings to the clinic staff, there was some discussion about how decisions about contraception are made. The staff were very interested in the extent to which there was agreement in the "choice" methods between MyWay, the young people and the facilitator (i.e. the research nurse). They felt many young people attend the clinic having already made a decision about what method they want. However the staff acknowledged that there is a need to improve continuation and adherence of contraception. They also thought it was important that staff should be questioned about how they make decisions. One person commented that it was important for staff to look at their own prejudices. Another staff member explained how decisions are often subjective, and factors such as how busy the clinic is and appointment times will play a role "if it's the last patient at 7 o'clock you may not be so thorough anymore going through all the methods". It was mentioned that contraindications to some methods were not factored into the program, and this could account for some inconsistencies between the program and the research nurse's recommendations.

5.3.3. Vignettes

Two vignettes are used to describe the MyWay experience in greater detail. Data from the questionnaire, the program outputs, observations and the exit interviews are used to describe the two young people's background and experience of MyWay. The names of each participant are fictitious.

*Vignette 1 (ID 136)*

Michael was aged 20 years, and studying at university. He had started seeing a new girlfriend three weeks ago, and during that period had been using condoms consistently. He had had no other sexual partners in the last year. He had no history of STIs or pregnancies. The reason for his attendance was for an STI check up as his girlfriend was going to start taking the pill.

Michael went through the program with one of the researchers (RF) after he had seen the doctor. He was computer literate and used the Internet everyday. He tried the holiday friend demo and this gave him a good grasp of what the program was trying to achieve. He was interested to know about the data for the demo. He went through the instructions by himself and felt the wording was appropriate. He chose seven contraceptive options (see Figure 5.2.) The attributes and weights he assigned to them
are shown in Figure 5.3. He did not feel he was at risk of pregnancy or STIs, although he reported that he was very concerned about both these outcomes. He was also very concerned about what his partner thought. He found the process of assigning weights to his selected attributes a useful exercise:

> It’s interesting actually, because you don’t quantify risks in your head. You don’t do it on such a formal basis. It’s quite weird because you are concerned about all these things really, and it’s quite weird saying what are you more worried about, getting your girlfriend pregnant or getting HIV, and that is like woo, so its weird. It’s quite educational to be forced to do that, and you are never going to be able to express statistically how they are feeling with their emotions and stuff and I know that’s not what you’re trying to do. You are trying to gauge what’s best in terms of what type of contraception is good for them. It’s not definitive the things you choose in terms of what way you give them, it is educational, it’s just reminded me of how many STDs (sexually transmitted diseases) there are which is probably quite good, so yeah.

**Figure 5.2. Michael’s selected attributes and weights**

![Figure 5.2. Michael's selected attributes and weights](image-url)
Figure 5.3. Michael's score bar chart

He was pleased the pill came up as the 'best' option as this confirmed the decision he and his girlfriend had already made. He also explained it was useful to think about contraception from a female perspective:

*It hasn’t changed my perspective or anything because like I say, I came here today to get the pill. But yeah I mean, I think it’s good for men certainly because a lot of men and I know a lot of my friends don’t give any thoughts to ... they let their girlfriends handle contraception, which I think is really out of order. They have to take responsibility, in fact this is interesting everyone likes playing around with bars and everything, then hopefully a lot of men would log onto it and learn a lot more about it. You should make it clear at the start that men can do it as well, if the questions seem to apply just to women then you answering on your perspective of your girlfriend cos, when it came up “How do you consider your risk of getting pregnant?” you don’t really know, but, yeah its good for men just as much as for women.*

He also described how it was useful to be able to adjust weights to see what affect this had on the scores bar chart:

*Yeah, I mean, I’d say any process where there are plenty of different options and there’s this kind of balance between people having very strong opinions and very strong feelings of what they want and what they don’t want. And also the fact that there is lots of different information and options that they might not be aware of. But I think that the whole problem of quantifying things is you can’t always express exactly what you think. It’s very good that you get the choice to*
move these (the weighting box segments) around after, if it just came up this is your best choice then I think that wouldn’t be very good at all. This is very good because you can stop to compare you know exactly, you know, how you can make a difference, and what kind of other things are you thinking of using it for.

Michael explained how the MyWay program could be particularly beneficial to young people who may feel uncomfortable seeking advice from a health care professional:

I have never discussed contraception with a nurse. My girlfriend has, but I haven’t. And it’s good that you can do this because I don’t know if I would discuss contraception with a nurse or a doctor. I would now, I think, now that I’m in a long-term relationship. But before then, when things were like casual and it’s just, I didn’t feel so comfortable with myself. I wouldn’t have. I would have been embarrassed coming here to have a test or anything like that, and I think there is a lot of shyness and nervousness about talking about these issues. And so, the fact that people can do this, perhaps instead of going to see a doctor or a nurse is very good, perhaps especially for men who aren’t necessarily comfortable speaking about it, like, with someone in public. So yeah, I can’t say how it compares, but it’s definitely a good thing.

Vignette 2 (ID 124)
Anna was aged 17 years and studying at college. She first had sexual intercourse aged 16 years. She reported 10 sexual partners in the last year, two of these in the last four weeks. She had a regular boyfriend of four months. She currently had a subdermal implant in situ. Despite this she was attending the clinic for a pregnancy test. Previous contraceptive methods used included the pill, condoms and withdrawal. She has used emergency contraception twice in the past. She described the problems when making decisions about contraception:

With most young people contraception doesn’t go with their way of life, you do have to think about it, worry if you’ve forgotten and go out of your way.

She had no history of pregnancy or STIs. She used the Internet everyday.
She went through the program as part of her consultation with the nurse. She did not want to use the demo and went straight to selecting the three contraceptive options she was interested in: the pill, implants and Double Dutch (i.e. the condom and pill).

Anna’s selected attributes and weights are shown in Figure 5.4. She did not feel at risk of pregnancy, STIs or HIV, although she stated she was very concerned about these outcomes. She explained that she was mainly interested in HIV in terms of infection, "because it can't be treated, if caught early enough, the others can be treated." Other factors that she was very concerned about included long-term side effects and having to remember to take contraception. She reported that if she experienced nausea, headaches or acne she would be very likely to discontinue a contraceptive method. Her concern with thrombosis was due to family history on her mother's side. She thought acne and nausea were "the worst side effects of contraception" and explained that she selected weight gain because "I have problems with my weight anyway."

**Figure 5.4. Anna’s selected attributes and weights**

During the exit interview Anna commented that she was surprised that Implants came up as the ‘best’ option as she felt that she had given HIV much importance and had expected Double Dutch to score the highest (Figure 5.5).
The researcher (MG) conducting the interview explained that in the weighting box she had only given HIV a relative importance of 6%. The greatest importance had been given to pregnancy and implants were the most effective in preventing this outcome. Anna described how she had found the process useful:

*I think it is good 'cause, if you are concerned, it doesn't just tell you about the methods, but it takes account what you actually want from it.*

*It's not just about finding a safe method or the method that works best but finding one that suits. It made me think whether this is the method I want to use.*

However, although she would access a program like *MyWay* on a computer at home, she still felt conversations with health care providers would be more informative.

**5.3.4. Process**

A summary of the strengths and weaknesses of the *MyWay* program used in consultations within a clinical setting which were identified through the pilot process are summarised in Table 5.7.
Table 5.7. Summary of strengths and weaknesses identified through the pilot

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ Popular with young people                                             ♦ Many participants had already made their decision or wanted the doctor nurse to make it for them</td>
<td></td>
</tr>
<tr>
<td>♦ The potential to access on demand as circumstances change if available on the Internet</td>
<td>♦ Time pressure – from user perspective. Some had already had to wait for a while. Pressures to go from friends/partners who were with them</td>
</tr>
<tr>
<td>♦ Demo helped to introduce concept                                       ♦ Men who were not in long-term relationships found it less useful</td>
<td></td>
</tr>
<tr>
<td>♦ Opportunity to look at different contraceptive options                  ♦ Not used during the consultations with regular clinic staff</td>
<td></td>
</tr>
<tr>
<td>♦ Young people liked the fact that outputs were personalised              ♦ Some young people said they would prefer human interaction</td>
<td></td>
</tr>
<tr>
<td>♦ Program viewed as non-judgmental, less embarrassing and less pressurised than consultations with health care workers</td>
<td>♦ Some technical problems, e.g. system crashed when user tried to return to previous pages</td>
</tr>
<tr>
<td>♦ Educational, although not an information site                           ♦ Time pressure – from staff perspective due to short appointment times and often large number of patients waiting to be seen</td>
<td></td>
</tr>
</tbody>
</table>

The mean time it took young people to participate in the research, including completion of the questionnaire, use of the program and have their exit interview was 34 minutes (range 19 – 50 minutes). This time represents an underestimate of an individual young person’s time spent participating in the research as it excludes time taken during recruitment and consent.

Design

All of the young people said they liked the colour scheme and layout of the program. The young people liked the fact that the program was interactive; this was a criticism of other websites that target young people.
When you go on the web you get loads of things, bumbling along about anything. With this you just read what you need to know and then it’s simple. You don’t get annoyed. It’s straightforward. It’s not telling you about what you don’t really want to know about. You don’t have to read. (Female, Age 17, ID 109)

Generally, the weighting box and the score bar chart were the popular sections in the site. However, some found it fiddly moving the boxes with the cursor to assign weights to the attributes they selected. This was more evident when they had selected the optimum number of eight. A couple felt there was too much text and some found some of the terminology difficult to understand, e.g. ‘attribute’. One of those interviewed felt more pictures, for example of different contraceptive methods, would improve the site. Most liked to use of pop-up boxes for definitions. When observing the young people, many found it easier to be talked through the ‘instructions’ rather than have to read them.

Some young people found it difficult to understand why, when they altered their weights, there was little change in the heights of the score bar chart. This is the mathematical consequence of the fact that many probabilities are very low and the absolute differences between them tiny. This was particularly evident for an outcome like HIV, where the probability of acquisition for the ‘average’ teenager based on the evidence used is so low, therefore even giving greater weight to HIV is going to make minimal difference to the ‘best’ contraceptive options provided by MyWay. Although young people had access to all the probabilities used in the program, few looked at these, and of those who did, these data were for the most part meaningless in their tabular form.

Young people’s views on the MyWay experience

During the exit interviews young people were asked how using MyWay compared with speaking to a doctor or nurse. Many of the young people described how they liked the anonymity of MyWay and how they could obtain personalised information without fear of judgement.
[MyWay] allows you to be yourself. No need to lie since you'd only be cheating yourself. (Male, Age 18, ID 106)

Never discussed contraception before. I would rather do this. I don't like to talk about it with people. (Male, Age 16, ID 128)

Prefer this because it can answer questions, so the nurse doesn't have to make judgement. It's useful because it will be consistent for every person using it. (Female, Age 20, ID 127)

It's a computer, not really a human being. It's easier to talk to, easier to relate to because talking to a doctor about contraception. It might be a woman, it's uncomfortable talking to them. If it's a computer, I find it easier. (Male, Age 19, 146)

It's easier cause sometimes you don't really want to talk about it. If embarrassed you don't really want to tell the truth. (Female, Age 16, ID 147)

Normally when you come to a clinic they deal with what you're there for and then you're out the door again. With this it's information and it's there for you. I would never think that they would have something like this. It's a good idea. It's about real things. (Female, Age 17, ID 109)

There were others who preferred going to see a health professional, particularly those who had already decided on the contraceptive method they wanted.

Personally I would go and see a doctor cause I kind of know. But say you were younger than me.. say 15 or 16.. this would be better if you were embarrassed about asking about these kind of things. It's easy. Anyone has access to the Internet nowadays. It's much easier. (Male, Age 19, ID 155)

When talking you get feedback. You can ask questions. With a computer you have less choice. (Female, Age 18, ID 115)
However, one young person felt the comparison of *MyWay* with a consultation with health care worker was not a fair one, as they were not necessarily exclusive of one another:

*It made me think about finding out information for myself rather than having a doctor or nurse, or someone explain to me. It was useful in a different way. I wouldn’t be able to say it was better or worse because it is too different to compare.* (Female, Age 17, ID 108)

Young people liked the individual focus of *MyWay*:

*It’s different, shows you things you wouldn’t think about but that you need to think about.* (Female, Age 15, ID 119)

*It focuses on you, not on things that are not important to you.* (Female, Age 17, ID 120)

*It tells me from my personal perspective what to do, giving me information about myself using a formula to give me answers.* (Male, Age 19, ID 126)

Some young people described how *MyWay* provided them with more choices and increased their awareness of methods they had little knowledge of.

*.. you’ve got different choices. You might have tried one or two choices before and this could help you choose a different one. ..It’s your choice. Things that you think are important to you are not what other people think are important.* (Female, Age 16, ID 129)

*It definitely gets your brain working. It makes you think about things that you don’t normally think about. I normally wouldn’t think about things other than the pill.* (Female, Age 17, ID 109)

For others, they had already made their decision and *MyWay* had little, if any, affect.
The pill is the easiest way and the more normal way, if you know what I mean. (Male, Age 19, ID 155)

However, even those who had already made up their mind described using MyWay helped either to validate their decision or to think about aspects of contraception they previously had not thought about:

*It was useful doing it. I have been using the pill for a while and I'm a bit scared of trying anything else and it (the pill) came up best.* (Female, Age 19, ID 144)

*It hasn't really changed my opinion about it. I will still continue to use condoms or my partner to use the pill. So.. I guess I didn't really know anything about these things. The effect on your partner. Cause they're female things. I guess that helps me"* (Male, Age 19, ID 155)

*MyWay was not too helpful to me since I have already discussed it with the nurse. So I'd thought of the effects of the pill but it was good to give order of importance to bother.* (Female, Age 17, ID 104)

One young women described how MyWay had introduced a new option she had not previously considered, but she was still undecided about MyWay’s recommendation:

*I was going to start using a spermicide alongside condoms. My plan is to use more than one form of contraception, whether it's with the pill or not, I'm not too sure yet. I need to take away the information first.* (Female, Age 17, ID 108)

Some of the men described how using MyWay helped think about contraception, particularly from their partner’s perspective:

*I really think men should know more, it broadens your mind.... Sadly yes, I did know very little before I came here.* (Male, Age 22, ID 145)

Most of the young people said they would recommend this type of site to a friend. Only two said they would not as their friends would be more likely to access information through sources such as magazines and television, or they do not use computers.
Target group, timing and setting

The program worked best with young people who were literate, whose first language was English, and those competent using computers. Amongst the male users, the program was felt to be more relevant to those in a relationship than those who were single. It was suggested during the interviews that *MyWay* may be more appropriate for younger people who had not yet formulated any opinions on different contraceptive methods and prior to visiting a health service:

> It's good for younger people who do not know what to do. For those who want to have sex, but don't know what to do, not for those who already know. It adds no information because you would have already discussed everything when you first got your method. (Female, Age 17, ID 107)

The fact that the program was web-based was popular as it had the potential to be easily accessible. Four of the 25 young people reported in the questionnaire that they learnt about sexual matters from the Internet. Only two of the young people reported that they did not have access to the Internet. Sources of Internet access included home (n=10), school or college (n=13) and cyber cafés (n=9). Nine young people reported that they used the Internet every day, five said they used it at least once a week, three once a month and five less than once a month. The most popular settings for *MyWay* access suggested by the young people were schools and youth clubs.

> Most times you've got girls having sex under age. And they don't like coming to clinics and stuff like that. They get embarrassed. ... A lot of people do go onto computers at schools. It would be good information to have. If you're young and embarrassed you don't really want to ask questions. When I was young I didn't ask about contraception. I wasn't even thinking about it. If there was a website you could go on and just play about with things it would be great. (Female, Age 17, ID 109)

The pilot found that there were problems introducing *MyWay* within consultations at the clinic (see section on consultations below). Clinic staff, like the young people, felt the program would be more useful prior to the consultation.
Incorporating MyWay into a consultation is hard but it would be extremely useful for before the consultation to help thinking and increase awareness. It could include myths and dispel them. (Staff member)

However, the staff felt that there was still a role for MyWay within the clinical environment and they felt that the program would be best accessed in the waiting room, so that young people could use it prior to their consultation. It was suggested that young people could print off their personalised output and then discuss it with the doctor or nurse. Having computers based in the waiting rooms would have resource and security implications.

Recruitment

Generally one to two young people were recruited at each session (it would not really have been possible to recruit more than two at each session due to the time needed to go through the program and the different components of the research).

The research team found that it was often easier to recruit young people prior to their consultation as taking part in the pilot was something for them to do while they were waiting to be seen. Once they had seen the clinic doctor or nurse they wanted to leave quickly and many had friends in the waiting room, who would text participants to see how much longer they were going to be. The research nurse (DG) was able to take sexual histories and conduct consultations, which helped with the recruitment. It took longer to recruit young men as they often felt a program about contraceptive decision-making was not relevant to them.

Consultations

It had been the intention that MyWay would be used as part of the consultation with the doctor or nurse. In reality, the program was either used before or after the young person's consultation with one of the researchers (MG and RF) or the contraceptive research nurse (DG) incorporated use of the program in her consultation with the participants. The reasons the clinic staff did not get actively involved in facilitating use of the program were discussed during a meeting to present the pilot findings. The reasons included:
The large numbers attending each of the clinics meant that staff were keen to ensure there were no further delays and felt that time going through the program would slow them down.

Staff felt it was more appropriate for young people to use the program prior to the consultation.

_It's more useful to have it before you make your decision as an information tool which will influence your decision. But to incorporate it into a consultation I think it's quite a challenge._ (Staff member)

The mean time it took a young person to go through the _MyWay_ program (excluding time spent on the questionnaire) was 10 minutes (range 5-15 minutes).

**Technical issues**

There were a couple of occasions when the program crashed. For one young person this meant that they were unable to obtain their _MyWay_ output.

Using a variety of languages and codes meant much work to ensure the integrity of the data as they passed from one section to another. Issues with the Java Virtual Machine and Java's handling of the graphics code meant that some situations arose with the interface that were not ideal, such as being unable to click on an area's border if the user had made the area too small.

**Research instruments**

The computer-based questionnaire was completed by young people prior use of the program. The mean time to complete the questionnaire was 14 minutes (ranging from 7 minutes to 30 minutes). Those who were less confident using computers did take longer. The questionnaire was designed with skips to omit questions that were not relevant. Those who had experienced pregnancy had more questions that added to the time it took to complete the questionnaire. Young people also had some comments on question wording and the relevance of some questions. A couple of young people commented that they found the questionnaire too long.
Individual questionnaire data were linked with data collected on selected contraceptive options and attributes (along with the assigned weights), as well as with the data from the observations and exit-interviews. Interestingly information on sexual behaviour and attitudes to contraception provided in the questionnaire were not disclosed during the consultation.

The research also provided the opportunity to pilot the observation sheets and topic guide for the exit-interviews with young people. These instruments worked well and provided the opportunity triangulate data from different sources.

The phase I pilot study provided an opportunity to investigate how the MyWay intervention worked, the feasibility of delivering the intervention within a clinical situation, its acceptability and potential effectiveness, and how the research instruments functioned. In the next chapter I discuss the interpretation and implications of the pilot findings, and the areas for further development.

5.4. Key points

- The aim of the phase I pilot was to access the feasibility, acceptability and potential effectiveness of the MyWay program in a young person’s sexual health clinic.
- Twenty-five young people (15 women and 10 men) attending a London sexual health clinic participated in the pilot.
- A multi-method approach was used to collect data, including 1) a computer-based questionnaire for self-completion by the young people; 2) program data on young people’s selected options and attributes, the relative weights placed on their selected attributes and the scores for each selected contraceptive option; 3) facilitator sheets; 4) researcher observation, 5) exit interviews with young people; and 6) staff feedback.
- Condoms and the pill were the methods most commonly selected by young people.
- Nearly all young people (n=24) selected pregnancy as an attribute they were concerned about when selecting contraception. HIV was the most commonly selected STI. There was variation in the other attributes selected by participants and the weights they placed n these attributes.
- The methods recommended by MyWay included the pill (recommended to 9 users), Double Dutch (7), condoms (4) and implants (4). There was agreement between the
method recommended by MyWay and the young person’s original preferred option on six occasions.

- Benefits of the program identified by young people included its non-judgemental and personalised approach, its inclusiveness of young men, that it was not just focused on ‘disease’, and it was interactive and educational.

- Weaknesses included problems using the program within consultations because of time pressures, some young people had already made their decision or wanted the doctor to make the decision for them, and there were some technical problems.

- The young people suggested that it would be beneficial to have access to the program at a younger age before they had started having sex and that schools would be an appropriate setting to introduce young people to the program.
Chapter 6. Lessons learnt and where next

The pilot study confirmed the *MyWay* program was popular with young people, and sexual health staff felt as a tool it has great potential in helping young people with contraceptive decision-making. The particular strengths identified included its individual focus, the provision of skills to aid contraceptive decision-making, its potential accessibility to young people who are either too nervous or too embarrassed to seek advice from sexual health services and being inclusive of men. Both staff and young people felt the program acted as an information source as well as a decision aid, although this had not been the main aim of the research team. The phase I pilot study provided useful information on how to refine the program, where and how it could be applied and how it should be evaluated.

The objectives of this chapter are:

- to provide a summary of the key findings from the exploratory phase I pilot study of the *MyWay* program’s use in consultations within a young people’s sexual health clinic.
- to examine the strengths and limitations of the *MyWay* intervention and the pilot study.
- to identify areas for further application and research

6.1. Key findings from the phase I study

6.1.1. Feasibility

The study did illustrate that there were difficulties in introducing the program within consultations in a young people’s sexual health clinic. The service which provided the setting for the pilot study is an extremely busy open-access clinic. Staff are under great pressure to see large numbers of young people, who are often presenting with complex sexual health needs, in a relatively short period of time. An intervention that requires an additional 10 minutes (the mean time it took for the young person to go through the *MyWay* program) will affect service capacity. This could potentially have negative consequences by reducing the numbers of young people able to be seen by health care staff.

The feasibility of implementing decision aids within consultations in health care settings has been identified as problematic in other studies, predominantly because of the need
for high productivity and time constraints. It has been suggested that decision aids may be better made available to consumers outside of the clinical consultation and the use of sites, such as the Internet, need further exploration. Bekker and colleagues note in their systematic review of interventions designed to assist decision-making that consumers need to be given some time to reflect on decisions. Sexual health consultations usually allow insufficient time for this process.

6.1.2. Acceptability

The program itself was popular with both young people and staff (although with the staff, their views were based on the idea of the program rather than actual experience of using the program within a consultation). Young people liked the individual value focus, and the fact that it was interactive and non-judgmental. There was also agreement amongst both users and staff about its acceptability within the clinical consultation in comparison to other possible settings. Most of those interviewed did not feel the decision aids should replace support provided by health care staff. They felt its role should be as a pre-clinical aid, with many of the young people suggesting that the MyWay program should be first introduced in schools (see Chapter 7.).

The general consensus amongst the young people participating in the pilot was that the MyWay program would be more appropriate for a younger age group (the average age of participants was 18 years). The majority of young people explained that they had made their decision on what method of contraception they wanted prior to coming to the clinic. This decision was usually based on peer norms or previous experience using different contraceptive methods. The young people attending the designated young people's service are not necessarily representative of the general teenage population. The self-reported data from the small number of participants showed relatively young age at first sexual intercourse, high numbers of sexual partners and poor sexual health outcomes in comparison to a general population sample of the same age group.

Embarrassment and the fear of being judged have been identified by young people as important factors when discussing their sexual behaviour. These emotions could lead to young people providing responses they feel are considered socially acceptable and what a health care provider would want to hear. For example, young women may feel uncomfortable admitting pregnancy is their preferred option (or even feeling ambivalent towards pregnancy). Some of the young people taking part in the MyWay...
pilot study did disclose that they were more likely to respond ‘honestly’ to a computer than to a health care worker. This work also highlights the fact that pressures within sexual health services may limit the time spent with young people discussing the context of their contraceptive use, eliciting their values and identifying how these may impact on their contraceptive decision making and ultimately on risk of pregnancy and/or STIs. How assistance with contraceptive choice is delivered is crucial to their acceptability to young people. (75) Research commissioned by Brook showed that young people wanted a service that was tailored to their needs and they wanted advice and support on contraception that was ‘suitable’ to them. (179) Not investing the time to discuss these matters with young people to save time may be a false economy if the end result is more young people with unplanned pregnancies and STIs.

6.1.3. Potential effectiveness

The rationale behind MyWay was that if young people’s values were considered when they were selecting and initiating contraceptive methods, effectiveness would increase. Although the young people participating in the pilot were concerned about poor sexual health outcomes, their perception of risk was often low, particularly those in regular relationships. The pilot showed that the young people found MyWay a useful tool to either validate the decision made prior to coming to the clinic or as a method of thinking about aspects of contraception they had not previously thought about. We were not able to ascertain what impact MyWay had on subsequent behaviour, in particular use of contraception and length of continuation, or on final endpoints (pregnancy or STI acquisition) as this was beyond the scope of the exploratory phase I pilot. However, it was apparent that although young people assigned relatively large weights to pregnancy and STIs, and therefore methods such as subdermal implants and Double Dutch came out as the ‘best’ option, the condom and pill (used separately) remained the methods most likely to be used. Those young people who spent time playing with the program to see how changing their values impacted on their ‘best’ method appeared to gain most at an educational level. O’Connor and colleagues in their systematic review of decision aids comment that people who are more uncertain about their options and do not have prior preferences may be the ones who would benefit the most from decision aids. (122) This supports the comments made by some young people in the pilot that MyWay should be first introduced at a younger age in school settings, i.e. before becoming ‘established’ on a method of contraception.
MyWay's impact on contraceptive decision-making may have been greater if the inclusion criteria had been limited to those who were wanting to start or were thinking about a new method of contraception. This group may be more likely to be at a stage ready for change. Those who were already established on a contraceptive method or those attending the service for non-contraceptive reasons (the majority of men were attending for an STI screen only) may have been more likely to have been in the pre-contemplative stage.

6.2. Strengths and Limitations

6.2.1. Strengths of the MyWay Program

Benefits of a computer-based intervention

There is much strength in having MyWay as a computer-based intervention. Although most of the young people participating in the pilot did not see it as a replacement to doctors and nurses, they did feel that they would be more honest in their responses to a computer program as fears about being judged were no longer a concern.

Another strength of computer-based interventions is that they have the potential to be used and revisited at one's own pace and convenience. This would have the added benefit of increasing the duration and intensity of the intervention, factors which have been identified as key to intervention effectiveness. MyWay was set up to be accessible via the Internet. A national study investigating Internet use among young people aged 9-19 years published in 2004, found that 75% had Internet access at home and over 90% at school. Over 80% of users accessed the Internet at least weekly. A quarter of this group used it for personal information and advice, and of these, 22% reported searching for advice on sex, contraception or pregnancy. By creating a web version of the software it would be possible to track use of MyWay as each user has given a unique ID number. This would allow an assessment of the intensity of the intervention (i.e. the 'dose' effect).

In their systematic review of information included in decision aids, Feldman-Stewart and colleagues comment that information critical to decision-making was frequently not included within decision aids. While accuracy and completeness of information is paramount, overloading patients or consumers with too much information could also have negative consequences. Computer-based programs can be designed to
provide layers of information which users can access further depending on need or interest. For example, in the *MyWay* program there were pages providing a definition of the different contraceptive methods or pages providing links to helplines.

**Value focus**

The novel feature of *MyWay* is that it is value-focused rather than information-focused. It elicits a young person's relative valuations of the attributes and outcomes they feel are relevant to them, and then combines these valuations with evidence-based ratings of the degree to which alternative contraceptive methods produce these attributes and outcomes. The scores produced by combining the ratings and weightings result in a recommendation based on the underlying decision analytic principle of maximising the person's expected utility. It is therefore a decision aid rather than an information aid, the latter typically providing information which the young person is assumed to be able to take into account in making their choice, leaving their valuations to be introduced and processed implicitly rather than explicitly. Decision aids on the other hand allow sophisticated and individual decision modelling to be made available to users in a more accessible format.(236)

A strength of *MyWay* was the simple way users were asked to assign weights to their selected attributes, that is by increasing or decreasing the area size of boxes representing the attributes. The young people did not appear to have difficulties in understanding the idea of weighting their values. The only problem was that users sometimes found it fiddly changing the size of the boxes, particularly when the full limit of eight attributes had been selected. This problem has been rectified for the new program by use of bar charts to assign weights (see Section 6.3.). Other studies of decision aids have found that users have experienced difficulties in utility assessment.(236) Although it is argued that this problem is more to do with insufficient instructions rather than difficulties with the concepts behind decision analysis.

**Data used in underlying matrix**

Clinicians and young people were able to access the data used in the underlying decision analysis if they wished. This ensured transparency and could allow clinicians, in particular, to question the appropriateness of the data and their applicability to clients.(144) As already discussed, some of the evidence used in the underlying matrix may not necessarily be generalisable to UK residents attending an inner city sexual
health clinic. Enkin and Jadad comment "it would be reasonable to expect that sometimes our knowledge of the individual patient, the clinical setting, or our own expertise may override the more generalized evidence even from the best formal studies." (p. 964).(237) For example, a clinician may be aware the prevalence of chlamydial infection in their local area is much higher than the estimate provided within the MyWay program. The program was designed by the team at LSHTM to ensure that it would be possible to add different matrixes to inform the decision analysis. Matrixes could be developed for different areas, different target groups or be up-dated as new evidence becomes available. It would be possible to create a library of matrixes; the only stipulation would be that changes would have to be justified to maintain transparency.

Trade-off
Another benefit of the MyWay program is that it provides a comparison of different contraceptive methods and allows the user to see the trade-off between these methods. For example, Sheeran and colleagues comment how often our focus has been on condom versus no condom (i.e. method versus no method) rather than acknowledging, as discussed in Chapter 1, that the decision to use a condom may involve weighing the advantages and disadvantages of condom use against the alternative contraceptive options.(57) The use of the MyWay program is not a one-off process. The values that shape the weight we place of different attributes and the relative trade-offs we are willing to make will be dependent on changing circumstances. Therefore the contraceptive method the program identifies as the ‘best’ option may vary over time, as influences on values, such as length of a relationship, change.

Dual focus
An unforeseen strength of the program was the benefit some men gained by thinking about contraception from a dual perspective (i.e. from both their and their partner’s perspectives). The role young men can have in contraceptive decision-making is often ignored. As Pyper and Freely highlight there is a need for a dual focus when addressing poor (and healthy) sexual health amongst young people, “we tend to forget when we’re talking in broad terms about the importance of reproductive choice is that it takes two to make a baby” (p. 94).(238)
6.2.2. Limitations of the MyWay Program

Introducing the MyWay intervention into a clinical situation enabled the research team to ascertain how it worked in 'real life'. This process identified some limitations of the program. Most of these problems would be relatively easy to address in future development. As discussed in Section 6.2.1. overloading patients or consumers with too much information may hinder effective decision-making. Therefore any potential gains resulting from additions to the program, as described below in this section, would have to be weighed up against the potential reduction in accessibility these additions might cause.

Contraceptive options

The MyWay program did not include all contraceptive methods available to young people in the UK in the list of options. For example, Evra (the contraceptive patch) was not available during MyWay's development phase, yet by the time of the pilot study it was. Some of the young women who participated in the pilot expressed an interest in this method. The IUS was not included as the research team felt this was a method that would not be made available to most young people, particularly those without children. However, National Institute for Health and Clinical Excellence (NICE) guidelines on contraceptive provision for young people report that the IUS can be offered to nulliparous women.(239) Emergency contraception (either the progestogen-only pill or the copper IUD) was not included as an option. The reason for its exclusion was that data on risk of events, such as pregnancy or side effects, were usually collected at one-year follow-up rather than looking at risk per episode of vaginal sex. We also assumed emergency contraception use was a responsive act to potential risk of an unwanted pregnancy rather than an active decision to use it as one's method of choice.

Abstinence from vaginal sexual intercourse and having oral or anal intercourse to prevent pregnancy were not included as options as they were viewed as behaviours adopted to avoid pregnancy rather than as methods of contraception. It was also assumed young people had already made the decision to have vaginal intercourse (either currently or in the future). If abstinence was to be included as an option young people would need to trade-off the pros and cons of having sexual intercourse with the pros and cons of not having sexual intercourse.
Contraceptive attributes

The contraceptive attributes listed in the program had been identified through previous qualitative work with young people. The attributes that affect decision-making identified in this work are similar to those found in a study by Grimley and colleagues conducted in the early 1990s with psychology students in the US. (240) The study examined the cognitive and motivational aspects of contraceptive decision-making at various stages of change with respect to adoption of contraceptive methods. Pros and cons associated with contraception were identified. The authors report that their work suggested “interventions designed to increase the use of contraceptives to prevent pregnancy and disease will be more effective if the pros of engaging in their use were more salient to users” (p.468). For the most part, the attributes identified by young people used in MyWay tended to focus on the negative effects of contraceptive use or failure, such as an unplanned pregnancy or a negative side effect. In MyWay the attribute “effect on sex” was assumed to be negative, such as the use of condoms or diaphragms interrupting the spontaneity of sexual intercourse. Young people participating in the pilot appeared to view “effect on sex” this way as well. However, as Grimley and colleagues point out contraceptive use can be viewed to have a positive effect on sex, for example being more relaxed during sexual intercourse because you know you are protected against pregnancy and/or STIs. Conversely, contraceptive non-use may have a positive effect in that unprotected sex may be viewed as more exciting. In any future application of MyWay, the attribute “effect on sex” would have to be more clearly defined.

There are also many other non-contraceptive benefits that perhaps the consumer should be made aware of when they are trying to make a decision. For example, the non-contraceptive benefits associated with pill use include more regular menstrual cycles, less dysmenorrhoea, and protection against endometrial and ovarian cancers. (210) Young people were also less likely to identify potential long-term risks associated with contraceptive use, such as the increased risk of cervical cancer amongst pill users. Therefore, although it was key that young people were involved in identifying the contraceptive attributes important in their decision-making process, attributes they may be less aware of, but potentially useful to decision-making, should also be included.

It is also worth noting that the young people who participated in the original focus group work, where the attributes for MyWay were identified, all came from the same
area of London (although they were recruited from a variety of clinical and non-clinical settings). It is possible that work with young people in other areas may identify different attributes. For example, cost of contraception was not highlighted. In parts of the country where it is more difficult for young people to access free condoms, cost may be an important influence in decision-making.

The final point about attributes that needs to be highlighted is that of consequence of outcomes that may follow from contraceptive use (and non-use). These will be often incomplete. For example, in MyWay if a user selected HIV acquisition as an attribute they were concerned about the probability of this event happening and the relative weight they placed on it would be used in the underlying decision analysis model to calculate the best contraceptive option for that individual. The effect of HIV on life expectancy is not directly addressed in the model. However, these consequences may affect the weight we place on the selected attributes.

**Contraindications**

Most contraceptive methods are not contraindicated on the grounds of age. Despite some concerns about the decrease in bone mineral density amongst young users of progestogen-only injectables, particularly DMPA, current Faculty of Family Planning and Reproductive Healthcare Clinical Effectiveness Unit guidelines state the benefits of these methods, may outweigh the risks.(82) However, these guidelines do recommend against use of any hormonal method prior to menarche.

The MyWay program did not ask young people about their own or their family’s medical history. Therefore it is possible MyWay could recommend a contraceptive method that would be contraindicated. For example, current UK Medical Eligibility Criteria for Contraceptive Use (UKMEC) guidance recommends against combined oral contraceptives (including the combined pill and the patch) for women who had a first degree relative with a history of venous thromboembolism (VTE) under the age of 45 years, unless other contraceptive methods are unavailable or not acceptable to the user.(241) As the pilot was in a clinical environment and hormonal contraceptive methods have to be prescribed, this was not thought to be problematic. However, it would be feasible to introduce a set of medical history questions to identify contraceptive methods that may be contraindicated for an individual user, and then remove any contraindicated methods from their list of options. It has been shown that
there is a high level of agreement between women’s and provider’s assessment of contraceptive risk factors.(242;243).

Presentation of Evidence

Attempts were made to ensure that the underlying decision analysis in MyWay was informed by the best available evidence. However, there are still many gaps in our understanding of the risks and benefits of contraceptive use. As already discussed in more detail in Section 4.2.3. many assumptions had to be made, in particular when trying to calculate risk of STI acquisition when using different contraceptive methods. However, as Dowie comments, “the necessity for a decision does not disappear just because there is little or no good evidence of a clinical sort.”(p.180)(132). Where no evidence is available, anecdotal evidence provides the best, and in the fact the only, source of evidence to inform decisions. A couple of the clinical members of our research team provided estimates when required. This level of evidence could be strengthened if estimates were gathered from a larger group of those working in reproductive and sexual health, so a consensus of opinion could be reached. Although the data used in the underlying decision analysis were made available to interested clinicians and young people, they had no means of judging its quality as no information was provided on their source. Although it may not be appropriate to include details of all the studies used for estimates (as seen in Appendix 2.), it is important there is sufficient transparency so that an assessment can be made of the evidence included within the program. In any future development of MyWay, grading the hierarchy of evidence (from example data from meta-analysis of RCTs through to anecdotal evidence) could be considered as a way of helping both providers and consumers understand the strengths and limitations of the included data. Some decision aid studies have provided easy systems to help users interpret the quality of the evidence, such as the use of gold, silver and bronze medals.(124) Currency of information could also be clearly identified by providing citations of the included studies.

The vast majority of young people participating in the pilot study did not look at the data used in the underlying matrix. This may have been due to lack of time within the consultation or lack of interest. The data in the matrix consisted of probabilities of events, such as pregnancy, occurring within a year whilst using each of the contraceptive options. Those accessing the matrix would have had difficulty interpreting the data, and ways of presenting the data in a more user-friendly way would need to be
addressed in future development of MyWay. The fpa commissioned some research to find out the most effective way to report contraceptive efficacy in their information leaflets to consumers.(102) One hundred women and men aged 16-45 years were interviewed. Interviewees found positive messages more reassuring, while negative messages could put people off using contraception. The majority of the sample preferred contraceptive efficacy presented as a percentage. Those who were less numerate preferred numbers. Some found it difficult to understand when failure rates were less than 1% as they could not see how you could have less than one person. The recommendation from this research is that efficacy should be presented as a percentage followed by the number of women who will become pregnant after one year of use. For example, injectables are 97% effective. If 100 women use injectables for a year, 3 of them will become pregnant.

Whilst evidence from the literature was sought for probabilities of pregnancy, STIs and side effects, the probabilities for 'bother' factors were estimated by the research team. It would be a fair assumption that a young person would have to attend a clinic to have a subdermal implant fitted (this attribute being assigned 1.0 in the underlying matrix). However, the assumptions made for other contraceptive attributes are more subjective. For example, the probability of condoms' effect on sex was 0.5 (See Appendix: Table A2.17.). It may be more appropriate for some of the 'bother' factors for the user to assign the probabilities. This, like the assignment of values, could be done through visual means. It would also be an interesting intellectual exercise to ask users to assign their own probabilities to the other attributes, such as what they think the probability is of becoming pregnant whilst using the pill. The evidence-based matrix could be available afterwards for them to compare their ratings with those from the scientific literature.

There was much uncertainty around some of the estimates included in the program. For example, Stephenson's systematic review of contraception and HIV acquisition risk estimated that the odds of HIV acquisition amongst women who used the pill was 0.3,
but the lower and upper limits of the 95% CI were 0.05 and 2.1, respectively\textsuperscript{vii}.(206) Where there is uncertainty in the literature, for example illustrated by wide confidence intervals around an estimate, the lower and upper limits can be used in sensitivity analyses.(125) Sensitivity analysis could be conducted to determine high risk and low risk scenarios and different matrices could be developed to reflect these different scenarios. This would allow further exploration of how altering the probability of different outcomes for selected contraceptive methods altered would affect the contraceptive option 'recommended' by \textit{MyWay}, even if user values remained the same.

The other consideration when presenting the evidence is that of 'rounding up' the estimates. If one selected the contraceptive options the male condom and nothing and HIV as the only attribute, both options would rate equally and score 1 (i.e. the probability of remaining free from HIV infection in one year would be 1.0 when rounded up to the nearest decimal point). The chance of HIV acquisition in one year amongst a general female population of 15-19 year olds in England using the male condom is estimated at 0.000002 or two in a million, but the chance without any protection is estimated 0.00003 or 30 in a million (see Table A2.9.). The percentage reduction is impressive, but the baseline number is so small that the difference disappears when we take both numbers away from 1 and round to two decimal places. If the condom is to score the highest in this situation more decimal places are needed. This example illustrates the important difference between relative and attributable risk; the increased attributable risk is negligible despite a large increase in relative risk.

\textit{Self-efficacy}

A systematic review of the qualitative research on factors that influence young people’s sexual behaviour has shown the importance of sexual partners in this context.(120) In a paper that examines the role of emotional factors in predicting STI risk, Whitten and colleagues comment that a problem with social cognitive theory is that it demands increased interpersonal self-efficacy in order to reduce sexual risk taking.(245) As

\textsuperscript{vii} A large African multi-centre study following up a cohort of women aged 18-35 years who were HIV negative at recruitment has found no association between combined oral contraceptive use and HIV acquisition (hazard ratio 0.99, 95% CI 0.69-1.42). Therefore as studies such as this one conducted by Morrison and colleagues are included any subsequent meta-analyses,(244) greater precision around the estimates will be observed.
described above, a strength of MyWay is that it can look at contraceptive decision-making from both an individual and partnership focus. When making decisions from a partnership focus, for example, a young woman may take account of or be influenced by the values she thinks her boyfriend would place on the effect contraceptive use may have on sex. For some young people, a partner’s values may dominate decision-making within a relationship, which can potentially cause conflict. MyWay aims to improve young people’s contraceptive decision-making and their understanding of how their values affect the decisions they make. It was never seen as MyWay’s role to improve user self-efficacy. This highlights the need for a number of different approaches to improve young people’s sexual health.

6.2.3. Strengths of the Phase I Pilot

The piloting phase was in line with MRC guidance for the development and evaluation of complex interventions. As Campbell and colleagues explain the framework is not about having a stepwise approach where each component is conducted in sequence.(246) Instead there needs to be flexibility. Defining the problem and context, intervention development, and development and refinement of the evaluation may be done simultaneously.

A major strength of the phase I pilot was the multi-methods approach used to collect data and the use of quantitative (the computer-based questionnaire and program data) and qualitative (observation of consultations, facilitator notes, in-depth interviews with young people and staff group feedback) techniques. This allowed triangulation of the data to provide a greater understanding of how the program was working at an individual level and within the setting it was being used. For example, analysis of data obtained from the observations, in-depth interviews and staff feedback provided insight into process of introducing MyWay into clinical consultations – what worked and where the barriers were. At an individual level, we were able to link the program inputs and outputs (young people’s selected contraceptive options and attributes, attribute weights and final scores) with the survey responses, which provided information on their demographic characteristics and sexual behaviour. In a larger scale study this would allow analysis of factors that influence young people’s contraceptive risk assessment and values. From an intervention perspective, this will provide us with a greater understanding of how the intervention is working, making specific links between thoughts, beliefs, values, decisions and behaviour. Hesie comments that research needs
to pay more attention to how contraceptive choices are made, "The challenge of elucidating the ‘black box’ of contraceptive decision-making is a task of theoretical import." (p. 12). (54) A synthesis of reviews looking at interventions aimed at reducing teenage pregnancy concluded that a lack of understanding of what works (i.e. the ‘black box’) have been limitations of previous interventions. (47)

6.2.4. Pilot Considerations

Bias

A number of biases need to be considered when interpreting the pilot findings and these would need to be addressed in any future study of the MyWay intervention. The development of the intervention and the pilot to assess its feasibility, acceptability and potential effectiveness were managed by the same team. Therefore the exploratory study was not independent and the team would not have been impartial. This may have led to an over-estimation of the positive impact on the intervention. This problem would be reduced in an RCT of the MyWay intervention, where allocation to the intervention or control group could be blinded to both clients and researchers. Although there would be obvious problems blinding clients and researchers to the intervention itself and when collecting process data, it would be possible to conduct the outcome analysis blinded.

A high proportion of young people attending the clinic who were invited to participate in the pilot study declined to take part. No information was collected on the characteristics of these individuals. It is possible that those agreeing to use the MyWay program and take part in the pilot are not representative of young people attending sexual health clinics. Information about non-responders would have to be collected in any future study of MyWay.

Structural problems

It was not possible to see what impact MyWay had on uptake as some of the methods identified as possible options, and some methods recommended by the program were not available on site. So those young women, who may have wanted to have a subdermal implants fitted, for example, would have to have been referred to other contraceptive service. This may have been a factor that acted as a barrier to the uptake of some methods.
Determining effect size

Campbell and colleagues in their paper updating the MRC's framework for the design and evaluation of complex interventions recommend that in order to calculate the sample size for the main trial the exploratory phase should be randomised to allow an assessment of effect size. (246) The ultimate goal of the MyWay program was to improve correct and consistent contraceptive use through use of methods acceptable to the user, and thereby reducing unplanned pregnancy. It was beyond the scope of this phase I study to follow up young people and therefore collect data on potential effect size. However, in any future pilot it would be worth using other variables relating to the decision-making process to inform sample size calculations for trials (see Section 7.3.1.).

Outcome measures

A trial of MyWay would need to be designed to collect measures of effectiveness and acceptability. A phase II study would be designed to collect the same outcome measures as those to be collected in a future trial (see Section 7.3.3.). For example, there are a number of ways contraceptive acceptability could be measured. In the phase I pilot we asked the young people what their method of choice was before and after using the MyWay program. Whether or not the option MyWay recommended was the preferred option was a hypothetical question. Unfortunately the evidence suggests that we are not good at predicting actual contraceptive preference from hypothetical scenarios. (54) In trials method uptake and continuation are often used as markers of acceptability. The phase I study provided the opportunity to identify appropriate measurements of acceptability, which could be investigated in further evaluation phases. Ways of measuring decision-making would also need to be explored. Decisional conflict scores and scales have been developed to measure internal perceptions of ability to make a decision, factors contributing to uncertainty and the extent to which people are satisfied with the decision they have made (95;135;247;248). Further exploratory work could also aim to develop and validate some specific contraceptive decision making scales.

6.3. Areas for future application and research

The focus of this section is to explore areas for the further application of MyWay within a clinical setting and other potential areas of research identified during the phase I pilot. The description of the proposed work to implement and pilot MyWay in school settings
(phase II) and to conduct preparatory work for a cluster RCT (phase III) is the focus of Chapter 7.

The phase I pilot provided the research team with information to refine the intervention. A generic decision analysis program, called *Annalisa*, has subsequently been developed (by Jack Dowie and Lorenzo Gordon). The underlying decision analysis principles remain the same, but the program has been made more user-friendly. For example, much of the text in the original program has been removed and the method of utility assessment has been made easier. The user is now presented with bar charts, with each selected attribute represented by a bar, rather than having segments within a box.

*MyWay* was developed for young people who were having or planning to have vaginal sexual intercourse. The program could easily be developed for other target groups, for example heterosexual adults or gay men, and could include other behaviours that affect fertility or STI/HIV risk, such as oral or anal intercourse. In further studies the principles of the intervention would remain the same but the mechanisms in terms of delivery may vary, depending on the target group and the setting.

### 6.3.1. Using *MyWay* as a pre-consultation tool

The idea behind *MyWay* developed because of concerns that young people’s values surrounding their use (or non-use) of contraception were often not being addressed during clinical consultations. The pilot study suggested that it was not feasible to use *MyWay* in consultations. However, the reasons for this were for the most part related to structural barriers rather than any indication that *MyWay* would not be effective or was not acceptable. Young people’s values and the context of their contraceptive use still need to be addressed during consultations. Staff felt that it may be easier for young people to use *MyWay* prior to their consultation with a doctor or nurse. *MyWay*’s recommendations and their basis could then be discussed within the consultation.

**Target group and setting**

Brook Advisory Centres have expressed interest in using *MyWay* as a pre-clinical decision aid for young women and men attending their clinics. Brook is a charitable organisation that provides sexual health services to young people aged under 25 years.
Intervention

The MyWay program would be accessed by young people prior to their consultation with the doctor or nurse. Computer access is already available in some Brook waiting rooms. The process would be the same as in the original intervention set within the clinical consultation, that is the young people would first do the introductory demonstration exercise and then they would go on to the contraceptive section of the program to select the contraceptive options and attributes they are interested in and assign weights to the attributes. This information, along with the expected utilities for each contraceptive option and the option with the highest score, would be made available as a printout for the young person to then discuss with the doctor or nurse. Future access to the program and previous outputs could also be made available to young people via the Internet, so decision support is also available outside of the clinical environment.

6.3.2. Areas for further research

The development and piloting of MyWay identified areas that warrant further research, identified in brief below. It would be possible to address some of these gaps in further research of the MyWay program.

How contraceptive use affects STI transmission and acquisition

The review of the evidence to inform the MyWay program showed that more research into the effect contraceptive method use has on STIs and the interplay with sexual behaviour is needed. We know, for example, that progestin-only contraception prevents sperm penetration by thickening the cervical mucosa.(210) The extent to which this action is protective against STIs is unknown.

At a population level, patterns of contraceptive use will impact on STI prevalence. The calculation of the reproductive ratio is a way of determining the sustainability of an infection at a population level by providing the average number of secondary cases generated by a primary case.(217) The reproductive ratio \( R_0 \) is calculated by combining the probability of transmission with a sexual partnership (\( \beta \)), the length of time someone is infectious (\( D \)) and the number of new sexual partners the infected has had within a defined period of time (\( c \)), \[ R_0 = \beta Dc \]. The spread and subsequent persistence of an STI occurs when \( R_0 \) is equal to or greater than 1.0. Contraceptive methods affect or are associated with \( \beta \) and \( c \), therefore patterns of contraceptive use at
a population level need to be considered when determining whether an infection is on the decline or spread.

**Perception of risk and value assignment**

Little is understood about how young people estimate their perceived risk of pregnancy and/or STIs. Getting young people to assign probabilities to these events would be a way of improving understanding, particularly if these data could be linked to other data relating to demographic characteristics (e.g. age), educational level (e.g. qualifications), sexual behaviour (e.g. age at first intercourse) and context (e.g. stage of relationship). The highly numerate tend to draw more affective meaning from probabilities and numerical comparisons than do the less numerate.\(^{(139;140)}\) Validated questions to assess individual numeracy could also be included to assess if this has any impact on contraceptive risk-taking behaviour.

Although the number of young people participating in the exploratory pilot of MyWay was small, there was wide variation in the values assigned to the different selected contraceptive attributes by different individuals. Further research is needed to investigate the association between young people's demographic characteristics, their beliefs, values and behaviour in relation to contraceptive use, and how these vary between individuals and within an individual over time.

**Provider decision-making**

Discussions with staff working in sexual health illustrated that how professionals make decisions about contraception is not necessarily evidence-based. There is little research on what basis professionals make decisions about what they consider the most appropriate contraception, and how their decisions compare with young people's decision making. The values that inform young people's decision-making may conflict with values held by providers. A postal survey of 169 doctors and 148 nurses working in general practice found there was great variation in the contraceptive methods these professionals thought were ideally suited to women depending on their personal characteristics.\(^{(250)}\) For example, 87.2% (95% CI 83.5-90.9) reported that condoms would be ideally suited for a 19-year old woman with no children and who had casual partners. For a 17-year old woman with one child and no regular partner, 76.1% (95% CI 71.4-80.9) of the professionals thought condoms would be ideally suited. How
providers influence young people’s contraceptive choices, either directly or indirectly, also warrants further investigation.

6.4. Key points

• The pilot study of MyWay’s use in consultations within a sexual health service found acceptability was generally high amongst the young people using the program and that as a tool it has potential in helping young people with contraceptive decision-making. However, the study also suggested that there may be practical barriers to introducing MyWay within clinical consultations.

• Strengths of the MyWay intervention included the non-judgemental approach, its potential accessibility, its value focus, and the transparency of what data were used in the underlying matrix.

• The pilot study did identify some areas where the program could be improved. The list of contraceptive options and attributes needed to be expanded and the non-contraceptive benefits of different methods could be included, such as reduced dysmenorrhoea amongst pill users. Ways of presenting the data in a more user-friendly format needs to be addressed, including ways of presenting risk of outcomes and study quality.

• The phase I pilot was in line with MRC guidance for the development and evaluation of complex interventions. The adoption of a multi-method approach ensured a good understanding of how MyWay was working at a user level and in consultations within a sexual health service.

• Further exploratory work would be required for the calculation of the sample size needed in a definitive trial and for the development and validation of specific contraceptive decision-making scales and effectiveness outcomes.

• Although there were problems introducing MyWay within the consultation, its application as a pre-consultation tool to be used within services warrants further investigation.

• Other areas of research identified through the development and pilot process worth pursuing included: the relationship between use of different contraceptive methods and STI transmission and acquisition, the basis on which providers make decisions about contraceptive provision, and young people’s perception of pregnancy and STI risk and value assignment.
Chapter 7.0. MyWay in schools: Phase II

7.1. Introduction
Introducing the MyWay program in schools was one of the recommendations suggested by the young people taking part in the phase I pilot study. Evidence from the research literature supports this view. School-based lessons are young people's main source of information about sexual matters, in particular for young men. Data from Natsal-2000 found that 39.2% of men and 30.1% of women aged 16-19 years reported it as their main source. Most of the SRE provided within schools is covered within Personal Social and Health Education (PSHE) lessons. Natsal-2000 data also showed that over a third of young people wanted more information about STIs and a quarter wanted more information on contraception. Young people still complain that SRE is too biological and does not meet their needs, and that the psycho-sexual topics should be included. Ways of engaging young people and putting sex in context are needed. As illustrated in Chapter 3, young people are increasingly using school-based services to gain contraceptive advice.

Just under a third of young men and just over half of young women in the UK have first intercourse before their 16th birthday. This group is significantly less likely to use contraception at first and subsequent sex than those who wait under after they are 16 years of age. Therefore targeting an intervention at 13-14 year olds to help them improve their skills for future contraceptive decision-making would seem appropriate. Stone and Ingham found that less than half of those who delayed access to a sexual health service until after first (and subsequent) intercourse had been using contraception consistently prior to seeing a provider. Some of the men who had not accessed a health service provider had obtained condoms elsewhere. They had not considered using a service or had not felt it necessary to seek help. Therefore the rationale for introducing interventions to improve future contraceptive use at an age when the majority of young people have not yet had sexual intercourse would seem justified.

A review of interventions aiming to reduce teenage pregnancy found there was evidence of the effectiveness of school-based programmes. Interventions in this setting also have the potential to reach a wide population. Process evaluations of sexual behavioural interventions in the UK have suggested their implementation within school settings are feasible. The main barriers have been problems of fitting the intervention into
an already tight timetable and questions relating to the ethics in obtaining parental consent for their children’s participation in the evaluation.

The application of the MyWay across PSHE and Mathematics lessons has been an area that I have been interested in exploring. There are a number of reasons which support this integrated approach. Learning about probability is part of the Mathematics National Curriculum for 13-14 year old pupils. Informal discussions with Mathematics teachers have suggested that introducing sexual health into Mathematics lessons would be a way of engaging young people by applying the subject of probability to an area that is relevant and likely to affect young people in the future (or already doing so for a particularly vulnerable minority). The goal of the MyWay program when used in the clinical consultations was to provide sexually active young people with their ‘best’ contraceptive option given the scientific evidence and their current values, which would lead to improved contraceptive use and ultimately to better sexual and reproductive health. Introducing a decision analysis intervention within a school setting provides more opportunities for young people to learn about probability and how their values affect judgments and to improve their decision-making skills in general as well as in relation to their sexual health. Using an integrated Mathematics and PSHE approach will encourage young people to understand the concept of risk, including that associated with sexual behaviour and contraceptive use, as well as how their values affect decision-making. This integrated approach fits in with the philosophy of national programmes, such as Every Child Matters and the National Healthy Schools Standards. (258;259)

The objectives of this chapter are to:
- to describe a proposed phase II pilot study of MyWay in schools and the preparatory work for a clustered RCT.

The definite trial would be designed to compare schools implementing the MyWay intervention plus their usual SRE programme against control schools just providing their usual SRE programme.

7.2. Aims and objectives
The aims of the proposed work for the next phase II study would be to adapt and pilot an intervention designed to improve contraceptive choice using a computer-based
decision analysis program (MyWay) in Mathematics and PSHE lessons, and to carry out preparatory work for a cluster-RCT.

The specific objectives related to the intervention development and implementation would be to:

1. adapt the MyWay computer-based program to a school setting using the Annalisa program, a generic decision analysis program.(249)
2. develop and deliver facilitator training for Mathematics and PSHE teachers involved in the implementation of MyWay.
3. deliver an intervention using the MyWay program to pupils aged 13-14 years across Mathematics and PSHE lessons.
4. develop and test process evaluation tools to assess if the intervention is delivered as intended.
5. evaluate probability assessments of young people pre and post intervention.
6. investigate the association between young people’s demographic characteristics, their beliefs, values and behaviour in relation to contraceptive use, and to determine how young people make decisions around the contraceptive choices available to them.

The specific objectives related to development of the definitive trial would be to:

1. assess recruitment of young people to the intervention and retention of participants.
2. determine the feasibility and acceptability of the intervention in schools through process evaluation.
3. estimate the likely variability between schools to use in the definitive trial sample size.
4. estimate likely prevalence of sexual health primary endpoints for the definitive trial, including contraceptive use, pregnancy and STI acquisition.

7.3. Methods

7.3.1. Study population and sampling

Setting
Two secondary inner city schools would be recruited to take part in the pilot. These would be comprehensive, mixed sex, non-selective schools. Both schools would
implement the *MyWay* intervention (plus usual SRE). As the purpose of this pilot is primarily to pilot the implementation of the *MyWay* intervention and other UK trials have already addressed the collection of outcome and process data in secondary schools who are implementing their usual SRE programmes, (255-257;260) there would be no control schools.

The *MyWay* intervention would be delivered across Mathematics and PSHE lessons.

**Target group**
All 13-14 year old male and female pupils (year 9) would be invited to participate.

Written consent would be obtained from young people participating in the pilot. Written information about the research would be provided and sufficient time would be allowed to consider participation. Contact details of a member of the research team and relevant helplines, such as Childline and Sexwise, would be provided with the information sheet. Participants would be informed that they are free to withdraw from the pilot at any stage without having to give a reason for their decision. Parents or guardians of pupils would be informed that the research is taking place, what it involves and that written consent would be sought from their children to participate. Parents would retain their right to withdraw their children from these classes. An opt-out policy regarding parental consent has been adopted in previous sexual behavioural trials in UK schools and this appeared to be acceptable to both parents and schools.(255;260)

Mathematics and PSHE teachers delivering the intervention would contribute to the process evaluation. Their written consent would also be obtained.

**Sample size**
Assuming around 5% of pupils are absent, and 2% of parents do not give consent, (based on the RIPPLE study [Randomised Intervention trial of Peer (Pupil)-Led sex Education])(260), it is estimated that at least 200 pupils would participate at each school, giving a total of 400 in the study. This would allow the mean change in ability (see Section 7.3.3. Analysis) to be measured within 10% of the standard deviation of changes seen, and allow an initial assessment of how such changes are linked to demographic or behavioural characteristics.
**7.3.2. The intervention**

The first stages of the phase II study would involve the adaptation of the original phase I intervention and then its delivery with Mathematics and PSHE lessons. A gant chart illustrates the timescale for this process (Table 7.1.).

*Adapting the original (Phase I) intervention*

Generic decision analysis software *Annalisa* would replace the original software used in the previous *MyWay* program in the clinical setting.(249) The principles behind the program and the users’ pathway through it would remain the same as the original program. The main differences would be in how it is delivered and the additional emphasis on educating young people about the wider principles of decision analysis.

An updated literature search (from 2002) would need to be conducted to obtain more recent epidemiological evidence on pregnancy, STI risk and side effects associated with the different methods and to include data on contraceptive options and attributes omitted from the original program, such as inclusion of data on the Evra patch. A new matrix holding this evidence would be incorporated into the program. Information about the studies, including an assessment of their quality, would also be made available within the program.

During the initial stages of development meetings would be held with the schools to discuss the delivery of the intervention (and the research process, for example pupil recruitment logistics). A workshop with a group of sixth form pupils would be conducted to get their advice on the program, including input on ideas for demonstration examples and how to illustrate study quality.

A one-day training workshop for Mathematics and PSHE teachers involved in the implementation of the *MyWay* program would be developed and implemented to ensure standardisation in the delivery of the intervention. The workshop would cover the principles of decision analysis and its application to contraception, how the program works and delivery of the intervention. Advice and support about the required training would be provided by the recently formed PSHE Association, based at the National Children’s Bureau.
Delivering the intervention

The plan would be for the program to be introduced over three lessons, with each lesson around one hour in length. Lessons involving use of the MyWay program would be conducted in computer labs to ensure each pupil had direct access. Each young person would be provided with a unique ID number and would have to create their own password to gain access to the program.

The agenda for each lesson is provided below:

**Lesson 1** - Introduction to basic principles underlying decision analyses, using a wide range of social, financial, health and other examples, and discussion about the different ways of making decisions. This would be run jointly by Mathematics and PSHE teachers.

**Lesson 2** – Introduction to MyWay, class exercise using decision analysis to, for example, chose a friend to go on holiday with (i.e. young people would be asked to assign relative weights to characteristics, such as fun, reliable, and talkative, to fictitious friends to see who would be their best holiday friend). Young people would then be allowed to use the contraceptive element of the program on an individual basis. This session would again be run jointly by Mathematics and PSHE teachers.

**Lesson 3** – Small group work to explore how values affect decisions related to sexual behaviour and contraceptive use (and life in general), and what pupils felt they learnt from the program (including about decision making in general). The group work would be led by the PSHE teacher.

The program would be made available to young people via the Internet so they could continue to access the program as and when they needed through use of their ID number and password. This would also allow access in settings outside school, for example at home, in libraries or in Internet cafes. This ongoing access could be monitored by the research team.
Table 7.1. Gant chart for proposed phase II study

<table>
<thead>
<tr>
<th>Stage 1: Development phase</th>
<th>Year 1</th>
<th>Year 2</th>
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<tbody>
<tr>
<td>Update evidence</td>
<td>Quarter 1</td>
<td>Quarter 1</td>
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<tr>
<td>Adaptation of decision analysis software</td>
<td>Quarter 2</td>
<td>Quarter 2</td>
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<td>Development of research instruments</td>
<td>Quarter 3</td>
<td>Quarter 3</td>
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<td>Establishing partnerships with selected schools</td>
<td>Quarter 4</td>
<td>Quarter 4</td>
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<td>Staff training programme</td>
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<tr>
<th>Stage 2: Collection of baseline data and implementation of the intervention</th>
<th>Year 1</th>
<th>Year 2</th>
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<tr>
<td>Baseline survey and probability exercise</td>
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<tr>
<td>Implementation of MyWay</td>
<td>Quarter 1</td>
<td>Quarter 1</td>
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<td>Monitoring of intervention implementation</td>
<td>Quarter 2</td>
<td>Quarter 2</td>
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<td>Repeat probability exercise</td>
<td>Quarter 3</td>
<td>Quarter 3</td>
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<td>Semi-structured interviews and focus groups</td>
<td>Quarter 4</td>
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<td>Tracking use of MyWay</td>
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<th>Stage 3: Follow up</th>
<th>Year 1</th>
<th>Year 2</th>
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<td>Follow-up questionnaire, probability exercise and focus groups</td>
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<th>Analysis and writing up</th>
<th>Year 1</th>
<th>Year 2</th>
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<tr>
<td>Preliminary analysis</td>
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<td>Final analysis</td>
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<td>Proposal development for clustered-RCT</td>
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<td>Writing up and dissemination</td>
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Figure 7.1. Pupil pathway through the *MyWay* intervention and the research process

**RESEARCH PROCESS**
- **Baseline**
  - Questionnaire
  - Probability exercise
  - (Month 0)
- **Intervention**
  - Collection of individually selected options, attributes, weights and scores
  - Observation of delivery
  - (Month 0-1)
- **Post intervention**
  - Probability exercise
  - Focus groups
  - (Month 1)
- **Final follow up**
  - Questionnaire
  - Probability exercise
  - Focus groups
  - (Month 9)

**INTERVENTION PROCESS**
- **Lesson 1:** Decision analysis principles
- **Lesson 2:** Introduction to and use of *MyWay*
- **Lesson 3:** Small group work

**Tracking continued access to *MyWay***
- (Months 1-9)

**Continued access to *MyWay* via the Internet**
7.3.3. The research process

The interaction between the intervention delivery and the research is illustrated in Figure 7.1. and the timescale is provided in Table 7.1. During the time the intervention is being developed, research instruments from the original phase I pilot study would be adapted, and where appropriate new tools developed. These tools would collect data for both the outcome and process elements of the study, and are described below. Process evaluation, alongside the evaluation of outcomes, can help with the interpretation of findings through the examination of how the intervention has been implemented, the context of its delivery and its acceptability. (257;261)

Questionnaire

Pupils would complete the computer-based questionnaire within the MyWay program in the school computer labs. They would each be allocated their own computer. The questionnaire would provide baseline data prior to the introduction to the MyWay intervention and at final follow-up nine months later.

Data would be collected on the pupils’ demographic and sexual behavioural characteristics. The questionnaire would also collect data on the following intermediate outcome measures to allow for an assessment of the intervention’s impact:

- **Knowledge and attitudes** (e.g. knowledge of different contraceptive methods, attitude towards teenage pregnancy)
- **Intentions** (e.g. intended method of contraception)
- **Behaviour** (e.g. levels of sexual activity, correct and consistent contraceptive use)
- **Biological** (e.g. self-reported pregnancy and STIs)

Questions would be used from validated sexual attitudinal and behavioural surveys where appropriate (i.e. Natsal-2000, RIPPLE and the tracking survey for the Teenage Pregnancy Strategy Evaluation).

Data on biological events would be self-reported. In the future trial this could be supported with routine pregnancy data. Previous school-based trials of SRE interventions have shown
it is feasible to link trial data at a cluster or sub-group level (e.g. leaving school before 16 years versus staying on at school) with routinely collected data on births, miscarriages and abortions.(256;260)

**Probability exercise**

This exercise has a dual purpose: to gain a better understanding of young people’s ability to assign probabilities and to form part of the assessment on what they have learnt from the intervention (i.e. the skills obtained).

Software called *Prober* has been developed by members of the research team. It basically works by inviting the user to assess whether a given statement is correct. Young people are asked to assign a probability to measure the extent to which they agree with a statement. Statements can be a combination of general knowledge (e.g. “London is the capital of England”) and sexual health knowledge (e.g. “A woman has to be over 16 years before she can be prescribed the pill”). Data on educational and cognitive outcomes could also be collected from this exercise for research purposes. Two key dimensions of ability can be examined in this context: discrimination and calibration (See Section 7.3.4. Analysis).(132)

The probability exercise, like the questionnaire, would be within the computer-based *MyWay* program. This will allow the linkage of data at an individual level from other sources (e.g. the selected contraceptive options and attributes in the *MyWay* program). The exercise will be conducted at baseline, immediately after the intervention (i.e. after lesson 3) and at final follow-up.

**Program data**

Data would be collected from each pupil using the program at Lesson 2 on the following outputs: selected contraceptive options and attributes, assigned weights to the selected attributes and their option scores.

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viii Jack Dowie, Lorenzo Gordon and Mark Clements
**Tracking use of MyWay**

Each young person will be allocated a unique ID and password when first introduced to the program. As the program will be Internet-based young people would be able to access *MyWay* for a nine-month period following their introduction to the program. The research team would be able to monitor the number of occasions the program has been accessed and link this to other data collected at an individual level.

**Observation and monitoring**

Standardisation of a complex intervention can be increased through the training and monitoring of those involved in its delivery.(262) Monitoring can be achieved by regular supervision and feedback, or by observing or even videotaping of some of the classroom sessions. Ideally this would be done by independent assessors.

The phase II study would provide the opportunity to assess the recruitment rate and level of retention likely in a subsequent trial. Campbell and colleagues note that problems of follow-up can be further complicated in clustered studies as there are two levels at which drop-out can occur; the cluster level or the individual level within a cluster.(246) The RIPPLE and SHARE (Sexual Health And Relationships, a teacher-led intervention) studies suggest the level of retention of clusters and individuals in school-based studies can be good.(256;260) Ways of increasing follow-up would be explored during the phase II study, including use of new ways to improve communication about the study, such as through the use of internet media.

**Focus groups with pupils**

Two focus groups (one with young men and the other with young women) would be conducted in each school. Participants would be purposively sampled to ensure a range of educational abilities. The focus groups would explore the young people’s experiences of the intervention, how the intervention has affected their decision-making skills, and assess its acceptability, including the acceptability of an integrated Mathematics and PSHE approach.
In-depth interviews with teachers

Face-to-face semi-structured interviews would be conducted with the school staff involved in the implementation of the MyWay intervention (n~6-8). The in-depth interviews will explore staff experiences of the intervention and views on its feasibility and acceptability.

7.3.4. Analysis

The analysis plan would follow the same approach used for the analysis of the questionnaire data and the qualitative data in the phase I pilot study in the sexual health service (see section 5.2.6). Again linkage of the different sources would allow data triangulation.

The two additional analysis components to this phase II study would be the analysis of the probability exercise and the analysis to inform the sample size needed for a future clustered RCT.

Data from the probability exercises would be used to assess the student’s overall ability to assign appropriate probability measures of their certainty in the truth of statements presented to them, from 0 (certain statement is false) to 100% (certain statement is true). Whilst this ability can be assessed with a single overall figure using the Brier Score, it is instructive to look at two key dimensions of ability in this context. The first is discrimination, which is concerned with the extent to which students differentiate correctly between the true and false statements. This would be measured by the difference between the average probability assigned to true and false statements. The second dimension is calibration, which is the extent to which the student’s assessments of their certainty match the proportions of statements that are in fact true, for example whether all those they assign as 0% are all false, half of those they assign as 50% are true, and all those they assign as 100% are true. This is measured by the distance between each assigned probability and the corresponding percentage of statements that are correct. These dimensions are distinct and can be very different for the same student. For example a student may assign very different and higher probabilities to true statements about condoms compared with those they assign to false statements and therefore show considerable discrimination, but the probabilities themselves may not be at all in line with the frequency of correctness at each probability.
The primary analysis would describe the distribution of discrimination and calibration ability across pupils in the two schools at baseline and describe the change observed between baseline and each of the two follow-ups. These descriptions would be based on figures and summary statistics, such as mean change in ability, together with confidence intervals. Statistical testing (with conventional 5% significance level) would address whether there has been change in the two ability measures. Standard parametric tests such as the ‘t-test’ (or non-parametric tests if required) would be used to test the associations between demographic and behavioural factors collected in the study questionnaire and the ability measures. Furthermore, linear regression would be used to assess how multiple factors are associated with the ability measures.

Data from the questionnaire would be collected to estimate likely prevalence of sexual health primary endpoints for the definitive trial to inform the sample size calculations for a trial. Clustering can cause a reduction in the effective sample size, but this can be addressed when planning the study design and in the analysis. The sample size in clustered RCTs usually has to be larger than in trials of individual randomisation because of the correlation between individuals in the same cluster, that is those within a cluster (such as a specific school) are more likely to be similar than different. The degree of correlation within clusters is called the intracluster correlation coefficient. Stephenson and colleagues describe the factors required to calculate the sample size for their clustered trial, RIPPLE, where the main outcome was abortion,(260) and a similar approach would be used for trials of MyWay:

1) the expected incidence rate of abortion in the absence of any intervention;
2) the variability in the abortion incidence rate between schools (i.e. the intracluster correlation coefficient)
3) the number of participating pupils in each school
4) the magnitude of effect of the intervention on abortion incidence that the trial intends to detect
5) the desired degree of certainty (i.e. statistical power) with which an effect on abortion is to be detected.
7.4. Outputs

The main phase II school study outputs would be:

1) An intervention, including facilitator training, ready for full-scale evaluation in schools (as well as health care settings) based on the principles of decision analysis to help young people with contraceptive decision-making.

2) A comprehensive quantitative dataset linking information collected on demographic and sexual behaviour characteristics, selected contraceptive options and attributes, relative weights assigned to the attributes, utility scores for selected contraceptive options, and number of occasions the program is accessed. This would provide us with an understanding of how the intervention is working, making specific links between thoughts, beliefs, values, decisions and behaviour (i.e. opening up the black box').

3) A process evaluation of the development of a decision analysis intervention, and use an integrated approach in the intervention delivery.

4) The design and research tools for a definitive clustered-RCT.

The definitive trial would be developed to meet the standards outlined in the Consolidated Standards of Reporting Trials (CONSORT) checklist.(68;263)

7.5. Key points

- The case for introducing interventions into schools to improve young people's understanding and skills around contraceptive decision-making is strong.

- A phase II study where the MyWay intervention would be adapted and implemented to 13-14 year old pupils in Mathematics and PSHE lessons is proposed.

- The development of the definitive clustered-RCT would also form part of this work.


Chapter 8. Conclusions

This thesis has described the development and piloting of a computer-based decision analysis intervention to help young people with their contraceptive decision-making. This process has followed the initial phases of the framework outlined by the MRC for the development and evaluation of complex interventions.(91;264) It can often be problematic trying to find the resources for the development and early piloting of interventions, however these phases are an absolute requirement to ensure good quality interventions and their evaluations.(92)

Campbell and colleagues explain how a complex intervention will be influenced by interacting components,(246) including:

- the 'disease' or health outcome (e.g. pregnancy and STIs),
- the 'patient' or the 'consumer' (e.g. their lifestyle and beliefs),
- the professionals (e.g. prescribing patterns and accessibility),
- health services (e.g. availability and setting),
- policy (e.g. policies on preventive services)
- social context (e.g. attitudes to teenage pregnancy)

The barriers to an intervention working at an individual level can be cognitive and behavioural, and at the wider level, organisational, socio-cultural and financial. Each decision we make is unique, with these decisions based on a combination of our background, knowledge, circumstances, values and our assessment of the probability of the consequences resulting from the decision. Sexual behaviour must be seen within the social, cultural and environmental context. As Wight comments, 'the behavioural outcome is frequently the result of a complex interaction of social factors .... and is rarely the subject of explicit decisions' (p. 17).(265) One of the key findings from this work with young people, even within the small sample, was the wide variation in the values they placed on contraceptive attributes. Free argues in her paper about providing sexual health advice for young people that the constraints on, or the facilitators of, contraception need to be considered when trying to understand contraceptive use and should be incorporated into models of contraceptive use.(59) One of the good practice points from the Faculty of Family Planning and Reproductive Health Care (FFPRHC) Guidance on contraceptive
choices for young people states: "A young person should be assisted in making contraceptive choices by considering her (sic) individual needs and wishes as well as other factors relating to lifestyle and risk of pregnancy or STI." (p. 240).(82)

However, the approach adapted by health (and education) services still tends to focus on a "top down" medical model. Lack of time during a consultation, information overload (in particular the 'pill talks') and use of a 'medical' approach are young people's criticisms of current contraceptive service delivery.(75) Frewer and colleagues comment that innovative methodologies to incorporate people's values are needed in health care, but are critical of current practice; "at present there is a problem with identifying methodological approaches which take account of both the need for patients to express preferences and concerns regarding treatment options using their own terminology, and the considerable intra-individual variation in treatment preferences which may explain why some treatments are successful for some patients but not for others." (p i54).(266) This is a problem that is likely to affect contraceptive choices as well as treatment choices.

Although there were questions about the feasibility of introducing decision aids, such as MyWay, within consultations, the fact that consumer values may not being elicited in health care consultations does need to be addressed. It may be more time consuming going through a program like MyWay (which will have resource implications), but if the program increases acceptability of the contraceptive method used, continuation of this method will hopefully increase and the risk of unplanned pregnancy reduced. Sonnenberg and colleagues conclude in their paper on the costs and net health effects of contraceptive methods that even a modest increase in the use of effective contraception will improve health and reduce costs.(18) In their analysis methods that require less than daily action, such as injectables and implants, are both more effective and less costly than methods that require daily action. The costs associated with methods that require daily action, such as condoms and the pill, were even greater amongst younger women because the effectiveness in preventing pregnancy in this group is lower, explained by lower compliance.

In the pilot phase I study, the pill was the method most likely to be used or selected by the young people and it was the method most likely to be recommended by the MyWay program when the evidence and young people's values were combined. Since the
publication of the NICE guidelines on LARC methods,(239) there has been a push to ensure their availability within health services. However, it is important that the focus on pregnancy prevention is not at the expense of STI prevention. An increase in STI prevalence amongst young people will have negative financial and health costs associated with, for example, PID, infertility and ectopic pregnancy. Until methods that are more effective at preventing both pregnancy and STIs are developed, and there is no indication of their development in the near future, our focus must be on improving interventions that tackle both these outcomes.

Sex and decision analysis theory would not immediately be seen as natural partners. Sex is often unplanned and emotional, and not a time for ‘rational’ decision-making. However, although sex may be unplanned, contraceptive use can be planned. Poor decisions can be wrong because of ignorance, but they are not necessarily ‘irrational’. While most young people do use contraception, predominantly the condom, as first intercourse, this is not necessarily maintained for subsequent sexual activity. Therefore it is appropriate to look at how interventions can help young people understand risks and decision-making to ensure they are protected against unplanned pregnancy and STIs prior to sexual intercourse taking place whether this is within casual or more long-term relationships. Simply providing young people will information about the risks associated with sexual activity, in particular, sexual activity without the use of condoms and/or other contraceptive methods, has had limited success. Young people need to be given the skills to support the accurate processing of information. Over 30 years ago Fishbein was recommending that contraceptive research needed to establish the relative weights for different behaviours and for different populations.(267) This knowledge, to help us understand individual’s perceived consequences of a behaviour and the subjective values of the consequences, is still needed to inform the development of effective interventions.

The National Strategy for HIV and Sexual Health recommends the adoption of new technologies, such as the Internet, to improve sexual health.(5) Internet interventions have the potential to be more cost-effective than face-to-face interventions because of the large numbers of people that can be reached. Jadad and colleagues argue “The Internet could benefit evidence-based decision-making by giving decision-makers cheap, fast and efficient access to up-to-date, valid and relevant knowledge at the right time, in the right amount and
in the right format." (p. 362). (268) The Internet can be used as a way of reaching young people, particularly those who may not be accessing sexual health services. (269) These types of interventions should be viewed as enhancements to more traditional care rather than as replacements. (270)

Sexual health interventions that focus on young people not only address the immediate consequences of risky sexual behaviour, but also future consequences as adolescent risk behaviour strongly predicts health problems in adulthood. (103) With the poor sexual health of Britain’s young people still being of great concern, the role of decision aids in reducing unplanned pregnancy and STIs warrants further investigation.
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APPENDIX

Appendix A.1. Publications

Appendix A.2. Evidence for the underlying decision analysis

Appendix A.3. Project information and documentation

Appendix A.4. Research instruments
Appendix A.1. Publications


What Impact Has England’s Teenage Pregnancy Strategy Had on Young People’s Knowledge of and Access to Contraceptive Services?


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Abstract

Purpose: To describe young people’s knowledge and use of contraceptive services over initial stages of England’s Teenage Pregnancy Strategy, and to investigate factors associated with use of different services.

Methods: A random location sample of young people aged 13–21 years (n = 8879) was interviewed in 12 waves over 2000–2004. Individual data were analysed to investigate factors associated with knowledge and use of contraceptive services and to observe trends over time. Area-level data were analyzed to explore differences in key variables.

Results: In all, 77% of young women and 65% of young men surveyed knew a service they could use to obtain information about sex. Amongst those who had had vaginal sexual intercourse, the most common source of contraceptive supplies was general practice for young women (54%) and commercial venues for young men (54%). Young women’s use of school-based services to obtain supplies increased significantly from 15.4% in Year 1 to 24.4% in Year 4, p < .001. Young men’s use of the commercial sector declined significantly over the same time period (60.3% to 50.6%, p = .002), while their use of general practice and family planning clinics increased (from 8.9% to 12.4%, p = .008, and 21.2% to 29.1%, p = .054, respectively). Use of family planning clinics and designated young people’s clinics was associated with first vaginal intercourse before the 16th birthday and living in a deprived area.

Conclusions: Young people’s patterns of contraceptive service use have changed since implementation of the Strategy; although no increase in overall service use was observed. The contribution of school-based services needs further exploration. © 2007 Society for Adolescent Medicine. All rights reserved.

Keywords: Pregnancy in adolescence; Family planning services; Contraception
ities. Yet there is evidence of other factors having contributed to lower rates in other European countries, including good access to sexual health services [2]. Young people in the U.K. have compared unfavorably with peers from other Western European countries in terms of use of contraception at first sexual intercourse and use at the last episode of sexual intercourse [4]. This would suggest that improving young people's knowledge of how to access services prior to first sexual intercourse is warranted.

In 1999, England embarked upon a 10-year Teenage Pregnancy Strategy with a desire to tackle social exclusion faced by teenage parents and their children, who are more likely than their peers to be living in poverty, lack formal education and be unemployed [3]. A programme was launched with two main aims: 1) to halve the conception rate among individuals in England under 18 years by 2010 (with an interim reduction target of 15% by 2004); and 2) to increase the participation of teenage mothers in education, training or work to 60% by 2010 to reduce the risk of long-term social exclusion.

The Teenage Pregnancy Unit (TPU) was established within the Department of Health (now based in the Department for Education and Skills) to implement and co-ordinate activities related to the Strategy at a national level. Teenage Pregnancy Co-ordinators, predominantly from youth work, education or health promotion backgrounds, were employed at a local top-tier authority level to manage Strategy implementation. There are 148 local top-tier authorities in England. Their purpose is to provide public services to their local population in liaison with the National Health Service. There is wide variation in their boundary sizes and in the demographic and health characteristics of those living in these areas, including the conception rates for individuals under 18 years old.

The component of the Strategy that aimed to prevent the causes of teenage pregnancy included better sex and relationship education (SRE) both in and outside of school settings, a national information campaign that targeted young people and provided support for their parents, improved access to contraception and the targeting of "at-risk" groups. A local implementation fund was provided to support integrated and innovative programmes and the application of new health service criteria for effective and responsible contraceptive advice and treatment for young people. This fund was larger in areas with high rates of teenage pregnancy. Further information about the programme are provided on the TPU's website (www.everychildmatters.gov.uk/teenagepregnancy/).

A team of academic and social researchers carried out an independent evaluation of the Teenage Pregnancy Strategy (TPSE). The aims of this article are to describe young people's knowledge and use of contraceptive services over initial stages of the Teenage Pregnancy Strategy (2000–2004), and to investigate factors that are associated with young people's use of different types of service.

Methods

As part of the TPSE a national tracking survey was carried out with the aim of monitoring progress towards the Strategy's goals. A random location sample of young people aged 13–21 years was interviewed in 12 waves at 4-month intervals between October 2000 and June 2004. Young people living in the randomly selected geographical areas (enumeration districts with on average 150 households) rather than the same individuals were interviewed at each wave. Fieldwork was spread across 200 sampling points in England, and to increase fieldwork efficiency, areas were chosen with a higher representation of 13–44-year-olds. Household screening interviews were conducted on the doorstep to ensure inhabitants were eligible with regard to age group. The sample included only young people living in a family home or those who were living independently. Written consent was obtained from all participants. For young persons aged 17 years or less and not living independently, written permission was sought from a parent or guardian. Face-to-face multi-media computer-assisted personal interviews (CAPI) were conducted by trained interviewers at the young person’s home. Interviews were not timed, but lasted around 40 minutes. The more sensitive questions, relating to sexual experience and experience of pregnancy, were contained within a self-completion section, to afford privacy. As well as collecting information about young people's awareness of Strategy media campaigns, the survey monitored changes in young people's knowledge, attitudes and behaviour over time. This included data on their knowledge and use of contraceptive services. With regards to knowledge of contraceptive availability, young people were asked, "Can you think of a clinic or place in your area you could visit if you wanted advice about sex? (for example, advice on contraception or infections passed on by sex)." They also were asked to report whether the following statements were true or false (or that they did not know): 1) contraceptives are available to everyone, free of charge; 2) people of any age can get free condoms from a Family Planning Clinic; and 3) a girl under 16 can be prescribed contraceptives without her parents knowing.

The young people were provided with a list of services and sources, and asked 1) if they had ever accessed any of the places for contraceptive advice and 2) if they had ever accessed any of these places for contraceptive supplies. Young people could select as many responses as applicable. The following responses or categories were examined: school-based services; general practice (either general practitioner [GP] or practice nurse); community contraceptive services (family planning clinics or youth advisory centres/Brook Advisory centers); retail (pharmacies or vending machines, where supplies have to be purchased). Data were also collected to explore variations in key variables at a local authority level. These included the following. First,
postcodes of contraceptive services identified from the 2004 Sexwise database (a source that provides information on all contraceptive services for young people in the UK). Postcode data were used to calculate how far individuals lived from their nearest contraceptive service. The distance from services was calculated as a population weighted average of the road distance (in km) from ward centroids to the nearest service (for all services and also young person specific services). Second, deprivation scores were collected. These scores are a measure of multiple deprivations at a small area level. A number of domains are used to derive these, including measures of income, employment and crime [5]. Third, Strategy-related “effort” scores were obtained. The TPU provided the “effort” scores. These were derived from regional panel assessments of Teenage Pregnancy Partnership Board reports. The panels were made up of professionals whose remits related to the Strategy, including representatives from the National Healthy Schools Programme and from Strategic Health Authorities. The effort that had been put into sexual health services at a local authority level was scored as “very good,” “good,” “satisfactory” or “poor.” Individual panel members were asked to provide scores and then a consensus was reached. These data were used as a means of rating some of the more intangible activities at a local level. Fourth, the level of Strategy expenditure each local authority was allocated by the TPU to implement the Strategy was sought. For the purpose of analysis expenditure was divided into quintiles.

A merged dataset was created to link data from individual survey respondents with corresponding area-level data. Analysis was conducted in SPSS (Version 12.0) [6]. Survey data were weighted by social grade. Data from respondents on knowledge and use of services were analysed at yearly intervals to observe trends over the 4 years of the evaluation. Univariate analyses of individual and area-level factors by gender associated with overall knowledge and use of services were conducted. The analysis of use of services for contraceptive supplies was confined to those who reported previous vaginal sexual intercourse in this paper sexual intercourse refers to vaginal sexual intercourse, as the focus of our analysis is use of services to obtain contraceptive advice or supplies to avoid pregnancy. We used $\chi^2$ tests for significance testing of trends over time and the univariate analyses. Statistical significance is considered at $p < .05$ for all analyses.

Results

Characteristics of respondents

Interviews were achieved with 8879 young people across the 12 waves of the tracking survey. Respondent characteristics are presented in Table 1. There were no significant variations in these characteristics over the course of the evaluation.

<table>
<thead>
<tr>
<th>Table 1 Characteristics of all survey respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Age at interview, years</td>
</tr>
<tr>
<td>13–15</td>
</tr>
<tr>
<td>16–17</td>
</tr>
<tr>
<td>18–21</td>
</tr>
<tr>
<td>Living in most deprived quintile</td>
</tr>
<tr>
<td>Had heterosexual intercourse before 16 years*</td>
</tr>
<tr>
<td>778 (27.1)</td>
</tr>
<tr>
<td>Average distance to any sexual health service†</td>
</tr>
<tr>
<td>&lt; 1 km</td>
</tr>
<tr>
<td>1–&lt; 2 km</td>
</tr>
<tr>
<td>2–5 km</td>
</tr>
<tr>
<td>&gt; 5 km</td>
</tr>
<tr>
<td>Average distance to designated young people's sexual health service</td>
</tr>
<tr>
<td>&lt; 1 km</td>
</tr>
<tr>
<td>1–&lt; 2 km</td>
</tr>
<tr>
<td>2–5 km</td>
</tr>
<tr>
<td>&gt; 5 km</td>
</tr>
</tbody>
</table>

Data are n (%). * Denominator = respondents aged 16 or over.
† Includes mainstream sexual health services and designated young people's services, but excludes general practice. Services identified through the Sexwise database.

Knowledge of contraceptive services

In all, 77% of young women and 65% of young men interviewed between 2000 and 2004 knew of a clinic or place they could visit if they wanted advice about sex (Table 2). Proportions were higher among young women and men who reported sexual intercourse (89% and 75%, respectively) (data not shown). No significant increase was observed over time in young women's knowledge of contraceptive services or availability; however, young men's awareness that contraception is freely available increased significantly (Table 2). Young people aged under 16 years had poorer knowledge of contraceptive availability compared to those aged 16 and over (data not shown). For example, 47% of young women under 16 were aware that contraceptives were available free of charge compared to 70% of those 16 and over ($p < .001$) and 40% of young men under 16 were aware, compared to 61% of those 16 and over ($p < .001$). This association remained after controlling for whether or not respondents had experienced sexual intercourse.

Use of contraceptive services for advice

Nearly two thirds of all young women and nearly half of all young men (including those who had not yet had sexual intercourse) reported that they had accessed a service to obtain contraceptive advice (Table 3). The most frequently cited service accessed for advice by young women was general practice and for young men was school-based.
Table 2
Knowledge of contraceptive services and contraceptive availability by year and gender (denominator = all respondents)

<table>
<thead>
<tr>
<th></th>
<th>Year 1 %</th>
<th>Year 2 %</th>
<th>Year 3 %</th>
<th>Year 4 %</th>
<th>p Value for trend</th>
<th>All years n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place to get information</td>
<td>79.5</td>
<td>74.5</td>
<td>77.7</td>
<td>78.0</td>
<td>.422</td>
<td>3445 (77.4)</td>
</tr>
<tr>
<td>Contraceptives free of charge</td>
<td>59.4</td>
<td>62.2</td>
<td>63.9</td>
<td>62.4</td>
<td>.110</td>
<td>2759 (62.0)</td>
</tr>
<tr>
<td>Any age can get free condoms</td>
<td>68.0</td>
<td>70.6</td>
<td>74.6</td>
<td>70.3</td>
<td>.051</td>
<td>2922 (71.1)</td>
</tr>
<tr>
<td>Can get contraceptives without parent's knowledge</td>
<td>62.9</td>
<td>63.7</td>
<td>64.6</td>
<td>63.6</td>
<td>.379</td>
<td>2837 (63.7)</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place to get information</td>
<td>65.4</td>
<td>65.1</td>
<td>65.2</td>
<td>64.3</td>
<td>.957</td>
<td>2859 (65.0)</td>
</tr>
<tr>
<td>Contraceptives free of charge</td>
<td>50.9</td>
<td>52.8</td>
<td>56.2</td>
<td>55.9</td>
<td>.003</td>
<td>2378 (53.9)</td>
</tr>
<tr>
<td>Any age can get free condoms</td>
<td>55.9</td>
<td>56.9</td>
<td>64.2</td>
<td>61.1</td>
<td>&lt; .001</td>
<td>2420 (59.8)</td>
</tr>
<tr>
<td>Can get contraceptives without parent's knowledge</td>
<td>55.1</td>
<td>53.3</td>
<td>58.6</td>
<td>54.4</td>
<td>.509</td>
<td>2441 (55.4)</td>
</tr>
</tbody>
</table>

There were significant increases over the period of the evaluation in the proportion of young women accessing school-based services and using the identified phone helplines and websites for advice. Significant decreases were observed in use of family planning clinics for advice over the 4-year period.

The proportion of young people who had experienced sexual intercourse and reported obtaining contraceptive ad-

Table 3
Use of different services for contraceptives advice and supplies by year and gender

<table>
<thead>
<tr>
<th>Services accessed for advice1</th>
<th>Year 1 %</th>
<th>Year 2 %</th>
<th>Year 3 %</th>
<th>Year 4 %</th>
<th>p Value for trend</th>
<th>All years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Women: All (n = 4116)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any service</td>
<td>63.1</td>
<td>61.1</td>
<td>67.7</td>
<td>65.1</td>
<td>.054</td>
<td>64.3</td>
</tr>
<tr>
<td>School-based services2</td>
<td>18.8</td>
<td>21.6</td>
<td>28.5</td>
<td>26.9</td>
<td>&lt;.001</td>
<td>24.4</td>
</tr>
<tr>
<td>General practice</td>
<td>36.5</td>
<td>33.8</td>
<td>34.5</td>
<td>33.4</td>
<td>.250</td>
<td>34.4</td>
</tr>
<tr>
<td>Family planning clinics</td>
<td>31.7</td>
<td>31.3</td>
<td>25.2</td>
<td>29.2</td>
<td>.043</td>
<td>29.2</td>
</tr>
<tr>
<td>Designated young people's clinics</td>
<td>8.5</td>
<td>7.3</td>
<td>7.5</td>
<td>7.8</td>
<td>.710</td>
<td>7.7</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>8.6</td>
<td>9.7</td>
<td>9.0</td>
<td>9.4</td>
<td>.771</td>
<td>9.2</td>
</tr>
<tr>
<td>Identified phone lines and websites3</td>
<td>5.3</td>
<td>5.7</td>
<td>8.2</td>
<td>9.6</td>
<td>&lt;.001</td>
<td>7.4</td>
</tr>
<tr>
<td><strong>Men: All (n = 4054)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any service</td>
<td>43.0</td>
<td>43.1</td>
<td>51.2</td>
<td>43.0</td>
<td>.333</td>
<td>45.3</td>
</tr>
<tr>
<td>School-based services2</td>
<td>22.8</td>
<td>22.1</td>
<td>29.7</td>
<td>23.2</td>
<td>.190</td>
<td>24.6</td>
</tr>
<tr>
<td>General practice</td>
<td>11.6</td>
<td>9.7</td>
<td>12.9</td>
<td>10.7</td>
<td>.814</td>
<td>11.2</td>
</tr>
<tr>
<td>Family planning clinics</td>
<td>13.9</td>
<td>13.8</td>
<td>12.6</td>
<td>11.0</td>
<td>.030</td>
<td>12.7</td>
</tr>
<tr>
<td>Designated young people's clinics</td>
<td>5.4</td>
<td>6.4</td>
<td>3.8</td>
<td>3.6</td>
<td>.004</td>
<td>4.7</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>5.2</td>
<td>7.1</td>
<td>6.3</td>
<td>7.3</td>
<td>.168</td>
<td>6.6</td>
</tr>
<tr>
<td>Identified phone lines and websites3</td>
<td>5.3</td>
<td>7.0</td>
<td>7.5</td>
<td>5.4</td>
<td>.936</td>
<td>6.4</td>
</tr>
<tr>
<td><strong>Services accessed for supplies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women: Reporting sexual intercourse (n = 1801)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any service</td>
<td>90.4</td>
<td>91.3</td>
<td>91.7</td>
<td>92.3</td>
<td>.304</td>
<td>91.5</td>
</tr>
<tr>
<td>School-based services2</td>
<td>15.4</td>
<td>15.0</td>
<td>23.2</td>
<td>24.4</td>
<td>&lt;.001</td>
<td>19.8</td>
</tr>
<tr>
<td>General practice</td>
<td>53.7</td>
<td>56.0</td>
<td>52.9</td>
<td>53.2</td>
<td>.616</td>
<td>54.0</td>
</tr>
<tr>
<td>Family planning clinics</td>
<td>49.9</td>
<td>51.2</td>
<td>44.3</td>
<td>52.4</td>
<td>.870</td>
<td>49.5</td>
</tr>
<tr>
<td>Designated young people's clinics</td>
<td>9.4</td>
<td>7.8</td>
<td>9.6</td>
<td>10.7</td>
<td>.301</td>
<td>9.4</td>
</tr>
<tr>
<td>Commercial4</td>
<td>39.4</td>
<td>40.2</td>
<td>38.4</td>
<td>38.5</td>
<td>.652</td>
<td>39.1</td>
</tr>
<tr>
<td><strong>Men: Reporting sexual intercourse (n = 1713)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any service</td>
<td>77.2</td>
<td>78.0</td>
<td>79.0</td>
<td>79.3</td>
<td>.442</td>
<td>78.5</td>
</tr>
<tr>
<td>School-based services2</td>
<td>25.5</td>
<td>20.7</td>
<td>27.2</td>
<td>22.2</td>
<td>.537</td>
<td>23.2</td>
</tr>
<tr>
<td>General practice</td>
<td>8.9</td>
<td>6.9</td>
<td>13.8</td>
<td>12.4</td>
<td>.008</td>
<td>10.7</td>
</tr>
<tr>
<td>Family planning clinics</td>
<td>21.2</td>
<td>28.7</td>
<td>26.5</td>
<td>29.1</td>
<td>.054</td>
<td>26.8</td>
</tr>
<tr>
<td>Designated young people's clinics</td>
<td>5.8</td>
<td>7.3</td>
<td>7.4</td>
<td>5.6</td>
<td>.760</td>
<td>6.6</td>
</tr>
<tr>
<td>Commercial4</td>
<td>60.3</td>
<td>57.2</td>
<td>51.0</td>
<td>50.6</td>
<td>.002</td>
<td>54.3</td>
</tr>
</tbody>
</table>

1 Respondents could report multiple services.
2 School-based services = teachers, school nurses or school-based clinics.
3 Identified phone lines and websites = Sexwise helpline, Contraceptive Education Service, rutherford website (promoted in TPU media campaigns) and the NHS Direct phone line and website.
4 Commercial = pharmacies or vending machines.
Table 4

<table>
<thead>
<tr>
<th>Age at interview (years)</th>
<th>Any service %</th>
<th>School-based clinic %</th>
<th>General practice %</th>
<th>Family planning clinic %</th>
<th>Designated young person's clinic %</th>
<th>Commercial %</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 16 (n = 157)</td>
<td>p &lt; .001</td>
<td>p = .001</td>
<td>p &lt; .001</td>
<td>p = .046</td>
<td>p = .332</td>
<td>p = .001</td>
</tr>
<tr>
<td>16-17 (n = 615)</td>
<td>83.4</td>
<td>40.1</td>
<td>30.6</td>
<td>43.3</td>
<td>13.4</td>
<td>32.5</td>
</tr>
<tr>
<td>≥ 18 (n = 1029)</td>
<td>89.9</td>
<td>25.2</td>
<td>45.9</td>
<td>48.1</td>
<td>9.2</td>
<td>42.4</td>
</tr>
</tbody>
</table>

*Factors associated with young people’s use of services for contraceptive supplies*

Data on type of service accessed and age at interview, age at first sexual intercourse and living in a deprived area are presented in Table 4. Young people who reported having first sexual intercourse prior to 16 years and those living in more deprived areas, were on the whole, more likely to use family planning clinics and designated young people’s clinics, than those who reported first sexual intercourse at 16 years or over and those living in more affluent areas. Young women reporting first sexual intercourse before their 16th birthday were significantly more likely to use school-based services. Both young women and men living in deprived areas were less likely to use a commercial service for contraceptive supplies than those living in more affluent areas.

The associations observed with contraceptive service access using the area-level data are presented in Table 5. A significant association was found in terms of greater effort put into the delivery of sexual health services (TPU data) and young men’s increased use of services, but no such association observed for young women’s use of services. Higher Strategy expenditure at an area level was not associated with increased service use by young people. There was no association between access and distance from any sexual health service, but there was an association between access to designated young people’s services and distance from these services, particularly evident amongst the young women.
Discussion

Improving young people’s knowledge and access to services are goals that have been set to meet the Teenage Pregnancy Strategy’s aim of reducing under-18-year-old conception rates. Little change in knowledge of contraceptive availability and services was observed, with the exception that over the 4 years more young men were aware that contraception is free of charge and condoms are freely available irrespective of age. A third of young women and just under half of young men remain unaware that they can obtain contraceptives without their parents’ knowledge. This suggests there is still a need for consistent messages about confidentiality of sexual health services to be conveyed to young people and for training of health care workers on confidentiality and young people. There appears to be confusion about confidentiality relating to provision of contraception to young people under 16-years-old in particular. An audit conducted over 2001–2002 found that one or more GPs in 14% of English practices would not see young people under 16 years without a parent present [7]. Specific guidance has since been provided for health professionals on contraceptive provision to those less than 16 years of age [8].

There is some evidence that patterns of young people’s use of different services for contraceptive advice and/or supplies is changing. However, there were no significant increases observed amongst young women and men’s overall use of contraceptive services. The survey data suggested young women are increasingly using school-based services and information sources, such as helplines and websites, to gain contraceptive advice. The proportion of young people obtaining contraceptive advice prior to first sexual intercourse, and in particular those having sexual intercourse before 16 years, declined over the evaluation period. However, it is not clear whether this is because young people felt unable, for whatever reason, to seek advice or whether it is because they did not feel it necessary to seek advice as they already had all the information they required through, for example, SRE and media sources.

Overall, general practice is the main provider of contraceptive supplies for young women, and the commercial sector is the main provider for young men. Although young men are far less likely to access general practice than young women, there was a significant increase in their use of general practice and family planning clinics and a decrease in their use of the commercial sector over the evaluation. This corresponded with young men’s increased knowledge of contraceptive availability. Although the “effort” scores need to be interpreted with caution due to their subjective and non-validated method of allocation, local authorities rated as “very good” by Regional panel assessments in terms of effort put into sexual health services have been particularly successful in attracting young men, a group often identified as hard to reach. However, condoms are still not provided in most general practices, so there is little in terms of supplies that can be offered to young men in this setting. Health care workers are less likely to raise the topic of contraception with men [9], and qualitative work has shown young men still view contraceptive services as female orientated [10].

The survey asked about actual service use rather than preferred use. For many young people, a visit to their general practice may be the only option. There are still relatively few specific services for young people, particularly in rural areas. The number of areas in which there was at least one sexual health service dedicated to young people did increase steadily from 68% at the beginning of 2000 to 84% by the end of 2001 [11]. Proximity and ease of getting to clinics have been cited as prominent reasons for choosing a particular service [12,13]. We found no association between access and distance to services used overall, but use of designated young people’s services did decline the further young people had to travel. It should be noted distance was measured along road networks, and did not take account of transport links. Opening times can also provide barriers to access. An audit of contraceptive services conducted during the early stages of the TPSE showed two thirds of services targeting young people were only open once a week [11]. Young people reporting sexual intercourse before age 16 and those living in more deprived areas were more likely to use designated young people’s services than those reporting sexual intercourse aged 16 years or above and those living in more affluent areas. However, these services tend to offer a narrower range of
contraceptive methods than mainstream services, and in general, young people are less likely than older women to be offered longer acting more reliable methods of contraception.

Much research on young people and contraceptive service use has been conducted within service settings and therefore omits non-users. A strength of this study's community approach was that both service users and non-users were interviewed. Respondents were selected through random-location sampling, therefore at each wave people living in the selected geographical areas were interviewed rather than the same individuals. However, we noted no difference in the characteristics of interviewees over time. A random probability sample was excluded on grounds of cost and time as it was calculated some 25 addresses would need to be screened to identify each within-scope contact. Random-location sampling has been shown to perform as well as random probability sampling in most circumstances [14] and this methodology was viewed to be beneficial due to the compatibility of the survey data with the area-level data collected. Another major benefit of our survey was that both male and female respondents between the ages of 13–21 years were interviewed. Other large-scale UK population-based surveys, such as the National Survey of Sexual Attitudes and Lifestyles (NatSAL-2000) and the Omnibus Surveys, looking at contraceptive service use have interviewed people aged 16 years and above [15–17]. Therefore patterns of service use amongst some of the most vulnerable young people were not examined.

It was not possible to produce the number of non-responders, either due to young people or their parent/guardian declining participation, because of the random location sampling approach. Another factor that needs to be considered when interpreting results is that those young people not living at home or not living independently, such as those living in care homes, were not approached to take part in the survey.

An area that warrants further research is young people's use of school-based services. Our findings suggest that young women are increasingly using these services to obtain contraceptive advice and supplies. School-based services have the potential to engage with young people prior to the starting of sexual activity, they are easily accessible and may have less stigma associated with their use in comparison to designated sexual health services as the reason for the visit is not apparent. However, our understanding of how these services are provided in school settings needs further examination.

The provisional 2004 conception rate in England for individuals under 18 years are 41.5 per 1000 girls aged 15–17 [18]. This represents an 11.1% decline from the baseline rates in 1998. The TPSE found the most significant declines in more deprived areas with higher baseline conception rates that received more funding [19]. The Teenage Pregnancy Strategy has ambitious targets, and it may be too soon since the start of its implementation to observe dramatic changes in young people's use of contraceptive services. Guidance for making services more youth friendly has been produced since our evaluation [20]. We found that the proportion of women who have had sexual intercourse reporting use of services for contraceptive supplies in the last year is already high at over 90%, and it may therefore be appropriate to target those young people at higher risk of teenage pregnancy rather than the general population in terms of improving access. Evidence suggests that the majority of young people “at risk” for pregnancy do use contraception [21]. Therefore, access to services is only part of the equation. Ways of improving young people's contraceptive choices and correct use of methods also need to be addressed.

Acknowledgments

We acknowledge the following groups and individuals for their support to this work: members of the Teenage Pregnancy Strategy Evaluation Advisory Group, the Evaluation team members of BMRB (Bridget Williams, Caroline Simpson and Patsy Lamb) and Rachael Parker, the Evaluation Co-ordinator. The evaluation research was supported by a grant from the Department of Health. Ethical approval for the evaluation was gained via the Joint UCL/UCLH Committees on the Ethics of Human Research. This work was undertaken by the TPSE research team. The views expressed in this paper are those of the authors and not necessarily those of the Department of Health or Department for Education and Skills.

References


Appendix A.2. Evidence for the underlying decision analysis

STI evidence and estimates

Side effect evidence and estimates

Bother estimates
<table>
<thead>
<tr>
<th>STI</th>
<th>Probability of female to male transmission per sexual act</th>
<th>Evidence for B</th>
<th>Probability of female to male transmission per partnership*</th>
<th>Prevalence Rate per 100 women</th>
<th>Evidence for E</th>
<th>Risk of acquisition in one year**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gonorrhoea</td>
<td>0.25</td>
<td>Modelling/Expert opinion (Garnett and Bowden, 2000)(187) and Garnett GP personal communication)</td>
<td>0.9994</td>
<td>0.18</td>
<td>Surveillance data (Source: PHLS and ONS) 2001 population estimates in England for 15-19 year old women calculated using GUM returns KC60 data and census population figures.</td>
<td>0.0018</td>
</tr>
<tr>
<td>Chlamydial infection</td>
<td>0.323</td>
<td>Modelling (Katz, 1992)(190) Provides estimates for heterosexual transmission probabilities derived from a deterministic model of transmission using of data generated from a contact tracing programme in a US STI clinic.</td>
<td>0.9999</td>
<td>3.0</td>
<td>Random probability sample (Fenton et al, 2001)(196) Prevalence amongst women aged 16-44 in the UK. Urine samples tested for Chlamydia trachomatis using urinary LCR. Amongst women aged 18-24 (weighted base = 364) prevalence = 3.0% (95% CI 1.7-5.0)</td>
<td>0.03</td>
</tr>
<tr>
<td>Syphilis</td>
<td>0.63</td>
<td>Review/Expert opinion (Garnett et al, 1997(271) and Garnett GP, personal communication) Review of prospective cohort studies of discordant couples and retrospective studies of infected couples</td>
<td>1.0</td>
<td>0.0007</td>
<td>Surveillance data (Source: PHLS and ONS) 2001 population estimates in England for 15-19 year old women calculated using GUM returns KC60 data and census population figures.</td>
<td>0.000007</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>0.5 (per partnership)</td>
<td>Modelling (Bowden and Garnett, 2000)(272) Estimate calculated from retrospective partnership studies data</td>
<td>0.5</td>
<td>0.1</td>
<td>Surveillance data (Waghorn et al, 1998)(273) UK cervical smear specimens, 52 440 samples tested between 1996-6</td>
<td>0.0005</td>
</tr>
<tr>
<td>STI</td>
<td>Probability of female to male transmission per sexual act</td>
<td>Evidence for B</td>
<td>Probability of female to male transmission per partnership*</td>
<td>Prevalence Rate per 100 women</td>
<td>Evidence for E</td>
<td>Risk of acquisition in one year**</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------------------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------------------------</td>
<td>-------------------------------</td>
<td>-------------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Herpes simplex virus Type 2</td>
<td>0.00015</td>
<td>Prospective cohort (Wald et al, 2001) (189)</td>
<td>Monogamous discordant couples 528 monogamous coule discordant for HSV-2 infection, including an HSV-2 susceptible population of 261 men and 267 women. In US. Subjects had participated in a double-blind randomised placebo controlled of an ineffective HSV-2 vaccine.</td>
<td>0.0039</td>
<td>5.1</td>
<td>Surveillance data (Vyse et al, 2000) (274) HSV-2 seroprevalence amongst 16-69 year olds in England &amp; Wales. Samples collected as part of a PHLS surveillance programme – anonymous residues of samples submitted for microbiological or biochemical testing to 15 public health labs. 3347 samples tested.</td>
</tr>
<tr>
<td>Human papilloma virus</td>
<td>0.75 (per partnership)</td>
<td>Expert opinion (Garnet GP, personal communication) Modelling of data from Koutsky et al study (275) to obtain probability estimate of HPV transmission per partnership.</td>
<td></td>
<td>0.75</td>
<td>15.0</td>
<td>Review (Koutsky, 1997) (197) Studies using direct-detection methods, such as Southern blots, have given HPV DNA prevalence estimates between 10-20%. 15% cited in Koutsky et al 1988 (275)</td>
</tr>
<tr>
<td>HIV</td>
<td>0.0013</td>
<td>Prospective cohort studies of discordant couples (Gray et al, 2001) (192) 174 monogamous couples, in which one partner was identified HIV-1 negative were retrospectively identified from a population cohort in Uganda. Sexual behavioural data and biological samples collected prospectively.</td>
<td>0.051737</td>
<td>0.0046</td>
<td>Surveillance data (Source: PHLS, Rice R, personal communication) Estimates calculated using data on 15-19 year old women resident in England who attended for HIV-related care in 2001 - GUM KC60 returns.</td>
<td>0.00003</td>
</tr>
</tbody>
</table>

Notes:
* D=1-(1-B)^6. Assumes 26 acts of vaginal intercourse per partnership (Source: Natsal 2000 data, Median number of sexual acts per heterosexual partnership for men).
** G=1-(1-D*(E/100))^6. Assumes one partnership per year (Source: Natsal 2000 data, Median number of sexual partners amongst sexually active heterosexual men)
N/K = Not known; N/A = Not applicable
Table A2.2. Probability of STI acquisition in one year: Women

<table>
<thead>
<tr>
<th>STI</th>
<th>Probability of male to female transmission per sexual act</th>
<th>Evidence for B</th>
<th>Probability of male to female transmission per partnership*</th>
<th>Prevalence Rate per 100 men</th>
<th>Evidence for E</th>
<th>Risk of acquisition in one year**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gonorrhoea</td>
<td>0.5</td>
<td>Retrospective cohort study (Platt et al, 1983)(276) Female spread contacts (n=26) of male index patients identified with gonococcal infection in a US STI clinic. Index cases' date of infection must have been known within previous 2 weeks, as well as dates of subsequent sexual contact. 6/12 women reporting one episode of sexual contact infected.</td>
<td>1.0</td>
<td>0.12</td>
<td>Surveillance data (Source: PHLS and ONS) 2001 population estimates in England for 15-19 year old men (excluding homosexually acquired infection) calculated using GUM returns KC60 data and census population figures.</td>
<td>0.0012</td>
</tr>
<tr>
<td>Chlamydial infection</td>
<td>0.395</td>
<td>Modelling (Katz, 1992)(190) Provides estimates for heterosexual transmission probabilities derived from a deterministic model of transmission using of data generated from a contact tracing programme in a US STI clinic.</td>
<td>1.0</td>
<td>2.7</td>
<td>Random probability sample (Fenton et al, 2001)(196) Prevalence amongst men aged 16-44 in the UK. Urine samples tested for Chlamydia trachomatis using urinary LCR. Amongst men aged 18-24 (weighted base = 388) prevalence = 2.7% (95% CI 1.2-5.8)</td>
<td>0.027</td>
</tr>
<tr>
<td>Syphilis</td>
<td>0.63</td>
<td>Review of prospective cohort studies of discordant couples and retrospective studies of infected couples/Expert opinion (Garnett et al, 1997(271) and Garnet GP, personal communication)</td>
<td>1.0</td>
<td>0.0006</td>
<td>Surveillance data (Source: PHLS and ONS) 2001 population estimates in England for 15-19 year old men calculated using GUM returns KC60 data and census population figures.</td>
<td>0.000006</td>
</tr>
<tr>
<td>STI</td>
<td>Probability of male to female transmission per sexual act</td>
<td>Evidence for B</td>
<td>Probability of male transmission per partnership*</td>
<td>Prevalence Rate per 100 men</td>
<td>Evidence for E</td>
<td>Risk of acquisition in one year**</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------</td>
<td>------------------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>0.85 (per partnership)</td>
<td>Retrospective cohort study</td>
<td>0.85</td>
<td>0.0044</td>
<td>Surveillance data (Source: PHLS and ONS)</td>
<td>0.00004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Catterall 1960)(277) 126 men diagnosed in two London STI clinics. 57/67 female contacts tested were positive to trichomoniasis.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herpes simplex virus</td>
<td>0.00089</td>
<td>Prospective cohort (Wald et al, 2001)(189)</td>
<td>0.0512</td>
<td>3.3</td>
<td>Surveillance data (Vyse et al, 2000)(274)</td>
<td>0.0017</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monogamous discordant couples 528 monogamous couple discordant for HSV-2 infection, including an HSV-2 susceptible population of 261 men and 267 women. In US. Subjects had participated in a double-blind randomised placebo controlled of an ineffective HSV-2 vaccine.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papilloma virus</td>
<td>0.75 (per partnership)</td>
<td>Expert opinion (Garnet GP, personal communication) Modelling of data from Koutsky et al study(275) to obtain probability estimate of HPV transmission per partnership.</td>
<td>0.75</td>
<td>15.0</td>
<td>Review (Koutsky, 1997)(197) Studies using direct-detection methods, such as Southern blots, have given HPV DNA prevalence estimates between 10-20%. 15% (cited in Koutsky et al 1988)(258)</td>
<td>0.1125</td>
</tr>
</tbody>
</table>
Table A2.2. (Contd.) Probability of STI acquisition in one year: Women

<table>
<thead>
<tr>
<th>STI</th>
<th>Probability of male to female transmission per sexual act</th>
<th>Evidence for B</th>
<th>Probability of male to female transmission per partnership*</th>
<th>Prevalence Rate per 100 men</th>
<th>Evidence for E</th>
<th>Risk of acquisition in one year**</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV</td>
<td>0.00009</td>
<td>Prospective cohort studies of discordant couples (Gray et al, 2001)(192) 174 monogamous couples, in which one partner was identified HIV-1 negative were retrospectively identified from a population cohort in Uganda. Sexual behavioural data and biological samples collected prospectively.</td>
<td>0.033256</td>
<td>0.0013</td>
<td>Surveillance data (Source: PHLS, Rice R. personal communication) Estimates calculated using data on 15-19 year old men resident in England who attended for HIV-related care in 2001 (heterosexually acquired infection or route of infection unknown) - GUM KC60 returns</td>
<td>0.00001</td>
</tr>
</tbody>
</table>

Notes:
* $D=1-(1-B)^2$. Assumes 26 acts of vaginal intercourse per partnership (Source: Natsal 2000 data, Median number of sexual acts per heterosexual partnership for men).
** $G=1-(1-D*(E/100))^{1/3}$. Assumes one partnership per year (Source: Natsal 2000 data, Median number of sexual partners amongst sexually active heterosexual men)
N/K = Not known; N/A = Not applicable
### Table A2.3: Probability of acquiring gonorrhoea in one year by contraceptive method

<table>
<thead>
<tr>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>Prob of acquiring gonorrhoea in one year by contraceptive method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.1.</td>
<td></td>
<td>0.0018</td>
</tr>
<tr>
<td>Spermicides</td>
<td>1.0</td>
<td>Team assumption</td>
<td></td>
<td>0.0018</td>
</tr>
<tr>
<td>Cap</td>
<td>0.75</td>
<td>Team assumption</td>
<td></td>
<td>0.0013</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td></td>
<td>0.0018</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.34</td>
<td><strong>Prospective cohort study</strong> (Darrow, 1989)(278) STD clinic attendees, USA 557 participants given condoms. 122 returned for FU and had had sexual intercourse since last visit. Condom use defined as any use versus non-use. Data collection period 1971 RR obtained from Cates and Stone review(279)</td>
<td></td>
<td>0.0006</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>N/A</td>
<td>Assume an additional protective effect of 10% over the male condom. Difference between two methods lost through rounding up of numbers.</td>
<td></td>
<td>0.0006</td>
</tr>
<tr>
<td>Pill</td>
<td>1.0</td>
<td>Team assumption</td>
<td></td>
<td>0.0018</td>
</tr>
<tr>
<td>IUD</td>
<td>1.0</td>
<td>Team assumption</td>
<td></td>
<td>0.0018</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Team assumption</td>
<td></td>
<td>0.0018</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td></td>
<td>0.0018</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.2.</td>
<td></td>
<td>0.0012</td>
</tr>
<tr>
<td>Spermicides</td>
<td>0.97</td>
<td><strong>Systematic Review</strong> (WHO, 2003)(203) Presentation by Wilkinson on evidence from a systematic review of RCTs comparing use of spermicides versus non-use at the technical consultation on nonoxynol-9. Women participating in the included trials tended to be sex workers or from other high risk groups. RR for gonorrhoea obtained from 6 studies with a total of 3017 women. 95% CI 0.85-1.11</td>
<td></td>
<td>0.0012</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.35</td>
<td><strong>Cross-sectional study</strong> (Rosenberg et al, 1992)(204) Target group: Female STI clinic attendees, US. Data collection period Jan. 1987 – Dec. 1988 Women asked about single most used contraceptive method over the last month. Women using sponge, diaphragm, or condoms were compared to a group using no method or tubal ligation. Women using other methods were excluded from the analysis Diaphragm users=227 Condom=1021. Nothing or tubal ligation=4332</td>
<td></td>
<td>0.0004</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td></td>
<td>0.0012</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.66</td>
<td><strong>Cross-sectional study</strong> (Rosenberg et al, 1992)(204) See cap entry above for study details.</td>
<td></td>
<td>0.0008</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>N/K</td>
<td>Assumed an additional 10% protective effective than male condoms. Difference between two methods lost through rounding up of numbers.</td>
<td></td>
<td>0.0008</td>
</tr>
</tbody>
</table>
Table A2.3. (Contd.) Probability of acquiring gonorrhoea in one year by contraceptive method

<table>
<thead>
<tr>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>RR for method users acquiring gonorrhoea</td>
<td>Evidence for H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pill</td>
<td>Case-control study (Austin et al, 1984)(212)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Target group: Female STI clinic attendees, US. Cases: 735 women diagnosed with gonorrhoea. Controls: 958 women, 400 diagnosed with another STI and 500 with no STI. Data collected period: July, 1982 – Feb. 1983. Oral contraceptive use = ever relative to none. (RR 1.03, 90% CI 1.0-1.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>IUD</td>
<td>Assumed same relative risk as risk of chlamydial infection i.e 0.8 (see Table A.2.4.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Injectables</td>
<td>Team assumption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subdermal implant</td>
<td>Team assumption</td>
</tr>
</tbody>
</table>
### Table A2.4. Probability of acquiring chlamydial infection in one year by contraceptive method

<table>
<thead>
<tr>
<th>Contraceptive methods</th>
<th>RR for method users acquiring chlamydia</th>
<th>Evidence for H</th>
<th>Prob of acquiring chlamydia in one year by method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.1</td>
<td>0.03</td>
</tr>
<tr>
<td>Spermicides</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.03</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.75</td>
<td>Team assumption</td>
<td>0.0225</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.03</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.34</td>
<td>Assumed same RR as that for chlamydial infection i.e. 0.34</td>
<td>0.0102</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>N/K</td>
<td>Assumed additional protective effect of 10% over male condoms</td>
<td>0.0092</td>
</tr>
<tr>
<td>Pill</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.03</td>
</tr>
<tr>
<td>IUD</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.03</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.03</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.2</td>
<td>0.027</td>
</tr>
<tr>
<td>Spermicides</td>
<td>0.88</td>
<td>Systematic Review (WHO, 2003)(203)</td>
<td>0.0238</td>
</tr>
</tbody>
</table>
|                      |                                        | Presentation by Wilkinson on evidence from a systematic review of RCTs comparing use of spermicides versus non-use at the technical consultation on nonoxynol-9. Women participating in the included trials tended to be sex workers or from other high risk groups.
<p>|                      |                                        | RR for Chlamydia obtained from 5 studies with a total of 2955 women. 95% CI 0.77-1.01 | |
| Cap/diaphragm         | 0.29                                   | Cross-sectional study (Rosenberg et al, 1992)(204) | 0.0078                                        |
|                      |                                        | Women asked about single most used contraceptive method over the last month. Women using sponge, diaphragm, or condoms were compared to a group using no method or tubal ligation. Women using other methods were excluded from the analysis. Diaphragm users=227 Condom=1021. Nothing or tubal ligation=4332 | |
| Withdrawal            | 1.0                                    | Team assumption| 0.027                                         |
| Condom (male)         | 0.97                                   | Cross-sectional study (Rosenberg et al, 1992)(204) | 0.0262                                        |
|                      |                                        | See cap entry above for study details. | |
| Condom (female)       | N/K                                    | Assumed additional 10% protective effect over male condoms | 0.0236                                        |</p>
<table>
<thead>
<tr>
<th>Contraceptive methods</th>
<th>RR for method users acquiring chlamydia</th>
<th>Evidence for H</th>
<th>Prob of acquiring chlamydia in one year by method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pill</td>
<td>1.04</td>
<td>Cross-sectional study (Magder et al, 1988)(205) Target group: STI clinic attendees, U.S. Data collection period: Sept. 1981-June 1983. Screened on Mons. &amp; Tues. 172 of the 1031 (15%) women recruited had cervical swabs positive to chlamydial infection. 54/254 pills users Chlamydia positive vs. 89/436 women using no contraception. RR calculated from these data. Suggestion in the paper that the risk of chlamydial infection amongst pill users under 20 years is higher. Therefore 1.04 may be an under-estimate.</td>
<td>0.0281</td>
</tr>
<tr>
<td>IUD</td>
<td>0.8</td>
<td>Cross-sectional study (Magder et al, 1988)(205) See above pill entry for study details. 10/61 IUD users Chlamydia positive vs. 89/436 women using no contraception. RR calculated from data in paper.</td>
<td>0.0216</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.027</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.027</td>
</tr>
</tbody>
</table>
### Table A2.5. Probability of acquiring syphilis in one year by contraceptive method

<table>
<thead>
<tr>
<th>Contraceptive methods</th>
<th>RR for method users acquiring syphilis</th>
<th>Evidence for H</th>
<th>Prob of acquiring syphilis in one year by method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.1.</td>
<td>0.0000007</td>
</tr>
<tr>
<td>Spermicides</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0000007</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.75</td>
<td>Team assumption</td>
<td>0.0000005</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0000007</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.24</td>
<td>Case control study (Finelli et al., 1993)(280) Comparison of individuals diagnosed with syphilis and those free of syphilis to investigate sexual behaviour and drug-use risks factors associated with acquisition of infection. Participants recruited in a US STI clinic. Male cases n = 46 and controls n=37 OR for early syphilis if used condom in the last three months = 0.24 (95% CI 0.08-0.67). Condom use not defined.</td>
<td>0.0000002</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>N/A</td>
<td>Assumed additional 10% protective effect over male condoms. Difference between two methods lost through rounding up of numbers.</td>
<td>0.0000002</td>
</tr>
<tr>
<td>Pill</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0000007</td>
</tr>
<tr>
<td>IUD</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0000007</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0000007</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0000007</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.2.</td>
<td>0.0000006</td>
</tr>
<tr>
<td>Spermicides</td>
<td>0.88</td>
<td>Assumed RR=0.88. Same as CT</td>
<td>0.0000006</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.29</td>
<td>Assumed RR=0.29. Same at CT</td>
<td>0.0000002</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0000006</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.89</td>
<td>Case control study (Finelli et al., 1993)(280) See above entry for men and condom use for study details. Female cases n = 41 and controls n=20. OR for early syphilis if used condom in the last three months = 0.89 (95% CI 0.25-3.22).</td>
<td>0.0000006</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>N/K</td>
<td>Assumed additional 10% protective effect over condoms</td>
<td>0.0000005</td>
</tr>
<tr>
<td>Pill</td>
<td>1.04</td>
<td>Assumed same RR as that for chlamydial infection i.e. 1.04 (see Table. A.2.4.)</td>
<td>0.0000007</td>
</tr>
<tr>
<td>IUD</td>
<td>0.8</td>
<td>Assumed same RR as that for chlamydial infection i.e. 0.8 (See Table A.2.4.)</td>
<td>0.0000005</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0000006</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0000006</td>
</tr>
</tbody>
</table>
Table A2.6. Probability of acquiring trichomoniasis in one year by contraceptive method

<table>
<thead>
<tr>
<th>Method</th>
<th>RR for method users acquiring trichomoniasis</th>
<th>Evidence for H</th>
<th>Prob of acquiring trichomoniasis in one year by method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.1.</td>
<td>0.0005</td>
</tr>
<tr>
<td>Spermicides</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0005</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.75</td>
<td>Team assumption</td>
<td>0.0004</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0005</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.44</td>
<td>Cross sectional study (Barlow, 1977)(281)</td>
<td>0.0002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Target group=STI clinic attendees, UK Data collection period: Jan. 1975-July 1975. Data from “approximately” 3300 men included. Men asked about condom use with recent sexual partners 1/257 condom users and 27/3083 diagnosed with trichomoniasis. RR calculated from data presented in the paper. Condom use included both “correct” and “incorrect” (i.e. condom not necessarily used consistently) use.</td>
<td></td>
</tr>
<tr>
<td>Condom (female)</td>
<td>N/K</td>
<td>Assumed 10% additional protective effect over male condoms. Difference between two methods lost through rounding up of numbers.</td>
<td>0.0002</td>
</tr>
<tr>
<td>Pill</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0005</td>
</tr>
<tr>
<td>IUD</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0005</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0005</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0005</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.2.</td>
<td>0.00004</td>
</tr>
<tr>
<td>Spermicides</td>
<td>0.84</td>
<td>Systematic Review (WHO, 2003)(203)</td>
<td>0.00003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presentation by Wilkinson on evidence from a systematic review of RCTs comparing use of spermicides versus non-use at the technical consultation on nonoxynol-9. Women participating in the included trials tended to be sex workers or from other high risk groups. RR for trichomoniasis obtained from 3 studies with a total of 1011 women. 95% CI 0.69-1.02</td>
<td></td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.24</td>
<td>Cross-sectional study (Rosenberg et al, 1992)(204)</td>
<td>0.000009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Target group: Female STI clinic attendees, US. Data collection period Jan. 1987 – Dec. 1988 Women asked about single most used contraceptive method over the last month. Women using sponge, diaphragm, or condoms were compared to a group using no method or tubal ligation. Women using other methods were excluded from the analysis Diaphragm users=227 Condom=1021. Nothing or tubal ligation=4332</td>
<td></td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.00004</td>
</tr>
</tbody>
</table>
Table A2.6. (Contd.) Probability of acquiring trichomoniasis in one year by contraceptive method

<table>
<thead>
<tr>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RR for method users acquiring trichomoniasis</td>
<td>Evidence for H</td>
<td>Prob of acquiring trichomoniasis in one year by method</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pill</td>
<td>1.04</td>
<td>Assumed same RR as that for chlamydial infection i.e. 1.04 (see Table. A.2.4.)</td>
<td>0.00004</td>
</tr>
<tr>
<td>IUD</td>
<td>0.8</td>
<td>Assumed same RR as that for chlamydial infection i.e. 0.8 (See Table A.2.4.)</td>
<td>0.00003</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.00004</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.00004</td>
</tr>
<tr>
<td>Contraceptive methods</td>
<td>RR for method users acquiring herpes</td>
<td>Evidence for H</td>
<td>Prob of acquiring herpes in one year by method</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------------------------</td>
<td>----------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.1.</td>
<td>0.0002</td>
</tr>
<tr>
<td>Spermicides</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0002</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.75</td>
<td>Team assumption</td>
<td>0.0001</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0002</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>2.99</td>
<td>Cross-sectional study (Obasi et al 1999) (282) Baseline survey. Random subsample from a trial cohort, Tanzania. Selection of subjects stratified by age, weighted to maximise number of young people. 231 men. HSV-2 serology at baseline. Condom use defined as ever used vs. never used. Crude Odds = 3.01. Adjusted for lifetime sex partners, marital status, and TPHA status 2.99 (95% CI 0.92-9.75)</td>
<td>0.0006</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>N/K</td>
<td>Assumed 10% additional protective effect over male condoms</td>
<td>0.0005</td>
</tr>
<tr>
<td>Pill</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0002</td>
</tr>
<tr>
<td>IUD</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0002</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0002</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0002</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.2.</td>
<td>0.0017</td>
</tr>
<tr>
<td>Spermicides</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0017</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.8</td>
<td>Cross sectional survey (Kjaer et al, 1990) (209) Random population-based survey. Greenland and Denmark. Greenland and Denmark. Women aged 20-39 years from Greenland (n=586) and Denmark (n=695) chosen at random through the Danish Central Population Register. Conducted interviews, serology and gynaecological examination. Analysis for HSV-2 virus antibodies tested on a random subset (388 in Denmark and 390 in Greenland) Definition = barrier methods (condom or diaphragm) ever used. (OR 0.8, 95% Cl 0.6-1.2) 0.9 Adjusted OR for age, area, age at first intercourse, number of sexual partners and years with unprotected cervix</td>
<td>0.0014</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0017</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.8</td>
<td>Cross sectional survey (Kjaer et al, 1990) (209) See cap entry above for study details</td>
<td>0.0014</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>N/K</td>
<td>Assumed 10% additional protective effect over male condoms</td>
<td>0.0012</td>
</tr>
<tr>
<td>Pill</td>
<td>0.9</td>
<td>Cross sectional survey (Kjaer et al, 1990) (200) See cap entry above for study details Pill use ever (OR 0.9, 95% CI 0.6-1.3) 0.9 Adjusted OR for age, area, age at first intercourse, number of sexual partners and years with unprotected cervix.</td>
<td>0.0015</td>
</tr>
</tbody>
</table>
Table A2.7. (Contd.) Probability of acquiring herpes simplex virus in one year by contraceptive method

<table>
<thead>
<tr>
<th>Contraceptive methods</th>
<th>RR for method users acquiring herpes</th>
<th>Evidence for H</th>
<th>Prob of acquiring herpes in one year by method</th>
</tr>
</thead>
<tbody>
<tr>
<td>IUD</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0017</td>
</tr>
<tr>
<td>Injectable</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0017</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.0017</td>
</tr>
</tbody>
</table>
## Table A2.8. Probability of acquiring HPV in one year by contraceptive method

<table>
<thead>
<tr>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraceptive methods</td>
<td>RR for method users acquiring HPV</td>
<td>Evidence for H</td>
<td>Prob of acquiring HPV in one year by method</td>
</tr>
</tbody>
</table>

### Men
- **Chance**: N/A  
  See Table XX.  
  Prob of acquiring HPV in one year by method: 0.1125
- **Spermicides**: 1.0  
  Team assumption  
  Prob of acquiring HPV in one year by method: 0.1125
- **Cap/diaphragm**: 0.75  
  Team assumption  
  Prob of acquiring HPV in one year by method: 0.0844
- **Withdrawal**: 1.0  
  Team assumption  
  Prob of acquiring HPV in one year by method: 0.125
- **Condom (male)**: 0.7  
  **Case control study** (Wen et al., 1999)(201)  
  Comparison of Australian GUM attendees diagnosed with genital warts and those not. Male cases = 649 and controls=649. Always condom use (excluding breakages). OR 0.7 (95% Cl 0.3-0.9) adjusted for age group, number of lifetime sexual partners and smoking.  
  Prob of acquiring HPV in one year by method: 0.0788
- **Condom (female)**: N/K  
  Assumed 10% additional protective effect over male condoms  
  Prob of acquiring HPV in one year by method: 0.0709
- **Pill**: 1.0  
  Team assumption  
  Prob of acquiring HPV in one year by method: 0.1125
- **IUD**: 1.0  
  Team assumption  
  Prob of acquiring HPV in one year by method: 0.1125
- **Injectables**: 1.0  
  Team assumption  
  Prob of acquiring HPV in one year by method: 0.1125
- **Subdermal implant**: 1.0  
  Team assumption  
  Prob of acquiring HPV in one year by method: 0.1125

### Women
- **Chance**: N/A  
  See Table XX  
  Prob of acquiring HPV in one year by method: 0.1125
- **Spermicides**: 1.0  
  Team assumption  
  Prob of acquiring HPV in one year by method: 0.1125
- **Cap/diaphragm**: 1.0  
  **Cross sectional survey** (Kjaer et al, 1990)(209)  
  Random population-based survey. Greenland and Denmark. Greenland and Denmark. Women aged 20-39 years from Greenland (n=586) and Denmark (n=695) chosen at random through the Danish Central Population Register. Conducted interviews, serology and gynaecological examination. Definition = barrier methods (condom or diaphragm) use ever. Screened for HPV type 6/11, type 16/18 or both  
  OR 1.0 (95% CI 0.7-1.5) Definition = barrier methods (condom or diaphragm) ever used. 1.0 (95% CI 0.7-1.4)= Adjusted OR for age, area, age at first intercourse, number of sexual partners and cervical smear result.  
  Prob of acquiring HPV in one year by method: 0.1125
- **Withdrawal**: 1.0  
  Team assumption  
  Prob of acquiring HPV in one year by method: 0.1125
- **Condom (male)**: 1.0  
  **Cross sectional survey** (Kjaer et al, 1990)(209)  
  See cap entry above for study details  
  Prob of acquiring HPV in one year by method: 0.1125
- **Condom (female)**: N/K  
  Assumed 10% additional protective effect over male condoms  
  Prob of acquiring HPV in one year by method: 0.1013
<table>
<thead>
<tr>
<th>Contraceptive methods</th>
<th>RR for method users acquiring HPV</th>
<th>Evidence for H</th>
<th>Prob of acquiring HPV in one year by method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pill</td>
<td>1.4</td>
<td>Cross sectional survey (Kjaer et al, 1990)(209) See cap entry above for study details Ever used pill. OR 1.4, 95% CI 0.9-2.1 Adjusted OR for age, area, age at first intercourse, number of sexual partners and cervical smear result = 1.4, 95% CI 0.9-2.2.</td>
<td>0.1575</td>
</tr>
<tr>
<td>IUD</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.1125</td>
</tr>
<tr>
<td>Injectables</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.1125</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.1125</td>
</tr>
<tr>
<td>Contraceptive methods</td>
<td>RR for method users acquiring HIV</td>
<td>Evidence for H</td>
<td>Prob of acquiring HIV in one year by method</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------</td>
<td>----------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance</td>
<td>N/A</td>
<td>See Table A.2.1.</td>
<td>0.00003</td>
</tr>
<tr>
<td>Spermicides</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.00003</td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td>0.75</td>
<td>Team assumption</td>
<td>0.00002</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.00003</td>
</tr>
</tbody>
</table>
| Condom (male)       | 0.15                             | **Systematic review** (Davis and Weller, 1999)(208)  
Study inclusion criteria: 1) examination of sexual transmission of HIV among serodiscordant heterosexual couples having penetrative sexual intercourse; 2) determined HIV status by serology; 3) inquired about condom usage 25 studies included in analysis  
Condom effectiveness (measured by comparing always with never users) in reducing female to male transmission = 84.7% (aggregate lower and upper confidence limits for both men and women 60.0% - 95.8%) | 0.000005 |
| Condom (female)     | N/K                              | Assumed 10% additional protective effect over male condoms | 0.000004 |
| Pill                | 1.0                              | Team assumption| 0.00003                                  |
| IUD                 | 1.0                              | Team assumption| 0.00003                                  |
| Injectable           | 1.0                              | Team assumption| 0.00003                                  |
| Subdermal implant   | 1.0                              | Team assumption| 0.00003                                  |
| **Women**           |                                  |                |                                          |
| Chance              | N/A                              | See Table A.2.2.| 0.00001                                  |
| Spermicides         | 1.14                             | **Systematic Review** (WHO, 2003)(203)  
Presentation by Wilkinson on evidence from a systematic review of RCTs comparing use of spermicides versus non-use at the technical consultation on nonoxynol-9. Women participating in the included trials tended to be sex workers or from other high risk groups.  
RR for HIV obtained from 5 studies with a total of 3570 women. 95% CI 0.92-1.41 | 0.000001 |
| Cap/diaphragm       | 0.7                              | **Expert opinion** (Kresge, 2003)(283)  
Article quoting Padian who describes anticipated reduction in HIV acquisition amongst female diaphragm of 30% | 0.000009 |
| Withdrawal          | N/K                              | Assumed RR=1.0 | 0.00001                                  |
| Condom (male)       | 0.13                             | **Systematic review** (Davis and Weller, 1999)(208)  
Study inclusion criteria: 1) examination of sexual transmission of HIV among serodiscordant heterosexual couples having penetrative sexual intercourse; 2) determined HIV status by serology; 3) inquired about condom usage 25 studies included in analysis  
Condom effectiveness (measured by comparing always with never users) in reducing male to female transmission= 86.8% (aggregate lower and upper confidence limits for both men and women 60.0% - 95.8%) | 0.000002 |
<table>
<thead>
<tr>
<th>Contraceptive methods</th>
<th>RR for method users acquiring HIV</th>
<th>Evidence for H</th>
<th>Prob of acquiring HIV in one year by method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condom (female)</td>
<td>N/K</td>
<td>Assumed 10% additional protective effect over male condoms</td>
<td>0.0000001</td>
</tr>
<tr>
<td>Pill</td>
<td>0.3</td>
<td>Systematic review and meta-analysis (Stephenson, 1998)(206)</td>
<td>0.000004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pooled data from two of the methodologically strongest studies - prospective partner studies- from a systematic review. Strongest studies were two prospective partnership studies (De Vincenzi et al, 1994(284) and Nagachinta et al, 1996(285)) pooled RR = 0.30 (95% CI 0.05-2.1) for HIV acquisition amongst pill users</td>
<td></td>
</tr>
<tr>
<td>IUD</td>
<td>1.2</td>
<td>Case-control study (Mati et al, 1995)(202)</td>
<td>0.00001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comparison of HIV seropositive and HIV seronegative women to establish risk (if any) associated with current and previous contraceptive use. Women (n=4404) recruited in two family planning clinics in Nairobi, Kenya. HIV prevalence 4.9%.Odds associated with previous IUD use = 1.2 (95% CI 0.8-1.7)</td>
<td></td>
</tr>
<tr>
<td>Injectables</td>
<td>3.7</td>
<td>Prospective cohort study (Martin et al, 1994)(216)</td>
<td>0.00005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prospective study of HIV negative casual sex workers in Mombasa, Kenya to determine risk factors associated with seroconversion. 435 enrolled between Feb 1993 - Feb. 1994. 16 seroconverted. HIV infection was associated with the use of depo provera (OR 3.7, 1.4-9.6)</td>
<td></td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>1.0</td>
<td>Team assumption</td>
<td>0.00001</td>
</tr>
</tbody>
</table>
### A2.10. Probability of side effects whilst using different contraceptive methods: Weight gain

<table>
<thead>
<tr>
<th>Contraceptive Method</th>
<th>Probability of weight gain attributable to the method</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spermicides</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Cap</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Pill</td>
<td>0.001</td>
<td><strong>RCT</strong> (Redmond et al, 1999 (219))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intervention: Pill (n=228) vs. placebo (n=234).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Participants and setting: 15-49 years with moderate acne in the US.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Follow-up: 6 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability of weight gain in pill users = 0.022</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability of weight gain in controls = 0.021</td>
</tr>
<tr>
<td>IUD</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Injectables</td>
<td>0.179</td>
<td>Team assumption=0.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability of weight gain in controls assumed to be 0.021 (see above entry for the pill)</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>0.05</td>
<td><strong>Meta-analysis</strong> (Urbancsek, 1998)(286)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meta-analysis of 13 different clinical trials (6 open, noncomparative trials of Implanon and 7 open randomised, comparative trials of Implanon versus Norplant. Implanon N=1716, Norplant N=689. Trials conducted in Europe, North and South America and Southeast Asia between 1989-1997. Participants: 18-40 years, in good health. Increase in body weight of &gt;10% from baseline at least once during contraceptive use was considered clinically significant. Probability of weight gain in implant users = 0.071 Probability of weight gain in controls assumed to be 0.021 (see above entry for the pill)</td>
</tr>
</tbody>
</table>

**Notes**

1. Weight gain = reported weight gain by the user or the investigators, unless otherwise stipulated
### A2.11. Probability of side effects whilst using different contraceptive methods: Heavy/prolonged bleeding

<table>
<thead>
<tr>
<th>Contraceptive Method</th>
<th>Probability of heavy bleeding attributable to the method</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spermicides</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Cap</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
</tbody>
</table>
| Pill                 | 0.01                                                    | Assumed probability of heavy/prolonged bleeding in pill users = 0.05  
Probability of heavy/prolonged bleeding in non-contraceptive users = 0.04 Reference period=10-12 months 3893 menstrual diaries (Source: Population Information Program. Summary of WHO studies)(287) |
| IUD                  | 0.16                                                    | Assumed probability of heavy/prolonged bleeding in IUD users = 0.2  
Probability of heavy/prolonged bleeding in non-contraceptive users = 0.04 (see pill entry above) |
| Injectables          | 0.125                                                   | **Summary of Prospective Studies** (Population Information Program, 1995)(287)  
Probability of heavy/prolonged bleeding in DMPA users=0.165 Reference period=10-12 months 241 menstrual diaries. WHO multicentre studies, 1983-1988  
Probability of heavy/prolonged bleeding in non-contraceptive users = 0.04 Reference period=10-12 months 3893 menstrual diaries (Source: Population Information Program. Summary of WHO studies) |
| Subdermal implant    | 0.061                                                   | **Meta-analysis** (Affandi, 1998)(288)  
Meta-analysis of 13 different clinical trials (6 open, noncomparative trials of Implanon and 7 open randomised, comparative trials of Implanon versus Norplant. Implanon N=1716, Norplant N=689. Trials conducted in Europe, North and South America and Southeast Asia between 1989-1997. Participants: 18-40 years, in good health and had regular menstrual cycles. Prolonged bleeding was defined as bleeding or spotting within a consecutive 90-day period for more than 14 days. Probability of prolonged bleeding in Implanon users = 0.101  
Probability of heavy/prolonged bleeding in non-contraceptive users = 0.04 (see pill entry above) |
### A2.12. Probability of side effects whilst using different contraceptive methods: No periods

<table>
<thead>
<tr>
<th>Contraceptive Method</th>
<th>Probability of no periods attributable to the method</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spermicides</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Cap</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Pill</td>
<td>0.014</td>
<td>Assumed probability of amenorrhoea in pill users = 0.03 Probability of amenorrhoea in non-contraceptive users = 0.016 (see injectable entry below)</td>
</tr>
<tr>
<td>IUD</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>0.17</td>
<td>Meta-analysis (Affandi, 1998)(288) Meta-analysis of 13 different clinical trials (6 open, noncomparative trials of Implanon and 7 open randomised, comparative trials of Implanon versus Norplant. Implanon N=1716, Norplant N=689. Trials conducted in Europe, North and South America and Southeast Asia between 1989-1997. Participants: 18-40 years, in good health and had regular menstrual cycles. Amenorrhoea (no periods) was defined as no bleeding or spotting within a consecutive 90-day period. Probability of no periods in Implanon users = 0.186 Probability of amenorrhoea in non-contraceptive users = 0.016 (see DMPA entry above) 0.016</td>
</tr>
</tbody>
</table>
### A2.13. Probability of side effects whilst using different contraceptive methods: Nausea

<table>
<thead>
<tr>
<th>Contraceptive Method</th>
<th>Probability of nausea attributable to the method</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spermicides</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Cap</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Pill</td>
<td>0.037</td>
<td>RCT (Redmond et al, 1999)(219)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intervention: Pill (n=228) vs. placebo (n=234). All participants were advised to also use non-steroidal contraception. Condoms were distributed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Participants and setting: 15-49 years with moderate acne in the US.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Follow-up: 6 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability of nausea in pill uses = 0.127</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability of nausea in non-pill users = 0.09</td>
</tr>
<tr>
<td>IUD</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Injectables</td>
<td>0.04</td>
<td>Prospective cohort (Harel et al, 1995)(289)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prospective follow up of 78 adolescents aged 12 - 20 years from urban hospital adolescent clinic, US.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 months follow up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability of nausea in DMPA users = 0.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability of nausea in non-DMPA users assumed to be 0.09 (see above entry for the pill)</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>0.027</td>
<td>Meta-analysis (Urbancsek, 1998)(286)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meta-analysis of 13 different clinical trials (6 open, noncomparative trials of Implanon and 7 open randomised, comparative trials of Implanon versus Norplant. Trials conducted in Europe, North and South America and Southeast Asia between 1989-1997.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Participants: 18-40 years, in good health. Implanon N=1716, Norplant N=689.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability of nausea in implant users = 0.036</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability of nausea in non-implant users assumed to be 0.09 (see above entry for the pill)</td>
</tr>
</tbody>
</table>
### A2.14. Probability of side effects whilst using different contraceptive methods: Acne

<table>
<thead>
<tr>
<th>Contraceptive Method</th>
<th>Probability of acne attributable to the method</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spermicides</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Cap</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
</tbody>
</table>
| **Pill**             | 0.0                                              | **Multi-centre open randomised trial** (Endrikat et al, 1999)(221)  
Trial of different preparations of low dose oral contraceptives. 67 European centres.  
Probability of acne in pill users (calculated by combining data from the different treatment arms) =0.03  
Probability of acne ("mild/moderate") in general female population assumed to be 0.05 (data from Rademaker et al, 1989,(220) 2014 randomly selected children aged 12-17 years from 15 Glaswegian schools (females =1041). Independent assessments of facial acne using a recognised scoring system) |
| IUD                  | 0.0                                              | Team assumption |
| Injectables          | 0.0                                              | Assumed probability of acne in injectable users = 0.02  
Probability of acne ("mild/moderate") in general female population assumed to be 0.05 (see entry for the pill above) |
| Subdermal implant    | 0.111                                            | **Meta-analysis** (Urbancsek, 1998)(286)  
Meta-analysis of 13 different clinical trials (6 open, noncomparative trials of Implanon and 7 open randomised, comparative trials of Implanon versus Norplant. Implanon N=1716, Norplant N=689.  
Trials conducted in Europe, North and South America and Southeast Asia between 1989-1997.  
Participants: 18-40 years, in good health.  
Probability of acne in implant users = 0.161  
Probability of acne ("mild/moderate") in general female population assumed to be 0.05 (see entry for the pill above) |
### A2.15. Probability of side effects whilst using different contraceptive methods: Thrombosis

<table>
<thead>
<tr>
<th>Contraceptive Method</th>
<th>Probability of thrombosis attributable to the method</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spermicides</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Cap</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (male)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Condom (female)</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Pill</td>
<td>0.0000645</td>
<td>Modelling (Farley et al, 1998)(222) Combined national reporting statistics and evidence from studies addressing the cardiovascular effects of oral contraceptive use – international perspective Attributable risk of thrombosis from oral contraceptive use amongst 20-24 year olds</td>
</tr>
<tr>
<td>IUD</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>DMPA</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
<tr>
<td>Subdermal implant</td>
<td>0.0</td>
<td>Team assumption</td>
</tr>
</tbody>
</table>

### A2.16. Bother factor probabilities*

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>Withdrawal</th>
<th>Cycle awareness</th>
<th>Cap/ diaphragm</th>
<th>Spermicides alone</th>
<th>Condom (male)</th>
<th>Condom (female)</th>
<th>Double dutch (pill &amp; condom)</th>
<th>Pill</th>
<th>Injectable</th>
<th>IUD</th>
<th>Subdermal implant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANY BOTHER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bother getting</td>
<td>0</td>
<td>0</td>
<td>0.25</td>
<td>1</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bother remembering</td>
<td>0</td>
<td>0.25</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.1</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Invasive procedure</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Effect on sex</td>
<td>0.25</td>
<td>0.75</td>
<td>1</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Notes**

* Based on team assumptions
Appendix A.3. Project information and documentation

Information sheet

Consent form

List of helplines

FAQs

How to

Glossary/Roll Over Definitions
What is the purpose of this study?
The proposed work addresses the challenge of teenage pregnancy and Sexually Transmitted Infections (STIs) through an interactive computer program ('My Way'), initially for use in a young people's contraceptive and STI clinic. It uses decision analytic principles to combine an individual's values (e.g. attitude to becoming pregnant) with data on the outcomes and effectiveness of different methods of contraception (e.g. probability of becoming pregnant, of STI infection). Essentially, decision analysis is a method for breaking down complex problems or questions into manageable components, and then combining them logically to show the best course of action. The model works by combining the best available scientific evidence on the outcomes and effectiveness of available contraceptive options, such as probability of pregnancy while on the pill, with quantitative assessments of the user's own preferences and values (known as 'utilities'), such as how they feel about the consequences of becoming pregnant. The model provides a ranking and rating of the various available options for each user, based on both scientific evidence and personal values. Hence it indeed has the potential to identify 'my way'.

Why have I been chosen?
Part of this research involves interviewing people aged 13 – 21 years. We are planning to recruit 25 young people who do not wish to get pregnant.
Do I have to take part?
It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

What will happen to me if I take part?
You will be asked to fill out a computer-based questionnaire which will ask you questions such as: What is the reason for your visit to the clinic today? What contraceptive methods have you used in the past? What factors do you/would you consider in choosing a form of contraception? Some of the questions may be quite personal so if there is a question that you do not want to answer or information you do not wish to provide, just say so. You are free to stop the interview at anytime without giving a reason.
Next you will be asked to experience ‘My Way’ the program we have developed to help young people select a contraceptive method according to the effectiveness of the various methods (e.g. the probability of pregnancy while on the pill) and the values they place on factors such as how they feel about the consequences of becoming pregnant. The contraceptive nurse or doctor will go through the program with you. A researcher will sit in on this consultation so that they can see what sorts of questions and/or difficulties you and the nurse/doctor may be having with the program. You will then be asked to participate in a face-to-face interview with the researcher to discuss your experience using ‘My Way’.

Will my taking part in the study be kept confidential?
The questionnaire will be strictly confidential. We will not be collecting any information that can be linked back to you. Your computer output will be saved but there will be no information linking you to the specific output you receive. The interview will be taped. This is to help us remember what was said and the tape will be destroyed once we have written up the interview. Your name will not be put onto the questionnaire or the tape, instead they will be identified by a study number.

What will happen to the results of the research study?
UCL and LSHTM will be the designated data owners. Researchers at the two institutions will collect, store and handle the anonymized data. They will analyse the questionnaires, computer outputs and exit interviews. The results from the questionnaires and focus groups will be used to write a report for the funders and to write research articles in health service research journals.

Who is funding this research?
This work has been funded by the North Central London Community Research Consortium.

Contact information
If you have any queries about the interview or any of the issues it raises, please ask the interviewer or contact Rebecca French (one of the researchers) on 020 7387 9300 ext. 8190 or email rfrench@gum.ucl.ac.uk. The researcher will also give you a list of help-lines and contact numbers for any questions about sexual and reproductive health you may have in the future.

"All proposals for research using human subjects are reviewed by a research ethics committee before they can proceed. This proposal was reviewed by UCLH Ethics Committee."

Your help with this piece of work is much appreciated. Thank you.
CONSENT FORM

Questionnaire/ *MyWay* Program/ Observation of consultations/ Exit interview

CONFIDENTIAL

*To be completed by all participants agreeing to be interviewed for the MyWay Program pilot study*

1. The researcher has explained the purpose of this research
   
   
2. Any questions about the research have been answered by the researcher.
   
   
3. I confirm that I have had sufficient time to consider whether or not want to be included in the study
   
   
4. I understand that any information I provide is completely confidential.
   
   
5. I understand that I am free to stop my involvement with the research at any time without giving a reason.
   
   
6. I am .......... years old

A. Participant

Signed ...........................................................  
Name (please print) ...........................................  
Date ............................................................

B. Researcher

Signed ...........................................................  
Name ............................................................  
Date ............................................................

Yes / No

Yes / No

Yes / No

Yes / No

Yes / No

265
Helplines and websites

Where can I go for help or advice?
First, thank you for being so open and for helping us with the MyWay pilot. Some of the questions we've asked have been personal and might have raised issues that you'd like to find out more about or discuss further. On this page are some numbers and web sites, if you want more facts, advice or someone to talk to.

Sexual Health line  www.playingsafely.co.uk  0800 567123
Run by the Department of Health. Confidential information and advice on HIV/AIDS and other sexually transmitted infections. Can put people in touch with local face-to-face services and send out free literature. Free calls. Open 24-hours

Sexual Health Direct (FPA)  www.fpa.org.uk  0845 310 1334/0207 837 5432
Run by the fpa (formerly known as the family planning association). Confidential information and advice on contraception, planning pregnancies, sexually transmitted infections (STIs), unplanned pregnancies and other sexual and reproductive health concerns. Details of family planning clinics, STI clinics and other sexual health services anywhere in the UK. Local rates. 9am-7pm Mon- Fri

Avert  www.avert.org
An international HIV and AIDS charity based in the UK. The website includes information, news, FAQs, sex education and personal stories.

bpas (formerly known as British Pregnancy Advisory Service)
0845 7304 030
Run by bpas. Information and advice on abortion and counselling after abortion. Local rates. Mon-Fri 8am-9pm, Sat 8:30am-6pm, Sun 9:30-2:30pm

Terrence Higgins Trust Direct line  0845 1221 200
Run by the Terrence Higgins Trust Pregnancy Unit. A gateway to HIV services, support and information. Local rates. Monday to Friday 10am to 10pm; 12pm to 6pm Saturday and Sunday. Menu with recorded messages about services offered also available. E-mail contact info@tht.org.uk
Brook Advisory Centres:  www.brook.org.uk  0800 0185 023
Run by Brook. Specially for under 25s. You can get the address of a centre near you to go to for advice and information on contraception STIs, pregnancy, abortion. Freephone number. Mon - Fri 9am-5pm (closed Thu 12:15-1:45). 24 hours recorded information on sexual health on 0207 617 8000.

Sexwise  0800 28 29 30
Run by the Department of Health. Confidential advice on sex, relationships, and contraception for young people aged 12-18. Freephone number. Mon- Sun 7am to midnight.

London Lesbian and Gay Switchboard  0207 837 7324
Run as a voluntary organization, it offers confidential advice on diverse subjects such as sexual health, coming out and employment rights as well as counselling and support. 24hrs.

National child protection helpline  0808 800 5000
Confidential counselling, information and advice for anyone concerned about a child at risk of ill treatment or abuse. Freephone number. 24 hours.

NHS  NHS Direct  0845 4647
FAQs

Why is MyWay relevant to me?
Research has shown that some young people feel that they are not given enough information about which contraceptive methods are best suited to their individual current circumstances and preferences. The MyWay program was created to help young people choose the contraceptive method they feel best suits their current situation and reflects their particular concerns. So for example, if you are very concerned about getting pregnant and worried about getting a sexually transmitted infection (STI), the MyWay program would score highly methods that reflect these concerns. The program also allows you to express concerns about practical factors, such as having to go to a clinic to get your contraception or having to remember when to take it.

How does MyWay work?
MyWay combines available evidence about the various contraceptive methods (in terms of how effective they are at preventing pregnancy and different sexually transmitted infections (STIs), as well as their side effects) with the importance you give to unwanted outcomes of sex (STIs and pregnancy, as well as side effects such as weight gain, heavier or no periods) into a mathematical equation to calculate which method best suits your current circumstance according to your selections. You can see a simple example of how a particular score was calculated by clicking here.

Where do you get the evidence that goes into the ratings for the various options?
The numbers come from published research papers conducted on contraceptive effectiveness and side effects as well as expert advice when there was a lack of published evidence.

The information on different contraceptive methods/ options (such as on average how likely are you to get pregnant using a particular method or combination of methods) is then combined with the relative importance you placed on the concerns/ attributes you selected (such as how concerned would you be if you became pregnant now).

Why do I have to fill-out a Questionnaire?
The purpose of the questionnaire is to collect some information on the individuals who use MyWay, to see what choices you make considering your current situation. The questionnaire and your MyWay responses will be linked for analysis by researchers, but since we do not ask for any personal information by which you can be identified, we have no way of knowing who you are.

Will anyone else know what I’ve entered into EITHER the Questionnaire OR the software?
The questionnaire will be strictly confidential. We will not be collecting any information that can be linked back to you. Your computer output will be saved, but there will be no information linking you to the specific output you receive. Your questionnaire results and MyWay outcome will be linked purely for research purposes to see what selections people in different circumstances make.

268
Why can’t I see the score bar chart when I’m making my choices or weighting my concerns?
You may already have feelings about the different contraceptive methods, but if you do, MyWay assumes you genuinely want to find out whether these prior feelings are in line with the consequences you value and the evidence about them. After you select which options and concerns (or attributes) you want to look at, you get to give each attribute a level of importance (or weight) by moving the borders of the coloured segments in the weighting box. At this point you get to see all your selected attributes and if you feel like changing them, you can go back to the selection page before saving your options and getting the result score bar chart. You do not see the score bar chart at this point in order that you are not influenced to select or weight your attributes based on which method scores highest as a result.

What Does The Score Bar Chart Mean?
The chart shows you which of the contraceptive options you selected scores highest given the evidence included in MyWay and what you have told MyWay about your concerns and preferences.

Each bar in the chart represents a different contraceptive method, or combination of methods.
The height of each score bar depends on two things:
1. How you weighted the undesirability of each concern (or importance of each attribute) using the weighting box provided.
2. The evidence available to MyWay on how effective each contraceptive option is in eliminating or reducing each attribute you selected.
These two pieces of information are combined into a score by a process which is illustrated here.

Why are some contraceptive options not available in MyWay?
Emergency contraception (either through use of progestogen pill or insertion of an IUD) is taken to prevent a potential pregnancy after intercourse has taken place. MyWay has been designed to help young people to identify contraception options for regular use; therefore emergency contraception has not been included in the list of contraceptive options.

New methods of contraception are constantly under development. When we designed this program the contraceptive patch, for example, was not available to the general public. If you would like to find out more information about the patch or emergency contraception please ask the doctor or nurse.

Why are some attributes not available?
We conducted some research with young people to find out what was most important to them when making decisions about contraception. This work helped us come up with the list of attributes. However, you may have concerns that have not been included in our list, for example concerns about long-term health risks. Please discuss any concerns you may have with the nurse or doctor at the clinic.
HOW TOs

How can I start using MyWay?
Find out your administrator’s name at your location and enter this in the administrator box on the MyWay homepage. First, you will be asked to complete a questionnaire. Then you will have a choice of 2 demonstrations to go through to help you use MyWay and understand how MyWay works. You will then be asked to select the methods of contraception you are interested in and to identify the main concerns you have, such as getting pregnant, acquiring an infection, experiencing a side effect or having some sort of ‘bother’.

How do I select the contraceptive methods I am interested in?
You choose up to 8 of the 12 listed contraceptive methods by clicking on the boxes next to them. If you do not know what some of the methods are, you can roll over them with the cursor to get a pop up definition. Further details on each method are provided in the glossary.

How do I select the ‘concerns/attributes’ that are important to me?
You can choose up to 8 of the 21 listed attributes or concerns by clicking on the boxes alongside them. If you do not know what some of the attributes mean, you can roll over them with the cursor to get a pop up definition. Further details on each attribute are provided in the glossary.

How do I show which of the concerns I have chosen are most important to me?
You do this in the ‘weighting box’ by using the cursor to move the inner borders of the segments which represent the concerns/attribute you selected. You can increase or decrease the size of a segment to give each one the importance or weight you want. The bigger you make a segment, the greater weight you give to that concern (i.e. the more you want to avoid that attribute). The smaller a segment, the less importance you give to that concern/attribute. You will be able to see the changes you make on the screen as you move the borders.

How do I move the borders of the attribute/concern segments?
You need to put the cursor on the inner borders of the weighting box. When the 4 arrow (crosshair) icon appears, hold either the left or right button of the mouse down, drag the border to where you want it to be and release the button.

How do I see and interpret the results?
After you are happy that the areas of the segments represent the relative importance of the concerns/attributes you selected, you can click on the ‘Click her to save and see option scores’ or ‘next’ button to store your choices on the system. You will then see a score bar chart showing the scores for each of the contraceptive options you have chosen. The highest bar shows the contraceptive option which scores best given the evidence MyWay uses and the weights you have given to the various concerns/attributes. The lowest bar shows the option that scores worst. The weighting box with the concerns/attributes you selected is to the right of the graph. You can now move the segment borders to see how changing the weight you have placed on each of the concerns/attributes changes the scores of the contraceptive options you selected.
How do I change the options I selected?
As long as you have not taken the last step -and seen the results in the score bar chart- you can go back and change the contraceptive options and attributes/concerns you selected. However, once you have clicked to see the final score bar chart, you will have to return to the start of the questionnaire to use MyWay with a different set of options and attributes.
<table>
<thead>
<tr>
<th>Term for use on screen</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONTRACEPTIVE METHODS</strong></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>Use of no contraceptive method for protection against pregnancy or sexually transmitted infections during sexual intercourse.</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>This means removing the penis from the vagina before ejaculation.</td>
</tr>
<tr>
<td>Cycle awareness</td>
<td>Fertility awareness helps you recognise the fertile times and infertile times during the menstrual cycle.</td>
</tr>
<tr>
<td>Cap</td>
<td>Caps are barrier methods of contraception. They fit inside a woman's vagina and cover the cervix. They need to be used with a spermicide.</td>
</tr>
<tr>
<td>Spermicide</td>
<td>Spermicides are chemicals that destroy sperm.</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>Diaphragms are barrier methods of contraception. They fit inside a woman’s vagina and cover the cervix. They need to be used with a spermicide.</td>
</tr>
<tr>
<td>Condom</td>
<td>Condoms are barrier methods of contraception. They stop sperm meeting an egg.</td>
</tr>
<tr>
<td>Pill</td>
<td>The combined pill is usually just called the pill. It contains two hormones – oestrogen and progestogen. These are similar to the natural hormones women produce in their ovaries.</td>
</tr>
<tr>
<td>Injectable</td>
<td>Injections use a progestogen hormone. This is injected into a muscle and is released very slowly into your body.</td>
</tr>
<tr>
<td>IUD</td>
<td>An IUD, also known as the coil, is a small plastic and copper device that is fitted into a woman’s womb.</td>
</tr>
<tr>
<td>Implant</td>
<td>Implanon is a type of contraceptive implant which is a very small, flexible tube, about the size of a matchstick. It is placed just under the skin of a woman’s inner upper arm. It steadily releases a progestogen hormone into the bloodstream.</td>
</tr>
<tr>
<td>Double Dutch</td>
<td>This is a term used to describe the use of both the pill and condoms as a method of contraception.</td>
</tr>
<tr>
<td>Emergency contraception</td>
<td>Emergency contraceptive pills, also known as the ‘morning after pill’ contain the hormone progestogen. They should be started within 72 hours (3 days) of having unprotected sex. They are more effective the sooner they are taken. The IUD can also be used as emergency contraception. It can be fitted up to five days after you have had unprotected sex.</td>
</tr>
<tr>
<td>The contraceptive patch</td>
<td>The Evra contraceptive patch is a small, thin, beige coloured patch. It is stuck on a woman’s skin and releases two hormones - oestrogen and progestogen. These are similar to the natural hormones that women produce in their ovaries and like those used in the combined oral contraceptive pill.</td>
</tr>
</tbody>
</table>
### INFECTIONS

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gonorrhoea</td>
<td>Gonorrhoea is a bacterial infection. Women may notice an unusual vaginal discharge, which may be thin/watery or yellow/green and have a strong smell. Men frequently notice a white, yellow or green discharge from the tip of the penis and pain when urinating.</td>
</tr>
<tr>
<td>Syphilis</td>
<td>Syphilis is a bacterial sexually transmitted infection. In the early stages of syphilis, sores can develop, usually found in the genital area.</td>
</tr>
<tr>
<td>Chlamydia</td>
<td><em>Chlamydia trachomatis</em> is the most common bacterial sexually transmitted infection. About 50% of infected men and 70% of infected women have no symptoms at all. Women may notice an unusual vaginal discharge, pain when passing urine, and/or bleeding between periods or after sex. Men may notice a white/cloudy and watery discharge from the tip of the penis and pain when passing urine.</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>Trichomoniasis is a genital infection with the germ <em>Trichomonas vaginalis</em>. Although it most commonly affects the vagina in women, who may notice an unusual vaginal discharge and pain when passing urine, there may be no symptoms. It may also involve the urine tube (urethra) of both men and women, and the prostate gland in men.</td>
</tr>
<tr>
<td>Genital wart virus</td>
<td>Genital warts are caused by a virus called Human Papilloma Virus (HPV). Genital warts are small fleshy growths that may appear anywhere on a man or a woman’s genital area.</td>
</tr>
<tr>
<td>Herpes</td>
<td>Genital herpes is a common virus infection caused by the herpes simplex virus (HSV). There are two types of HSV that can cause genital herpes. Both of these can cause sores around the mouth (cold sores) and around the genital and anal region.</td>
</tr>
<tr>
<td>HIV</td>
<td>HIV stands for Human Immunodeficiency Virus. This is the virus known to cause AIDS (Acquired Immune Deficiency Syndrome).</td>
</tr>
</tbody>
</table>

### Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bother</td>
<td>General term for characteristics associated with a contraceptive option such as having to visit a clinic, remember to take a pill every day, remember to carry condoms or having to put a condom on during sex.</td>
</tr>
<tr>
<td>Bother getting</td>
<td>This means having to see a doctor or nurse to obtain a particular contraceptive method.</td>
</tr>
<tr>
<td>Invasive procedure</td>
<td>This means having to have an invasive procedure in order to be fitted with a particular contraceptive method. For example, having to have a vaginal examination in order to get an IUD fitted.</td>
</tr>
<tr>
<td>Bother remembering</td>
<td>This means for example having to remember to take the pill every day, or having to remember to carry your condoms.</td>
</tr>
<tr>
<td>Effect on sex</td>
<td>This means that certain contraceptive methods may disrupt sexual intercourse. For example, putting on condoms during sex.</td>
</tr>
</tbody>
</table>
SIDE EFFECTS

<table>
<thead>
<tr>
<th>Side Effect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight gain</td>
<td>This means that a woman has no bleeding during menstrual cycle for 90 days.</td>
</tr>
<tr>
<td>No periods</td>
<td>This means having heavier bleeding than is normal for a particular woman during her period.</td>
</tr>
<tr>
<td>Heavy periods</td>
<td>Acne is another word for spots.</td>
</tr>
<tr>
<td>Acne</td>
<td>Nausea means feeling sick.</td>
</tr>
<tr>
<td>Nausea</td>
<td>Thrombosis means the clotting of blood within an artery or a vein.</td>
</tr>
<tr>
<td>Thrombosis</td>
<td></td>
</tr>
</tbody>
</table>

DECISION AID TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option</td>
<td>Any contraceptive method (e.g. the pill, condoms) or combination of methods (e.g. ‘Double Dutch’) contained in a list of possible options from which the user must choose one.</td>
</tr>
<tr>
<td>Rating</td>
<td>The chance that an option will produce a specified outcome (e.g. the chance of getting pregnant on the pill).</td>
</tr>
<tr>
<td>Attribute</td>
<td>One characteristic or one possible outcome of an option (e.g. the possibility of getting pregnant when using a particular method of contraception).</td>
</tr>
<tr>
<td>Weighting Box</td>
<td>A box diagram within which each selected attribute is represented by a rectangular coloured sub-area.</td>
</tr>
<tr>
<td>Weight</td>
<td>The relative undesirability attached to an attribute or outcome when it is a concern.</td>
</tr>
<tr>
<td>Score</td>
<td>A summary measure of how well an option performs in relation to the other selected options,</td>
</tr>
<tr>
<td>Score Bar Chart</td>
<td>A diagram in which the scores for each option are displayed side by side, the height of the bar indicating the score.</td>
</tr>
</tbody>
</table>
Appendix 4 Research Instruments

Facilitator comment sheet

Questionnaire

Observation sheet

Exit interview topic guide
MyWay

Facilitator Comment Sheets
Version 2 November 2004

Part 1
(Before use of MyWay program)

Date __________
User ID __________

Your favoured contraceptive option based on initial risk assessment _______________

What option do you think the young person is most likely to actually implement? ______

Part 2
(After use of MyWay program)

Highest score bar on MyWay _______________

Did the MyWay session change your favoured option in any way? Why? Why not?

To be completed after young person leaves for exit interview:

What option do you think the young person is most likely to actually implement? ______

Your Comments:
About the experience of the young person with MyWay :

About how MyWay affected your interaction with the young person:

Other:
A computer program to facilitate informed contraceptive choice by teenagers ("My Way")

CONFIDENTIAL

Questionnaire

Version 9-November, 2004

The purpose of this project is to find out whether the program we have developed is useful in helping young people choose contraceptive methods that are most appropriate for their needs. We will be asking you to:

- Fill out this questionnaire
- Use the MY Way program
- Discuss your views on the program

Some of the questions may seem a bit personal, but your answers will not be seen by anyone other than the researcher. Do not put your name on the questionnaire, so no one will know how you have answered any questions. Please use this questionnaire to tell us about the things that matter to you in choosing a contraceptive method. If you do not wish to fill in this questionnaire for any reason, please hand it back empty.

If you would like any more information about this study, you can phone the researcher Rebecca French at the Royal Free and University College Medical School on 020 7387 9300 Ex. 8190.
Q.1. How old are you?

Age (in years): ..........

Q.2. Sex:  
Male  □¹  
Female □²

Q.3. Why are you visiting this service today?  *(Please select all that apply)*

To find out if I have a sexually transmitted infection □¹  
My partner has had an infection and I need treatment □²  
To get treatment for a sexually transmitted infection □³  
For HIV testing □⁴  
For advice on contraception □⁵  
To pick up condoms □⁶  
For emergency contraception □⁷  
To start a new method of contraception □⁸  
For a repeat prescription □⁹  
For a contraception check up □¹⁰  
For a pregnancy test □¹¹  
I came with my partner □¹²  
Other reason □¹³  
Don't know □¹⁴
Below are a number of statements about young people and sex. Please indicate whether you agree or disagree with each of these statements. It doesn't matter if they don't really apply to you at the moment, we are also interested in what you think.

A. I would find it really difficult to talk to my partner about contraception.
   Agree □1
   Disagree □2

B. Condoms make sex less fun.
   Agree □1
   Disagree □2

C. Young women shouldn't take the pill because it's bad for their health.
   Agree □1
   Disagree □2

D. I am not the sort of person who would become a teenage parent.
   Agree □1
   Disagree □2

E. There is no reason for anyone to be a parent at my age if they don't want to – we're all in control of our lives
   Agree □1
   Disagree □2

F. Using emergency contraception (the morning after pill) to prevent an unwanted pregnancy is always wrong.
   Agree □1
   Disagree □2

G. Contraception is a woman's responsibility.
   Agree □1
   Disagree □2

H. I am not the sort of person to get a sexually transmitted infection.
   Agree □1
   Disagree □2

I. You can tell by looking at people whether they have a sexually transmitted infection.
   Agree □1
   Disagree □2

J. Older people are more likely to have sexually transmitted infections.
   Agree □1
   Disagree □2

K. There is no need to use condoms in longterm relationships.
   Agree □1
   Disagree □2
Q.5. When you were growing up, in which of the ways listed here did you learn about sexual matters? *(Please select *all* that apply)*

<table>
<thead>
<tr>
<th>Source</th>
<th>Ever used (Please select all that apply)</th>
<th>Preferred source (Please select one only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mother</td>
<td>□ 1 television/radio</td>
<td>□ 9</td>
</tr>
<tr>
<td>father</td>
<td>□ 2 videos</td>
<td>□ 10</td>
</tr>
<tr>
<td>brother or sister</td>
<td>□ 3 books</td>
<td>□ 11</td>
</tr>
<tr>
<td>other relative(s)</td>
<td>□ 4 magazines/newspapers</td>
<td>□ 12</td>
</tr>
<tr>
<td>lessons at school</td>
<td>□ 5 cinema/films (other than TV/video)</td>
<td>□ 13</td>
</tr>
<tr>
<td>friends of about my own age</td>
<td>□ 6 the internet</td>
<td>□ 14</td>
</tr>
<tr>
<td>boy/girl friend/sexual partner</td>
<td>□ 7 No method/ Did not learn about sexual matters</td>
<td>□ 15</td>
</tr>
<tr>
<td>doctor/nurse/clinic</td>
<td>□ 8 other</td>
<td>□ 16</td>
</tr>
</tbody>
</table>

Please specify ________________

Q.6. In the past year have you obtained contraceptive supplies, from any of these sources?

<table>
<thead>
<tr>
<th>Source</th>
<th>Ever used (Please select all that apply)</th>
<th>Preferred source (Please select one only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have not obtained any supplies</td>
<td>□ 1</td>
<td>□ 2</td>
</tr>
<tr>
<td>GP</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Family Planning clinic</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Young person’s sexual health/contraceptive clinic</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Chemist/pharmacy (e.g. Boots)</td>
<td>□ 5</td>
<td>□ 6</td>
</tr>
<tr>
<td>School nurse</td>
<td>□ 6</td>
<td>□ 7</td>
</tr>
<tr>
<td>Vending machine (e.g. in pubs or clubs)</td>
<td>□ 7</td>
<td>□ 8</td>
</tr>
<tr>
<td>Supermarket/Petrol Station</td>
<td>□ 8</td>
<td>□ 9</td>
</tr>
<tr>
<td>Through the post</td>
<td>□ 9</td>
<td>□ 10</td>
</tr>
<tr>
<td>Emergency department at hospital</td>
<td>□ 10</td>
<td>□ 11</td>
</tr>
<tr>
<td>Boyfriend/girlfriend provides</td>
<td>□ 11</td>
<td>□ 12</td>
</tr>
<tr>
<td>Given by parent/relative/friend</td>
<td>□ 12</td>
<td>□ 13</td>
</tr>
<tr>
<td>Other please</td>
<td>□ 13</td>
<td>□ 14</td>
</tr>
<tr>
<td>specify__________________________</td>
<td>□ 14</td>
<td>□ 14</td>
</tr>
<tr>
<td>Don’t know</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q.7. Thinking about the first time you went to get contraceptive supplies, was this (Please select one only) ...

- Before you first had sex □ 1
- After you first had sex □ 2
- Have not had sex □ 3
- Don't know/can't remember □ 4

Q.8. Hypothetically, if you were thinking of starting or changing your method of contraception which method would you choose?


SECTION B. The questions in this section are about sexual experience

Q.9. Have you had vaginal sexual intercourse (vaginal sexual intercourse means a man putting his penis into a woman's vagina)? (Please select one only)

- Yes □ 1
- No □ 2
(if no, skip to Q.35)

Q.10. How old were you the first time? ..............

Q.11. When you FIRST had sexual intercourse, did you or your partner use or do anything to prevent pregnancy and/or sexually transmitted infections?

- Yes □ 1
- No □ 2
- Don't know/can't remember □ 3
(if no or don't know skip to Q.13)

Q.12 If yes, what did you use? (Please select all that apply)

- Condom □ 1
- The Pill □ 2
- Emergency contraceptive pill □ 3
- Withdrawal □ 4
- Can't remember □ 5
- Don't know □ 6
- Other □ 7
  Please specify ..................
Q. 13. Which contraceptive methods have you or a partner used?

<table>
<thead>
<tr>
<th>Method</th>
<th>Ever used (Please select all that apply)</th>
<th>Currently using (Please select all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The pill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coil/intrauterine device (IUD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Femidom (female condom)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cap/diaphragm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spermicide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertility awareness (eg. safe period/rhythm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withdrawal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injections / Depo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implanted capsules (Implanon)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency contraception</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abstinence (not having sex)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other please specify ________________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q. 14. On how many occasions, if ever, have you or a partner used the emergency contraceptive pill? (Please select one only)

- None
- One
- Two
- Three or more times
- Don’t know

Q.15. How many sexual partners have you had in the last year? ...........
(If 0 skip to Q.21 if female and Q. 28 if male)

Q.16. How many sexual partners have you had in the last 4 weeks? ...........

Q.17. How many times have you had sexual intercourse in the past 4 weeks? 

........
Q. 18. And have you had unprotected intercourse at all in the past 4 weeks? By that, we mean sexual intercourse where you haven’t used any form of contraception at all?

- Yes □ 1
- No □ 2
- Don’t know □ 3

Q. 19. Do you have a regular sexual partner at the moment (that is a boyfriend or girlfriend who you are having sexual intercourse with)? (Please select one only)

- Yes □ 1
- No □ 2
(If no, skip to Q.21 if female and Q. 28 if male)

Q. 20. How long have you been together? (Please select one only)

□ 1 years ..............
□ 2 months ..............
□ 3 weeks ..............

FEMALE ONLY

Q. 21. Have you ever been pregnant? (Please select one only)

- Yes – In the past □ 1
- Yes – I am at the moment □ 2
- No, never □ 3
- Don’t know □ 4
(If no or don’t know, skip to Q.35)

Q. 22. How many times have you been pregnant? (Please select one only)

- Once □ 1
- Twice □ 2
- Three or more times □ 3
- Don’t know □ 4

Q. 23. When you (first) became pregnant, how old were you?

Type in age in years ......
Q. 24. Was the pregnancy planned?
   Yes   □ 1
   No    □ 2
   Don't know    □ 3

Q. 25. What happened?
   I had / am having the baby   □ 1
   I had a miscarriage    □ 2
   I had / am having an abortion □ 3
   Don't know    □ 4

Q. 26. In the month that you became pregnant, which of these applies?  
(Please select one only)
   I / We were not using contraception □ 1
   I / We were using contraception but not every occasion □ 2
   I / We always used contraception but knew that the method had failed (broken, come off/out, not worked, etc) at least once □ 3
   I / We always used contraception □ 4
   Don't know    □ 5

Q. 27. In the month you became pregnant, which of the following methods of contraception, if any, did you use?  
(Please select all that apply)
   Did not use contraception □ 1
   Condom    □ 2
   Pill      □ 3
   Injectable / Depo contraception □ 4
   Diaphragm / cap □ 5
   IUD / coil □ 6
   Safe period □ 7
   Withdrawal □ 8
   Emergency contraception □ 9
   Other □ 10
   Don't know □ 11
MALE ONLY

Q.28. Have you ever made a woman pregnant?

   Yes   □ 1
   No   □ 2
   Don’t know   □ 3

(If no or don’t know, skip to Q.35)

Q. 29. How many times? *Please select one only*

   Once   □ 1
   Twice   □ 2
   Three or more    □ 3
   times
   Don’t know   □ 4

Q. 30. How old were you (the first time if more than once)?

   Type in age in years ........

Q. 31. Was the pregnancy planned?

   Yes   □ 1
   No   □ 2
   Don’t know   □ 3

Q. 32. What happened? *Please select one only*

   She is still pregnant and will have the baby   □ 1
   She had the baby   □ 2
   She had a miscarriage   □ 3
   She had/will have an abortion   □ 4
   Don’t know   □ 5

Q. 33. In the month that your partner became pregnant, which of these applies? *Please select one only*

   I / We were not using contraception   □ 1
   I / We were using contraception but not every occasion   □ 2
   I / We always used contraception but knew that the method had failed (broken, come off/out, not worked, etc) at least once   □ 3
   I / We always used contraception   □ 4
   Don’t know   □ 5
Q. 34. In the month your partner became pregnant, which of the following methods of contraception, if any, did you use? (Please select all that apply)

- Did not use contraception
- Condom
- Pill
- Injectable / Depo contraception
- Diaphragm / cap
- IUD / coil
- Safe period
- Withdrawal
- Emergency contraception
- Other please specify..................
- Don’t know

ALL

Q. 35. Have you ever been told by a doctor that you had any of the following? (Please select all that apply)

- Genital herpes
- Genital warts
- Trichomonas
- Pelvic inflammatory disease
- Gonorrhoea
- Vaginal thrush
- Syphilis
- Yes but can’t remember which one
- Chlamydia
- None of these
- Non-specific/non-gonococcal urethritis (NSU)

Q. 36. How at risk do you feel:

(Please select one only in each row)

- of getting pregnant
- of getting HIV
- of getting other sexually transmitted infections

Greatly at risk
Quite a lot
Not very much
Not at all at risk
Don't know

1 1 1 1 1
2 2 2 2 2
3 3 3 3 3
4 4 4 4 4
5 5 5 5 5

286
Q.37. The next question asks about things that matter to you NOW, in relation to contraception. If you were thinking about starting contraception TODAY (taking account of your current personal circumstances, for example where you are living, etc.) how concerned would you be about the following factors:

(Please select **one** only in each row)

<table>
<thead>
<tr>
<th>factor</th>
<th>Very concerned</th>
<th>A bit concerned</th>
<th>Generally unconcerned</th>
<th>Not at all concerned</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>You or your partner... becoming pregnant</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>You or your partner... getting sexually transmitted infections</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>What your friends think</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>What your boyfriend/girlfriend thinks</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Parents finding out</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Possible side effects</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Possible long-term health risks</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Having to remember when to take contraceptive method (e.g. remembering to take the pill or carry condoms)</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Having to go to a clinic to get it</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Having to be examined by a doctor or nurse</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
</tbody>
</table>
The next question is for WOMEN ONLY. MEN GO STRAIGHT TO Q39

Q. 38. Some women can experience some side-effects when using hormonal contraceptives (e.g. the pill, injections). Often these side-effects settle after a few months. If you were experiencing any of the side effects listed below, having started a new method of contraception a couple of months ago, how likely would it be that you would STOP using it: (Please select one only in each row)

<table>
<thead>
<tr>
<th>Side Effect</th>
<th>Very Likely</th>
<th>Likely</th>
<th>Unlikely</th>
<th>Very Unlikely</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headaches</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Weight gain</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Heavy periods</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>No periods/very light periods</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Feeling nauseous/sick</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Acne/spots</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
</tbody>
</table>

This is the last section of questions. We now need to ask you some questions about yourself, so that we can look at your answers alongside the answers of people like you. None of the information you provide will be linked back to you.

Q.39. Which of these describes the main thing you do? (Please select one only)

<table>
<thead>
<tr>
<th>Activity</th>
<th>□ 1</th>
<th>□ 2</th>
<th>□ 3</th>
<th>□ 4</th>
<th>□ 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>At school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At college/university</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paid employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government training / employment scheme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Looking after home or family</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Please specify</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

.................................
Q.40. Thinking realistically, which of these is the highest qualification you think you will achieve? (Please select one only)

- Degree or higher qualification ☐ 1
- A level or equivalent ☐ 2
- GCSE or equivalent ☐ 3
- Completed recognised trade apprenticeship ☐ 4
- HND ☐ 5
- NVQ ☐ 6
- Clerical or commercial qualification (e.g. book keeping/typing/commerce) ☐ 7
- None of these ☐ 8
- Other ☐ 9
- Don't know ☐ 10

Q.41 What is your father's job? .......

Q.42. What is your mother's job? .......

Q.43. What is your religious denomination? (Please select one only)

- Catholic ☐ 1
- Presbyterian ☐ 2
- Church of England ☐ 3
- Methodist ☐ 4
- Other protestant ☐ 5
- Muslim ☐ 6
- Sikh ☐ 7
- Hindu ☐ 8
- Jewish ☐ 9
- Other ☐ 10
- None of these ☐ 11
- Don't know ☐ 12
Q.44. Can you tell me which best describes your ethnicity? (Please select one only)

White □ 1
Black-Caribbean □ 2
Black-African □ 3
Black-other Black groups □ 4
Indian □ 5
Pakistani □ 6
Bangladeshi □ 7
Chinese □ 8
Other □ 9
None of these □ 10
Don't know □ 11

Q.45. Do you personally have access to the internet nowadays, whether it is at home, school or somewhere else? (Please select all that apply)

No – no access □ 1
Yes – at home □ 2
Yes – at school / college / university □ 3
Yes – at work □ 4
Yes – at cybercafes □ 5
Yes – at a friend or relative’s house □ 6
Yes - elsewhere □ 7
Don’t know □ 8
(If no, end)

Q.46. How often do you use the internet? (Please select one only)

□ 1 Everyday □ 2 Less often □ 4
□ 2 Less than everyday, but at least once a week □ 3 Never □ 5
□ 3 Less often than once a week, but at least once a month □ 6 Don’t know □ 6

Thank you very much for your help and time with this project.
MyWay

Observer Comment Sheet
Version 1-10 December 2004

Date___________
User ID________

Facilitators explanation of MyWay.
e.g. Language used, questions raised by young person.

Use of MyWay
e.g. Process

Understanding of output
e.g. Questions raised about the output

Other
e.g. Observer opinions on how young person engaged with program

Questionnaire start_____ end_____
MyWay use start_____ end_____
Interview start_____ end_____

291
A computer program to facilitate informed contraceptive choice by teenagers
("My Way")

Topic guide for exit interviews: Pilot

Version 4 - 3rd December, 2004

A. About the My Way website

What do you think about the web site?

Would you recommend this site to a friend? Why yes/ no? ..................

Design - homepage, main headings, menu, ease of navigation
Colour - background, text, graphics, artwork, logo
Language - tone, wording, font legibility

Best/worst features
Omissions/ comments

B. About the information provided

What did you think about the information provided on the website?

Clarity of instructions/ purpose - availability of "help", clarifications
Usefulness - info on STIs, contraception, new information learnt, links
Level information was pitched at - too complicated, specify...
- too simple, specify...

Missing info/links/ comments
C. Experience of using My Way

What was your experience of using the program?
How has the experience compared with other times you have discussed contraception with a doctor or nurse?

What setting would you like to consult MyWay in?
Would you use it completely on your own (after an introduction)?
What did you like about it?

What would you change?
Omissions/ comments

About decision making model
Are there other factors besides those listed, you would like to consider when thinking about contraception?
Were you surprised about the options which scored highest for you?
Was it useful to include your personal 'concerns' in choosing a contraceptive method for you?
Is it likely that you will use the method that scored highest for you? Why yes/ no?

About your decision making process
Was the whole experience useful in thinking about making contraceptive choices?
Was the MyWay experience useful in developing your ability to think about other sorts of life choices you face?
Do you understand how incorporating your personal 'concerns' affects your contraceptive choice?
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