Teenage Pregnancy in Trent: Factors associated with variations in rates and outcomes.

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Thesis submitted to the University of Nottingham for the degree of Doctor of Philosophy

2005

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ABSTRACT

BACKGROUND

The United Kingdom has the highest rate of teenage pregnancy in Western Europe, and also ranks highly on an international level. Previous research has shown that factors such as socio-economic status are strongly associated with variations in pregnancy rates and outcomes of pregnancy. However, the impact of service provision, specifically primary care based services, is less clear.

AIMS AND OBJECTIVES

The primary aim of this thesis is to describe the incidence of teenage pregnancy in the former Trent health region, and to identify any factors associated with variations in rates and outcomes. The specific objectives are as follows:

- To describe the incidence of teenage pregnancy in Trent, and identify any factors associated with outcome of pregnancy, and with risk of intervention at delivery.
- To describe general practice and family planning services in Trent, with an emphasis on services specifically provided for teenagers.
- To identify any potentially modifiable general practice characteristics associated with variations in teenage pregnancy rates.
- To explore the opinions and attitudes of GPs towards key issues such as prescribing contraception to under 16s, and relate these to both GP characteristics and pregnancy rates.

METHODS

Data for all pregnancies in women aged under 20 years at the time of hospital admission during the period 1994-1997, were collected from the Trent hospitals admissions database. General practice characteristics data for all 826 practices in existence in Trent in 1997 were collected from all health authorities that were part of the Trent region at the start of the study period (1994). These data were collected for inclusion in a cross sectional survey of potentially modifiable practice characteristics associated with variations in teenage pregnancy rates.

Hours of service and location of family planning clinics within Trent were identified through a survey of all clinics in existence in 1997. A cross sectional survey of all GPs and practice managers from four health authority areas, was carried out to identify both

the number and nature of teenage specific initiatives running during the study period, and also to explore GPs attitudes and opinions towards key issues relating to the care of young teenagers.

RESULTS

A total of 18692 pregnancies were identified, and 5.1% of these were to women aged under 16 years. Outcome of pregnancy was significantly associated with deprivation status, with women from poorer areas being more likely to continue with their pregnancy (OR 4.04 95%CI 2.40-6.78, P<0.001). Of the 10554 women who continued with their pregnancy, 22% experienced intervention at delivery, and this was associated with place of treatment (hospital), with women who delivered at one hospital for example, having 1.5 times the risk of experiencing either a vaginally assisted birth or a caesarean section (OR 1.53 95%CI 1.30-1.81, P< 0.001). Risk of intervention at delivery was not associated with age or deprivation status.

In terms of service provision, of the 826 general practices identified, 58% had at least one female GP and 39% had at least one GP aged under 36 years. Twenty one percent of practices from the four health authority areas studied in detail, offered teen specific services, and 11% had a specific confidentiality policy for under 16s. In terms of family planning services, 108 clinics were identified, which provided 498 hours of service and 261 of these were accessible to younger teenagers.

General Practices with younger GPs (OR 0.67 95%CI 0.49-0.93, P=0.02) and practices that were running teenage specific initiatives (OR 0.61 95%CI 0.41-0.91, P=0.02) had significantly lower teenage pregnancy rates in women aged under 16 years. In terms of attitudes towards key issues related to the care of younger teenagers, age of GP was significantly associated with most issues, with older GPs being less likely to prescribe contraception to under 16s without parental consent (OR 0.55 95%CI 0.33-0.93, P<0.001) and also being more likely to believe it was illegal to do so (OR 4.27 95%CI 1.50-12.22, P<0.001).

CONCLUSION

Deprivation status was associated with incidence and outcome of teenage pregnancy. General Practices with younger GPs (aged under 36 years) were found to have independently lower teenage pregnancy rates in women aged under 16, as were practices that were running a teenage specific initiative. Younger GPs were found to be more likely than older GPs to prescribe contraception to young women aged under 16 without parental consent, and to believe that it was legal to prescribe contraception to this age group. These issues of age of GP, and the impact of teen specific services, should be further researched in order to fully understand their relationship with variations in teenage pregnancy rates.

DECLARATION

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other institute of learning.

ACKNOWLEDGEMENTS

I would firstly and like to thank Professor Julia Hippisley-Cox for her excellent guidance, advice and continued support throughout not only this process, but also throughout my time spent working at the University of Nottingham. I would also like to thank Carol Coupland for her much appreciated statistical advice and Professor Mike Pringle for his support and guidance. I would also like to acknowledge the guidance and advice provided over many years by Dr Dick Churchill who is responsible for developing my initial interest in the area of teenage health and teenage pregnancy. Many thanks also to Dave Ebdon from the Department of Geography, who provided much valuable assistance during the initial phases of this project, and who very sadly died in 1999.

I would like to thank the Trent Focus and the NHS Executive Trent for their financial support and Dr Nadeem Qureshi for his advice and understanding. Many thanks also to Ms Lindsay Groom of the Nottingham Primary Care Research Partnership for considering the many statistical and methodological queries that came her way, and to Dr Sarah Rodgers for understanding the demands of a part time PhD. Thanks also to Rachel llingworth, R&D Manager of the Nottingham Primary Care Research Partnership for her support during the writing up phase.

Finally, many thanks to my sister Rachel for her patience and listening skills, and to all of my friends and family who have endured listening to me during the final months of writing up. Greatest thanks must go to my husband Damian for his support, guidance and excellent child care skills, and to my children Tom and Toby, just for being themselves and for keeping me amused.

LIST OF ABBREVIATIONS

TOP	Termination of pregnancy
GP	General Practitioner
NBREG	Negative Binomial Regression
ONS	Office for National Statistics
SPSS	Statistics Package for the Social Sciences
WHO	World Health Organisation
IUD	Inter-uterine Device
WTE	Whole Time Equivalent
MDU	Medical Defence Union
BMA	British Medical Association
ICD 9	International Statistical Classification of Diseases and Related Health Problems Diagnostic Codes Version 9
ICD 10	International Statistical Classification of Diseases and Related Health Problems Diagnostic Codes Version 10
OPCS	Office of Population, Censuses and Surveys - Classification of Surgical Operations and Procedure Codes
NCDS	National Child Development Study
NICE	National Institute for Clinical Excellence

For Tom and Toby

CHAPTER 1 SUMMARY OF AIMS AND OBJECTIVES, AND STRUCTURE OF THE THESIS

1.1 Background and rationale

It is well documented that the UK has high teenage pregnancy rates, and although there has been much research into factors associated with risk of teenage pregnancy, and also those associated with outcomes of these pregnancies, there has been little research examining the role of primary care.

The research presented in this thesis was initiated in 1997, when the NHS Executive Trent funded a project at the University Of Nottingham, to identify potentially modifiable practice characteristics associated with variations in teenage pregnancy rates. The initial findings of this project suggested that there were some practice characteristics, including age of GP and sex of GP, associated with variations in teenage pregnancy rates, and these findings had not previously been reported in other studies. The work presented in this thesis builds on to this initial work. It further explores these findings and offers alternative analysis methods and interpretations, and also looks in more detail into the role of primary care.

1.2 Primary Aims

This thesis aims to identify factors associated with variations in teenage pregnancy rates and outcomes in the Trent region; and also to describe the incidence and experience of teenage pregnancy for young women living in this area of the United Kingdom. Specifically, it aims to identify the features of primary care provision associated with variations in teenage pregnancy rates, and then to further explore the attitudes and perceptions of GPs towards key issues related to the care of young people.
The specific aims and objectives relevant to each chapter are outlined below.

1.3 Research Questions

The following research questions form the basis of this thesis:

- What is the incidence of teenage pregnancy in Trent, and what factors are associated with variations in outcomes of teenage pregnancy?
- What primary care based, and family planning based services are available to young people living within Trent?
- Are there any potentially modifiable practice characteristics associated with variations in teenage pregnancy rates?
- How do GPs view issues around the care of young teenagers, and what practitioner characteristics are associated with these beliefs and opinions?

1.4 Overall structure of the thesis

A summary of each specific chapter is given in section 1.5, however as the thesis consists of several studies that are linked to form a body of work, a general summary of the structure is also provided.

This thesis aims to explore the issue of teenage pregnancy and to identify factors associated with variations in pregnancy rates and outcomes. To do this, both routinely collected pregnancy and general practice characteristics data, as well as data generated through cross sectional surveys has been utilised. The thesis then does not report on the findings of one single study; rather it presents the findings of four studies that together form the thesis. In order to describe the incidence of teenage pregnancy in the study period, and to explore factors associated in variations in outcomes of pregnancy; chapters three and four present data on the incidence of teenage pregnancy and identify factors associated with outcome of the pregnancy. In order to describe general practice and family planning services available to young people in the study period, and to also generate data for use in subsequent analyses, chapter five presents descriptive data pertaining to the practice characteristics of practices within the former Trent region. In addition this chapter presents the findings of a cross-sectional survey of practice managers which aimed to identify the incidence and nature of teenage specific services, both for descriptive purposes and also to generate data for inclusion in the analysis presented in chapter six. In addition to general practice services, this service provision element includes the findings of a survey of Family Planning services. Specifically it explores the accessibility of these services to young people of school age.

The initial chapters then provide the data necessary for the main analysis presented in chapter six. This chapter presents an analysis of potentially modifiable general practice characteristics described and presented in chapter five, associated with variations in pregnancy rate (utilising the pregnancy data described in chapters three and four). Specifically, the analysis presented in this chapter aims to identify whether potentially modifiable characteristics such as age, sex of the GP are associated with variations in teenage pregnancy rates. The findings of this analysis are then further explored through a cross-sectional survey of General Practitioners. For clarity, the aims and objectives of the survey, as well as the methodology adopted are presented in chapter seven, and the results are presented in chapters eight and nine. The main aim of this element of the thesis is to explore GPs attitudes and behaviours towards key issue associated with teenage healthcare (for example prescribing to under 16s) and to identify any association between response and age and sex of the GP. The conclusions and discussion relating to this element are presented in chapter ten, and the final conclusions and recommendations are given in chapter eleven.

1.5 Summary of each chapter

1.5.1 Chapter two: Introduction and background

Chapter two gives some background into the issue of teenage pregnancy, and provides both international and national data to describe the issue. It provides evidence from both a social and health perspective in order to ascertain the long-term outcomes of teenage pregnancy for individual women and also the community in a wider sense. The literature included in this section provides the evidence base necessary for describing teenage pregnancy, and is also used to highlight the gaps in knowledge that this thesis aims to address. This chapter also gives the political context, and includes policies held by both the Conservative and Labour governments that are relevant to the study.

In addition, included in this chapter is a description of key studies, included in the review, which have been published by the Researcher with colleagues from the University of Nottingham. These peer-reviewed articles are included in appendix 8.

1.5.2 Chapter three: Teenage Pregnancy in Trent

This chapter looks specifically at teenage pregnancy in the context of the study area. It describes in detail the incidence of teenage pregnancy in the former Trent region for the period 1994-1997, using data collected from the Trent hospitals admissions database. Methodological information and issues relating to the collection and validation of the pregnancy data file are also presented and discussed.

Specifically this chapter will:

- Describe the data collection process and issues around validity of the data set
- Describe the study area in detail
- Provide data on the incidence of teenage pregnancy in Trent, by age and health authority area

1.5.3 Chapter four: Obstetric outcomes to teenage patients in Trent

This chapter also looks at the obstetric outcomes element of the thesis. Specifically it looks at the experience of delivery for young women aged under 20 years, and identifies factors that are associated with increased risk of a teenage mother having an assisted delivery (either a vaginally assisted delivery such as a forceps delivery or a caesarean section). This section of the thesis reports the findings of a cross sectional survey of the mode of delivery for women aged under 20 years for the period 1994-1997.

The specific aims of chapter section are to:

- Provide some background evidence into the experience of delivery for young women aged under 20 years.
- Provide data on the type of delivery experienced by young women aged under 20 years.
- To ascertain whether factors of age, specifically being aged under 16, and deprivation status are associated with a young woman's risk of experiencing an assisted delivery (vaginally assisted or abdominal delivery).

- To determine whether place of treatment (hospital) has any association with risk of assisted delivery and type of assisted delivery.

1.5.4 Chapter five: General Practice and family planning services in Trent

This chapter explores and discusses service provision, and presents information relating to the characteristics of general practices in the former Trent region.

General practice characteristics data are presented for all practices from within the former Trent region. In addition, this chapter also presents the findings of a cross sectional survey of Practice Managers. The survey was carried to determine the number and type of teenage specific initiatives running in the four Health Authority areas, focused upon in subsequent chapters. The collection of the practice characteristics data used in this and subsequent chapters is also described and relevant methodological issues are discussed.

In addition to general practice based services, this chapter also presents data for all family planning clinics in existence during the study period. These services have been included in this service provision element of the thesis, as teenagers are known to access them for contraception and sexual health advice. The actual data presented includes a description of the number of clinics by health authority area, and also presents a survey of the accessibility of these services to younger teenagers, specifically those of school age (16 and under).

The aims of this chapter are:

- To outline and discuss the process of data collection for the practice characteristics data.
- To describe general practice based services in the former Trent region.
- To identify the number and nature of teenage specific, general practice based services within four health authority areas of Trent.
- To determine how many practices have a specific confidentiality statement for their patients aged under 16 years.
- To describe the number of family planning clinics in the Trent region and to determine how accessible these are for young people who are school aged (16 and under).

1.5.5 Chapter six: General Practice Characteristics associated with variations in teenage pregnancy rates

This chapter gives the findings of a cross sectional survey of general practice characteristics and their association with variations in teenage pregnancy rates. The initial analysis of this data was published in 2000 in the British Medical Journal (see appendix 7), and formed part of the research funded by the NHS Trent Executive in 1997.

This chapter is essentially a re-analysis of the data, focusing on four health authority areas within Trent. This analysis differs from that presented in the British Medical Journal article, firstly it presents data for women aged 13 to 15 years, as well as for all women aged 13-19, and secondly it includes information collected through the survey of practice managers presented in chapter four. Specifically this includes, whether practices were running teenage specific initiatives and whether they had a specific confidentiality policy for young teenagers (those aged under 16 years).

The data is presented utilising two different statistical methods, and so this section also includes a detailed discussion around these methods and their implications for interpretation.

Therefore, this chapter aims to:

- Present a re-analysis of the data-set to determine whether characteristics of general practice, such as age and sex of practitioner, found to be associated with variations in teenage pregnancy rate in the initial analysis can be replicated using a different analysis method.
- To identify whether the additional factors collected through the survey of practice managers are associated with variations in teenage pregnancy rates.
- To discuss the statistical method employed (Negative binomial regression analysis), and compare it to the method employed in the initial analysis (Poisson regression analysis).

1.5.6 Chapters seven: General Practitioner survey of attitudes and behaviour: Aims, objectives and methodology

Chapters seven to ten present the methods and findings of a cross sectional survey of GPs from the four health authority areas of Trent focused upon in chapter six. The overall aim of this element of the thesis is to explore the initial findings of chapter six, and present data relating to key issues pertinent to young people attending general practice, including issues around confidentiality and prescribing of contraception to young people aged under 16.

Chapter seven gives the aims and objectives of the survey, describes the methodology adopted and discusses issues around questionnaire design. The aims of this chapter are as follows:

- To provide the aims and objectives of the questionnaire survey
- To describe the method adopted
- To describe the statistical methods employed
- To present and discuss issues pertinent to questionnaire design

1.5.7 Chapter eight: General Practitioner survey of attitudes and behaviour: Results of primary and secondary analyses

Chapter eight presents the finding of the primary and secondary analyses of the questionnaire data. Specifically, this chapter aims to:

- To explore the attitudes and perceptions of GPs towards key issues relating to the care of young teenagers, for example the provision of contraception to young people aged under 16 years
- To identify any association between response to questionnaire items and the characteristics of the respondent (i.e. the age and sex of the GP)
- To determine any relationship between response to the questionnaire items and the teenage pregnancy rate of the respondent's practice

1.5.8 Chapter nine: General Practitioner survey of attitudes and behaviour: Analysis of textual responses

Chapter nine presents the results of the qualitative data generated through the questionnaire study. This chapter aims to:

- Describe the analysis method
- Present the findings of a template analysis

1.5.9 Chapter ten: General Practitioner survey of attitudes and behaviour: Discussion and conclusions

Chapter ten discusses the implications of the main findings of the questionnaire survey and also provides discussion around the limitations and strengths of the methodology. Specifically, this chapter will:

- Summarise the main findings of the cross-sectional survey
- Discuss the main findings in relation to existing literature and policy
- Discuss issues around the limitations of the method adopted
- Discuss issues pertinent to the interpretation of the findings

1.5.10 Chapter Eleven: Conclusions and recommendations.

This final chapter will summarise and discuss the main findings of the research presented in the thesis, and explore them in relation to both the existing literature and their implications for practice. It will also provide recommendations for further research based on these main findings.

CHAPTER 2 INTRODUCTION AND BACKGROUND: THE PROBLEM OF TEENAGE PREGNANCY

2.1 Chapter summary

This chapter provides some background into the issue of teenage pregnancy. This comes from a review of the literature, which aims to provide some context for the present study, and also highlight where there are gaps in the knowledge, which the research presented in this thesis aims to address.

2.1.1 Identification of the literature

The literature review presented in this chapter is not a systematic review. It is a review of peer-reviewed research that provides evidence that is relevant and appropriate for the understanding of the key issues around teenage pregnancy and other issues relating to this thesis. The literature in this chapter, and also that presented in all chapters of this thesis, has been identified through electronic databases (OVID, EMBASE, MEDLINE) and also through searches of on-line journal sites, including the British Medical Journal and Family Practice. Identification has been through the use of key word, subject and author searches, and also through the examination of references given in key papers. The searches carried out did not exclude papers from countries other than the UK, and some studies have been included from Europe, the United States and Australia. However, as primary care services are different between countries, the majority of the primary care based literature is from the UK.

2.1.2 Critical appraisal

Critical appraisal is essential in determining the quality and impact of research. Studies that are poorly designed or presented can lead the reader to make inappropriate assumptions. With this in mind, the studies included in the literature review have been selected and appraised following the basic principles of critical appraisal. Therefore key questions pertinent to critical appraisal have been considered, these include: are the aims, method and statistical approach appropriate and clearly described, and have the authors considered issues such sample size and potential bias? (Crombie I K 1996).

The studies presented utilise a very wide range of research methodologies, including systematic reviews/meta analyses, randomised controlled trials (RCTs), cross-sectional

surveys and case studies. In terms of the overall strength of these studies, in their ability to demonstrate causality as oppose to association, systematic reviews/meta analyses and RCTs have the greatest strength, and cross-sectional surveys and case studies have the least. However, these methods can provide a great amount of descriptive data that can both add significantly to the field of study and indicate association, and as such have been included in the literature review.
There are features that are common to many of the studies reported in this review that should be considered. Firstly many of the studies looking at attitudes and behaviours have utilised questionnaires to meet their objectives. In some cases these have used validated tools, for example the study by Spingbarn (see section 2.12) utilised a tool developed and validated by the Centers for Disease Control (Spingbarn RW & Durant RH 1996). However, in other cases such as that of Churchill et al, survey tools using both validated and unvalidated elements (Churchill for example used elements of the Locus of Control and the CO-OP charts as well as questions designed specifically fro the study) have been used (Churchill R et al 2000). Although such tools are likely to have high face validity, issues such as content or criterion validity are less certain (see section 7.4.3 for further explanation of issues around validity and questionnaire design), and so this should be considered in interpreting the findings.

Another issue highly pertinent to questionnaire-based research is the potential for recall and social desirability bias. It has been demonstrated that self- reported behaviour does not always reflect actual behaviour (Eccles M et al 1999) and this may due to these sources of bias. In most of the studies reported in the review, this issue has been addressed through comparison with other studies as opposed to comparison to actual behaviour. In addition, though all studies of this type discuss the generalisability of the findings, few actually provide any evidence of this further than comparisons of findings of with similar studies. However, as questionnaires are generally easy to administer and can yield large numbers of participants, most of the surveys reported in the review present findings based on large numbers of respondents, and in addition have made efforts to assess the impact of non-responders and other sources of potential bias in the interpretation.

The studies in the review that are concerned with the long term impact of teenage pregnancy depend largely on analyses of routine datasets or data collected through large longitudinal studies such as the National Child Development Study (Dearden KA et al

1995, Kiernan K 1995). This approach has advantages in that it can utilise large amounts of data, can look at change over time and is able to provide evidence of statistically significant associations. The disadvantages of this approach are that routinely collected data is not always accurate (Mckee M 1993) and in addition it cannot look in depth at personal experiences. Qualitative methods, such as those adopted by Seamark (Seamark C & Blake S 2005, see section 2.11.3) are more appropriate for this purpose.

Several RCTs have been reported in this review (for example Quinlivan J, Box H & Evans S 2003 and Walker Z et al 2002) and as with all methodologies, there are several issues that are important to consider in interpreting associated findings and implications. How the randomisation process has been conducted and presented is important, as are issues around masking and how non-response and loss to follow up are dealt with and reported. The studies included in this review have been appraised in-line with these issues. For example the findings of the RCT by Walker et al are reported within the context of pertinent issues, for example the disappointing findings of the impact of the intervention are considered bearing in mind that the assumptions assigned to non-responders for analysis purposes may have under estimated the true effect of the intervention (Walker Z et al 2002).

2.2 Published work relating to the review of the literature

In 2000 a version of the literature review was published in the International Journal of Adolescent Medicine and Health, and this is included in appendix 7. In addition, work done with Dr Dick Churchill and colleagues at the University Of Nottingham is also included in the literature review. A brief description of these studies is given below, and each of the published articles are included in appendix 8.

2.2.1 Published work relating to teenage health

In 2000, an article was published in the British Journal of General Practice that presented the findings of a general practice based study of 678 young people aged 13-15 years living in the East Midlands (Churchill, R et al 2000). This study matched responses to a self-completed questionnaire to general practice consultation data. This study found that girls were more likely than boys to report negative attitudes towards the care received from their general practice, and also found that approximately a third of respondents were unsure as to whether their consultation was confidential. Although some negative perceptions, such as feeling like they did not have enough time with their GP to discuss everything, and feeling unable to talk to their GP about very personal things were associated with lower consultation rates, most other negative perceptions did not impact on consultation rate. Similarly, young people who reported concerns over confidentiality did not consult less frequently, though young women who reported that they might be too embarrassed to discuss some issues did have lower consultation rates for contraception and gynaecological conditions.

This study, which at the time of publication, was the first to link responses from a self-completion questionnaire to actual consulting behaviour in young people, concluded that negative perceptions, particularly those linked with confidentiality, have less impact upon actual consulting behaviour than previously thought.

2.2.2 Published work relating to teenage pregnancy

In 2000 a study exploring the consultation patterns and provision of contraception in general practice prior to teenage pregnancy was published in the British Medical Journal (Churchill, D et al 2000). This case-control study examined general practice records of 240 young women who had conceived at aged under 20 years. Each case was matched to three controls and then their consulting behaviour in the 12 months prior to the pregnancy was examined, along with all consultations for contraception at any time prior to pregnancy.

This study found that in the year prior to the pregnancy, the young women who became pregnant were significantly more likely than controls to consult frequently (four or more times), and to consult for contraception. In terms of contraception provided at any point prior to the pregnancy, those who became pregnant were three times more likely to have been provided the oral contraceptive pill, twice as likely to have received injectable progestogens and three times more likely to have been provided with condoms. In the year prior to the pregnancy, cases where the pregnancy resulted in a termination were three times more likely than cases that had a delivery or a miscarriage to have been provided with emergency contraception. They were also three times more likely than controls to have ever been provided with emergency contraception and over four times as likely to have ever been provided with condoms.

This study concluded that young people who become pregnant do access general practice services and are likely to have consulted for contraception prior to becoming pregnant. Use of emergency contraception was associated with increased risk of termination of pregnancy, and so this could be an indicator of risk taking within sexual activity. This suggests that young women who consult for emergency contraception should be followed up so that their long-term contraceptive needs can be met.

This data was further explored in an a study published in 2002, that aimed to identify practical risk markers for use in general practice, to identify young women at increased risk of unintended pregnancy (Churchill, D et al 2002). This study focused upon women who had had a termination of pregnancy, and explored their consultations prior to the event. This study found that half of the cases had discussed contraception and 40% had been prescribed oral contraception. Significantly more cases than controls had consulted for emergency contraception and similarly more cases than controls had consulted with urinary tract symptoms. This study concluded that there are some practical risk markers that could be used to identify teenagers at increased risk of unintended pregnancy, including previous teenage pregnancy, lapsed oral contraception and provision of emergency contraception.

2.3 Why is teenage pregnancy a problem? Health and social outcomes of teenage pregnancy

2.3.1 Health and social outcomes for the mother

The health and social outcomes of teenage pregnancy are the motivating forces behind government strategies to reduce teenage pregnancy rates. Teenage pregnancy, particularly for young women aged under 16 years, has been associated with poor health and social outcomes. Young teenagers (those aged under 16 years) are more likely to experience health problems during their pregnancy. They are more likely to suffer from anaemia, gestational hypertension and urinary tract infection (Konje JC et al. 1992). There is a higher incidence of pre-term birth in teenagers (Hardy J et al 1997, Smith GC & Pell JP 2001) and babies born to these young women are also more likely to be of low birth weight (Amini SB et al 1996, Miller HS, Lesser KB &Reed KL 1996). The risk of still birth and post neonatal death is also higher for babies born to teenage women (Phipps MG, Blume JD, & DeMonner SM 2002; Smith GCS & Pell JP 2001). In a study of 2516 post neonatal deaths, Phipps et al found that infants born to women aged 15 years and under had three times the risk of post neonatal death compared with babies born to women aged 23 to 29 years. This study also found that younger teenagers were significantly more likely to have had inadequate prenatal care, and when this was controlled for in the model, the risk of post neonatal death did reduce, though the risk in this age group was still twice that of older women (Phipps MG, Blume JD, & DeMonner SM2002).

Premature death has also been found to be associated with having a child during teenage years. A study of women born between 1950-1964, found that those who had had a child whilst a teenager, were at increased risk of premature death in later life. Overall, independently of socio-economic factors, they were at 1.6 times the risk of premature death compared to women who had given birth at a later age. This difference was larger for injury and poisoning (rate ratio: 2.1) and diseases of the respiratory system (rate ratio: 2.8). The authors conclude that these poor outcomes are probably due to the environments teenage parents live in, and a predisposition to unhealthy lifestyles (Olausson P et al. 2004).

In terms of social outcomes, having a baby as a teenager has been linked with several unfavourable outcomes in later life. Hobcraft and Kiernan used data from the National Child Development Study and found that compared to having a child when aged 23 or over, having a child during teenage years was associated with a four fold increased likelihood of being in social housing at age 33. In addition, this group were over 8 times as likely to experience being a lone parent, were almost 3 times as likely to not gain any formal qualifications and were twice as likely to have a low household income. In terms of health, those who had a baby when aged under 20 years, were more likely to be smokers, and more likely to have general ill-health. This group were also more dissatisfied generally with their lives (Hobcraft J & Kiernan K 2001).

2.3.2 Outcomes of repeat pregnancy

Rapid repeat pregnancy is not uncommon in teenagers. The number of teenagers who go onto have a second pregnancy varies from between 10-30% (Smith GC & Pell 2001; Steven-Simon C et al 1997), and the repeat pregnancy is often within 18 months of the first (Stevens-Simon C et al 1997). It has also been reported that repeat teenage pregnancies are associated with negative outcomes, specifically an increased risk of preterm delivery and stillbirth. In a study of over 100,000 deliveries, Smith and Pell found that with second deliveries, compared to older women aged 20-29 years, teenagers had three times the risk of preterm delivery and still birth (Smith GC & Pell JP 2001).

2.3.3 Health and social outcome for the children of teenage parents

There is evidence to suggest that the children of young mothers do not generally do as well in later life compared with children born to older mothers. Hardy et al studied interviews given by 1758 inner-city children who were born between 1960 and 1965 (Hardy J et al 1997). Those who had mothers who were under 20 years at the time of their birth were more likely themselves to have a child in their teenage years, did less well at school and were less likely to be financially independent (i.e. not reliant on benefits). In this study, children who were born to women aged 25 or over had the best outcomes in terms of education attainment and financial independence.

A study into the impact of early motherhood on the behaviour of children at school, found that the children of young mothers were more likely to have attention problems and to display aggressive and delinquent behaviour (Trautmann-Vilalba P et al. 2004). There is also evidence to suggest that children born to teenagers have a significantly increased risk of both unintentional and violent injuries compared to children born to older mothers (Ekeus C, Christensson K, & Hjern A 2004). Ekeus et al found that compared to children of older mothers, the children born to teenagers had a 40% higher risk of unintentional injury (for example a fall, accidental poisoning or road traffic accident), and twice the risk of experiencing a violent, intentional injury.

2.3.4 *Interventions aimed at improving health and social outcomes*

Quinlivan et al conducted a randomised-controlled trial that was designed to evaluate the effectiveness of providing postnatal home visits designed specifically for teenage mothers. The aim of the study was to provide support for up to 6 months. During this time the young mothers would receive information on breast-feeding, contraception, vaccinations and safety as well as drug use and how to access services. Parenting and coping skills also formed part of the information provided in this intervention. At six months post delivery, women in the intervention group were less likely than controls to have experienced adverse neonatal outcomes (such as infant death or non-accidental injury) and were more likely to be using contraception. The authors concluded that this approach was both cost-effective, and also effective in improving outcomes for a group that is often associated with poor outcomes (Quinlivan J, Box H & Evans S 2003).

In 2003, Core et al published a systematic review that aimed to determine how effective parenting programmes were in improving outcomes for young mothers and their children (Coren E, Barlow J, & Stewart-Brown S 2003). This review examined 14 studies, and concluded that interventions can have some positive impact on outcomes for this vulnerable group. Group based interventions, and one to one or one to two work with young mothers did have some significant effect. The studies included in this review were diverse with many different types of outcomes, and the authors did highlight many significant methodological issues that were not considered in the original pieces of research. However, some studies did have positive outcome, one study looking into infant development found that the children of young mothers who were part of a group based education programme, had significantly better development in terms of motor and cognitive skills compared to a control group. Another study looking at the level of maternal involvement with the child, which included measures of the quality of the child's home environment, found that mothers in the intervention arm were significantly more likely than controls to have 'no risk' scores reported.

2.4 Teenage pregnancy: the historical context

2.4.1 Changes in rates over the last quarter of a century

Though it is true that compared to countries such as the Netherlands, the UK does have high teenage pregnancy rates, compared to thirty years ago, the number of live births to teenagers has actually decreased. In 1970 the live birth rate for women aged 15-19 years was 49.4 per 1000 women, compared with a rate of 30.8 per 1000 women in 1998. This drop in rates has been mirrored in other countries, and figures published by UNICEF show that some countries have seen a much bigger reduction, with the rate for Iceland for example dropping from 73.8 per 1000 women in 1970, to 24.7 per 1000 women in 1998 (UNICEF 2001). However, although the numbers of live births has decreased, figures for England and Wales for the period 1976 to 1998 show that overall conception rates to young women aged under 18 have not changed significantly. This may be due to an increase in the number of conceptions leading to a termination of pregnancy, particularly in older teenagers, from 21% of all conceptions in women aged 18-19 years resulting in a termination of pregnancy in 1976 to 35% in 1998 (Botting B & Dunnell K 2000).

2.5 Teenage pregnancy: The international context

In 2001, UNICEF published a report presenting birth rates for the world's rich nations (UNICEF 2001). The average age at first birth appears to be rising, and in countries such as Spain, the Netherlands and Italy, the average age at first birth in 1998 was approaching 30 years. In terms of teenage births, as shown in Table 1, of the 27 nations included in the analysis, the UK came second with a birth rate for women aged 15-17 years of 16.6 per 1000 women, and 51.8 per 1000 women for women aged 18-19 years. This figure is only superseded by the United States. On a European level, the UK has the highest rate in Western Europe, and the rate for women aged 15-17 years is greatly different to that for countries like the Netherlands and Sweden, where the figure for this age group is 2.2 births per 1000 women. The birth rate for the UK is also higher than countries where abortion is not easy to obtain, on religious or legal grounds. In Poland for example, a predominantly Catholic country, termination of pregnancy is only permitted under limited circumstances and yet their birth rate for both women aged 15-17 and 18-19 is significantly lower than figures for the UK.

Table 1. Live birth rates for the world's rich nations for women aged 15-17 and 18-19 years

Country	Birth rate (per 1000 women) aged 15-17	Birth rate (per 1000 women) aged 18-19
Japan	1.4	9.2
Switzerland	1.5	11.6
Sweden	2.2	13.0
Netherlands	2.2	12.0
Denmark	2.5	15.6
Finland	2.6	19.4
Italy	2.9	11.6
Luxembourg	3.0	19.7
Belgium	3.4	19.6
France	3.4	18.6
Norway	4.0	24.7
Spain	4.2	12.8
Czech Republic	5.0	31.0
Austria	5.1	28.2
Germany	5.3	25.2
Greece	5.3	20.4
Poland	5.8	38.4
Ireland	8.2	34.4
Australia	9.5	31.0
Canada	10.8	33.9
Iceland	11.2	44.6
Slovak Republic	11.4	48.2
Portugal	11.8	33.5
Hungary	14.1	41.8
New Zealand	15.4	50.7
United Kingdom	16.6	51.8
United States	30.4	82.0

Source: UNICEF 2001: Data for 1998.

2.6 Teenage pregnancy in the UK

2.6.1 The political context and the development of the Teenage Pregnancy Unit

In 1992, the Conservative government made an attempt to address the issue of teenage pregnancy in the publication: 'The Health of the Nation' (Secretary of State for Health

1992). This government aimed to reduce conceptions in young women aged under 16 years by about half, which would bring rates for England and Wales in line with those of most other countries in Western Europe. This target was not achieved and with the election of the Labour government came new targets for the reduction of conception rates in teenage women.

The Labour government approached the reduction of teenage pregnancy rates differently in terms of the age groups they intended to target. The previous Conservative government had looked at the reduction of rates for women aged 19 and under, with a special emphasis on the under 16 age group, whereas Labour aimed to look at reducing pregnancies in women aged under 18 years.

The Labour Government, under the remit of the Social Exclusion Unit, published a report in 1999, outlining plans to reduce conceptions in young women under 18 by half by the year 2010. The other main thrust of the strategy is to actively encourage young people back into education, training or employment. In the foreword, Tony Blair writes:

"It (the report) calls for a concerted campaign, involving all the different agencies and including religious leaders and the media to give a clear and consistent message to teenagers about the real impact of teenage pregnancy and parenthood on their lives. It shows how we can and must improve education on relationships and sex for teenagers. We must give teenagers the confidence and the information so they don't feel compelled to have sex. No one should become pregnant or contract a sexually transmitted infection because of ignorance."

The plan of action proposed by the government, included what is termed as 'joined-up action', which led to the development of the Teenage Pregnancy Unit and also the employment of local teenage pregnancy co-ordinators, whose remit is to implement the strategy on a local level.

The specific remit of this post is to:

- ***Provide information and needs assessments***. This process aims to include young people themselves and focuses on where there are gaps in the knowledge, for example teenage pregnancy in black and ethnic groups. The co-ordinators also have the task of developing evaluation and implementation strategies, and to disseminate good practice on a local level.

- ***Develop local stakeholders.*** This element of the remit looks at identifying local stakeholders (community based groups, health professionals, the media etc) and seek their commitment to the strategy. The co-ordinator is also responsible for improving and developing skills for key professionals such as teachers and midwives in order to meet the requirements of the strategy.

- ***Promote the development and provision of locally available services/support.*** This part of the role is concerned with the development of targeted services for those young people who are most at risk. These services should reflect local need and be integrated across services and include elements of peer support and education.

Other elements of the strategy include preventative measures, such as changes to sex education provision and information campaigns, and better support for young parents in terms of education and training for work. The specific targets in terms of outcome measures are as follows:

- To reduce the conception rate for young women aged under 18 by 50% by the year 2010.
- To reduce the conception rate for young women aged under 18 by 15% by 2004.
- To achieve a general and well established downward trend in conception rates for young women aged under 16 years.
- To reduce the inequalities in conception rates between wards with the highest rates and the average ward rate by at least 25% by the year 2010.
- To increase the number of teenage parents taking part in education and training to 60% by the year 2010.

2.6.2 The success of the strategy to date

Although conceptions data for 2003/4 is not yet available, there does seem to have been a small downward trend in teenage pregnancy rates in young women aged under 18 years, with the rate for this age group dropping from 47.0 per 1000 women in 1998, to 42.6 per 1000 women in 2002 (see Table 2).

The most current progress report at this time is that presented in September 2004 (Teenage Pregnancy Unit 2004b). Overall conception rates (based on the most current conception data for 2002), have fallen by 9.4% since 1998 for women aged under 18 years, and by 11% for women aged under 16 years. This decline in conception rates for under 18s was observed in 79% of local authorities, though an increase in rate was observed for the remaining 21%. In terms of the target of reducing rates by 15% by 2004, the data for 2002 shows that this target is likely to be achieved in half of the local authority areas.

In terms of the targets around the provision of education and training for teenage parents, the report states that for the period 2002-04, 29.7% of teenage parents were in education, training or work, compared with 23.1% in the period 1997-99. Although this is an overall increase, it is unlikely that this will increase to the target figure of 60% by the year 2010.

Table 2. Number and rate of conceptions in England for women aged under 18 for the period 1998-2002

Year	Number of conceptions	Rate of conceptions per 1000 women
1998	41,089	47.0
1999	39,247	45.3
2000	36,699	43.9
2001	38,439	42.3
2002*	39,286	42.6

Source: Office for National Statistics.
* Provisional estimates based on incomplete abortion estimates

2.7 Teenagers: their health status and use of health services

2.7.1 General health status

Data published by the Office for National Statistics shows that in young men aged 16-24 years, accidents and suicide account for 62% of deaths. A further 8% of deaths are due to cancers and nervous system disorders account for a further 5% (Office of National Statistics 1999). In teenage girls, 39% of deaths are due to accidents and suicide, and 18% are due to cancers (McPherson A, Donovan C & Macfarlane A 2002).

Teenagers do quite often report that they have serious health concerns. In a primary care based randomised controlled trial, Walker et al found that 10% (100 cases) of teenagers reported that they had a serious health problem, with asthma being the most commonly given condition (Walker Z et al 2002). This study also found that a significant number of young people have health concerns that they would like to discuss with a primary care professional, these included diet, dealing with stress and smoking.

In 2004, the World Health Organisation published a report based on a total of 162,000 interviews with young teenagers in 35 countries. The findings of this study show marked sex differences, with girls reporting worse health status than boys. However, boys were more likely than girls to have engaged in unhealthy activities, such as drinking alcohol and smoking. Interestingly, although girls had more concerns over their weight, the boys were more likely to be overweight (World Health Organisation Europe 2004).

In terms of general practice consultations, a study of the consultations of young people aged 13-15, found that the most common reasons for consultation were respiratory conditions such as asthma (35%), dermatological conditions such as acne or eczema (29%) and musculoskeletal conditions such trauma or sport injury (22%) (Churchill R et al 2000).

2.7.2 The mental health of teenagers

In a study of 1516 teenagers in the primary care setting, Walker et al found that 16% had mental health problems, including anxiety and depression (Walker Z et al 2002). A general practice based study of 2359 adolescents, found that 4% of 15 year olds had consulted their GP for mental health problems, and 3% of young people in this age group had attended mental health services. In addition, 1% of young people in this study had attempted suicide at least once. This study also found that many young people with psychiatric morbidity identified through the GHQ-12 (The 12 item General Health Questionnaire), had not consulted their GP about these issues, though they did have a higher consultation rate overall (Potts Y, Gillies M L, & Wood SF 2001). This might suggest that young people with mental health issues use other conditions to mask their true reason for attending, perhaps for fear of breach of confidentiality. Certainly

Churchill et al found that some young people stated that they would not talk to their GP about some emotional problems through fear of disclosure (Churchill R et al 2000).

2.7.3 The sexual health of teenagers

The legal age of consent for heterosexual sex in England, Wales and Scotland is 16, though it has been estimated that as many as 1 in 3 people have first intercourse before this age (Swann C 1998). In a study of 1,500 school pupils, Burack found that 20% of 13 year olds had experienced full, or oral sex (Burack R 1999). However, a study by Wellings et al published in 2001, concluded that the increase in young people having sex aged under 16 observed during the early to mid 1980s did not appear to continue throughout the 1990s. This study, which recruited a total of 11,161 participants also found that a large amount of women (84%) who had reported that first intercourse had occurred when they were 13 or 14 years, regretted it and wished they had waited longer (Wellings K et al 2001). However, this study utilised self-completion questionnaires and computer assisted interviews, which may have introduced an element of recall or social desirability bias. It is certainly the case that studies of self reported behaviour are not always a true reflection of actual behaviour (Eccles et al 1999). The authors of this study did however explore this issue further through a comparison with comparable data from 1990. They concluded that reporting of abortion was similar, though data from 2000 reported greater incidence of under age sexual activity and homosexual activity, an outcome that the authors believe is due to changes in the social acceptability of these activities (Copas AJ et al 2002).

For young people in the UK, the decision to have first intercourse has been reported to be due to factors such as peer pressure and opportunity. This contrasts sharply with young people in the Netherlands who are more likely to give love and commitment as the main reasons for first intercourse (The Social Exclusion Unit 1999). The impact of peer pressure on the decision to engage in first intercourse does appear to reduce with increasing age. Wellings et al found that peer pressure was the main reason for having first intercourse in 13% of people who had had first intercourse at 13 or 14 years, compared with only 3% for people who had first intercourse between the ages of 18 to 24 years (Wellings K et al 2001).

In terms of accessing sexual health services, a study looking into the use of young peoples' sexual health clinics, found that over 70% of teenagers do not access services before first intercourse. This study found that the median age at first visit to these services was 15 years, and that age at first visit was significantly younger for females (15 years for females compared to 17 years for males). In addition, this study highlighted the fact that teenagers do not use just one service, and many use general practice services, teenage specific clinics and family planning clinics. Stone and Ingham also found that young people who had used sexual health services prior to ever having sex did so because they wanted to feel well prepared for first intercourse (Stone N & Ingham R 2003).

Sexual health is important, not just for teenagers but for the wider population. Sexually transmitted diseases have been linked with increased likelihood of infertility and cervical cancer (Nicoll A et al. 1999). The highest rates of the sexually transmitted diseases Chlamydia and Gonorrhoea, occur in young people aged 16-19 years (Conner N, Catchpole M & Nicoll A 2002). A study based in a genitourinary clinic in London found that young women aged 16 and under were three times more likely than any other age group to be diagnosed with a sexually transmitted infection, and half of the young people in this age group did not attend for follow up appointments (Creighton S et al 2002).

In terms of knowledge about sexually transmitted infections, Walker et al found that two out of three 14-15 year olds did not know that Chlamydia was a sexually transmitted disease (Walker Z et al 2002). This finding was also reported by Garside et al who also found that only a third of young people knew that Chlamydia was a sexually transmitted infection, and most had a limited knowledge of other infections as well as of services provided for the treatment of such infections (Garside R et al. 2001).

2.7.4 Teenagers use of General Practice services

Approximately one half to three quarters of teenagers consult with their GP in a 12 month period (Churchill R et al 2000; Kari J et al 1997; Kramer T et al 1997) . The median annual consultation rate for teenagers has been reported as being between 1 and 3 (Churchill R et al 2000; Potts Y, Gillies ML & Wood SF 2000). There are sex and age differences however, with younger female teenagers (those aged 11-14) having median consultation rates of approximately 3 per annum, and older females (15-19 years) having a median rate of approximately 5 consultations per annum. Males have lower annual consultation rates than females, and older males (aged 15-19 years) have been reported as having a median annual consultation rate of just 1 (Churchill R et al 2000; Jacobson LD & Owen PA 1993).

Interestingly, although females are more frequent attenders, they have also been reported as having more negative perceptions of the care they receive from general practice. They have been found to be less satisfied overall with their care, and are also less likely to report that they feel they could talk to their GP about personal things, or that they feel their GP takes them seriously (Churchill R et al 2000). Burack found that approximately a third of both males and females felt that their consultation was wasting the GP's time, and the same number also thought that their GP would not understand their problems (Burack R 2000).

Teenagers have been reported as having serious concerns over confidentiality, with studies reporting that between 20 and 63% of teenagers have doubts as to whether their consultation with their GP is confidential (Burack R 2000; Kari J et al 1997). In one study almost half of the young teenagers surveyed when asked to respond to the statement:

" *I might not tell my GP about emotional problems because I would worry about other people finding out* "

stated that either they agreed with the statement or were not sure (Churchill R et al 2000). This does suggest that approximately 50% of young people do not have any significant worries over confidentiality and believe that their consultation is confidential. However, this figure is markedly different to the adult population who are more likely than teenagers to believe that their consultation with their GP is confidential. A questionnaire based study in the UK for example, found that 97% of women in their thirties and fifties considered their consultation with their GP to be confidential (Seamark C & Blake S 2005).

Young people do, in most cases, have the same right to confidentiality as adults. It is only if non-disclosure is likely to cause serious harm, or if the young person does not meet the requirements of competency that disclosure can occur without consent. In terms of how GPs regard this issue, a study of 235 GPs found that only 15 (6.5%)

believed that they did not have the same duty of confidentiality to their young patients aged under 16 than they did for their older patients (Garside R et al 2000).

Although teenagers frequently report concerns over confidentiality, and as shown above, state that they might not discuss some issues with their GP because a fear of disclosure, there is little evidence to suggest that this actually impacts on their decision to consult. Churchill et al matched responses to a self-completed questionnaire to actual consultation behaviour, and found that having concerns about confidentiality was not associated with consultation rate. This study did find that embarrassment, particularly for young girls, was more of a perceived barrier, and girls who reported that they might not talk to their GP because of embarrassment were less likely to have consulted for any gynaecological issue, including contraception (Churchill R et al 2000).

There is evidence to suggest that prior to pregnancy, teenagers do actually consult more often, and in many cases these consultations are for contraception. McIlroy et al found that prior to pregnancy, teenagers consulted more frequently for gynaecological problems. In this study, 53% of teenagers who became pregnant consulted for gynaecological problems, compared with 9% of matched controls. The authors concluded that these consultations may well have masked the true reason for consulting, which was likely to have been to discuss the issue of contraception. (McIlroy C, Bradley T, & Wilson-Davis K 1995). Churchill et al also found that teenagers who became pregnant consulted more frequently, and also found 71% had consulted for contraception at some point prior to the pregnancy (Churchill D et al 2000).

Overall, young people are generally satisfied with the care they receive from general practice (Churchill R et al 2000, Potts Y, Gillies ML & Wood SF 2000). Dissatisfaction with care has been found to be due to lack of improvement in condition, having to wait a long time to see a GP, and insufficient information or lack or perceived care from the GP (Churchill R et al 2000, Jacobson LD et al 2000). The issue of insufficient information or perceived lack of care may well be associated with the length of time GPs spend with their young patients. Jacobson et al compared GP consultation times for 119 teenagers (aged 11-19) against 781 consultations with non-teenagers. The length of consultation was significantly shorter for the teenage group, by a mean of nearly two minutes. This was found for all of the six GPs studied within a single practice. Unaccompanied teenagers had even shorter consultations. The authors conclude that this difference in consultation time may be due to several factors. Firstly that illness in this age group is more likely to be minor and so takes less time to deal with, secondly that the young people themselves may feel uncomfortable and so prefer a shorter consultation, or that the GP may make the consultation shorter in order to create more time for patients with a greater perceived need (Jacobson LD, Wilkinson C & Owen PA 1994). It could also be of course that GPs are themselves uncomfortable with young people, and this could itself impact on the amount of time spent in the consultation.

Adolescent health care has been made part of the undergraduate curriculum in some parts of the United States, and this has been done to address concerns of health care professionals who do not always feel equipped to deal with the needs of adolescents. This curriculum covers issues including how to discuss confidentiality, drug and alcohol use, as well as sexuality and sexually transmitted infections. (Djuricich AM 2002). In the UK, the amount of undergraduate medical school training in adolescent health care does differ between institutions (Churchill R, personal communication), though GPs have expressed an interest in receiving postgraduate continuing medical education in this area (Veit FC et al. 1996). In an effort to promote good practice in adolescent health care, The Royal College of General Practitioners has set up The Adolescent Task Group, whose principle aim is as follows:

"To promote improved quality of general practice-based primary care medical services in relation to meeting the health needs of young people aged 11-19 years and the transition to adulthood."

The objectives of this group include the improvement of the knowledge and practice of primary care staff in relation to the care of teenage patients. The task group also supports the provision of appropriate training to those involved in the care of teenage patients, and does develop and provide training sessions for GPs and other primary care staff.

2.7.5 Initiatives to improve health status

There have been many different types of initiatives aimed at improving teenagers' health status. These have aimed to give advice on diet and healthy eating, drugs and alcohol and sexual health. These have been in a variety of settings, including primary care and community-based settings such as youth clubs. What young people want from these initiatives varies. They have reported that they want to be able to access drop-in sessions, that are completely confidential, and they also want to be offered a broad range of services by staff who are welcoming and are able to communicate well with teenagers (Little L 1997).

Interventions aimed at improving health or health related behaviours in this group may only however, have a limited effect. Walker et al conducted a randomised controlled trial to evaluate how effective invitations to general practice consultations to discuss health behaviours were, in improving knowledge and health behaviours in young people aged 14-15 years. In this study, the intervention group showed small but significant improvements in terms of intention to change and maintained change for some issues, including diet and exercise. However, these differences were not observed at one-year follow-up, though it is possible that this was due at least in part to some of the assumptions made for analysis purposes. The authors state that an assumption of no change was assigned to non-responders, which may have led to an under estimation of the overall effect. The intervention group were however, more likely at follow up to know where to go to get information regarding contraception and to know where to go for confidential advice. The authors suggest that more attention should be given to motivation and reinforcement to sustain improvements in health behaviour and suggest that a larger study with a more sustained intervention may help to show more significant benefits of this approach (Walker Z et al 2002).

2.8 Young people and contraception

2.8.1 The legal position for young teenagers

In the 1980s there were a series of high court judgements that radically changed how health professionals dealt with young people aged under 16 years. In 1980 issuing contraception to young women aged under 16 was at the doctor's discretion, and whilst parental consent was preferred, it was not essential. In 1984 Mrs Victoria Gillick went to court to put the case forward that this practice was giving unlawful advice which impacted upon the right and duties of parents. In the initial high court hearing, she lost the case, though in the appeal court she won with a unanimous decision. The legal situation at this point was that health professionals providing contraception to under 16s without parental consent were acting illegally unless they were providing it in an emergency, or with leave of the court. Following a public outcry forecasting rises in unwanted pregnancies, the case then went to the House of Lords, where she then lost the case with a vote of 3 to 2 (de Cruz P 2002).

In 1986, the Fraser Guidelines came into force (Department of Health and Social Security 1986). These state that health professionals can provide contraception to young people aged under 16 without parental consent, though the practitioner should endeavour to encourage the young person to discuss it with their parent or guardian. However the health professional must be satisfied that the young person understands the advice given, that she is likely to continue or begin sexual intercourse, that without treatment her physical or mental health will suffer and that the treatment is in the best interests of the young person. If these criteria are met then confidentiality must be upheld. These principles, known widely as 'Gillick competency', place a heavy burden on the health care provider, as they have to make the decision as to whether a young person meets the criteria for competency.

2.8.2 Use of contraception by teenagers

Teenagers can access free contraception and sexual health advice from many services, including:

- NHS family planning clinics
- Brook/other young people's advice/sexual health centres
- Their GP (excluding condoms)
- Another GP (through temporary residency)
- Some NHS walk in centres
- Some drop in/support centres (Connexions Centres for example)
- Some GU clinics
- Some pharmacists under NHS projects , i.e. those using Patient Group Directions

They can also buy (if they are aged 16 or over), emergency contraception over the counter from pharmacists. Data for 1995, produced by the Office for National Statistics as part of the General Household Survey , show that 25% of young women aged 16-17 years reported using the contraceptive pill as their main contraceptive, and condoms were used by 13% (Office for National Statistics 2003).

A study of four developed countries (United States, France, United Kingdom and Sweden) found that 25% of young women in the UK did not use contraception at first intercourse (Darroch JE, Singh s & Frost JJ 2001). Of those who did use contraception at first intercourse, approximately 65% reported that they had used a condom. At most recent intercourse, 72% of 16-19 year old women were using medical methods of contraception (oral contraceptive pill, IUD, injectibles or implants). These findings are also similar to those reported in a study of over 11,000 people in the UK. This study found that overall, 22% of women and 21% of men did not use contraception at first intercourse, and those who engaged in first intercourse when aged 13 or 14 years were the least likely to have used contraception. In terms of condom use, 21% of people did not use a condom at first intercourse, and this rate of non-use was consistent for all respondents who had engaged in first intercourse between the ages on 13 to 24 years (Wellings K et al 2001). Another study exploring the use of sexual health services, found that two thirds of young people access sexual services after first intercourse and more than half of these young people had had unprotected sex at least once. The most frequently given reason for delaying visiting sexual health services prior to first intercourse was that first intercourse happened unexpectedly (Stone N & Ingham R2003). Other studies have reported that reasons for not using contraception include the side effects of the contraceptive pill, embarrassment and again, sexual intercourse happening unexpectedly (Coleman L & Ingham R 1998; Lo SV et al. 1994; Wareham V & Drummond N 1994).

A study of pregnant teenagers found that of those who had engaged in sexual intercourse below the age of 16, only a quarter used contraception on a regular basis (Barron SL 1986). In terms of what influences use of contraception at first intercourse, a study of young peoples clinics in England found that using contraception at first intercourse, or at most recent intercourse, was associated with young people discussing the issue prior to the event, and also with delaying intercourse beyond four weeks. There were some gender differences reported, with use of contraception at first intercourse for young men, being associated with discussing the issue beforehand. For young women, reporting that they had sex with their partner for 'intimate reasons' (being in love with their partner, have a desire for physical intimacy or seeing sex as a natural progression within a relationship) was significantly associated with discussing the use of contraception before first intercourse (Stone N & Ingham R 2002).

Compared with the adult population, contraception failure is common in teenagers. A study of 3516 women reported that 51% who had not planned their pregnancy were using contraception at the time of conception (Rasch V, Knudsen L & Wielandt H 2001). In comparison, a study of pregnant teenagers reported that 80% had stated that they were using contraception at the time of conception (Pearson VAH et al 1995). In addition, a general practice based study found that most young women who do conceive have consulted for contraception in the year prior to conception (Churchill D et al 2000).

2.8.3 Use of emergency contraception by teenagers

Although most teenagers are aware of emergency contraception, for example 90% of young women aged 14-15 in one study based in Scotland had heard of it (Graham A, Green L & Glasier AF 1996), they are not always aware of some of the important aspects of the use of emergency contraception, including the time limits in place (Graham A, Green L & Glasier AF 1996; Walker Z et al 2002). In terms of how many young people use emergency contraception, in under 16s, research suggests that approximately a third of sexually active teenagers have used it at least once (Graham A, Green L & Glasier AF 1996; Pearson VAH et al 1995a).

Wider access to emergency contraception was put forward by the government in the Social Exclusion Report as a way of reducing unintended pregnancies (Social Exclusion Unit 2000). Emergency contraception was until quite recently available only through prescription from the GP or at family planning clinics. Since January 2001 emergency contraception has been available to women aged over 16 years over the counter at pharmacies, at a cost of £19.99 for two tablets. However, there is currently little evidence that this is likely to have a significant effect on teenage pregnancy rates. A study by Glasier and Baird found that women given emergency contraception to keep at home did have a reduced likelihood of unintended pregnancy, but this difference was not statistically significant (Glasier A & Baird D 1998). This study did however find that women who took emergency contraception unsupervised (i.e. they had it at home and did not need to consult with the GP) did take it correctly. However a general practice based study found that teenagers who consult for emergency contraception are three times more likely to go on to have an unintended pregnancy. The authors concluded that follow up and advice about long term contraception needs should be given to young people consulting for this purpose as this may help reduce the risk of unintended pregnancy (Churchill D et al 2000). Whether this advice and follow up is or can be provided by pharmacies is questionable.

2.9 Factors known to be associated with likelihood of teenage pregnancy

2.9.1 Socio-economic status

There are some factors that are known to be associated with increased risk of teenage pregnancy. In areas of high deprivation, teenage pregnancy and maternity rates are far higher than in areas classified as most affluent (Babb P 2003; Boulton-Jones C & McInnery K 1995; McLeod A 2001; Smith T 1993; Wilson SH, Brown T P & Richards RG 1992). A study based in Scotland found that in women aged under 16 years, the pregnancy rate in deprived areas was three times higher than in areas described as most affluent. The young women from more affluent areas were also more likely to terminate their pregnancy with two out of three taking this route as opposed to only one in four in deprived areas (Smith T 1993). Similarly, a study conducted by The Centre for Sexual Health Research, found that deprivation indicators, such as number of 17 year olds in full time education, unemployment and claims for family credit were strongly associated with a lower incidence of abortion (Clements S et al. 2004).

2.9.2 Educational attainment and teen parents

Young parenthood has been found to be associated with low educational attainment. Wellings et al found that 29% of people who had left school at aged 16 with no qualifications had become mothers before the age of 18, compared to 1% who had left education at over 17 years (Wellings K et al 2001). Similar findings have been reported by Kiernan who found that teen parents were more likely to have performed less well in school and to leave school with fewer qualifications. In this study 92% of teenage mothers had left school at or before the age of 16, and 61% had no formal qualifications by the time they reached their early 20s. Similar patterns were found for teenage fathers, though significantly more (58%) had gone on to gain formal qualifications by the age of 23 (Kiernan K 1995).

2.9.3 *The importance of family structure*

Kiernan et al used data collected through the National Child Development Study (NCDS) to identify factors associated with risk of teenage pregnancy. As also found by Seamark et al (Seamark C & Pereira Gray D 1997), this study found that young people who become teen parents were found to be more likely to have had a parent who was themselves aged under 20. The NCDS data shows that the young person's mother was also a teen parent in 26% of cases for young women who became pregnant in their teens, compared to 13% of young women who did not become a teen parent. In addition, teen parents were more likely to have come from families who had experienced financial hardship and were from a lower socio-economic grouping (Kiernan K 1995).

Teenage pregnancy is also more likely to occur in families where the parents have divorced or where the mother was a lone parent (Hobcraft J & Kiernan K2001; Quinlivan et al. 2004), and in families that have experienced economic hardship (Hobcraft J & Kiernan K2001; Trautmann-Vilalba P, Gerhold M, Laucht M, & Schmidt MH2004). Exposure to violence in childhood has also been found to be associated with increased risk of teenage pregnancy (Quinlivan JA et al 2004; Quinlivan JA & Evans SF 2001). A longitudinal study conducted in Germany, found that young mothers (aged 15-24 years), compared with older mothers (aged 25-41years) were significantly more likely to have parents with low educational attainment levels, to come from one parent families and families where the parents had separated during their childhood. The parents of young mothers were also more likely to have had poor parental coping skills (Trautmann-Vilalba P, Gerhold M, Laucht M, & Schmidt MH2004).

In a study of family structure, East and Kiernan found that young women who had multiple sisters who had had a teenage pregnancy were at increased risk themselves of having a teenage pregnancy. These young women, who had often lived with their parenting siblings, were more sexually promiscuous and were more likely to report an intention have a baby at a young age. Young men who had multiple sisters who had experienced teenage pregnancy were more likely to display behavioural problems and to be sexually promiscuous (East PL & Kiernan EA 2001).

Parental interest and communication has been linked with teenage pregnancy risk. In a study based on data collected as part of the National Child Development Study, teen fathers were more likely than men who did not become a father during their teenage years to have parents who were disinterested in their education (Dearden KA, Hale CB, & Woolley T 1995). It also been reported that in families with good communication between parent and child, particularly about sexual matters, young people are more likely to postpone first intercourse (Blake SM et al 2001). In addition young people aged 14-17, who live with both parents are less likely, independently of socio-economic status, to have had sex compared to young people of the same age who live in single parent families (Blake SM et al 2001).

Parental attitude to discussing sex has also been found to be associated with contraception use at first intercourse. In a study of 963 young people aged 16-18, Stone et al found that young men whose parents positively portrayed sex during their child-hood and early teenage years, were more likely to use contraception at first intercourse. These young men were also found to be better at talking about contraception prior to using it. For young women, the likelihood of using contraception at first intercourse was associated with the availability and 'warmth' of parents (Stone N & Ingham R2002).

2.9.4 Drug and alcohol use

Drug use is quite common amongst teenagers, and by the age of 15, 38% of boys and 33% of girls will have tried illegal drugs (McPherson A, Donovan C & Macfarlane A 2002). Pregnant teens are more likely than older women to use illegal drugs, smoke and drink alcohol during pregnancy (Rickert VI, Wiemann CM, & Berenson AB 1997), though in the case of intended pregnancy, drug use has been reported to decline significantly just before or during the pregnancy (Flanagan P & Kokotailo P 1999). One study found that 40% of young women who used drugs, ceased doing so when they got pregnant (Quinlivan JA & Evans SF 2002).

However, the impact of drug use, at least in terms of outcomes such as birthweight, is unclear. Quinlivan studied 456 pregnant teenagers, and found that 20% had used cannabis during the pregnancy, and a third of these women were also using other drugs. Although the women who had used drugs had a higher incidence of threatened preterm labour, there were no differences between drug and non-drug users in terms of gestational age, birth weight or Apgar score. Mode of delivery or breast-feeding likelihood, were similarly not associated with drug use (Quinlivan JA & Evans SF 2002).

2.9.5 Ethnicity and teenage pregnancy

Berthoud conducted an analysis based on UK data collected through the Labour Force Survey. This analysis included data for over 17,000 women aged 16 to 30 years, and found that incidence of teenage pregnancy does differ significantly according to ethnicity. In this analysis Pakistani, Caribbean and in particular, Bangladeshi women were more likely to be teenage mothers compared to white women. Birth rates for women aged 15-19 years, show a birth rate of 75 per 1000 for Bangladeshi women, compared to 29 per 1000 for white women. The birth rate for Caribbean women in this age group was 44 per 1000 women, and for Pakistani women this rate was 41 per 1000. Conversely, Indian women had a significantly lower rate of births in this age group (17 per 1000 women). The author concluded that although rates for Caribbean and white teenagers have remained stable, the number of births to Asian teenagers is falling, in the mid 1980s for example, the teenage birth rate for Bangladeshi women was more than three times that of white teenagers (Berthoud R 2001).

In terms of ethnicity and abortion rates, a study based in the Netherlands examined both birth and abortion rates, and again found significant differences between ethnic groups. In this study, abortion rates were highest among Ghanaian teenagers, and lowest among Turkish teenagers (Stuart MA, van der Wal MF, & Schilthuis W 2002).

Raine et al studied the medical records of 605 teenagers attending a teen specific family planning clinic. Black teenagers, independently of socio-economic factors were three times more likely than white teenagers to be pregnant at their first visit, and were more likely to rely on less effective barrier methods of contraception, rather than hormonal methods (Raine T et al. 2002).

2.10 Unintended and Intended pregnancy

It is important to distinguish between intended and unintended teenage pregnancy. These are different concepts compared to wanted and unwanted pregnancy, as although a pregnancy may be unintended, it is not therefore necessarily unwanted. In terms defining unintended pregnancy, the National Surveys of Family Growth in the United States defined unintended pregnancies as pregnancies where women were using contraception at the time of conception, or had expressed the view that they did not want to become pregnant either at all, or at a later time (Henshaw SK 1998).

It is difficult to identify whether teenage pregnancies are intended or not without discussing the pregnancy with the young person. Certainly crude estimates of unintended pregnancy can be made from abortion statistics, but it is not unreasonable to assume that some young people are pressured into a termination though the pregnancy was intentional. Data from the United States, suggests that in young women aged under 15, 18% of pregnancies were intended, and this increased to 22% in women aged 15-19 years (Henshaw SK1998). Another study based around the use of mothering dolls found that 15% of young people aged 11-13 years were planning to become teen parents (Kralewski J & Stevens-Simon C 2000). Data from the National Child Development Study (NCDS) found that only one in four people who had become pregnant whilst a teenager had actually planned the pregnancy. This study also found that 36% of teen parents (those who had become a parent whilst aged under 20 years) had previously expressed the desire to have a child before the age of 21 (Kiernan K 1995).

2.10.1 Factors associated with unintentional pregnancy

If approximately 20-25% of teenage pregnancies are intended (Henshaw SK1998; Kiernan1995; Kralewski J & Stevens-Simon C2000), then at least 75% are unintended pregnancies. Unintended pregnancy is largely due to either non-use of contraception or contraception failure. Studies have reported that at the time of pregnancy up to 80% of teenagers used contraception (Pearson VAH et al 1995), and as reported earlier, teenagers, particularly young teenagers, do not use contraception consistently (Barron SL1986).

Unintentional pregnancy may also be associated with other risk taking behaviours, and Wellings et al found that 7% of young people having first intercourse at aged 13-15 gave being drunk as the main reason for engaging in first intercourse (Wellings K 2001).

2.10.2 Factors associated with intentional pregnancy

The motivation behind intentional pregnancy is unclear. Though teenage pregnancy undoubtedly has a financial impact in terms of reliance on state benefits (Department of Social Security 1997), there is little evidence to suggest that accessing state benefits and housing is actually a motivating force behind intended teenage pregnancy. As reported in the Social Exclusion Report, young people quite often do not know what they can actually claim (The Social Exclusion Unit1999), and in reality, finding housing and surviving on benefits can be extremely difficult for young people. In a study conducted by Newcastle University, young mothers were interviewed and found to have significant difficulties finding suitable housing in areas close to family and friends, and often ended up living in some of the less desirable areas which were then difficult to move on from. This study found very little evidence to suggest that young women purposefully made themselves homeless to secure housing, and those who were housed quickly due to being homeless were often dissatisfied with the housing that was provided. Most young mothers also had a great deal of difficulty affording basic furnishing, and found that the maternity grant given to them for essential items such as a cot, too be far too little to cover most items (Speak S 1995).

2.11 The pregnant teenager: outcomes and experiences

2.11.1 What are the options for young women who become pregnant?

Young women in the UK who become pregnant have three choices. They can decide to continue with the pregnancy and then keep the child after delivery, continue with the pregnancy and then have the child adopted, or terminate the pregnancy (though the 1967 Abortion act was not actually extended to Northern Ireland and so as a consequence young women wishing to have a termination of pregnancy tend to travel to England for the procedure)

Termination of pregnancy is more common in young women aged under 16, and approximately 50% of conceptions in this age group result in a termination (Appleby L et al 1996). Termination is legal in England, Wales and Scotland on the grounds of there being a risk to the life or mental well being of the woman or foetal abnormality; and can be accessed for free through the NHS; or for a fee through privately run clinics. Overall, approximately three-quarters of terminations in England and Wales are funded by the NHS, and nearly all of those carried out in Scotland are funded in this way

(Family Planning Association 1998b). For the procedure to take place, two doctors have to agree that the requirements have been met. For young women aged under 16, referral for a termination can take place without parental consent if they are considered to be competent to understand the implications of their decision (Family Planning Association1998b).

Adoption is an option that is not frequently chosen, and figures show that in the past twenty years, overall adoption figures have fallen by 75% (The Social Exclusion Unit1999). The reasons for this decline are not clear, though it is likely to be due at least in part to the fact that in the 1960s and 1970s, young single women were put under pressure to have their babies adopted. It may also be due to the fact that lone parenting and young parenting are more acceptable in today's society.

2.11.2 Teenagers experience at delivery

There is some conflicting evidence around whether young teenagers have a better or worse experience at delivery compared to older teenagers and older women. It is well reported that younger teenagers have an increased likelihood of preterm birth (DuPleiss HM, Bell R & Richards T 1997; Olausson P et a; 2004; Smith GC & Pell JP 2001), and have been reported as being late and less frequent users of antenatal care (Amini SB et al 1996; Satin A et al 1994). It is less clear however, whether they are more likely to experience intervention at delivery.

Some studies have found that younger teenagers are more likely to experience an assisted delivery, for example a caesarean section (Amini SB et al 1996; Konje et al 1992). In a study based in the United States, Amini et al, for example, analysed data pertaining to 1875 births to young women aged under 16 years and 17,359 deliveries to women aged 16-19 years. In this study 12% of teenagers aged under 16 had a caesarean section, compared to 9% of teenagers aged 16-19 years, and this difference was statistically significant (Amini SB et al 1996). However, these findings are different to those reported by Satin et al, who also compared caesarean rates for older and younger teenagers in the United States. They found that 14% of young teenagers (under 16 years) and 14% of 16-19 year olds experienced a caesarean delivery, and both of these groups were less likely than women aged over 20 years to experience this mode of delivery, as 18% if women in this age group delivered by caesarean (Satin A et al 1994). Similarly, Smith found that younger teenagers were not at increased risk of caesarean delivery compared to older women (Smith GC & Pell JP 2001).

2.11.3 The experience of motherhood

The majority of studies looking into the impact of teenage pregnancy utilise quantitative methods that are unable to explore individual experience. There has however been some qualitative work that has aimed to investigate young womens' experience of early motherhood. These studies report that most young women enjoy being a parent, and consider it to be a positive experience (Lee E et al 2004; Burghes L & Brown M 1995; Seamark CJ & Lings P 2004). Young women have also reported that taking this route actually helped them to avoid involvement in drugs or crime or has encouraged them to go into further education and training (Lee E et al 2004; Seamark CJ & Lings P 2004). In 2004 Lee et al published a report looking into national variations in abortion rates. Part of this study included interviews with young women who had experienced either having a termination or motherhood. Some of these young women reported that having a baby gave them some direction in life, and had provided some security, in what was for most, an unstable and uncertain life. This quote illustrates this point well:

"I'm just a better person all round... (it has) been the best thing that's ever happened to me... If I hadn't had the baby I'm sure I would've been in jail, I'm sure I would have"

Seamark found in a qualitative study of nine women, that having a child whilst a teenager was overall a positive experience, and for some had been a catalyst for making positive life choices, such as entering into further education (Seamark CJ & Lings P 2004).

It may actually be that it is living on a limited income, or being a lone parent that presents the most difficulty for young women. Certainly, Burghes et al found that of the young mothers interviewed, none advocated lone early parenting, and as lone parents they reported that living on benefits and having to cope alone was extremely difficult. These mothers stated that they would encourage other teenagers to use effective contraception to avoid early pregnancy (Burghes L & Brown M 1995).

In terms of parenting skills, there is evidence to suggest that compared to older mothers, young mothers experience some difficulties. One study found that young mothers were more likely to display inadequate control over their children, were more unresponsive towards their children and were also less supportive (Trautmann-Vilalba P, Gerhold M, Laucht M, & Schmidt MH2004) . In addition, the children of young parents have also found to be at increased risk of accidental and intended injury (Ekeus C, Christensson K, & Hjern A2004).

2.11.4 Young women's experience of abortion

A significant number of teenage conceptions result in a termination of pregnancy. Deciding whether to continue with a pregnancy, or have an abortion is strongly associated with socio-economic status, with women from more affluent areas being more likely to have an abortion (Smith T 1996). Making the decision to terminate a pregnancy is never easy for any woman, and a study published by the Centre for Sexual Health Research in 2004, found that young women who did decide to go down this route did so because they did not want to be responsible for a child at such a young age, and because they saw the right age to have a baby as being in their late 20s. Some of these young women also had plans for the future that did not include early motherhood:

" There was no question of me keeping it because I knew I was going to go to University...I didn't want a baby...I'd had a good education and I had a career path to go down, it was all laid out for me."

Some of the young women did feel pressured into either having an abortion, or in other cases into having the child. The use of emotive language, by both the young person themselves, and their family and friends, and having a 'foetus-centred' approach to the pregnancy had an influence on their decision not to have an abortion. An example is given, where a young girl aged 14 at conception and who went on to have the baby described abortion as:

"It's like murdering someone isn't it, killing a baby...it's evil, you're killing a baby"

This study also found that although none of the women interviewed continued with the pregnancy because they couldn't get access to termination services; some did have problems getting appointments and physically getting to the venue. In terms of how they perceived the care they received from abortion services, some had negative experiences in that they felt uninformed and also felt that personal beliefs of professionals impacted upon their care. Others however, commented on how helpful and supportive staff were and how being young did not mean they were talked down to or patronised. The authors conclude that services and professional attitudes to abortion vary greatly between areas, and that although this may not impact on variation in rates, it may well impact upon the young woman's experience (Lee E et al. 2004).

2.12 Teenage fathers

The fathers of children born to teenage mothers are not necessarily teenagers themselves. A study based in Sweden, found that 19% of fathers of children born to teenage mothers were also teenagers at the time of the birth, and 10% were more than ten years older than the mother (Ekeus C & Christensson K 2003). Another study of African American teens, where the mean age for young women at delivery was 14.9 years, found that only 5% of teenage mothers had partners who were aged 15 or below. Two-thirds of the young women in this study had partners who were 19 or over at the time of the delivery (Rhein LM et al. 1997). The study by Ekeus also found that fathers of children born to teenage women were more likely than fathers of children born to older women, to have used illegal drugs and to have been prosecuted for a criminal offence. This group were also more likely to have divorced parents and to have had little or no contact with their own father since childhood (Ekeus C & Christensson K2003).

It may be that becoming a teen father is part of wider culture of risk taking behaviour. Spingbarn et al used a validated tool to survey young men about their involvement in risk taking behaviours. This study found that young men who had been involved in a teenage pregnancy were significantly more likely than young men who were sexually active but who had not made anyone pregnant, to have taken illegal drugs, to have drunk alcohol excessively and to have had more sexual partners. These young men were also more likely to be involved in violence and to carry a gun (Spingbarn RW & DuRant RH 1996). A UK based study looking at young men who had fathered a child whilst a teenager, and comparing their behaviour to those who had not become a teen father, found that those men who had fathered a child whilst aged under 20, were significantly more likely to have been involved in illegal activity, to have been absent from school and to have shown aggressive behaviour. These young men were also 11.5 times more likely to have left school at age 16 (Dearden KA, Hale CB & Woolley T 1995).

There have been studies that have reported that after the birth of a child, partners of teenage mothers provide inconsistent financial support to their partners, and rarely or in some cases never see their children (Rivara, Sweeney, & Henderson 1986; Unger DG & Cooley M 1992). However, as reported by Rhein et al, studies exploring the role and involvement of teen fathers often rely on reports given by the mother, and this may not give an accurate picture of the true situation. Rhein et al asked teen mothers and teen fathers about their contact with their children and experience of being a teen parent. This study had several interesting findings. In terms of finding out the young woman was pregnant; the teen fathers were significantly less likely to have reported that they wanted the child, yet less likely to have considered abortion. When asked about the father's involvement with the child, the mothers and fathers gave very different reports. 70% of the mothers stated that the father never fed the child, whereas only 27% of the fathers reported this, and 21% of the mothers reported that the father never provided any financial support, whereas only 4% of fathers reported this to be the case. Conversely, only 33% of the fathers reported that they played with the child at least weekly, whereas 74% of mothers reported this. In addition only 34% of fathers claimed that they dressed the child at least weekly, compared to 65% of the mothers who reported that the father did this task at least weekly. This study also found that the fathers described maternal resistance as a barrier to their involvement with the child, and the mothers reported that paternal disinterest was a barrier to the father of the child being involved in child rearing (Rhein LM et al 1997).

2.13 Intervention Strategies to reduce teenage pregnancy rates

In 1998 the Health Education Authority published an over-view of interventions aimed at the reduction of unintended pregnancies in young people (Swann C1998). The authors concluded that there are several key points that indicate good practice, and these included the integration of clinical and educational services, ensuring that prevention strategies are aimed at vulnerable groups in a way that reflects local needs, and that provision is in place prior to the onset of sexual activity. The authors suggest that some interventions may have failed to show any positive impact due to the timing of the strategy – i.e. too late, and also perhaps because they failed to learn lessons from countries with low rates and did not use adolescents themselves in the design.

School based sex education is mandatory in the UK, though the amount of sex education provided does vary between schools. The impact of sex education on knowledge and behaviour has been studied, and an example is a retrospective study of nearly 20,000 respondents to the national survey of sexual attitudes and lifestyles. This study was undertaken to explore the relationship between sex education and early sexual intercourse, and found that those who had received the majority of their sex education from school, were less likely to have had early sexual intercourse, and more likely to have used contraception at first intercourse (Wellings K et al. 1995).

There have been several other studies that have examined school-based interventions. An example is a large study based in Devon, where the primary aims were to increase secondary school pupils' knowledge of contraception and safe sex practices and also to reduce the level of reported sexual behaviour (Mellanby AR et al 1995). This study evaluated an intervention which consisted of 25 to 30 one hour sessions which were delivered by a multi-disciplinary team, which included a GP, supervised peer leaders and a senior teacher. In terms of attitudinal and knowledge based changes, the pupils in the intervention group were more likely to show a greater knowledge of issues such as emergency contraception, and also scored better on attitudinal questions relating to early sexual intercourse. In terms of behaviour, those in the control group were more likely to have reported that they had had sexual intercourse compared to those who had taken part in the intervention programme. Another study, this time looking at an abstinence promotion programme, found that the effect of a school-based intervention can be greatly enhanced through the involvement of parents. Blake et al evaluated the impact of an intervention where young people either took part in a school-based programme only, or took part in this programme and also had homework that had to be completed with their parents. This study found that post intervention; those who had taken part in the enhanced intervention (the parental involvement arm of the study) were less likely to report intention of having sex and were more positive about refusing sex. They also reported far more communication between themselves and their parents with regard to sex and related issues (Blake SM et al 2001).

The promotion of abstinence is a more controversial strategy, and is more commonly seen in interventions based in the United States. In the US federally funded programmes give no information on sex and contraception, and the funding provided relies on such information being omitted. These programmes have been shown to have some positive effect, though the duration of this effect may be limited. A study by Jermot et al, found that compared to a safe-sex programme, young people in an abstinence only programme were significantly less likely to have had sex three months after the end of intervention period. However, this difference disappeared after this initial period (Jermot JB, Sweet Jermot L, & Fong GT 1998). This does lead to the question of whether these young people were then equipped to make informed choices about contraception, as they had not received any information or advice on this issue in their school-based sex education.

Another study by Lieberman et al compared a control group to young people who had taken part in a four month long abstinence programme. This programme did include some advice on contraception but focused on the message that abstinence was the best choice. This study found that the young people in the intervention group had one year post intervention, better relationships with their parents in terms of communication and respect, and had higher locus of control scores. Crucially though, the young people in the intervention group did not differ in terms of sexual activity. This study actually reported that one-year on; more young people in the intervention group had initiated intercourse, though this difference was small and not statistically significant. There were also similar numbers of pregnancies in both groups one-year post intervention, and similar reported use of condoms (Lieberman LD et al. 2000).

Young people themselves have reported that although abstinence and the importance of relationships are important aspects of interventions and sex education, they are issues that should be discussed along side information about contraception, as at some point most young people will engage in sexual intercourse (Aquilino ML & Bragadottir H 2000). The following quote from a young man who was part of this study, demonstrates this point well:

"...you need to drain your swimming pool, 'cause your children are going to want to swim in it no matter how a high a fence you're going to put around it. They are going to get into it so you might as well teach them to swim."

2.13.1 Measuring the success of intervention strategies

When considering the success or impact of a specific intervention, it is important to consider the outcomes measures that have been adopted. The Devon study for example, showed that the young people in the control group were 1.45 times more likely than those in the intervention group to report that they had had sexual intercourse (Mellanby AR et al 1995). However, this is self-reported behaviour, which has been shown to not necessarily reflect actual behaviour (Eccles M et al. 1999).

Other interventions have used a reduction in pregnancy rate to demonstrate the impact of an intervention. An example is a study based in Nottingham, where a teen specific clinic was set up and then evaluated through an analysis of teenage pregnancy rates pre and post the intervention, and also through a measurement of service uptake. In terms of uptake, the service was a success in that it attracted high numbers of teenagers for services including abortion and pregnancy counselling, and contraception. However, this success was not reflected in a reduction of pregnancy rates (Wilson S et al. 1994). Why interventions like this do not show a reduction in pregnancy rates may be due to the fact that they are not carried out over a long enough period of time. It may also be due to the fact that accessing services for contraception may not necessarily mean that pregnancy is avoided (Churchill D et al 2000).

In 2002, DiCenso and colleagues published a systematic review of interventions aimed at the reduction of unintended pregnancies in adolescents. This study reviewed 26 published and un-published trials, some of which aimed to increase contraception use or reduce sexual activity, and some whose primary outcome measure was a reduction in pregnancy rate. This study concluded that the strategies evaluated did not delay first intercourse or increase likelihood of contraception use, nor did they report a reduction of pregnancy rate. Also in a quality assessment of these strategies, the authors reported that some of those which had reported a positive impact of the intervention, some had not used appropriate units of randomisation, and some had biased data collection (DiCenso A et al 2002). Similar findings were reported by Oakley et al. Who found that in a methodological review of sexual health interventions aimed at young people, many had serious methodological flaws, which impacted upon the interpretation of the findings. The authors found that only 12 of the 73 strategies reported were methodologically sound (Oakley A et al 1995).

2.13.2 The use of mothering dolls in reducing intended pregnancy

Life like mothering dolls (Baby Think It Over dolls – BTIO), that are programmed to cry for food, attention and care were thought to be a good way of introducing teenagers to the difficulties of being a parent. These dolls, which have been purchased in some areas of the UK as part of the current strategy to reduce teen pregnancies, cost £353 and some models can imitate the impact of foetal alcohol syndrome and maternal drug abuse. The manufacturers of this doll claim that over 40,000 have been sold in the US, UK and Australia.

In recent years, BTIO dolls have been used widely on television talk shows and in schools, in an attempt to educate young people about the responsibility of looking after a young child. In Rotherham for example nearly all of the secondary schools involve the BTIO doll in their teaching (Teenage Pregnancy Unit 2004a). The effectiveness of these dolls in reducing teenage pregnancy is unclear, and there have not been any systematic reviews in the UK to determine this. However, what evidence there is, is not consistent. A study in the US aimed to measure the effectiveness of this approach, and gave girls aged 12-15 a mothering doll for a period of three days and two nights. This doll was programmed to cry at random intervals of 15 minutes to 4 hours, 24 hours a day, and could only be placated by a probe attached to the young person's wrist. This study found that young people who had expressed a desire to become a teen parent were not at all deterred through this experience, and had a firmly held belief that their own baby would be easier to look after. The authors describe this as the 'fable of omnipotence' which allows some young people to overlook any negative aspects or potential difficulties (Kralewski J & Stevens-Simon C2000).

Another study, however, found that the doll had a significant impact upon young people, and that young people after looking after the BTIO doll had much more realistic opinions on how difficult it is to look after young children. The young people in this study also had a better understanding of the consequences of teenage pregnancy and had more insight into how having a baby would impact upon their life and their future plans (Didion J & Gatzke H 2004).

2.14 Conclusions and gaps in knowledge

There has been a significant amount of research exploring factors influencing likelihood of teenage pregnancy, and several factors seem to be associated with increased risk. Socio-economic disadvantage is strongly associated with risk of teenage pregnancy (Babb P 2003; Boulton-Jones C & McInnery K 1995; McLeod A 2001; Smith T 1993; Wilson SH, Brown T P & Richards RG 1992), though as reported by Lee et al, this does not account for the total amount of variation in teenage pregnancy rates that has been observed in this country (Lee E et al 2004). How much of this variation, if any, is due to the characteristics of service provision and providers has not been researched. Although teenage girls in particular have expressed a desire to see a female GP for some problems (Churchill R et al 1997, Little L 1997), it is not known whether characteristics such as the sex of GP actually have any impact upon teenage pregnancy rates. This gap in the knowledge will therefore be addressed in this thesis through an analysis of general practice characteristics associated with variations in teenage pregnancy rate.

Research has shown that although some pregnancies are intended in teenagers, the majority are unintended (Henshaw SK 1998; Kiernan K 1995; Kralewski J & Stevens-Simon C 2000), and are reported to be due to contraception failure as well as non-use and inconsistent use of contraception (Pearson VAH et al 1995; Barron SL 1986). Since the majority of teenagers do consult with their GP, and as found by Churchill et al, do consult for contraception prior to pregnancy (Churchill D et al 2000), then there is potentially a role for general practice in preventing unwanted pregnancy in this age group.

How GPs view some key issues relating to teenage health care, such as confidentiality has been researched (Garside R et al 2000), though with small numbers of GPs, and this has not been explored in relation to how it impacts upon pregnancy rate. Therefore this thesis presents the results of a cross sectional survey which explores GPs perceptions and attitudes to key issues including the prescribing of contraception to young people under 16 years and confidentiality, and explores associations between these attitudes and perceptions and pregnancy rate.

Another gap in the knowledge highlighted in this review includes teenagers' experience at delivery. Studies have been contradictory as to teenagers' risk of experiencing assistance at birth, and some studies have suggested that young women aged under 16 are at increased risk of a caesarean delivery (Amini SB et al 1996, Konje JC et al 1992). The impact of place of treatment and socio-economic status has not been examined in relation to this age group, and so this issue is explored using data for all teenage pregnancies in Trent that occurred within a three-year period.

CHAPTER 3 TEENAGE PREGNANCY IN TRENT.

This chapter describes the incidence of teenage pregnancy in the former Trent region for the period 01/04/1994 to 31/03/1997. Data for deliveries, abortive outcomes, and miscarriages are presented by health authority area. The issues of age and deprivation status are explored in terms of their relationship with the outcome of pregnancy. This chapter also includes a description of how the pregnancy data used here for descriptive purposes, and also in chapters 6 to10 as part of the practice characteristics and survey analyses, were collected and validated.

The data collected pertaining to teenage pregnancies also included data relating to mode of delivery. This was collected to further explore young women's experience of delivery, and to determine whether factors such as age at delivery, place of treatment and deprivation status, had any association with risk of experiencing an assisted delivery (either a caesarean section or a vaginally assisted delivery, for example a forceps delivery). This analysis aimed to identify risk factors and also to address conflicting previous research, which has either identified younger teenagers (those aged under 16 at delivery) as being at increased risk of intervention at delivery, or as having better outcomes in terms of intervention compared to older women. The key findings of this analysis were published in The International Journal of Adolescent Medicine and Health in 2003 (see appendix 7).

The overall aim of this chapter is to:

- Describe the incidence of teenage pregnancy in the former Trent region during the study period of 1994-1997.

The objectives are:

- To describe the collection of the data relating to teenage pregnancies in Trent
- To report numbers of teenage pregnancies to women aged under 20 years, living in the Trent region during the period 1994-1997
- To report the outcomes (i.e. maternities, and abortive outcomes) of teenage pregnancies

- To identify any association between age and the outcome of pregnancy
- To identify any association between deprivation status and the outcome of pregnancy
- To describe the experience of delivery for teenagers in Trent, specifically to identify factors associated with risk of assisted delivery.

3.1 Background:

3.1.1 The study area: Trent Region

Due to the re-structuring of the NHS in 2000, Trent as a region no longer exists. Before this re-structuring, England and Wales were made up of 8 health regions, which were themselves made up of health authority areas. Trent Region was in mid England and had a total population of 5.1 million. The region comprised of 11 health authorities, with a total of 2,740 General Practitioners (NHS Executive Trent 2001).

Currently, Strategic Health Authorities are responsible for the performance management of all Trusts within their geographical area. Whereas Trent covered 11 health authorities, the Trent strategic health authority is currently responsible for Trusts within Nottinghamshire, Lincolnshire and Derbyshire. Areas that were previously in North Trent, such as Sheffield are now part of the South Yorkshire strategic health authority, and Leicester is part of the Leicestershire, Northamptonshire and Rutland strategic health authority. However, as the data reported in this thesis were collected prior to this re-structuring, data is presented both for the former Trent region as a whole and also by the health authority areas that were until recently, part of this region.

As the data collection period was 1994-1997, data for pregnancies and also general practice characteristics were not collected for the South Humber health authority area. This is because this area was not part of the former Trent region at the start of the study period (1994).

3.2 Health Authority areas of interest

In chapters 6 to 10 and in some elements of chapter 5, the data presented is specific to four Health Authority areas. These are Barnsley, Doncaster, Lincolnshire and Sheffield. These areas were chosen to represent areas with high (Barnsley and Doncaster), moderate (Sheffield) and low (Lincolnshire) teenage pregnancy rates. Barnsley and Doncaster were combined as they are significantly smaller than the other areas, but were similar to each other in terms of deprivation status; pregnancy rate and population (see Table 3).

Table 3. Rankings of Health Authority Areas in Trent for conceptions for women aged under 16 years

Health Authority Area	Population of 12-16yr olds*	Townsend score**	No of conceptions at ages 11-15	Rate per 1000 women aged 11-15	Rank (1=highest 10=lowest)
Barnsley	13,500	3.86	165	14.3	1
Doncaster	18,500	3.28	226	13.6	3
Nottingham	42,500	0.72	397	11.9	4
Rotherham	16,000	2.63	171	11.7	5
Sheffield	34,750	4.81	276	10.9	6
North Nottingham	23,500	-1.92	223	10.1	7
South Derbyshire	34,500	-1.18	296	10.1	7
North Derbyshire	21,000	-1.18	179	9.4	8
Lincolnshire	35,750	-4.54	270	8.2	9
Leicestershire	63,000	-2.98	399	7.7	10
TRENT	**303,000**		**2864**	**10.4**	**3*** **

Source: Department of Health. Public Health Common Data Set 1998. National Centre for Health Outcomes Development.
*Derived from 1991 census data
**Derived from ONS mid 1996 estimates
*** Trent ranked 3 of 8 Regional Offices in England

3.3 Characteristics of health authority areas

In order to describe the areas focused upon in chapters 5 and 6, health profiles for the year 2001 were collected for each of the four health authority areas (NHS Executive Trent 2001). These are published by the NHS and include information on the social and health characteristics of the population. The data included in each profile is collected from the Centre for Public Health Monitoring (London School of Hygiene and Tropical Medicine) and the Office for National Statistics (ONS).

As part of each health profile, information on teenage conception rates, and also targets for reductions in rates are given. This data is expressed differently from data, which precedes the publication of the Social Exclusion Report in 1999. Before this date, teenage conception rates were given for women aged under 16 years of age, and also for women aged 16-19 years. The government strategy outlined in the Social Exclusion report is aimed at women aged under 18 years of age. Hence more recent figures, including those in the health profiles, report rates for this age group.

3.3.1 Characteristics of the Doncaster health authority area

Doncaster lies in South Yorkshire and has a total population of 289,897 (ONS mid-year estimates 1999). Doncaster was once a mining area, but since the decline of the mining industry, employment now comes mainly from retail and textile manufacturing. Deprivation rankings show that out of 354 local authorities, Doncaster ranks 36th. The most deprived ward is Coninsbrough, which ranks 274 out of 8414 wards in England. Table 3 gives conception rates for young women aged under 16 years, and shows Doncaster as having a rate of 13.6 per 1000 women. This is significantly higher than the average for England and Wales for the same period, which is 8.8 per 1000 women. Figures for under 18's for the years 1997-1999 show that Doncaster had a conception rate of 69 per 1000 women. This again, is significantly higher than the rate for England and Wales (46 per 1000), and also the overall rate for the Trent region, which in 2000 stood at 51 per 1000 women.

When ranked in terms of teenage conceptions, Doncaster is placed 97th of 99 health authorities in England and Wales (with the health authority ranked 99th having the highest conception rate). However, in line with the targets set by the present Government, local conception rates need to be reduced by 55% by the year 2010, and an interim milestone of 15% has been set for the year 2004.

3.3.2 Characteristics of the Barnsley health authority area

Barnsley has a population of 228,158 was also an area classified by the ONS as a mining and industrial area, though as with Doncaster, mining has all but ceased in recent years and now manufacturing is the main source of employment.

Manual workers form a large part of the workforce in Barnsley, and over 60% of the population are manual workers and their families. The long-term unemployment rate in Barnsley is 21.3%, which is very slightly lower than the overall rate for the UK which in 2001 was 22.1%. In terms of deprivation, Barnsley is in the top 20 of the most deprived local authorities in England, and within Barnsley there are electoral wards that also rank highly for the country as a whole. Dearne Thurscoe for example, ranks 94th out of 8414 wards in England.

Barnsley, according to data for 2001, has the second highest (second only to Doncaster) conception rate for women aged under 18. This rate of 61.2 per 1000 women for women aged 15-17 is higher than the overall rate for Trent (51 per 1000 women) and for England and Wales (46 per 1000 women).

3.3.3 Characteristics of Sheffield health authority area

Sheffield is an ex-steel manufacturing city, and has a total population of 530,649 (ONS 1999 mid-year estimates). Sheffield lies in South Yorkshire, which during the study period was in northern Trent. Within Sheffield there are areas that are very deprived (Southey Green for example, ranks 43 out of 8414 wards in England), but also areas of considerable wealth. Areas like Fulwood have amongst the highest proportion of professional workers in England and Wales. Long-term unemployment in Sheffield in 2000 was 25.1%, which in this period was the highest in the Trent region.

In this area, the teenage conception rate in 2001, for young women aged under 18 years of age was 54 per 1000 women, which again, is higher than the overall national average of 46 per 1000 women and also higher than the overall rate for Trent (51 per 1000 women). In terms of rankings for teenage conceptions, Sheffield is ranked 75th of the 99 health authority areas in England and Wales.

3.3.4 Characteristics of the Lincolnshire health authority area

In contrast to Sheffield, Doncaster and Barnsley, Lincolnshire is a predominantly rural area, with a total population of 628,612 (ONS 1999 mid-year estimates). In terms of employment, although there is some light industry in this area, agriculture and the tourism industry account for the largest proportion of employment. Long term unemployment across this area varies from 19.6% in Lincoln to 9.8% in East Lindsay. Lincolnshire is a large geographical area and covers areas of affluence and relative socio-economic disadvantage. The local authority area of East Lindsay area for example is ranked 78th of the total 354 authorities in England, whereas North Kesteven is ranked 231st of 354.

The conception rate for Lincolnshire is lower than the national average of 46 per 1000 women. The rate for the Lincolnshire health authority area in 2001 was 45 per 1000 women, though within North Lincolnshire and North East Lincolnshire, the rates were significantly higher (53 and 72 per 1000 women respectively).

3.4 Method

3.4.1 Ethical approval

Ethical approval for the collection of pregnancy and general practice characteristics data was obtained from the Trent Multi-Centre Research Ethics Committee (MRE C) and from the relevant Local Research Ethics Committees prior to data collection in 1997 (MREC approval reference: Trent 98FEB012).

3.4.2 Identifying pregnancies in Trent

The teenage pregnancy data used in all analyses within this thesis were collected from the Trent hospitals admissions database in 1997. This database held information for all hospital-based episodes, for patients who lived within Trent, including episodes for women resident in Trent but treated in hospitals from outside of the region.

The individual cases were identified using International Statistical Classification of Diseases and Related Health Problems diagnostic codes (ICD codes versions 9 & 10) and Office of Population, Censuses and Surveys - Classification of Surgical Operations and Procedure codes (OPCS) for conceptions resulting in a delivery or an abortive outcome. The individual codes used to identify all pregnancies were selected under the guidance of a Consultant Obstetrician and Gynaecologist based at a large teaching hospital in the former Trent region. The codes were also discussed with Clinical Coders who worked in the same large trust.

Once permission to access the hospitals admissions database had been granted from the Trent regional office, the Researcher was given training by the officer responsible for the development and maintenance of the database, to ensure that the retrieval process was correct and did not exclude any potential cases. The data were collected in Microsoft Access format, and then removed from the regional office, with patient identifiable characteristics removed, in this electronic format.

3.4.3 Eligibility criteria

The codes used to identify deliveries and abortive outcomes were (see appendix 1 for full description of codes):

- International Statistical Classification of Diseases and Related Health Problems diagnostic codes version 9: 630 to 639.9; 660 to 669.9; 650 to 652.9.
- International Statistical Classification of Diseases and Related Health Problems diagnostic codes version 10: O00 to O08.9; O60 to O75.9; O80 to O84.9.
- Office of Population, Censuses and Surveys - Classification of Surgical Operations and Procedure codes: Q09.1; Q10.1; Q10.2; Q11; Q14; Q31.1; R03; R14.

Cases were eligible for inclusion if they were 19 or under at the time of the hospital admission, during the time period of 01/04/1994 to 31/03/1997. This means that the data presented in this thesis are for admissions to women aged under 20 as opposed to conceptions to young women aged under 20. Eligible cases also had to be registered with a GP from within the Trent region (for the purposes of the analyses presented in chapters 5 and 6). To determine the patient's general practice, the referring GP code was extracted from the hospitals admissions database and then linked with individual practice codes. Those patients who were from the South Humber area were not selected, as South Humber was not part of the Trent region at the beginning of the study period (1994).

Eligible cases were coded as either having had an abortive outcome (either a miscarriage or a termination of pregnancy or other abortive outcome, for example ectopic pregnancy) or a delivery. As it was possible that more than one admission could occur for each case's delivery or abortive outcome, the data file was searched to identify any further admissions, which occurred within six weeks of the index admission. If such an admission was found, it was deleted from the data-file.

3.4.4 Data extracted for each case

The following data were collected for women who fitted the eligibility criteria:

- Age at admission
- Year of admission
- District Health Authority (of the patient)
- Referring GP code
- Place of treatment (hospital)
- Diagnosis code
- Procedural Code
- Patient's electoral ward

The following variables were also computed from those extracted from the database:

- Outcome of pregnancy (abortive or maternity)
- Primary diagnosis (using ICD codes and OPCS codes)
- Townsend Score of deprivation associated with the patient's electoral ward
- Age at admission category (aged under or over 16 at admission)

3.4.5 Deprivation score

Townsend Score of deprivation was used as a measure of material disadvantage (Townsend P, Phillimore P, & Beattie A 1988). This score has been widely used in health and social research (Hippisley-Cox et al. 2001; Whitley E et al. 1999), and is calculated according to the following variables, extracted from the Census:

- Percentage of private households with more than one person per room (a measure of overcrowding)
- Percentage of economically active residents aged 16-64 who are unemployed
- Percentage of private households who do not possess a car
- Percentage of private households which are not owner-occupied

This measure of deprivation is not the only one used in health research, the Carstairs Index for example is also widely used, and is very similar to Townsend score as it uses similar variables, again extracted from the census (Carstairs V 1991). This measure differs in that it uses proportions of heads of households who are in social classes IV or V, and the proportion of male heads of households who are unemployed. Townsend score was chosen over the Carstairs index, because weighted general practice Townsend score was available from most of the health authorities at the time of data collection. In addition, using a score that is widely used in other research, helps with the comparability of findings.

3.4.6 Missing Data

The data-file extracted from the hospitals admissions database, was examined to highlight any missing data. There were no missing cases for all variables with the exception of age at admission, where there were a total of 26 (0.14%) missing cases.

3.5 Validation of the pregnancy data file

3.5.1 Completeness of the data

To determine the completeness and accuracy of the data-file, the number of terminations of pregnancies (TOPs) performed within Trent by the NHS for one whole year (1995), which had been identified on the hospital admissions database, were compared to the number reported by the Office for National Statistics (ONS) for the same period. The ONS figures showed that there were 2473 terminations performed for young women aged 13-19 years, compared to 2013 identified in the NHS data-file. This represents 81.4% of the cases reported by the ONS. However, ONS figures include terminations that have been done in the private and charity sectors. Data for private terminations of pregnancy were requested from private hospitals and also from the British Pregnancy Advisory Service (BPAS). The majority of hospitals were not willing to provide this data, and the data provided by the BPAS were presented as whole numbers for patients within the health authority areas in Trent, rather than on an individual case basis.

However, in an effort to estimate the completeness of the data for one health authority area (Nottingham), the numbers of NHS funded terminations done in hospitals within

Nottingham, were compared with the numbers of private terminations done in one private hospital in Nottingham. A total of 42 private terminations were carried out for women aged 13-19, compared to 361 performed in NHS hospitals in Nottingham. This number of private terminations of pregnancy is an underestimation as it does not take into account procedures done in other private hospitals both in and out of the health authority area for women residing in Nottingham. However, it does suggest that at least, or more than, 11.6% of the shortfall within the data-file, is due to terminations done within the private sector. This, in conjunction with data produced by the ONS for 1995, which states that for all women aged under 20, 17.9% of terminations of pregnancy are done by the private or charity sectors, led to the conclusion that the data-file, at least in terms of NHS terminations of pregnancy, was complete.

The completeness of the delivery data was determined through a comparison with the number of births published by the Office for National Statistics (ONS). In 1996, the Office for National Statistics reported that there were 4928 live births to women aged under 20 years whose usual residence was within the Trent region. This compares to 3414 births identified from the data-set collected from the Trent hospitals admission database. This represents 69.3% of the cases reported by the ONS. This difference is likely to be due at least in part to differences in the respective data collection processes. ONS birth data is collected through registration of births, according to the woman's usual place of residence, whereas the data presented in this thesis were collected according to hospital admission episodes. In addition, the data presented in this thesis are pregnancies where the patient was registered with a GP from within the Trent region. This omits any women that were resident in Trent, but registered with a GP from outside of the boundaries of Trent. However, this number is likely to be small, and may not explain the 30% shortfall. A larger shortfall would also have been seen in the data for terminations of pregnancy if this were the case.

It is possible that the diagnosis and procedural codes used to identify cases did not include all those related to pregnancy. However, the list of codes used for this purpose was developed in conjunction with a Consultant Obstetrician from a large teaching hospital in Trent, and also with advice from clinical coding staff from the same hospital, who advised that the codes were appropriate for the identification of all pregnancies.

3.5.2 Reliability of the data

The eligible cases were identified using codes assigned by hospital clinical coding staff. To test the reproducibility of the coding relating to the data, a clinical coder from one hospital within Trent was asked to re-code 50 sets of notes for patients who were included in the data-file. This process was organised by a Consultant Obstetrician & Gynaecologist, who agreed to identify 50 of her patients who had had a delivery or an abortive outcome during the study period. This sample represented a one in ten sample of her case-load for that time period. The clinical coder (who had not been responsible for the original coding) then assigned a code and 98% of those fell within the same categories of a pregnancy leading to an abortive outcome or a delivery.

3.6 Statistical method

The data presented in this section, is largely descriptive and gives whole numbers and percentages for outcomes by age and area. Associations between categorical variables are described using chi-square tests (with relative risk estimates) and logistic regression has been used for data with dichotomous outcomes. The independent samples t test has been used to identify any differences between mean values.

The chi-square test is used to identify associations between categorical data, and the assumptions of this test are that the measures are independent (i.e. a case cannot appear in more than one cell) and that the data is frequency data. Sample size is also an issue with this test, as expected frequency for two by two tables, in each cell, must be greater than five. In larger tables however, cells with an expected frequency of less than five are less problematic, it is only if more than 20% of the cells have this expected frequency, that action should be taken to group subjects into a smaller number of categories. If however, the expected frequency of a two by two table is below five, then this statistical technique can still be utilised, but in this case the Fisher's exact test is more appropriate (Hazard Munro B 2001; Swinscow TDV 1996).

Logistic regression analysis is used to model a binary dependent variable and determines which variables have an effect upon the outcome. It examines associations between this dependent variable, and independent variables, which can be categorical,

binary or continuous. The assumptions for logistic regression are that the cases are independent and that the data is not over dispersed (Campbell MJ 2001).
The results of this analysis include odds ratios, which present the probability of occurrence over the probability of non-occurrence. Odds ratios add to the interpretability of the data, as for example an odds ratio of three can be easily interpreted as three times the risk of an occurrence. It is important to note however that odds ratios are different from relative risk estimates, which are also reported in this chapter. Relative risk is described by Munro as the risk given one condition versus the risk given another condition. Munro goes on to describe how odds ratios produced by the logistic regression procedure, often over estimate risk, especially if the occurrence of an event is not rare (Hazard Munro B 2001).

The independent samples t test identifies any difference between the means of two samples, for example the difference between Townsend scores for women aged under and over 16 years of age. This test has three underlying assumptions, these being that the data are normally distributed, that the observations are independent and that the two samples may differ in terms of their mean value, but do not differ in terms of their standard deviations (Swinscow TDV1996).

3.7 Results

3.7.1 Teenage pregnancies in Trent

In the three-year study period, there were a total of 18692 eligible cases identified from the hospital admissions database. Of these a total of 957 (5.1%) were to women aged under 16 years, and this ranged from 4.8% of pregnancies in South Derbyshire to 6.1% in North Derbyshire (see Table 5). There was no association between health authority area and age at conception, i.e. there were not significantly more pregnancies to women aged under or over 16 in any one health authority area (OR 1.01 95% CI 0.99 to 1.04, P=0.27).

Table 4 presents conception rates for women by age and health authority area for the year 1995 (the data here is presented for a single year to allow for the calculation of conception rates, using Office for National Statistics population data). The total number of women aged 13-19 for each health authority area was provided by the department of Population Statistics within the Office for National Statistics. The conception rate overall for Trent in this year for women aged 13-19 was 30.7 per 1000 women. The highest rates, in line with data published by the ONS were for Barnsley (42.7 per 1000 women) and Doncaster (49.2 per 1000 women). For women aged 13-15 years, the overall rate for Trent was 3.8 per 1000 women, and the highest rate in this age group was reported for Nottingham, which had a rate of 5.8 per 1000 women.

Table 4 Number of conceptions, and conception rates by health authority area for 1995.

Health authority area	*Number of women aged 13-19 years	Total no . Of conceptions to women aged 13-19	Conception rate for women aged 13-19	Number of women aged 13-15	No. of conceptions to women aged 13-15	Conception rate for women aged 13-15	Number of women aged 16-19	No. of conceptions to women aged 16-19	Conception rate for women aged 16-19	Rank
Barnsley	8127	347	42.7	3811	19	5.0	4316	328	76.0	2
Doncaster	11439	563	49.2	5606	29	5.2	5833	563	96.5	1
Nottingham	25897	1001	38.7	11051	64	5.8	14846	936	63.0	3
Rotherham	10197	374	36.7	4922	27	5.5	5275	347	65.8	4
Sheffield	20609	741	35.9	8441	41	4.9	12160	699	57.5	5
South Derbyshire	21714	435	20.0	9872	22	2.2	11842	413	34.9	9
North Nottingham	15825	539	34.1	7537	20	2.7	8288	519	62.6	6
North Derbyshire	13656	373	27.3	6379	22	3.4	7277	349	48.0	8
Lincolnshire	23366	650	27.8	11072	42	3.8	12294	607	49.4	7
Leicestershire	39781	832	20.9	17322	39	2.3	22459	791	35.2	10
Total	190611	5855	30.7	86013	325	3.8	104590	5552	53.1	

* Source: ONS department of Population Information: Estimated resident population mid 1995 based on the 1991 census. Age missing for 6 cases.

Table 5 Number of conceptions by health authority Area 1994-1997

Health Authority Area	No. (%) of conceptions to women aged 13-15	No. (%) of conceptions to women aged 16-19	Total no (%). Of conceptions to women aged 13-19
Barnsley	56 (5.5)	955 (94.5)	1011 (100)
Doncaster	96 (5.3)	1699 (94.7)	1795 (100)
Nottingham	158 (5.1)	2952 (94.8)	3111 (99.9)
Rotherham	65 (5.6)	1088 (94.3)	1153 (99.9)
Sheffield	116 (4.9)	2268 (95.0)	2385 (99.9)
South Derbyshire	66 (4.8)	1311 (95.1)	1377 (99.9)
North Nottingham	87 (5.0)	1641 (95.0)	1728 (100)
North Derbyshire	68 (6.1)	1047 (93.7)	1115 (99.8)
Lincolnshire	115 (5.7)	1912 (94.0)	2027 (99.7)
Leicestershire	128 (5.7)	2836 (94.0)	2964 (99.7)
Total	957 (5.1)	17709 (94.9)	18666 (99.9)*

*Variable of age missing for 26 cases

3.7.2 Outcome of pregnancy

Of the total number of 18692 cases identified, a total of 10554 (56.5%) resulted in a delivery, and 7092 (37.9%) had an abortive outcome. In addition, 1046 cases (5.6%), were coded as having a miscarriage. These outcomes were determined through the use of diagnosis and procedural codes (ICD 9 and ICD 10, and OPCS codes) associated with delivery, abortive outcome or miscarriage. Outcome by age and type is presented in Table 6 and figure 1, and outcomes by type and area are given in Table 7 and Figure 2.

Age at admission was significantly associated with the outcome of pregnancy, with 74.6% of pregnancies to women aged under 16 leading to an abortive outcome, compared to 38.4% of pregnancies to women aged 16-19 years (X^2 =470.3 df=1 P<0.001, RR 4.7 95%CI 4.1 to 5.5).

3.7.3 Deliveries.

Of the 10554 cases identified as being a delivery, age at admission was available for 10528 (99.8%) cases. Overall, 2.2% of deliveries were to women aged under 16. The numbers of abortive outcomes and deliveries are presented in Table 6, and this illustrates how, with increasing age, the number of deliveries compared to abortive outcomes also increases.

Of the 10554 deliveries, 199 (1.9%) were coded as being pre-term deliveries, and 13 (0.1%) were multiple deliveries. Other complications according to diagnosis codes included, long labour (803 cases, 7.6%), labour complicated by foetal distress (1251 cases, 11.9%) and postpartum haemorrhage (66 cases, 0.6%).
More information relating to mode of delivery is provided in section 3.5, though a total of 1343 (12.7%) of women experienced a forceps or ventouse extraction, and a further 987 women had a caesarean section, 762 (77.2%) of which were emergency caesareans.

3.7.4 Abortive outcomes

Table 8 presents the numbers of abortive outcomes, maternities and miscarriages by health authority area. As shown in table 6, a total of 7092 cases were identified as having an abortive outcome, and of these 9.5% (677) were to women aged under 16. For women aged 16-19, 36.2% (6415) of cases ended with an abortive outcome. As shown in Table 6 and Figure 1, the percentage of abortive outcomes decreases with age, with 100% of pregnancies to young women aged 12 resulting in an abortive outcome, compared to 30.4% for women aged 19 years.

Abortive outcomes as shown in Table 7, included ectopic pregnancies, hydatidiform moles and other abnormal products of conception. The majority of abortive outcomes were those coded as a medical abortion (termination of pregnancy, 6269, 88%).Ectopic pregnancies accounted for 72 (1.0%) of abortive outcomes and 71 of these (98.6%) were to women aged 16 and over.

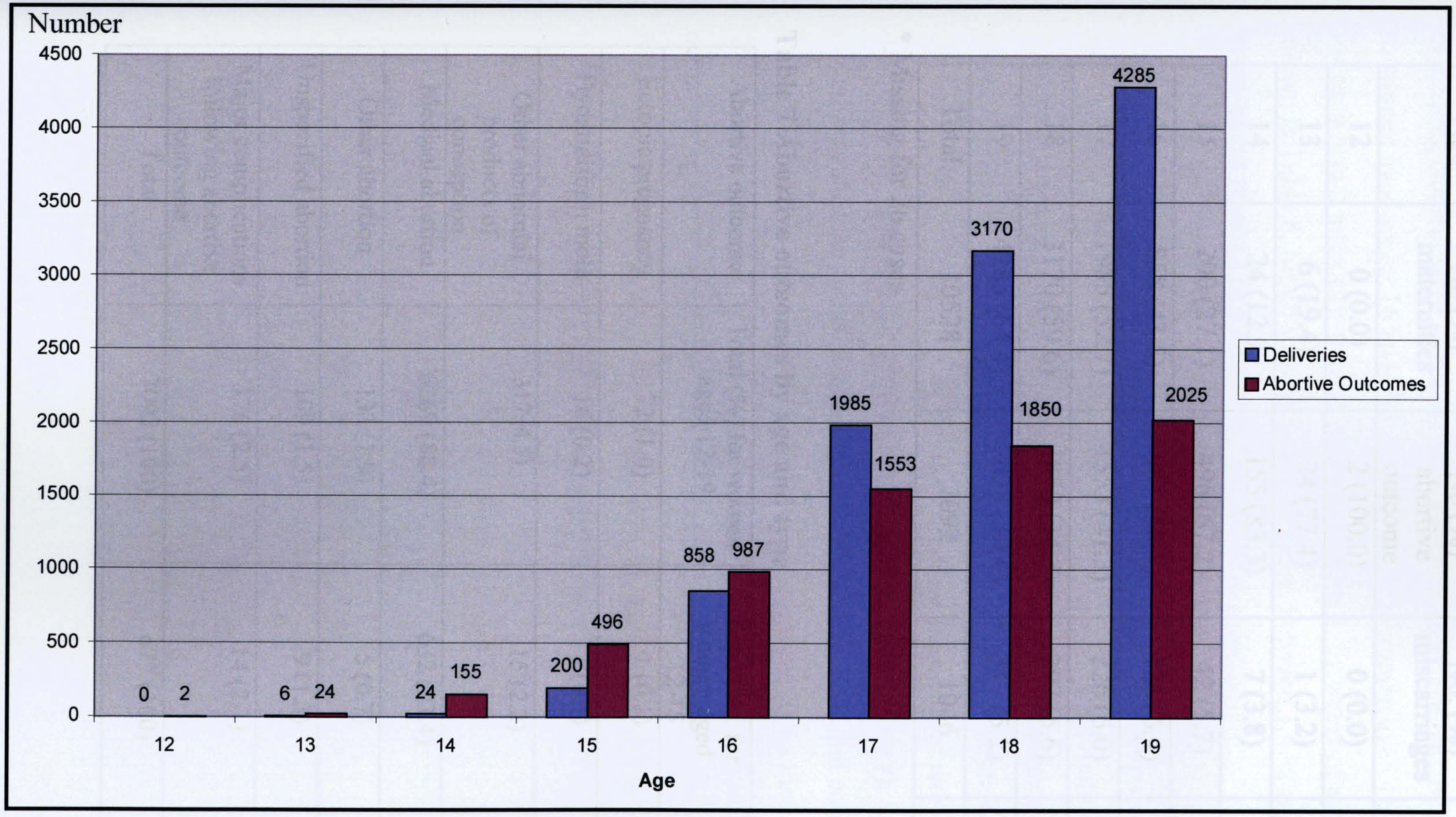


Figure 1. Numbers of deliveries and abortive outcomes by age for 1994-1997

Table 6 Abortive outcomes, deliveries and miscarriages by age 1994-1997

*Age	No (%) maternities	No (%) abortive outcome	No. (%) miscarriages	Total (%)
12	0 (0.0)	2 (100.0)	0 (0.0)	2 (100.0)
13	6 (19.4)	24 (77.4)	1 (3.2)	31 (100.0)
14	24 (12.9)	155 (83.3)	7 (3.8)	186 (100.0)
15	200 (27.1)	496 (67.2)	42 (5.7)	738 (100.0)
16	858 (43.5)	987 (50.1)	126 (6.4)	1971 (100.0)
17	1985 (52.7)	1553 (41.3)	226 (6.0)	3764 (100.0)
18	3170 (59.6)	1850 (34.8)	297 (5.6)	5317 (100.0)
19	4285 (64.4)	2025 (30.4)	347 (5.2)	6657 (100.0)
Total	10528	7092	1046	18666

* Missing for 26 cases

Table 7 Abortive outcomes by age and type

Abortive outcome	Total (%) for women aged 12-19	Total (%) for women aged 12-15	Total (%) for women aged 16-19
Ectopic pregnancy	72 (1.0)	1 (0.1)	71 (1.1)
Hydatidiform mole	16 (0.2)	1 (0.1)	15 (0.2)
Other abnormal products of conception	317 (4.5)	15 (2.2)	302 (4.7)
Medical abortion	6269 (88.4)	632 (93.4)	5637 (87.9)
Other abortion	133 (1.9)	5 (0.7)	128 (2.0)
Unspecified abortion	109 (1.5)	9 (1.3)	100 (1.6)
Major complications following abortive outcome	176 (2.5)	14 (2.1)	162 (2.5)
Total	7092 (100)	677 (100)	6415 (100)

3.7.5 Miscarriages

Miscarriages were identified from the data-file as cases that had been coded as a spontaneous abortion according to primary diagnosis code. A total of 1046 cases (5.6% of all pregnancies) were identified as having a miscarriage, and of these 50 (4.8%) were to women aged under 16 and 996 (95.2%) were to women aged 16 –19 years. Figures for each health authority area are shown in Table 8. In terms of age at admission, as shown in Table 8, for all women under 20 years, between 1.4 % and 8.8% of pregnancies resulted in a miscarriage.

Data pertaining to miscarriages is not included in the analyses presented in chapters 5 and 6 as the number of miscarriages is a significant underestimation of the true figure. Not all miscarriages result in a hospital admission, and it has been estimated that at least 25% of miscarriages occur at home and do not lead to admission to hospital (Everett C 1997). However, in terms of the characteristics of women who experienced a miscarriage compared to other outcomes (abortive or delivery), these women were more likely to have come from areas classified as deprived, but were not more likely to be aged under 16 years. Women who had a miscarriage had a mean Townsend score of 2.93 (standard deviation 3.45) compared to a mean Townsend score of 2.68 (standard deviation of 3.60) for women who experienced other outcomes (t=-2.15 df 18690 P=0.03). In terms of age, 5.5% of conceptions to women aged under 16 years resulted in a miscarriage, compared to 5.9% in women aged 16-19 years (χ^2 =0.27 df=1 P=0.60).

Table 8. Number of abortive outcomes, deliveries and miscarriages by health authority area 1994-1997

Total No of conceptions by health authority area	Total No. (%) Abortive outcomes for women aged 12-19	No. (%) Of abortive outcomes for women aged 12-15	No. (%) Of abortive outcomes for women aged 16-19	Total No. (%) Of deliveries for women aged 12-19	No. (%) Of deliveries for women aged 12-15	No. (%) of deliveries for women aged 16-19	Total No. (%) of miscarriages for women aged 12-19	No. (%) of miscarriages for women aged 12-15	No. (%) of miscarriage for women aged 16-19
Barnsley N= 1011	283 (28.0)	37 (13.1)	246 (86.9)	639 (63.2)	17 (2.7)	622 (97.3)	89 (8.8)	2 (2.2)	87 (97.8)
Doncaster N=1795	612 (34.1)	69 (11.3)	543 (88.7)	1061 (59.1)	20 (1.9)	1041(98.1)	122 (6.8)	7 (5.7)	115 (94.3)
Nottingham N=3114	1237 (39.7)	112 (9.1)	1125 (90.9)	1700 (54.6)	38 (2.2)	1659 (97.6)	177 (5.7)	9 (5.1)	168 (94.9)
Rotherham N=1154	456 (39.5)	56 (12.3)	400 (87.7)	682 (59.1)	9 (1.3)	672 (98.5)	16 (1.4)	0 (0.0)	16 (100.0)
Sheffield N=2387	1043 (43.7)	88 (8.4)	955 (91.6)	1252 (52.5)	25 (2.0)	1225 (97.8)	92 (3.9)	4 (4.3)	88 (95.7)
S. Derbyshire N= 1378	569 (41.3)	38 (6.7)	531 (93.3)	737 (53.5)	24 (3.3)	712 (96.6)	72 (5.2)	4 (5.6)	68 (94.4)
N.Nottingham N=1728	563 (32.6)	52 (9.2)	511 (90.8)	1077 (62.3)	28 (2.6)	1049 (97.4)	88 (5.1)	7 (8.0)	81 (92.0)
N. Derbyshire N=1118	458 (41.0)	60 (13.1)	398 (86.9)	593 (53.0)	7 (1.2)	583 (98.3)	67 (6.0)	1 (1.5)	66 (98.5)
Lincolnshire N=2033	752 (37.0)	81(10.8)	671 (89.2)	1129 (55.5)	25 (2.2)	1098 (97.3)	152 (7.5)	9 (5.9)	143 (94.1)
Leicestershire N=2974	1119 (37.6)	84 (7.5)	1035 (92.5)	1684 (56.6)	37 (2.2)	1637 (97.2)	171 (5.7)	7 (4.1)	164 (95.9)
Total N=18692	7092 (37.9)	677 (9.5)	6415 (90.5)	10554 (56.5)	230 (2.2)	10298 (97.6)	1046 (5.6)	50 (4.8)	996 (95.2)

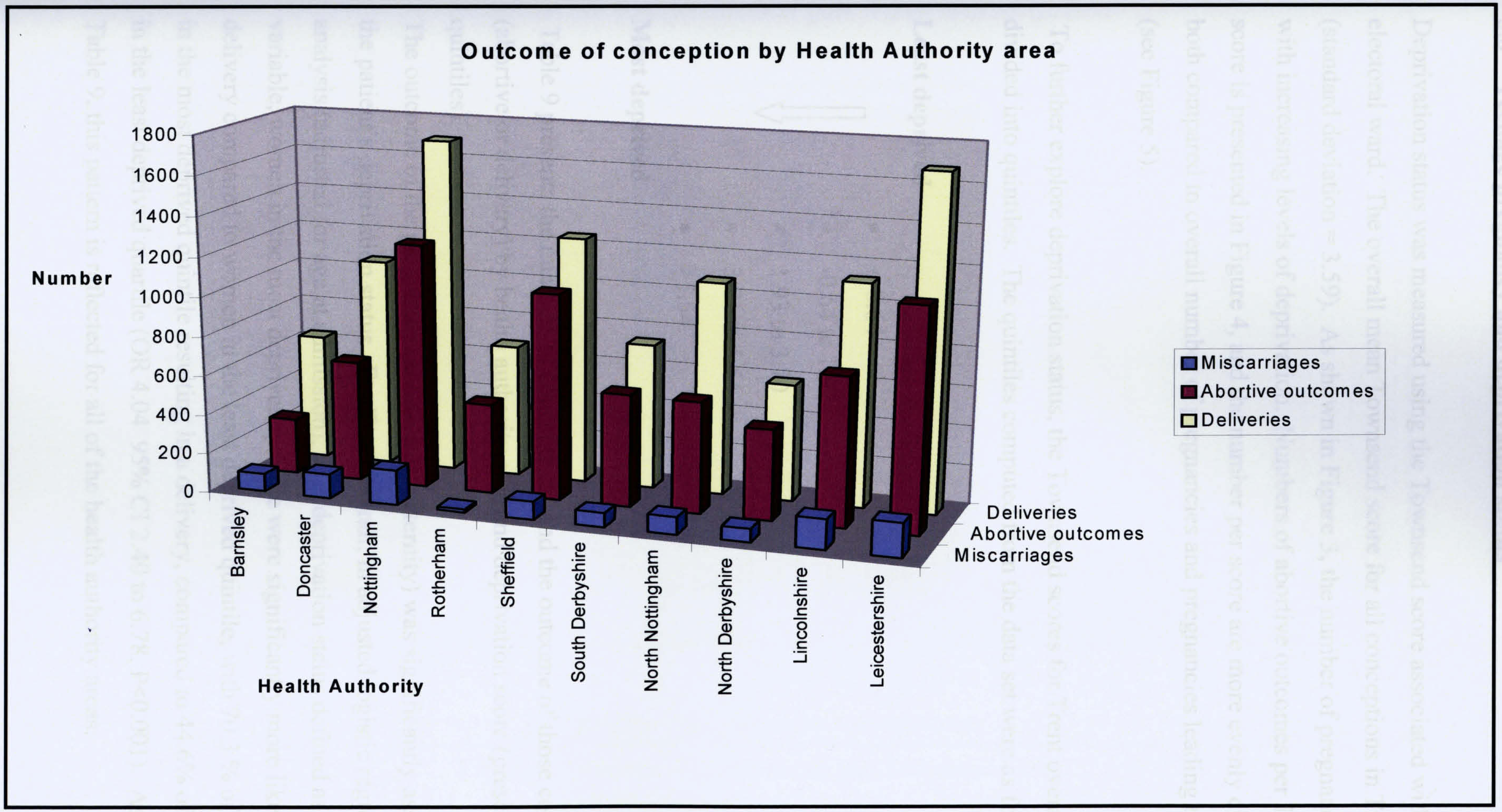


Figure 2. Outcome by health authority area.

3.8 Teenage pregnancy and deprivation status

Deprivation status was measured using the Townsend score associated with the patient's electoral ward. The overall mean Townsend score for all conceptions in Trent was 2.70 (standard deviation = 3.59). As shown in Figure 3, the number of pregnancies increases with increasing levels of deprivation. Numbers of abortive outcomes per Townsend score is presented in Figure 4, and the number per score are more evenly distributed, both compared to overall number of pregnancies and pregnancies leading to a delivery (see Figure 5).

To further explore deprivation status, the Townsend scores for Trent overall were divided into quintiles. The quintiles computed from the data set were as follows:

Least deprived

- <-0.64
- -0.64 to 1.92
- 1.93 to 3.70
- 3.71 to 5.54
- >5.54

Most deprived

Table 9 presents the numbers of conceptions, and the outcome of those conceptions (abortive or delivery) by health authority area and deprivation score (presented in quintiles).

The outcome of the pregnancy (abortive or maternity) was significantly associated with the patient's deprivation status. For Trent overall, in adjusted logistic regression analysis (adjusted for age at admission), with deprivation status defined as a categorical variable, women in the most deprived quintile were significantly more likely to have a delivery compared to women in the least deprived quintile, with 70.3 % of conceptions in the most deprived quintile resulting in a delivery, compared to 44.6% of conceptions in the least deprived quartile (OR 4.04 95% CI 2.40 to 6.78, P<0.001). As shown in Table 9, this pattern is reflected for all of the health authority areas.

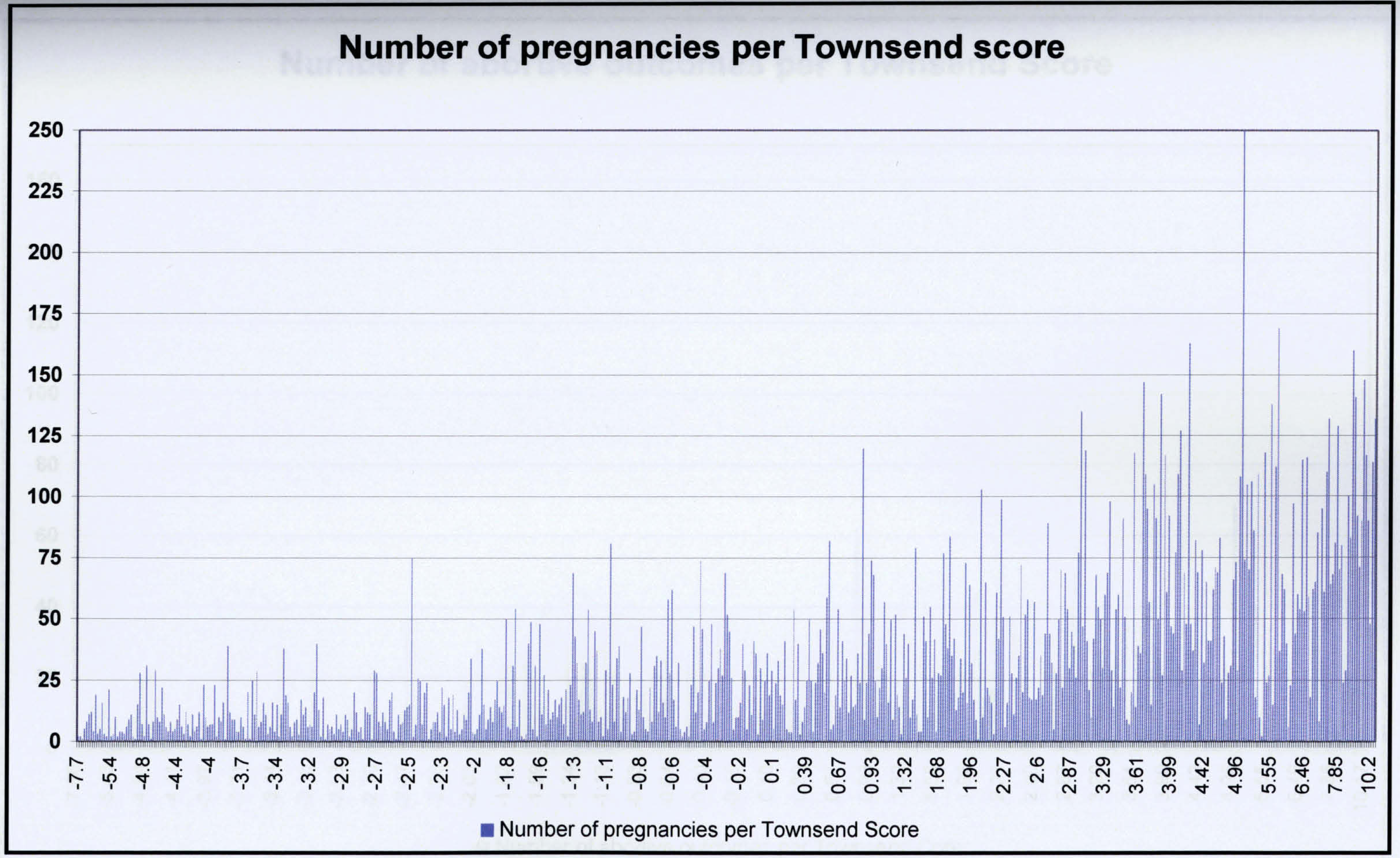


Figure 3: Number of pregnancies per Townsend Score

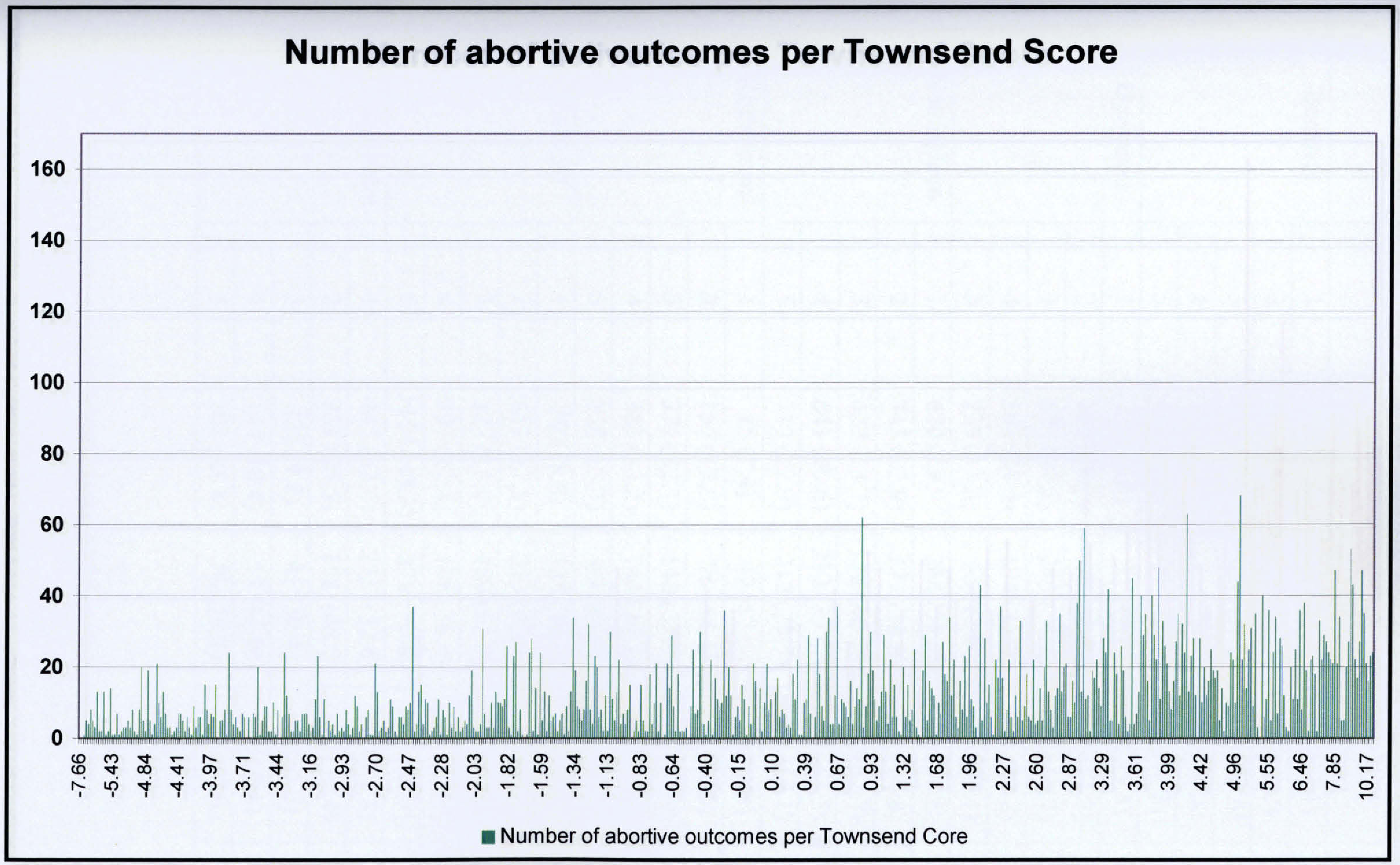


Figure 4: Number of abortive outcomes per Townsend Score

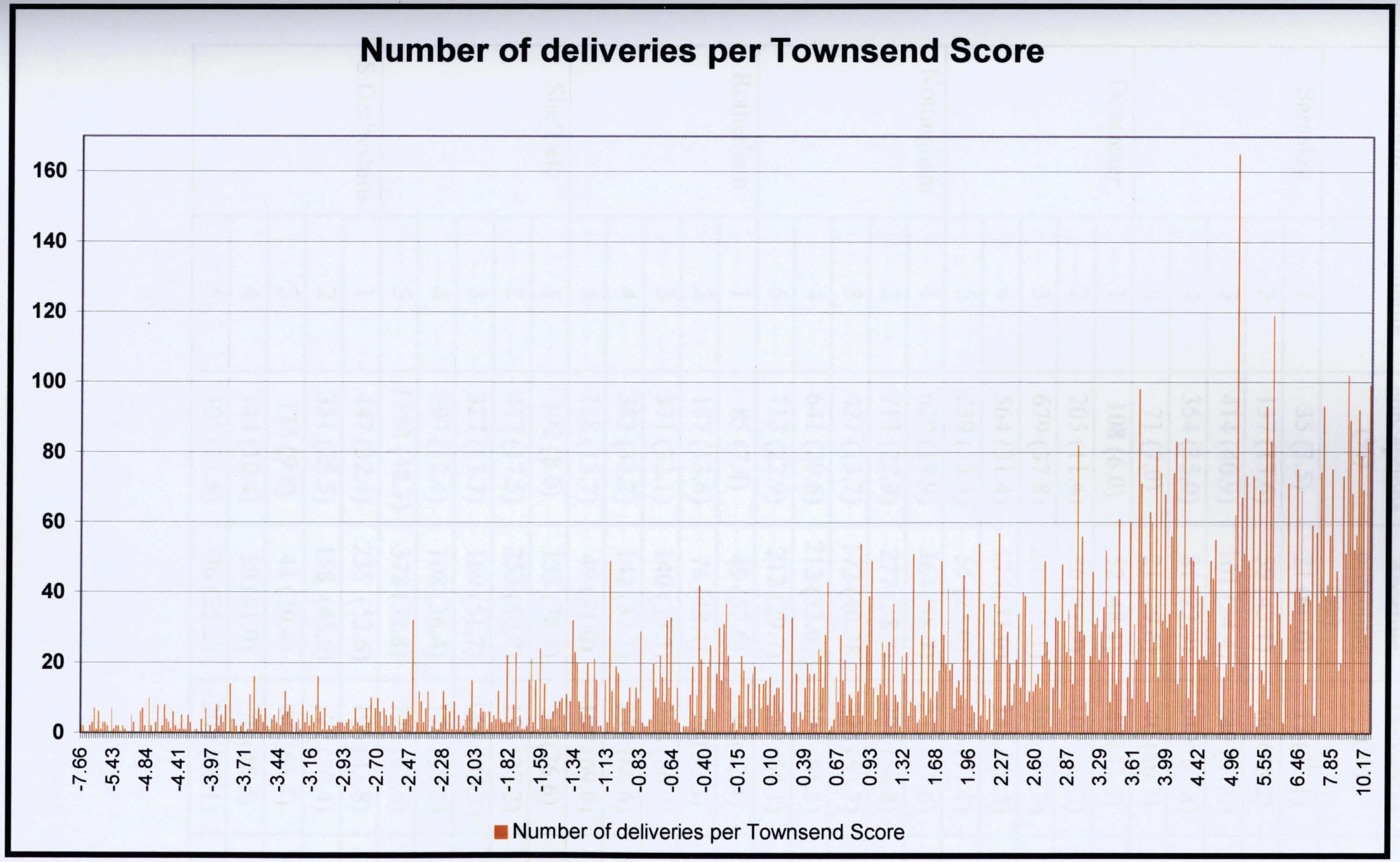


Figure 5: Number of deliveries per Townsend Score

Table 9. Outcome of conception by deprivation status and health authority area

Deprivation quintile	Deprivation quintile	No. conceptions (%)	No. Abortive outcomes (%)	No. Deliveries (%)	OR Abortive outcome V delivery (95%CI)
Barnsley	1	35 (3.5)	21 (60.0)	13 (37.1)	1.0
	2	137 (13.6)	59 (43.1)	66 (48.2)	1.61 (1.46-1.77)
	3	414 (40.9)	101 (24.4)	280 (67.6)	2.12 (1.93-2.34)
	4	354 (35.0)	81 (22.9)	240 (67.8)	2.47 (2.24-2.72)
	5	71 (7.0)	21 (29.6)	40 (56.3)	3.00 (2.71-3.30)
Doncaster	1	108 (6.0)	52 (48.1)	47 (43.5)	1.0
	2	205 (11.4)	86 (41.9)	107 (52.2)	1.44 (0.87-2.38)
	3	679 (37.8)	245 (36.1)	392 (57.7)	1.93 (1.24-3.00)
	4	564 (31.4)	174 (31.0)	345 (61.2)	2.27 (1.45-3.56)
	5	239 (13.3)	55 (23.0)	170 (71.1)	3.60 (2.15-6.01)
Nottingham	1	620 (19.9)	364 (58.7)	233 (37.6)	1.0
	2	713 (22.9)	277 (38.8)	391 (54.8)	1.96 (1.45-2.65)
	3	427 (13.7)	172 (40.28)	225 (52.7)	2.39 (1.75-3.26)
	4	641 (20.6)	212 (33.07)	394 (61.5)	2.05 (1.42-2.97)
	5	713 (22.9)	212 (29.7)	457 (64.1)	4.69 (2.56-8.61)
Rotherham	1	85 (7.4)	49 (57.6)	36 (42.4)	1.0
	2	157 (13.6)	76 (48.4)	79 (50.3)	1.99 (0.90-4.41)
	3	371 (32.1)	140 (37.3)	226 (60.9)	4.54 (2.16-9.53)
	4	383 (33.2)	142 (37.1)	232 (60.6)	5.07 (2.39-10.74)
	5	158 (13.7)	49 (31.0)	109 (69.0)	3.21 (1.32-7.79)
Sheffield	1	192 (8.0)	135 (70.3)	51 (26.6)	1.0
	2	417 (17.5)	253 (60.7)	155 (37.2)	1.52 (1.19-1.93)
	3	327 (13.7)	169 (51.7)	148 (45.3)	2.17 (1.62-2.90)
	4	297 (12.4)	108 (36.4)	176 (59.3)	2.38 (1.79-3.18)
	5	1154 (48.3)	378 (32.8)	722 (62.5)	3.49 (2.33-5.24)
S.Derbyshire	1	447 (32.4)	235 (52.6)	196 (43.8)	1.0
	2	351 (25.5)	158 (45.0)	177 (50.4)	1.33 (0.99-1.78)
	3	135 (9.8)	41 (30.4)	86 (63.7)	2.45 (1.61-3.72)
	4	144 (10.4)	59 (41.0)	70 (48.6)	1.35 (0.91-2.01)
	5	301 (21.8)	76 (25.2)	208 (69.1)	3.25 (2.35-4.51)

Table 9 . Continued.

Deprivation quintile	Deprivation quintile	No. conceptions (%)	No. Abortive outcomes (%)	No. Deliveries (%)	OR Abortive outcome V delivery (95%CI) †
North Nottingham	1	299 (17.3)	137 (45.8)	145 (48.5)	1.00
	2	577 (33.4)	188 (32.6)	359 (62.2)	1.58 (1.07-2.31)
	3	517 (29.9)	146 (28.2)	344(66.5)	2.30 (1.55-3.41)
	4	241 (14.0)	76 (31.5)	158 (65.6)	4.15 (2.76-6.23
	5	93 (5.4)	16 (17.2)	70 (75.3)	4.96 (3.50-7.04)
North Derbyshire	1	294 (26.3)	155 (52.7)	124 (42.2)	1.0
	2	412 (36.9)	166 (40.3)	221 (53.6)	1.66 (1.25-2.89
	3	190 (17.0)	77 (40.50)	101 (53.2)	1.78 (1.20-2.64)
	4	112 (10.0)	35 (31.25)	66 (58.9)	2.19 (1.35-3.56)
	5	110 (9.8)	25 (22.7)	81 (73.6)	4.04 (2.40-6.78)
Lincolnshire	1	668 (32.9)	318 (47.6)	301 (45.1)	1.0
	2	518 (25.5)	201 (38.8)	287 (55.4)	1.26 (0.73-2.19)
	3	326 (16.0)	97 (29.8)	200 (61.3)	2.06 (1.26-3.38)
	4	345 (17.0)	100 (29.0)	218 (63.2)	1.91 (1.16-3.12)
	5	176 (8.7)	36 (20.5)	123 (69.8)	2.73 (1.56-4.80)
Leicestershire	1	989 (33.3)	503 (51.0)	438 (44.3)	1.0
	2	294 (9.9)	107 (36.4)	172 (58.5)	1.78 (1.35-2.35)
	3	345 (11.6)	144 (41.7)	184 (53.3)	1.48 (1.15-1.92)
	4	526 (17.7)	156 (29.7)	325 (61.8)	2.33 (1.85-2.94)
	5	820 (27.6)	209 (25.5)	565 (68.9)	3.07 (2.50-3.77)
Trent overall	1	3553 (20.1)	1969 (55.4)	1584 (44.6)	1.0
	2	3585 (20.3)	1571 (43.8)	2014 (56.2)	1.66 (1.21-2.29)
	3	3518 (19.9)	1332 (37.9)	2186 (62.1)	1.78 (1.20-2.64)
	4	3368 (19.1)	1143 (33.9)	2225 (66.1)	2.19 (1.35-3.56)
	5	3622 (20.5)	1077 (29.7)	2545 (70.3)	4.04 (2.40-6.78)

† adjusted for age

3.9 Conclusion and discussion

3.9.1 Summary of findings

Of the 18692 eligible cases identified, 7092 (37.9%) resulted in an abortive outcome, 10554 (56.5%) in a delivery and 1046 (5.6%) in a miscarriage. In terms of conception rates, data for the year 1995 show that the pregnancy rate for each of the health authority areas varied from 49.2 per 1000 women for Barnsley health authority, to 20.0

per 1000 women for South Derbyshire health authority. The rate for Trent overall was 30.7 per 1000 women.

In terms of the outcome of the pregnancy, 38% of pregnancies resulted in an abortive outcome, and 56% resulted in a delivery. The outcome of the pregnancy was linked to both age and deprivation status, with women aged under 16 being more likely to have an abortive outcome compared to women aged 16 and over, and women from more deprived areas were more likely to have a delivery compared to women from less deprived areas. These findings are similar to those found in other studies (Clements S et al 2004, Smith T 1996), which have found that in more deprived areas, women are more likely to continue with their pregnancy.

3.10 Limitations

3.10.1 Completeness of the data

As discussed in section 3.5, the data presented does not account for all cases reported by the Office for National Statistics. The data for terminations of pregnancy are likely to be complete, as the data presented does not include procedures done in private hospitals. Considering that the data represents 81% of the cases reported by the ONS, and approximately 18% of terminations are done within the charity sector, then it seems fair to conclude that the data-set is complete for this outcome.

However, this may not be the case for pregnancies resulting in a delivery. The data presented represents approximately 70% of the births reported by the ONS. It is likely that a proportion of this difference is due to the criteria set out for eligible cases (largely the need for cases to be registered with a GP from within Trent), and also to differences in collection methods (data collected through the hospitals admissions database compared to registration of live births). In addition, the figures presented in this analysis omit any births that occur outside of hospital, and so births at home may account for some of the shortfall. Though this is likely to account for a small number of cases, as only approximately 2% of births occur at home (Office for National Statistics2003).

It is possible that some codes relating to delivery were omitted during the data collection process. It is also possible that some of the coding carried out at each of the individual hospitals was inaccurate, which then led to some cases being omitted from the data-file. However, care was taken to identify the appropriate codes, by involving a Consultant Obstetrician and Gynaecologist as well as coding staff, and so the specific reason for this shortfall is difficult to absolutely determine. This issue should not have a great impact on the interpretation of the findings of this or other chapters utilising this data. The data does reflect the patterns of rates reported by the ONS, in that areas with the highest rates according to ONS figures are also shown to have the highest rates in this data-set.

3.10.2 Deprivation status data

Deprivation status was determined in this analysis, as in all other analyses presented in this thesis, according to the Townsend score associated with the electoral ward, of in this case the patient, and in other analyses, general practices. The method of data collection did not allow for the collection of individual data to determine deprivation status, and so the Townsend scores associated with the electoral ward of residence were used as a proxy measure of deprivation. There will therefore be some imprecision where the average deprivation score of the electoral ward does not reflect individual circumstances. However, this method of assigning deprivation scores is widely used in health research and has been found to be effective in identifying material disadvantage (Morris R & Carstairs V 1991). In addition, the findings reflect those reported in previous research that has found a significant association between outcome of pregnancy and deprivation status (Clements S et al 2004).

3.10.3 Statistical method

Logistic regression analysis was used to identify the association between the outcome of delivery or abortive outcome and deprivation score, adjusting for the potential confounder of age. An assumption of this test is that all of the cases are independent. However, as discussed throughout this thesis, the method of data collection did not allow for the identification of repeat events. Although subsequent admissions relating to the index pregnancy were deleted from the data file, it is likely that some cases had more than one pregnancy in the three year study period. To determine how this might impact upon the findings of this particular analysis, data for a single year (1995) were re-analysed, as in a single year the likelihood of repeat occurrence is low. This reanalysis reflected the results reported in this chapter, both overall for Trent and also for individual health authority areas, suggesting that the conclusions drawn were appropriate.

Another issue to consider in logistic regression analysis is goodness of fit. How well the model fits the data is indicated in analyses done in SPSS by the Hosmer-Lemeshow statistic. If this statistic is not significant then the model fits the data well, and so the investigator can feel assured that they are able to interpret the coefficients appropriately. However, in this case the Hosmer-Lemeshow statistic was significant which does not suggest the model fits well. However, this does not mean that the test was inappropriate or that the interpretations are incorrect. Campbell argues that with enough data, the test used for goodness of fit will always reject the model, and that inferences can still be made from the model but some care should be taken (Campbell MJ 2001).
The poor fit of the model is likely to be due to Townsend score not accounting for all of the variation, and also as the analysis method did not allow for the clustering of pregnancies at ward level. It is possible that a random effects logistic model would be more appropriate as this allows for observations that may be clustered, to be grouped and this protects against an underestimation of the standard error (Campbell MJ 2001). However, considering that this analysis was simply aiming to describe a relationship that has been well documented in other studies, and that poor fit of the model does not mean that interpretations cannot be made, then the conclusions drawn from this analysis can still be considered to be appropriate.

CHAPTER 4 OBSTETRIC OUTCOMES TO TEENAGE PATIENTS IN TRENT

This aim of this element of the thesis is to look specifically at the mode of delivery of young women aged under 20 years living in Trent in the study period (1994-1997). It will report the frequency of normal deliveries, assisted vaginal delivery (forceps or ventouse extraction) and abdominal delivery (emergency or elective caesarean section); and also explores the factors that might influence risk of intervention at delivery. Specifically the objectives are as follows:

- To determine the relationship between risk of assisted delivery (instrumental vaginal delivery or caesarean section) and:
  - the age of the woman (under 16 years compared to over 16 years)
  - place of treatment (hospital)
  - deprivation status

4.1 Background

4.1.1 Percentages of births resulting in an assisted delivery

In England between 1990 and 1995, the overall number of spontaneous, non-assisted deliveries fell from 78.1% to 72.8%, and the number of caesarean sections in this period rose from 11.3% of all deliveries to 15.5% (Macfarlane A et al. 2000). The number of vacuum extractions (ventouse deliveries) in this period also rose from 1.6% of deliveries to 4.8%, whereas the use of forceps in instrumental delivery fell from 7.8 to 5.8% of all deliveries (see Table 10). Figures for all deliveries (not specifically to women aged under 20 years) presented by Health Region for the period 1995-1996, show similar numbers of assisted and spontaneous delivery for the Trent Health Region compared to the overall percentage reported for England and Wales. For hospitals within Trent, there is however, some unexplained variation, with percentages of all births resulting in any type of caesarean section ranging from 13-19%, and those resulting in an emergency caesarean section ranging from 8% to 17%. The percentage of births resulting in a vaginally assisted delivery ranges from 7%to 16%, and of these assisted deliveries, between 17% and 83% are vacuum extractions (Macfarlane A et al 2000).

Data published by the Office for National Statistics for the years 1994-1996 reports that women aged under 20 years are less likely to have a caesarean section compared to women of all ages (10% versus 16%). However, the percentage of births assisted by forceps or ventouse extraction are similar (10% for women aged under 20 years compared to 11% for women of all ages) (Office for National Statistics 1997).

4.1.2 The impact of an assisted delivery

An assisted delivery has implications for both the woman herself and the care provider. In terms of the outcome of an assisted delivery, data published by the National Institute for Clinical Excellence as part of the 2004 guideline, reports that compared to women who have a vaginal birth, women who have a caesarean section are significantly more likely to experience a bladder injury (relative risk = 36.6), admission to an intensive care unit (relative risk =9.0) or a maternal death (relative risk = 4.9). Respiratory morbidity is also more likely in babies born through caesarean section (relative risk = 6.8). Women who have a c-section are also more likely to experience a uterine rupture in subsequent pregnancies (relative risk = 42.2) (The National Institute for Clinical Excellence 2004).

Time spent in hospital by women who have had an assisted delivery is also significantly longer than for women who have a normal, unassisted delivery. Women who have an unassisted delivery spend on average, one day in hospital, compared to two days for women who have a vaginally assisted birth and four days for women who have had any type of caesarean section (Macfarlane A et al 2000).

4.1.3 Age as a risk factor for assisted delivery

Lubarsky et al conducted a study of 261 women aged under 15 years who were matched to women aged 20-29 years. They concluded that the young women were not at increased risk of an assisted delivery and found that they had a lower incidence of caesarean section (Lubarsky SL et al. 1994). Similarly, Smith and Pell found that compared to women aged 20-29; women aged 15-19 years were significantly less likely to experience an emergency caesarean section (Smith GC & Pell JP 2001). However, there are some inconsistencies in research findings and it has also been reported that young teenagers aged 12-15 years have worse outcomes compared to older teenagers and adults. Studies by Amini (Amini SB et al 1996) and Konje (Konje et al 1992) have suggested that young teenagers have a higher incidence of instrumental delivery and caesarean section.

Table 10. Overall percentage of assisted and non-assisted deliveries in NHS Hospitals in England, 1989-1990 to 1994-1995.

Year	Spontaneous deliveries			Caesarean section			Instrumental deliveries			
	All	Vertex	Breech	All	Elective	Emergency	All	Forceps	Vacuum extraction	Breech extraction
1989-1990	78.1	76.7	1.4	11.3	4.9	6.3	9.7	7.8	1.6	0.3
1990-1991	76.7	75.6	1.1	12.4	5.3	7.1	9.9	7.5	2.1	0.3
1991-1992	76.3	75.1	1.2	12.9	5.5	7.4	9.8	6.9	2.7	0.2
1992-1993	75.5	74.4	1.1	13.8	5.6	8.1	9.9	6.6	3.1	0.2
1993-1994	73.8	72.5	1.3	15.0	6.1	8.9	10.4	6.5	3.7	0.2
1994-1995	72.8	71.5	1.3	15.5	6.5	9.0	10.8	5.8	4.8	0.2

Source: Data presented in Birth Counts. Statistics of pregnancy and child birth (Macfarlane A, Mugford M, Henderson J, Furtado A, Stevens J, & Dunn A2000).
Original source: Maternity Hospital In-patient enquiry and OPCS. Birth Statistics Series FM1.
Department of Health, Maternity Hospital Episode Statistics. Statistical Bulletin 1997/28 Table 3.

4.2 Method

4.2.1 Identifying assisted deliveries

From the data file extracted from the Trent hospital admissions database, patients who had an elective caesarean (R17 OPCS codes), emergency caesarean (R18 OPCS codes), forceps delivery (R21 OPCS codes), and vacuum delivery (R22 OPCS codes) were coded as having had an assisted delivery (see appendix 2 for full a description of these codes). These codes were identified and assigned under the guidance of a Consultant Obstetrician from a large teaching hospital within the former Trent region.

4.2.2 Statistical Methods

The data were analysed using SPSS for windows version 9.0. Categorical data were analysed using the chi-square test and continuous data were analysed using the independent samples t-test. Logistic regression analysis was used to calculate adjusted odds ratios (adjusted for age, deprivation and whether the place of treatment was a teaching/secondary referral centre) with 95% confidence intervals for the variables place of delivery and type of assisted procedure (forceps delivery, vacuum extraction or emergency or elective caesarean section). The deviation change contrast in SPSS version 9 was chosen to display results, which compare each category of the predictor variable except the reference category, to the overall effect.

4.2.3 Post-hoc power calculation

A post-hoc power calculation showed that a two group continuity Chi-square test with a 0.05 two sided significance level, will have 81% power to detect the difference between a Group 1 (aged 16 years and older) proportion of 0.22 and a Group two (under 16 years) proportion of 0.30 (odds ratio of 1.54) when the sample sizes are 10257 and 233 respectively.

4.3 Results

Of the 10554 deliveries identified, 2334 (22.1%) were coded as assisted, and 8220 (77.9%) were coded as being a normal delivery. In young women aged under 16 years, the figures for those having an assisted delivery were similar to older teenagers (26.5% in under 16s V 22.0% in over 16s). Table 11 shows the number and type of assisted deliveries for women aged under 16 years of age and 16 to 19 years of age at delivery.

Table 11 Type of assisted delivery by age

Age group†	No. deliveries	No. not assisted (%)	No. assisted (%)	No. delivered by forceps or vacuum (%)	No. delivered by emergency section (%)	No. delivered by elected section (%)
Under 16	230 (3.9)	169 (73.5)	61 (26.5%)	38 (16.5%)	18 (7.8%)	5 (2.2%)
Over 16	10298 (97.8)	8029 (78.0)	2269 (22.0%)	1305 (12.7%)	744 (7.2%)	220 (2.1%)
Total	10528	8198	2330	1343	762	225

† Missing data = 26

4.3.1 Age at delivery

Previous research has suggested that young teenagers (those aged under 16) are at increased risk of some procedures compared to older teenagers and so initially a chi-square test was carried out to detect any overall increased risk. Younger teenagers were not at greater risk of assisted delivery compared to older teenagers ($X^2 = 2.63$ df =1 P=0.10, OR 1.28 95% CI 0.94 -1.73). For teenagers experiencing any assisted delivery procedure, there was no association between age and type of assisted delivery ($X^2 =$ 0.56 df=1 P = 0.46 OR 0.82 95% CI 0.47 -1.42).

4.3.2 Deprivation status

The mean Townsend score of women having an assisted delivery was 3.18 (standard deviation = 3.44) and the mean score for those not having this outcome was 3.25 (standard deviation = 3.5). This difference was not statistically significant (independent samples t-test df= 10552 P = 0.40), suggesting that women who have an assisted delivery are not from more deprived areas than those who have an unassisted delivery.

4.3.3 *Place of treatment (hospital)*

Logistic regression analysis was carried out to determine any association between place of treatment and the outcome of assisted or unassisted delivery. Of the 16 hospitals included in the analysis (hospitals within the former Trent region), five were identified as being teaching hospitals and secondary referral centres, who had a direct affiliation to a University Medical School. A logistic regression analysis was carried to identify whether these hospitals were more likely to perform assisted deliveries. This was done because feasibly, it could be the case that smaller units are likely to refer patients to these larger centres if there are complications associated with a pregnancy, and this would artificially inflate the number of assisted deliveries for these larger centres. However, in univariate logistic regression analysis, teaching secondary/referral centre status was not associated with increased risk of assisted delivery (OR 1.02 95%CI 0.93 - 1.12, P = 0.68).

Table 12 presents the odds ratios for each hospital (place of treatment), adjusted for deprivation, age and teaching/secondary referral centre status. For two of the hospitals there is an increased risk of assisted delivery in women aged under 20 years (hospitals 9 and 11), with young women delivering at hospital 9 being 1.5 times as likely to experience an assisted delivery (OR 1.53 95% CI 1.30 to 1.81, P<0.001). Conversely, for two hospitals (hospitals 2 and 12), there is a decreased risk of assisted delivery, with the odds ratio for hospital 12 for example being 0.79, suggesting that the risk of an assisted delivery in this hospital is 21% lower compared to the overall effect (see table 12).

There was a large amount of variation in type of assisted delivery. The percentage of young women who experienced a vaginally assisted birth ranged from 8.6% to 19.8%; and for emergency sections percentages ranged from 4.4% to 9.0% of births. Logistic regression analysis was used to identify any association between type of assisted delivery (forceps/vacuum delivery and emergency caesarean section) and place of treatment. Table 12 shows that patients delivering at hospitals 4, 6 and 9 were significantly more likely to experience a forceps or vacuum delivery rather than any kind of abdominal delivery. Figures for hospitals 8 and 12 suggest that patients were more likely to have a caesarean section than a vaginally assisted delivery.

Teaching/secondary referral centres had fewer deliveries by caesarean section, with 38.3% of assisted deliveries resulting in a caesarean section in these centres compared to 44.8% in other hospitals. However, these secondary/referral centres had a higher incidence of vaginally assisted deliveries, with 61.7% of assisted deliveries being either a vacuum or forceps extraction, compared to 55.2% in other hospitals (OR 1.23 95%CI 1.10-1.54, $P<0.001$).

4.4 Discussion and conclusion

4.4.1 Summary of the main findings

Younger teenage women (under 16 years) were not at increased risk of an assisted delivery compared to women aged 16-19 years. In those teenagers who underwent an assisted delivery, younger women were at no greater risk of a particular mode of delivery than older teen-aged women. The proportion of teenagers having an assisted delivery varied from 18 to 30% between hospitals. There were also differences between hospitals in terms of the patients' risk of experiencing a vaginally assisted delivery rather than an abdominal delivery. Young women who had an assisted delivery in this study lived in areas with similar levels of deprivation compared to young women who had a normal delivery.

4.4.2 Methodological issues

The issues relating to the use of Townsend score as a measure of deprivation status, and the completeness of the pregnancy data are discussed in sections 3.4 and 3.5. Other methodological issues relevant to this chapter are discussed below.

4.4.3 Use of routine data-sets

This study utilised a large data set of routinely collected data and provided a large number of cases for analysis. The Health Region from which the data were drawn is broadly representative of Health regions in the UK, having an overall assisted delivery (both caesarean section and vaginally assisted) rate in line with the average rate for England (Macfarlane A et al 2000), thus giving the results a high level of generalisability. However, there is evidence that routinely collected data-sets such as this, has a degree of inaccuracy and may not be complete (McKee M 1993). The number of assisted deliveries presented here is however, similar to those published by the Department of Health and so the level of possible inaccuracy in the data is not likely to have impacted upon the overall findings (Macfarlane A et al 2000).

4.4.4 Repeat pregnancy

The data file used in this analysis and in all of the analyses including the pregnancy data that are presented in this thesis, did not allow for the identification of cases of rapid repeat pregnancy. This means that parity could not be included in the analysis. This is likely to be an important issue for this analysis as approximately 30% of teenagers who become pregnant will go on to have a second pregnancy (which in most cases will lead to a maternity) in the 18 months following the first delivery (Stevens-Simon et al 1997). This is not necessarily problematic in interpreting the results as there is no evidence to suggest that second pregnancies in teenage women are associated with increased risk of assisted delivery. In a large population based cohort study, Smith and Pell found that compared to women aged 20-29, teenagers were less likely to experience a caesarean section in either their first or second delivery (Smith GC & Pell JP 2001). In addition birth statistics published by the Department of Health, show that the percentage of women having an instrumental delivery (forceps or ventouse extraction) decreases with parity. In 1995, 16% of women aged under 25 years had an instrumental delivery with their first maternity, and this decreased to 3% for women whose parity was between 1 and 3 (Macfarlane A et al 2000). Therefore it is possible that women in this data-file who had already experienced a delivery had a decreased risk of an instrumental delivery compared to women who were delivering their first baby. In terms of how this issue might impact upon the interpretation of the results of this analysis, it is likely that by including multiparous women the incidence of assisted delivery is actually reduced. If only nuliparous women were included in the analysis, then it is possible that the results would have been more, rather than less significant.

The issue of repeat pregnancy is more problematic however in terms of the statistical method employed. As discussed earlier, an assumption of logistic regression analysis is that all of the observations are independent (Campbell MJ 2001). However, as stated above, it is likely that not all of the cases were truly independent as it is possible that repeat pregnancy occurred in up to 30% of cases. To attempt to determine the impact of this, as with the logistic regression presented in 3.10.3, the analyses were repeated for an individual year of data (1995), since it is unlikely that a case had two deliveries within a one-year period and so the cases are likely to be independent. This data analysis showed no significant differences to the data for the three year period. The numbers of assisted deliveries were similar (24.2% for one year compared to 26.5% over the three year period), and as with the main analysis there were no statistical differences in terms of age and risk of assisted delivery, or age and type of assisted delivery. The findings for place of treatment were also similar to those found in the main analysis.

4.4.5 Other characteristics not considered in the analysis.

There are other factors, not controlled for in this analysis, which are known to be associated with risk of assisted delivery. Women with a Body Mass Index of over 30 (Murphy DJ et al. 2001) and women of very short stature (McGuinness BJ & Trivedi AN 1999) have been found to be at increased risk of having a caesarean section. The original data collection did not include these factors and so they could not be included as potential confounders in the analysis.

4.4.6 Comparison with other studies

The findings of this study are significant in that although young teenagers (those aged under 16) are reported as having poor outcomes generally, and are less likely to utilise ante-natal services; they are not at increased risk of experiencing problems during delivery that lead to either an abdominal or instrumental delivery. The findings are similar to other studies, which conclude that young women are not at increased risk of an assisted delivery (Lubarsky SL 1994; Smith GC & Pell JP 2001), but go further to consider other potential risk factors; in this case place of delivery and deprivation score.

The reasons for variations between hospitals are not clear. There is evidence to suggest that inter-hospital variation in caesarean rates cannot be explained by obstetric risk or clinical factors, and that individual obstetrician characteristics and practice style may play an important role in explaining variation (Goyert GL et al 1989). Further research into ward policies and the impact of individuals would possibly provide an explanation as to why such a significant variation exists.

In terms of deprivation score, this study found no association between socio-economic status and increased risk of an assisted delivery. These findings are similar to those reported for teenage patients in a study based in the United States. In this study of over 240,000 cases, 22.9% of women who lived in areas with a median family income of more than $30,000 had a primary caesarean section, compared with 13.2% of women from areas where the median family income was under $11,000. However, this difference was only observed for women aged over 18 years, and for patients aged under 18 years, this difference was much smaller, with 12.7% of less affluent women in this age group having a primary caesarean section, compared to 14.1% of more affluent women (Gould, JB., Davey, B & Stafford R S 1989).

Table 12 Risk of assisted delivery and risk of type of assisted delivery by place of treatment (hospital)

Place of treatment	Odds ratio for assisted v unassisted delivery (95% CI)†	Unassisted deliveries (%)	Emergency Sections (%)	Elective sections (%)	Forceps or vacuum extractions (%)	Odds ratio for forceps or Vacuum v any Section (95% CI) †
1	1.06 (.89-1.27)	532 (77.2)	55 (8.0)	9 (1.3)	93 (13.5)	1.16 (.84 – 1.60)
2	.83 (.71-.96)*	860 (81.1)	71 (6.7)	21 (2.0)	109 (10.3)	.89 (.67-1.17)
3	1.21 (.93-1.56)	208 (74.3)	21 (7.5)	6 (2.1)	45 (16.1)	1.22 (.77-21.93)
4	1.12 (.97-1.28)	795 (76.0)	51 (4.9)	27 (2.6)	173 (9.2)	1.66 (1.27-2.17)*
5	.90 (.74 to 1.10)	449 (80.0)	35 (6.2)	9 (1.6)	68 (12.1)	1.20 (.83-1.74)
6	.89 (.71-1.12)	345 (80.2)	19 (4.4)	6 (1.4)	60 (13.9)	1.79 (1.14-2.79)*
7	.94 (.82-1.09)	895 (78.9)	90 (7.9)	22 (1.9)	127 (11.2)	.86 (.66-1.11)
8	.95 (.79-1.14)	504 (78.9)	57 (8.9)	23 (3.6)	55 (8.6)	.52 (.37-.73)*
9	1.53 (1.30-1.81)*	456 (69.7)	50 (7.6)	19 (2.9)	129 (19.8)	1.40 (1.05-1.87)*
10	.99 (.83-1.17)	574 (77.9)	59 (8.0)	13 (1.8)	91 (12.3)	.92 (.68-1.25)
11	1.26 (1.06-1.49)*	503 (74.0)	62 (9.0)	18 (2.6)	98 (14.4)	.95 (.71-1.27)
12	.79 (.63-.99)*	382 (81.6)	39 (8.3)	7 (1.5)	40 (8.6)	.64 (.42-.96)*
13	.93 (.72-1.18)	290 (78.8)	31 (8.4)	7 (1.9)	40 (10.9)	.74 (.48-1.14)
14	1.04 (.88-1.22)	614 (77.0)	52 (6.5)	20 (2.5)	111 (13.9)	1.14 (.85-1.52)
15	.99 (.73 to 1.35)	165 (77.8)	18 (8.5)	7 (3.3)	22 (10.4)	.65 (.38-1.12)
16	.81 (.65-.1.01)	393 (81.2)	30 (6.2)	5 (1.0)	56 (11.5)	1.17 (.78-1.76)

†*adjusted for age (under or over 16 years) , deprivation (Townsend score) and secondary referral centre/teaching status* * *P = < 0.05*

CHAPTER 5 GENERAL PRACTICE AND FAMILY PLANNING SERVICES IN TRENT

This chapter describes general practice services in the former Trent region. These services are described in terms of numbers and also the characteristics of the practices (for example, number of practices with female GPs and young GPs) by health authority area. The focus of this description is on the key practice characteristics of age of GP, sex of GP, and amount of nurse provision, which are focused upon in the analysis presented in chapter 6. Other factors, known to be associated with teenage pregnancy, such as deprivation status, are also presented as well as other potential confounding factors such as fund-holding status.

This element of the chapter also presents the findings of a survey of practice managers from practices within the four health authority areas that have been focused upon in chapters 6 to10. This survey asked specifically about teenage health initiatives running within the practice, as well as about practice policies relating to the issue of confidentiality and young people aged under 16.

In addition, as teenagers are known to access not only general practice based services, but also family planning clinics, this chapter also describes the number of family planning clinics in each of the health authority areas in Trent. The accessibility of these clinics for young people of school age (those aged 16 and under) is also described through a survey of clinic times. The key findings of this analysis were published in The Journal of Family Planning and Reproductive Health Care in 2001 (see appendix 8).

5.1 Aim:

- To describe general practice and family planning services in Trent, focusing on elements of provision that are relevant in the care of young teenagers.

5.2 Objectives:

- To describe the characteristics of practices in Trent during the study period.
- To describe the number and type of teenage specific health initiatives running in four health authority areas (Barnsley, Doncaster, Sheffield and Lincolnshire) in 1997.
- To report the number and type of written policies held by practices with regards to the issue of confidentiality and young people aged under16 in 1997.
- To report the number of and accessibility of family planning clinics in the former Trent health region in 1997.

5.3 General Practice services in the Trent Region : Method

5.3.1 Collection of Practice characteristics data

In order to describe general practice services in Trent, and also for the analysis presented in chapter 6, which aimed to identify associations between practice characteristics and teenage pregnancy rates, practice characteristics data for all general practices within the region were collected. The data collection took place in 1997 and specifically, the following variables were collected:

- Unique identifying practice code
- Surgery postcode
- Fundholding status (ever fund-holding)
- Training status
- Number of whole time equivalent GPs
- Age of whole time equivalent GPs
- Sex of whole time equivalent GPs
- Number of whole time equivalent practice nurses
- Total list size
- Single handed status
- Number of female patients aged 13-15 and 16-19
- Townsend score associated with the practice

From this data, the following variables were computed for each practice:

- Average list size per whole time equivalent GP
- Whether the practice has at least one female GP
- Whether the practice has at least one GP aged under 36 years

The continuous variable of age was categorised according to the ages of all GPs in Trent in the year 1997. This was cut into quartiles, which were used to identify the categories used in the analysis presented in chapters 6 to 10. The categories computed from the data were as follows:

Youngest quartile

< 36 years

36 to 41 years

42 to 48 years

>48 years

Oldest quartile

As this information was not available in the public domain, or at this time collected centrally, each individual health authority was contacted with a request for the above information. The data was requested in Microsoft Excel format and then transferred into a Microsoft Access database for management (though one health authority could only provide the data in paper form, which was directly entered into the Microsoft Access database). A practice level file was developed, and for each practice, the total number of conceptions and also the number of deliveries and abortive outcomes for women aged 13-19 were identified from the pregnancy data-set. This was done using the unique practice code, and then the rate for each practice was calculated using the number of registered patients aged 13-19 as the denominator.

5.3.2 *Validation of the practice characteristics data file:*

The data provided from each of the health authorities was difficult to validate as the majority of the data provided was not in the public domain. It is possible therefore that some of the data was inaccurate. However some variables could be compared to national and regional data to determine whether figures were comparable. Figures published for 2000 show that the average list size per GP for Trent was 1885, compared to 1965 for the data provided by the Health Authorities in 1997. Figures for the individual health authority areas were are also similar, with the average list size per WTE for Barnsley being 2059 compared to 1969 for 2000, according to the Exeter Attribution Data Set. In addition, data for 2000 also shows that there were 41.7% of practices that did not have a female GP and this is very similar to the figure of 39.6% found in this analysis.

The data from the individual health authorities were combined to form one single data-file. Considering that most of the health authorities presented their data in different formats, and in some cases did not have unique identifiers to electronically link each element of their data-file, then there was the potential for significant error within this process. Therefore, to ensure that errors were not made during data management, the database developed through these individual files had to be carefully and repeatedly checked against the original data. The final practice level file was then compared against the data provided from each health authority and it was concluded that errors had not been made during data management.

5.3.3 *Missing Data*

There were missing data for most of the variables collected (see Table 13). The amount of missing data varied between health authorities, and for three health authority areas (Nottingham, North Nottingham and North Derbyshire) there was a substantial amount of missing data. No data for number of whole time equivalent practice nurses were provided for practices in Nottingham . Weighted Townsend score was missing for four areas, and in this case the un-weighted Townsend score associated with the electoral ward was assigned.

5.3.4 *Statistical Analysis*

Chi-square tests have been used to identify any differences in terms of practice characteristics between health authority areas. For variables with a continuous, rather than dichotomous independent variable, different tests have been employed. Where there is equal variance and a normal distribution, ANOVA (analysis of variance) has been used to indicate any significant differences in practice characteristics between health authority areas. This test has three assumptions, firstly that the sample is random , secondly that the data are normally distributed, and thirdly that the variance across the groups of the dependent variable is equal (Hazard Munro B2001). For data that are not normally distributed, the non-parametric equivalent test (Kruskal-Wallis) has been used.

Table 13. Missing practice characteristics data by health authority area.

Health Authority Area*	Number of practices	Sex of GP (%)	Age of GP (%)	No WTE GPs (%)	List size per WTE GP (%)	No. WTE PNs (%)	Weighted Townsend score (%)	No. of registered females 13-19 years (%)
Barnsley	33	1 (3.0)	1(3.0)	1 (3.0)	1 (3.0)	0 (0.0)	33 (100.0)	1 (3.0)
Doncaster	51	3 (5.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (7.8)	0 (0.0)
Nottingham	121	11 (9.1)	45 (37.2)	62 (51.2)	62 (51.2)	121 (100.0)	16 (13.2)	38 (31.4)
Rotherham	47	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	47 (100.0)	0 (0.0)
Sheffield	109	4 (3.7)	4 (3.7)	4 (3.7)	4 (3.7)	0 (0.0)	13 (11.9)	3 (2.8)
North Derbyshire	62	0 (0.0)	3 (4.8)	0 (0.0)	1 (1.6)	2 (3.2)	58 (93.5)	56 (90.3)
North Nottingham	65	0 (0.0)	0 (0.0)	3 (4.6)	0 (0.0)	57 (87.7)	8 (12.3)	7 (10.8)
South Derbyshire	78	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	61 (78.2)	78 (100.0)	3 (3.8)
Lincolnshire	103	1 (1.0)	0 (0.0)	1 (1.0)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)
Leicestershire	152	0 (0.0)	0 (0.0)	0 (0.0)	5 (3.3)	2 (1.3)	0 (0.0)	2 (1.3)
Total	821	20 (2.4)	54 (6.6)	71 (8.6)	75 (9.1)	244 (29.7)	258 (31.4)	111 (13.5)

*Missing for 5 cases

5.4 Characteristics of General Practices in Trent

5.4.1 Summary of Practice Characteristics

According to the data provided from all health authorities, there were 826 general practices in existence in 1997, and 821 of these could be assigned to a health authority area. Overall for Trent, 316 (38.5%) practices at had least one GP aged under 36 years (the youngest quartile for all GPs in Trent), and 477 (58.1%) had at least one female GP. The overall median practice pregnancy rate for women aged 13-19 years was 27.6 per 1000 women (interquartile range= 15.4 to 44.2), and the median rate for women aged 13-15 years was 1.85 (interquartile range 0.0 to 5.5) per 1000 women. A summary of practice characteristics is given in Table 14, and the characteristics are discussed in more detail below:

5.4.2 Age and sex of GPs

Overall for Trent, a total of 477 (58.1%) practices had at least one female GP, and there were significant differences between health authority area (χ^2=44.79 df=9 P<0.001). In Sheffield, 73.4% of practices had at least one female GP and similarly 73.1% of practices in South Derbyshire had at least one female GP. Conversely, only 28% of practices in Rotherham had at least one female GP.

Overall 316 (38.5%) practices had at least one GP in the youngest quartile for all GPs in Trent (under 36 years). In terms of differences between area, although there was some variation between health authority area, for example only 29.8% of practices in Rotherham had at least one GP aged under 36 years, this was only of borderline significance (χ^2 = 17.10 df =9 P = 0.05).

5.4.3 Practice Nurse provision

Practice nurse time was defined through calculating the number of whole time equivalent practice nurses for each practice and then calculating a median score for each area. The overall median was 1.1 (inter-quartile range = 0.5-1.6) whole time equivalent. Although there was some variation between health authority area, there were no significant differences between areas (χ^2 =15.8 df=8 P=0.05).

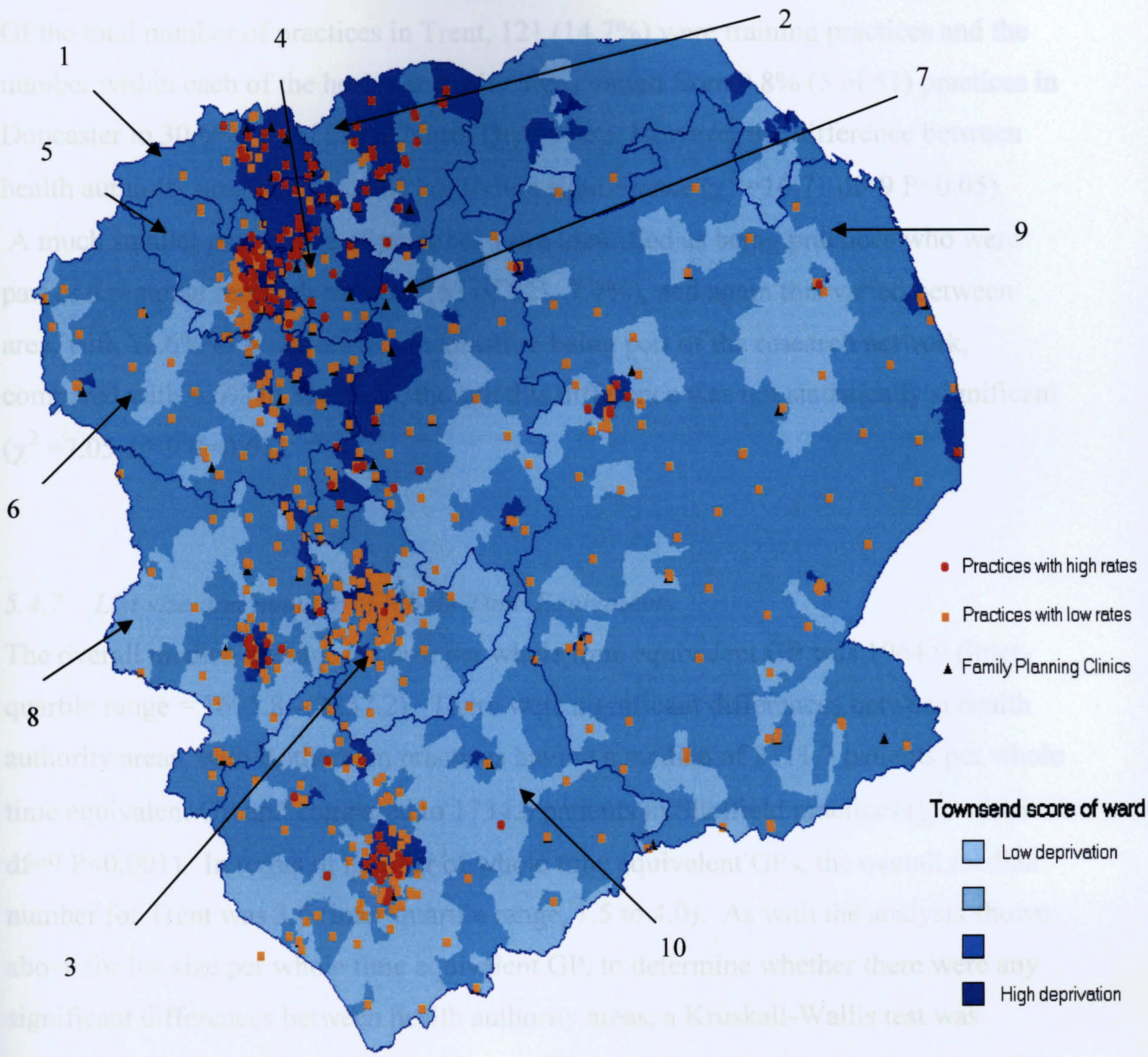
5.4.4 Deprivation status

The overall mean weighted Townsend score for Trent was 1.31 (standard deviation = 3.48). There was significant variance between health authority area with the least deprived area being North Derbyshire (mean score = -1.36) and the most deprived being Nottingham (mean score = 3.16). The weighted scored were not available for three health authority areas, and so the un-weighted score was used to identify any significant variation between area. A one way ANOVA was used for this purpose and the results showed that there were statistically significant differences between the areas ($F=10.52$, $df=9$ $P<0.001$). This test is not able identify where the significant differences lie within the data, though as shown in Table 15, South Derbyshire and Lincolnshire had Townsend scores of –0.07, indicating relative affluence, particularly when compared to areas such as Rotherham where the mean Townsend score was 3.46.

5.4.5 Deprivation and pregnancy rate

Deprivation status is known to be strongly associated with pregnancy rate. In order to describe this relationship using the data collected for this study, the post codes for all practices, and pregnancy rates for these practices, were given to colleagues within the Department of Geography. They were then able to produce a graphical representation of this data, which shows both practices with high and low rates, and the deprivation status of the area (Figure 6, source: David Ebdon. Department of Geography. University of Nottingham). As shown in this figure, practices with high rates tended to be in areas that were most deprived according to the Townsend score of electoral wards, and practices with low rates were in the majority of cases, in areas classified as less deprived.

Figure 6 Map of Trent showing conceptions to women aged 12-19 years



Key:

1 = Barnsley health authority area

2 = Doncaster health authority area

3 = Nottingham health authority area

4 = Rotherham health authority area

5 = Sheffield health authority area

6 = North Derbyshire health authority area

7 = North Nottinghamshire health authority area

8 = South Derbyshire health authority area

9 = Lincolnshire health authority area

10 = Leicestershire health authority area

5.4.6 Training and Research Practices

Of the total number of practices in Trent, 121 (14.7%) were training practices and the number within each of the health authority areas varied from 9.8% (5 of 51) practices in Doncaster to 30.6% (19 of 62) in North Derbyshire. However the difference between health authority area only reached borderline significance (χ^2 =16.71 df=9 P=0.05) A much smaller percentage of practices were identified as being practices who were part of a regional research network (63 of 821, 7.7%), and again this varied between area, with 12.6% of practices in Lincolnshire being part of the research network, compared with 4.6% in Sheffield, though this difference was not statistically significant (χ^2 =7.05 df=9 P=0.63).

5.4.7 List size and number of Whole Time Equivalents

The overall median average list size per whole time equivalent GP was 1964.9 (inter-quartile range = 1695.8 – 2257.2). There were significant differences between health authority areas, with Rotherham practices having a median of 2111.7 patients per whole time equivalent GP and compared to 1734.0 patients in Sheffield practices (χ^2 = 46.6 df=9 P<0.001). In terms of number of whole time equivalent GPs, the overall median number for Trent was 3.0 (inter-quartile range, 1.5 to 4.0). As with the analysis shown above for list size per whole time equivalent GP, to determine whether there were any significant differences between health authority areas, a Kruskall-Wallis test was conducted. This test showed no significant differences between the areas in terms of the number of whole time equivalent GPs (χ^2 =14.41 df=9 P=0.11).

The overall number of single-handed practices in Trent was 196 (23.9%). The number of single-handed practices varied significantly between health authority area, from 15.4% for practices in South Derbyshire to 40.4% of practices in Rotherham (χ^2 =17.75 df = 9 P= 0.04).

Table 14. General Practice characteristics by health authority area.

*Health Authority Area	Total no of practices (N = 821)	No. Research practices (%)	No with at least one female GP (%)	No. with at least one GP <36 years (%)	Single handed GPs (%)	Ever fund-holding (%)	No. Training practices (%)
Barnsley	33	3 (9.1)	16 (48.5)	12 (36.4)	9 (27.3)	11 (33.3)	4 (12.1)
Doncaster	51	3 (5.9)	25 (49.0)	16 (31.4)	17 (33.3)	30 (58.8)	5 (9.8)
Nottingham	121	9 (7.4)	67 (55.4)	41 (33.9)	33 (27.3)	24 (19.8)	21 (17.4)
Rotherham	47	3 (6.4)	13 (27.7)	14 (29.8)	19 (40.4)	28 (59.6)	5 (10.6)
Sheffield	109	5 (4.6)	80 (73.4)	50 (45.9)	22 (20.2)	52 (47.7)	26 (23.9)
North Derbyshire	62	7 (11.3)	41 (66.1)	33 (53.2)	13 (21.0)	53 (85.5)	19 (30.6)
North Nottingham	65	5 (7.7)	33 (50.8)	24 (36.9)	15 (23.1)	23 (35.4)	13 (20.0)
South Derbyshire	78	5 (6.4)	57 (73.1)	38 (48.7)	12 (15.4)	78 (100.0)	10 (12.8)
Lincolnshire	103	13 (12.6)	55 (47.0)	50 (48.5)	18 (17.5)	62 (60.2)	15 (14.6)
Leicestershire	152	10 (6.6)	90 (59.2)	75 (49.3)	38 (25.0)	66 (43.4)	27 (17.8)
Total	821	63 (7.7)	477 (58.1)	316 (38.5)	196 (23.9)	397 (48.4)	121 (14.7)

*Missing cases = 5

Table 14 continued. General Practice characteristics by health authority area.

Health Authority Area	Median WTE GPs (IQR)	Median WTE PN (IQR)	Median list size per WTE (IQR)	Mean weighted Townsend Score (SD)	Mean Townsend score of electoral ward (SD)	Median practice pregnancy rate 13-19 years (IQR)	Median practice pregnancy rate 13-15 years (IQR)	Median practice pregnancy rate 16-19 years (IQR)
Barnsley	3.0 (1.0-3.9)	1.1 (0.6-1.4)	2050.9 (1903.1 –2403.0)	N/a	2.78 (1.51)	39.7 (28.7-51.0)	4.2 (0.0-9.2)	66.6 (50.5 -84.3)
Doncaster	3.0 (1.0-4.0)	1.3 (0.5-2.0)	1982.0 (1787.1 – 2309.0)	3.4 (2.4)	2.97 (2.30)	48.1 (38.1 - 57.5)	4.1 (0.0 - 9.5)	81.8 (63.4 -101.6)
Nottingham	3.0 (2.0-4.0)	N/a	1976.2 (1652.0 –2256.7)	3.16 (3.61)	2.60 (4.28)	15.6 (9.2 –22.7)	1.5 (0.0-3.4)	26.5 (14.8- 37.8)
Rotherham	2.0 (1.0-3.0)	0.9 (0.5-0.9)	2111.7 (1816.7 – 2631.7)	N/a	3.46 (2.15)	46.0 (35.8 - 64.1)	5.1 (0.0 -11.5)	78.4 (56.3 -105.6)
Sheffield	2.8 (1.6-4.0)	1.0 (0.5-1.6)	1734.0 (1515.4 –2033.3)	-0.01 (3.74)	3.15 (3.98)	32.8 (18.8 - 59.3)	1.3 (0.0 - 6.3)	55.3 (30.0 - 96.2)
North Derbyshire	3.0 (2.0-4.8)	1.3 (0.8-1.9)	1923.8 (1732.88-2174.31)	-1.36 (0.95)	-0.07 (2.59)	16.2 (12.1 - 29.8)	0.0 (0.0 - 3.8)	27.4 (19.5 -52.3)
North Nottingham	3.0 (1.5-4.1)	1.4 (0.7-2.2)	2035.3 (1762.5 – 2356.3)	0.98 (1.91)	1.32 (2.61)	29.0 (19.4- 43.7)	2.5 (0.0 - 5.1)	51.1 (37.6 -73.5)
South Derbyshire	3.0 (2.0-5.0)	1.4 (0.9-2.0)	1983.0 (1737.7 – 2327.3)	N/a	0.96 (3.89)	27.9 (19.3 -38.5)	3.0 (0.0 -4.9)	44.4 (31.5 -66.7)
Lincolnshire	3.0 (2.0-4.0)	1.1 (0.7-1.6)	1923.0 (1675.4 – 2190.1)	0.77 (2.73)	-0.07 (2.48)	22.6 (12.9 -35-7)	0.0 (0.0 - 5.5)	38.7 (24.5-60.0)
Leicestershire	2.5 (1.0-4.0)	0.9 (0.5-1.6)	2035.6 (1728.4 – 2304.8)	0.71 (3.64)	1.44 (4.45)	18.9 (11.2 -38.6)	0.0 (0.0 - 4.1)	31.4 (19.3- 66.7)
Trent	3.0 (1.5-4.0)	1.1 (0.5-1.6)	1964.9 (1695.8-2257.2)	1.31 (3.48)	1.74 (3.70)	27.6* (15.4 – 4 4.2)	1.85* (0.00-5.5)	45.68 (25.9 – 74.5)

*Not including data for Nottingham or North Derbyshire (missing data: Nottingham = 34, North Derbyshire = 56)

5.5 Teenage specific services provided In Trent: Survey of Practice Managers and family planning clinics

5.5.1 Aims and objectives of survey

The purpose of this survey was two-fold. Firstly, it was used as a tool for collecting practice characteristics data that may have been missing from the data-files used in the analyses presented in this chapter and also chapters 6 to 10. This data included number of GPs, and number of whole time equivalent GPs. Secondly the questionnaire was used to audit existing teenage specific initiatives running within practices, and to identify whether any of the practices had a written policy regarding confidentiality for patients aged under 16years. This information was also included in the analyses presented in chapters 6 to 10.

Specifically the aim of the survey was:

- To describe teen specific initiatives currently running in practices within four health authority areas within Trent.

The objectives were:

- To collect descriptive information regarding current teenage specific services within general practices in Doncaster, Barnsley, Sheffield and Lincolnshire.
- To determine whether practices in these four health authority areas had written policies on confidentiality for teenagers aged under 16.
- To identify any other teenage specific clinics running in the practice area.
- To collect practice characteristics data (number of GPs, number of WTE GPs).

5.6 Method

5.6.1 Participants

In order to describe the services offered to young people in Trent, a short, two-sided questionnaire was sent to all practice managers from practices within the four health authority areas chosen to represent areas with high (Barnsley and Doncaster), moderate (Sheffield) and low (Lincolnshire) teenage pregnancy rates. The practice managers were identified through the practice characteristics information provided by the individual health authorities.

The practice managers were sent the questionnaire with a letter, which outlined why they had been sent the questionnaire and where it had been sent from The University of Nottingham (see appendices 3 and 4). Three weeks after the initial mailing, a follow up mailing of non-respondents was done to maximise the response rate.

5.6.2 Development of the questionnaire

Although the questionnaire was developed to audit current practice rather than to gauge attitudes or behaviour, issues of face and content validity were still pertinent (see section 7.4 for further discussion of this issue in questionnaire design). The questions were developed through discussion with primary care professionals, and practice managers, who were accessed through GPs in an academic department of general practice. The practice managers (who were not from any of the four health authority areas included in the study) were given the questionnaire, asked to complete it and highlight any unclear or ambiguous questions. This was done primarily to ensure that the questions were clear and not ambiguous. None of the practice managers who took the time to consider the questionnaire gave any suggestions for alterations, or reported that they had had any difficulty in completing the questionnaire.

5.6.3 Data analysis

The analysis presented is purely descriptive. Associations between variables have been analysed using the chi-square test for categorical data. Due to the small number of textual comments, the template analysis method discussed in chapters 7 and 9 was not used for this analysis. As this analysis aimed to audit activity, categories representing all responses were developed and then the responses were numerically coded according to these categories in SPSS version 9. Quotes taken from the returned questionnaires have also been included to further illustrate the initiatives reported.

5.7 Results

5.7.1 Response rate

A total of 269 Practice Managers were identified and mailed a questionnaire. Of these 227 (84.4%) Practice Managers responded to the survey after two mailings. Table 15 presents the response to the survey by area, and there was some variance between areas, with practice managers from Sheffield being more likely to respond than practice managers from other areas (91.3% compared to 80.8% in other areas, X^2 =5.08 df = 1 P = 0.02).

Table 15. Response to practice manager survey by health authority area.

Area (high, moderate or low pregnancy rate)	No (%) responded	No (%) non-responders	Total
Barnsley (high)	29 (82.9)	6 (17.1)	35 (100)
Doncaster (high)	34 (79.1)	9 (20.9)	43 (100)
Sheffield (moderate)	84 (91.3)	8 (8.7)	92 (100)
Lincolnshire (low)	80 (80.8)	19 (19.2)	99 (100)
Total	227 (84.4)	42 (15.6)	269 (100)

5.7.2 Provision of teen specific services

The questionnaire asked the practice managers whether the practice was running any teenage specific initiatives, and also asked for a written description of that service. Overall, 47 practices (20.7%) stated that the practice did run a teenage specific initiative (see Table 16). Lincolnshire had the highest number of teen specific services, with 31.3% of practices running some type of service. Between 62% and 74% of the practices in the other areas stated that although they did not currently have any teenage specific initiatives running in the practice, they did intend to set-up some sort of teen initiative in the future.

Table 16. Number of practices running teenage specific services

Area	Number (%) currently running teen specific initiatives	Number (%) intending to run a teen specific initiative in the future	Number (%) not currently, or intending to run a teenage specific initiative	Total (%)
Barnsley (high)	6 (20.7)	18 (62.1)	5 (17.2)	29 (100)
*Doncaster (high)	6 (17.6)	22 (64.7)	5 (14.7)	33 (97.1)
Sheffield (moderate)	10 (11.9)	62 (73.8)	12 (14.3)	84 (100)
**Lincolnshire (low)	25 (31.3)	39 (48.8)	12 (15.0)	76 (94.8)
Total N=227	47 (20.7)	141 (62.1)	34 (15.0)	222 (97.8)

* Missing cases=1**Missing cases = 4

5.7.3 Types of teenage specific services:

A total of 41 (87.2% of the 47 respondents who stated that they did run a teenage specific service) respondents gave a written description of the teen specific initiative running in their practice. The responses given were categorised, in most cases the responses fitted one category, but in 6 cases, the response covered two categories, for example the practice ran a clinic and also provided free condoms. Table 17 presents the types of initiatives run by area, and shows that the most frequently reported initiatives were youth/teenage clinics (12 out of 47, 25.5%), invitations to health checks at age 15 (12 out of 47, 25.5%) and the provision of free condoms (9 out of 47, 19.1%).

Table 17 Service by type and area.

Service provided	Area				
	Barnsley (high)	Doncaster (high)	Sheffield (moderate)	Lincolnshire (low)	Total (%)
Youth/teen clinic run regularly at the practice	2	1	4	5	12 (25.5)
Youth clinic run regularly in separate clinic	0	2	0	1	3 (6.4)
Provision of free condoms	0	1	3	5	9 (19.1)
Invitation to 15 years or school leavers health check	0	3	0	9	12 (25.5)
Same day/immediate appointment	0	0	0	2	2 (4.3)
Education based work with schools	0	0	0	3	3 (6.4)
Provision of a teen booklet	0	0	1	0	1 (2.1)
Teen support group	0	0	1	0	1 (2.1)
Adverts aimed at teens	0	0	1	0	1 (2.1)
Nurse providing emergency contraception	0	0	0	2	2 (4.3)
Being more teen friendly	1	0	0	0	1 (2.1)
Total	3	7	10	27	47 (100.0)

Teenage clinics were most frequently given as a service provided for teenagers. What these offered varied, though most offered general health advice about issues such as smoking and illegal drugs, as well as contraception and sexual health advice:

"The practice runs a youth drop in centre in a separate building. Here we issue condoms and give advice on any youth issue. Including pregnancy and STIs" Practice manager from Doncaster

Three of the respondents stated the clinics they ran were not well attended:

"We offer an after school drop in without an appointment sessions twice a week for teenagers, though the offer is seldom taken up despite advertisement in the surgery and the local school." Practice manager from Doncaster

Inviting young people to a school leavers health check (at aged 15, quite often as part of the immunisation programme) was also a frequently reported teen specific initiative. These, as with the teenage clinics, tended to offer general health advice, including contraception, and sexual health advice:

"Invited for immunisation at age of 15 years within this consultation they are offered sexual health advice which would include contraception and safe sex prevention of sexually transmitted disease" Practice manager from Lincolnshire.

Free condom provision was also given as a service provided for teenage patients, and in most cases the respondent stated that this was as part of a local scheme or initiative. Two practices in Lincolnshire stated that teenagers were able to access a nurse or in one case a nurse practitioner, for advice , and in one case, for emergency contraception:

"only an emergency contraception appointment where the practice nurse will see them immediately. Adhering to a protocol will advise and issue PC4" Practice manager from Lincolnshire.

One of the Sheffield based practices offered support groups for their teenage patients, one of which was aimed specifically at teenage mothers:

"Teen group- health education support group for young people. Pregnancy group- support group for pregnant women/young mothers" Practice manager from Sheffield.

The school-based services, all of which were running in Lincolnshire, were based around education and providing teenagers with sexual health and general health information:

"Health Visitor attached to the practice and the local school nurse have weekly term time classes within the local secondary school PSHE programmes. Topics included are: 1)Changing bodies and emotions 2) Assertiveness and peer group pressure 3) relationships and responsibility." Practice manager from Lincolnshire.

5.7.4 Written policies on confidentiality for teenagers aged under 16 years

A total of 211 (16 missing cases) respondents gave an answer to this question. Twenty four (10.6%) stated that they did have a written policy for young people aged under 16. A total of 26 gave a written response, and 12 of these were from practice managers who had responded that they did not have a written policy (see Table 18). In this group, most stated that their policy was written, but not age specific and so related to the entire practice population. Some reported that there was an agreed verbal policy, and that the staff were aware of issues relevant to young people aged under 16:

"We do not have a written policy but all staff have attended confidentiality training and understand that young people are entitled to confidentiality" Practice manager from Barnsley.

And:

"Verbal understanding by the team on dealing with these issues " Practice manager from Lincolnshire.

A total of 3 respondents reported that they were currently writing a policy and one of these had initiated the process as a result of receiving the questionnaire. A further 3 of the respondents reported that they their policy followed guidelines provided by agencies including the MDU (Medical Defence Union) and the Family Planning Association:

"Guidance issued jointly by the BMA, GMSC, HEA, Brook advisory clinic, FPA and RCGP." Practice manager from Sheffield

Table 18 . Written responses to question regarding written practice policy for confidentiality and young people aged under 16 by type and area.

Type of policy	Area				
	Barnsley (high)	Doncaster (high)	Sheffield (moderate)	Lincolnshire (low)	Total
Written statement in a practice leaflet or displayed in waiting room	1	0	3	0	4
Written statement for all patients (not age specific)	1	2	2	2	7
Follow guidelines (BMA, Brook or MDU)	0	0	1	2	3
Doctor does not disclose information	0	0	0	1	1
Currently being written	0	0	2	1	3
Staff are trained and aware but no written policy, verbal only	1	1	2	1	5
Confidentiality maintained with consent	0	0	1	0	1
Written policy as part of Practice Nurse protocols	0	0	0	1	1
Parents should preferably attend with them if they are pregnant, but not necessary	0	0	1	0	1
Total	3	3	12	8	26

5.7.5 Other services in the practice area

The Practice Managers were also asked if they were aware of any other teenage clinics that were operating within their practice area, and to estimate how far from the practice the nearest family planning clinic was. As well as being collected for descriptive purposes, this information was included in the analysis presented in chapter 5 as potential confounding variables.

As shown in Table 19, 85 (37.4%) of practices had a teenage clinic in the practice area. This varied significantly between area (X^2 = 12.67 df=3 P=0.005), with 22 (75.9%) practices in the Barnsley area reporting to have a teenage clinic in the area, compared to 20 (23.8%) in the Sheffield area.

In terms of distance to the nearest family planning clinic, overall 66 (29.1%) of practices reported that the nearest clinic was less that one mile away, and 108 (47.6%) stated that the nearest clinic was 1 to 6 miles from the practice. When this variable was collapsed into less than one mile and more than one mile from the practice for analysis purposes, no significant differences were observed between area (X^2 = 1.29 df=3 P=0.73).

Table 19. Number of practices with a teenage health clinic in the practice area.

Area	*Response			
	Yes there is a teenage clinic in the practice area	No, there is not a teenage clinic in the practice area	Don't know	Total
Barnsley	22 (75.9)	5 (17.2)	1 (3.4)	28 (96.6)
Doncaster	16 (47.1)	8 (23.5)	8 (23.5)	32 (94.1)
Sheffield	20 (23.8)	25 (29.8)	34 (40.5)	79 (94.0)
Lincolnshire	27 (33.8)	31 (38.8)	17 (21.3)	75 (93.8)
Overall	85 (37.4)	69 (30.4)	60 (26.4)	214 (94.3)

*Missing cases= 13

Table 20. Distance to nearest Family Planning Clinic by area.

Area	Distance to nearest family planning clinic	*Number or responses (%)
Barnsley	< one mile	10 (34.5)
	1 to 6 miles	17 (58.6)
	> 6 miles	1 (3.4)
Doncaster	< one mile	11 (32.4)
	1 to 6 miles	15 (44.1)
	> 6 miles	6 (17.6)
Sheffield	< one mile	21 (25.0)
	1 to 6 miles	54 (64.3)
	> 6 miles	4 (4.8)
Lincolnshire	< one mile	24 (30.0)
	1 to 6 miles	22 (27.5)
	> 6 miles	29 (36.3)
Overall	< one mile	66 (29.1)
	1 to 6 miles	108 (47.6)
	> 6 miles	40 (17.6)

* Missing cases =13

5.8 Family Planning Services in Trent: A survey of accessibility

5.8.1 Background

Teenagers do not exclusively use general practice based services, they also attend family planning clinics for contraception and sexual health advice, and it has been reported that some teenagers, particularly those aged under 16 years, consider family planning clinics as an appropriate venue for sexual health advice (Pearson VAH, Owen, & Phillips 1995). It is therefore important that these services are included in any description of the services available to young people within this region.

In the Social Exclusion Report, a significant emphasis was placed upon the importance of accessibility of contraceptive services, and the report stated that the location and opening hours of services were:

"Critical for teenagers who may be tied to a school timetable and rely upon public transport"(The Social Exclusion Unit1999).

Considering that in a study by the Centre for Sexual Health Research, most teenagers walked to the clinic, and only 2% would consider travelling for over half an hour to access services, then location and opening times of services are very important issues (Stone N & Ingham R 2000).

5.8.2 Aims and objectives of the survey

In order to describe family planning services in Trent, a survey of all clinics in existence in the Autumn of 1997 was carried out. The main aim of this was:

- To identify the number of clinics in each of the health authority areas in Trent and determine how accessible they were to young people of school age (16 and under)

5.9 Method

5.9.1 Identification of Family Planning Clinics

To describe family planning provision for young people in Trent, details for all clinics in existence in the autumn of 1997 were collected. The information was either collected through the Community Health Trust or through large centrally based clinics.

The information obtained for each clinic was as follows:

- Location (address and contact details)
- Total hours of service provision and time of clinics
- Number of hours provided that would be accessible by school aged teenagers (16 years and under)

In most cases, the Trust or central clinic provided current patient information leaflets which detailed times and locations of clinics. In the few cases where patient information was not available, times and locations were either faxed or sent through the post. The hours accessible to school aged teenagers were defined as clinics provided either at lunch-time (12.30 – 1.30pm to cover school lunch periods) and after school clinics (4-9pm). Information was also collected for any clinics that were run at the weekend, though these were rare with only five recorded for the whole region.

5.10 Results

In 1997, as presented in Table 21, there were a total of 108 Family Planning Clinics in the Trent region. These clinics provided weekly, a total of 498 hours of service provision and 260.5 of these were accessible to young people of school age. There was a wide variation between health authority areas, with Sheffield providing 76 hours of provision per week, with only 26 of these (34%) being accessible to young people of school age. More than half of the clinics in Sheffield provided no clinic sessions, which could be accessed by young people who are at school. In comparison, Lincolnshire provided a total of 40.5 hours of service provision, and 32.5 (80%) of these were accessible to young people under 16 years. Only 1 of the 15 clinics in Lincolnshire did not provide any clinics that could be accessed by under 16s who attended school.

Table 21. Number of clinics and hours of provision for each Health Authority area.

Health Authority Area	No. of Clinics	No. (%) of clinics not providing any young teen accessible service	Total hours of provision (per week)	Total hours accessible to young teenagers (per week)
Barnsley	9	3 (33%)	45.5	22.5
Doncaster	4	1 (25%)	18.25	10.5
Nottingham	20	10 (50%)	66.5	31.5
Rotherham	7	1 (14%)	43.75	17.25
Sheffield	8	5 (62.5%)	76	26
South Derbyshire	9	2 (22%)	38.75	21.75
North Nottingham	14	2 (14%)	58.75	36
North Derbyshire	13	2 (15%)	44	31
Lincolnshire	15	1 (7%)	40.5	32.5
Leicestershire	9	1 (11%)	66	31.5
Total	108	28	498	260.5

5.11 Conclusion and discussion

5.11.1 Characteristics of practices in Trent

In terms of the characteristics of practices in the former Trent region, of the total number of 826 practices, a total of 316 (38.5%) had at least one GP aged under 36 years, and 477 (58.1%) had at least one female GP. The median practice pregnancy rate was 27.6 per 1000 women, and for women aged under 16 years this rate was 1.85 per 1000 women.

Focusing on the health authority areas explored in more detail in subsequent chapters of this thesis, Barnsley had a median practice pregnancy rate for women aged 13-19 years of 66.6 per 1000 women, and Doncaster had a rate of 81.8 per 1000 women in this age group. The rate for Sheffield was lower (55.3 per 1000 women), and for Lincolnshire this rate was lower still (38.7 per 1000 women). These practices were not significantly different from other practices for any characteristic except for sex of GP, where practices in Sheffield were significantly more likely to have at least one female GP

(73% of practices in Sheffield had at least one female GP, compared to 58% for Trent overall).

5.11.2 Provision of teen specific services

In terms of teenage specific initiatives, a total of 47 (20.7%) practices in the four health authority areas were running a teenage specific initiative at the time of data collection (1997). Although there were many types of initiative reported, the most frequent were teenage clinics, invitations for health checks for young people aged 15 years, and the provision of free condoms. The use of these clinics for health promotion has been supported by both teenagers and professionals (McPherson A, Donovan C & Macfarlane A 2002 ; Little L 1997), and McPherson et al state that to succeed, such initiatives need to be led by an enthusiastic member of staff and local needs should have been identified and considered.

However, whether teenage specific initiatives actually have any association between improvement in health condition is less clear. Health promotion in primary care has been found to effect a small improvement in health and health related behaviour, but this is not always sustained (Walker Z et al 2002). Whether the teen specific initiatives reported in this study have any effect upon teenage pregnancy rates is reported in chapter five as part of the analysis exploring practice characteristics associated with variation in teenage pregnancy rates.

5.11.3 Confidentiality polices for under 16s

A total of 10.6% of practices stated that they had a specific written confidentiality policy for young people aged under 16, and most who gave a written response stated that their policy for under 16s was the same as that for patients of all ages. Lee et al asked the same question to 175 GPs, and 43% responded that yes they did have a written policy of confidentiality for young people aged under 16. However, this study then went on to ask if this policy was advertised to young people, and a third of respondents said that it was not advertised (Lee E et al 2004). Although this specific question was not asked in the practice managers' questionnaire, some of the respondents did state that their policy was verbal or something that was understood between staff members. This does bring into question whether this understanding is actually conveyed to their young patients, and if so, is the message consistent and is it made clear to all young patients in this age group.

5.11.4 Family planning provision

The survey of family planning services showed that in all areas there were clinics that could not be accessed by young people who attended school, as they were only open during school hours. This varied greatly between areas, with only 37% of clinics in Sheffield accessible to young people in this age group, compared to 93% of clinics in Lincolnshire. In addition the clinics did not always run on a weekly basis, and in some cases were run on, for example, the third Monday in the month, which is likely to cause some confusion.

However, there is evidence to suggest that provision of family planning services, rather than being linked with lower pregnancy rates, is actually linked with higher rates of pregnancy. A recent study found that abortion rates were higher in areas with family planning clinics (Clements S et al 2004) and a study by Paton in 2002 found that conception rates and abortion rates to under 16s were positively associated with family planning clinic provision (Paton D 2002).

In some areas, including Sheffield and Nottingham, a significant amount of family planning time, accessible to school aged teenagers, was provided by large centrally based clinics. Although these clinics are likely to be easily accessible by public transport, it should be considered that young people have reported that proximity to a service does influence their decision to attend. A study by the Centre for Sexual Health Research in Southampton, found that most young people walk to services, and only 2% of young people were willing to travel for more than 30 minutes to access a service and only 9% would travel for 20 minutes (Stone N & Ingham R2000).

5.12 Methodological Issues

5.12.1 Data quality

It was not possible to validate the practice characteristics data files provided by the health authorities, though the figures for numbers of whole time equivalents and number of female GPs was comparable to national figures. There were also missing data from some health authorities, most notably weighted Townsend score. This practice specific score was not provided by several health authorities, including Barnsley, which has been focused upon in this thesis. The weighted score was in most cases, slightly lower than unweighted scores, showing slightly lower levels of deprivation. It is likely therefore that practice level analyses including unweighted Townsend score have overestimated the deprivation status associated with the practice area, and this issue should be considered in the interpretation.

The data provided by the practice managers was self-reported, and self-reported questionnaire data, particularly self reported behaviour, may not always accurately represent reality (Eccles M et al 1999). However, the questionnaire was not based on attitudinal or behavioural measures, and asked only for information relating to practice services, and so there is no reason to suspect that the information was not accurate. In addition the response rate to the survey was 84%, which is a good response rate for a postal questionnaire (Bowling A 1997).
It is difficult to assess how accurate the practice manager's assessment of distance to nearest family planning clinic was. It is likely that those who reported that the nearest clinic was less than a mile away have given a reasonable accurate response. Certainly an examination of the post codes of practices that reported that the nearest clinic was less than a mile away showed that they are very similar post codes to that of the nearest family planning clinic identified through the survey of clinic opening times.

The data provided by the family planning clinics was likely to be reliable as in most cases copies of patient leaflets were provided by the clinics. In the few cases where the opening times were provided either over the telephone or by letter or fax, a follow up phone call was made to ensure the information provided was correct.

CHAPTER 6 PRACTICE CHARACTERISTICS ASSOCIATED WITH VARIATIONS IN TEENAGE PREGNANCY RATES

6.1 Background

The data presented in this chapter were collected as part of a larger study, funded by the NHS Trent Executive, to identify potentially modifiable factors, for example the mix of health care providers within the primary care setting, associated with variations in teenage pregnancy rates. The initial analysis, which was published in 2000, (see appendix 8) presented data for the whole of the Trent region, and used Poisson regression analysis to identify any association between general practice characteristics and variations in pregnancy rate. This analysis included all 826 general practices in Trent and drew the following conclusions:

- General practices with female GPs had lower teenage pregnancy rates
- General practices with young GPs (aged under 36 years) had lower teenage pregnancy rates
- General practices with more nurse time had lower teenage pregnancy rates.

The initial univariate analysis also found, as one would expect, that higher pregnancy rates were associated with increasing deprivation scores, and so this was included as a potential confounder in the multivariate analysis. Fund-holding status, partnership and list size, training status and rurality were also included in the multivariate Poisson regression analysis as potential confounders.

This chapter presents a re-analysis of this data, but focuses on the four areas (Sheffield, Barnsley, Doncaster and Lincolnshire) that have are explored further in chapters 7 to 10. This chapter presents the findings using two methods of analysis, and the implications of these methods are also discussed. In addition to the variables included in the initial Trent-wide analysis, variables collected through the survey of practice managers were also included, these were specifically whether the practice was running a teenage specific initiative and whether practices had a specific confidentiality policy for young people aged under 16.

6.2 Aims and objectives

The aim of this chapter is to:

- Identify practice characteristics associated with variations in teenage pregnancy rates

The objectives are to:

- Determine whether key practice characteristics (having at least one GP aged under 36 years, having at least one female GP, number of WTE nurses, existence of written confidentiality policies and teen specific initiatives) are associated with variations in teenage pregnancy rates.
- Present the findings according to two analysis methods, and to discuss the implications of this.

6.3 Background literature

6.3.1 Female General Practitioners

Female GPs have been found to differ significantly from male GPs in terms of their working hours, patient population and type of conditions diagnosed and treated. In a study of Australian GPs, Britt et al found that female GPs were more likely to work part-time, were significantly younger than their male counterparts and were less likely to be single-handed. In terms of their patient contact, they were more likely to have long consultations with their patients and their patients were more likely to be female. Reasons for encounter were also significantly different, with patients presenting more frequently to female GPs with problems of a psychological or social nature, for reproductive issues and conditions of the female genital system (Britt H et al. 1996).

Teenage girls have reported that they would prefer to see a female GP (Little L1997), and in one study 98% of girls aged 13-15 reported that they would prefer to see a female GP for sexual health matters and if they were to be medically examined (Burack2000). This may be because female GPs have been reported as paying more attention to preventative and human aspects of patient care (Maheux B et al. 1989), or possibly because female GPs have been reported as being more comfortable discussing sexual health with teenagers compared to male GPs (Maheux B et al. 1997). The impact of the sex of the health professional has not been researched on a practice level, and so the analysis presented in this chapter will identify any relationship between sex of GP and pregnancy rate.

6.3.2 *Age of General Practitioners*

Older and younger GPs do differ significantly in some aspects of their practice. Older GPs have been found to be less positive about the use of guidelines in the consultation (Watkins C et al. 1999) and in a study looking at prostate cancer, have also been found to support the use of tests where the evidence base for their use is lacking (Ward J & Young J 1998). Younger GPs have been found to have higher rates of immunisations and smear uptakes (Baker D & Klein R 1991). However, there is no evidence to suggest that teenagers either would prefer to see a younger GP or that younger GPs have a different approach in dealing with younger patients. In terms of patient satisfaction and age of GP, Sixma et al found that age of GP and difference in age between patient and doctor was not associated with levels of patients satisfaction (Sixma HJ 1998).

6.3.3 *The role of the Practice Nurse in teenage health care*

McPherson et al state that practice nurses have an important role in the care of young people, and through routine care, such as immunisations, have the opportunity to discuss issues such as sexual health and pregnancy (McPherson A, Donovan C & Macfarlane A 2002).

In primary care based surveys the practice nurse has been reported as being someone that young people would like to see for health advice (Churchill R et al 1997, Gregg 1998). In terms of sexual health, in a survey of 234 practice nurses, Stokes found that practice nurses were comfortable talking to teenagers about sexual health issues, and that just over half offered contraception advice. This study also found that 13% offered teen specific health clinics (Stokes T & Mears J 2000). Gregg found that 15% of nurses surveyed offered teen specific facilities, and in this study 97% felt that there was a role for practice nurses within adolescent health care (Gregg et al 1998). However, as with the issues of age and sex of GP, there is no evidence to indicate whether increased practice nurse time has any impact upon variations in outcomes, in this case, variations in teenage pregnancy rates. The analysis in this chapter therefore includes the variable of practice nurse time to identify any significant association.

6.4 Method

6.4.1 Data collection

6.4.2 Pregnancy data

The collection of the pregnancy data used in this analysis is described in chapter three see section 3.4. In summary, data for all pregnancies for women aged 19 or under at the time of the hospital admission for the period 1/4/1994 to 31/3/1997 were collected from the Trent hospital admissions database. The cases were selected by identification of appropriate procedural and diagnostic codes associated with delivery or termination of pregnancy (see appendix 1). For the purpose of this analysis, patients from the four health authority areas (Doncaster and Barnsley, Sheffield and Lincolnshire) were selected. These pregnancies were assigned to the patient's GP practice code. The pregnancy rate for each practice was then calculated using the number of registered females aged 13-19 years as the denominator.

6.4.3 Miscarriage data

Of the 18692 pregnancies that were identified, which could be linked to a General Practice in Trent, 1046 (5.6%) were coded as being a miscarriage. As discussed in section 3.3.2.3, this data is likely to be significantly incomplete as not all miscarriages result in a hospital admission and unlike terminations of pregnancy done on the charity sector, it is difficult to determine how many cases of miscarriage are missing. It has been reported that at least 25% of miscarriages do not result in a hospital admission (Everett C 1997), though the true number may be even higher as it is impossible to determine how many women consider early miscarriages to be delayed onset of menstruation. With this in mind, the outcome of miscarriage is not included in the analyses presented in this chapter.

6.4.4 Collection of general practice characteristics data

The collection of the general practice based practice characteristics is discussed in section 5.3.1. In summary, in order to look for associations between general practice characteristics and variations in teenage pregnancy rates, it was necessary to approach the relevant health authorities for the following data:

- Unique identifying practice code
- Surgery postcode
- Fund-holding status
- Training status
- Number of whole time equivalent GPs
- Age of whole time equivalent GPs
- Sex of whole time equivalent GPs
- Single –handed status
- Number of whole time equivalent practice nurses
- Total list size
- Number of female patients aged 13-15 and 16-19
- Townsend score associated with the practice
- Number of registered females aged 13-15 years
- Number of registered females aged 16-19 years

From this data, further variables were computed, these were:

- List-size per WTE GP
- Rurality (according to Carstairs' categories and coded either rural or urban)
- At least one GP at the practice aged under 36 years
- At least one female GP at the practice

The age variable (aged under 36 years) was defined by taking the ages of all GPs in the Trent region at the point of data collection (1997), and then cutting this into quartiles. The youngest quartile were those aged under 36 years.

In addition to these variables, the following were added from information gathered through the survey of practice managers (see section 5.5):

- Teenage specific initiative running at the practice
- Written confidentiality statement for under 16s available at the practice
- Existence of a teenage clinic in the practice area
- Family Planning Clinic less than one mile from the practice

6.5 Statistical analysis

6.5.1 Negative binomial regression analysis and Poisson regression analysis.

The overall aim of the analysis was to identify any associations between the pregnancy rate associated with the practice, and the characteristics of that practice. In the initial analysis of the Trent wide data set, Poisson regression analysis was used to identify these associations. Poisson regression analysis is often used to identify associations where the chance of an event occurring is small, but the sample is large (Campbell MJ2001), which is relevant for incidence of teenage pregnancy amongst the general teenage population. However, Poisson regression is not appropriate for use with data where there is a chance of a repeat event, in this case, a repeat pregnancy. Considering that as many as 30% of teenagers will have a repeat pregnancy in the 18 months following first delivery, then this is an important issue to take into account (Stevens-Simon C et al 1997). In cases such as these, negative binomial regression analysis may be a more appropriate method to adopt. Glynn and Buring (Glynn RJ & Buring JE 1996), outline the case for the use of negative binomial regression by giving the case of rates of accidents amongst machine workers. They argue that the Poisson distribution in this case assumes that all machinists will have the same number of accidents, and that no one machinist is more likely to have an accident. The model then overestimates the number of machinists having one accident, but underestimates the number having four or more accidents. Therefore the interpretation of the data is flawed, as it does not take into account the fact that some people are more accident prone than others. Similarly, some teenagers are more likely than others to have a teenage pregnancy, and some will have 2 or more pregnancies during their teenage years.

Negative binomial regression, in this case, uses the number of teenage pregnancies as the numerator and the number of registered females aged 13-19 as the denominator. It has an extra parameter that accounts for over dispersion. Therefore the Poisson regression model is (StataCorp 2001):

$$y_i \sim \text{Poisson}(\mu_i)$$

Where

$$\mu_i = \exp(\mathbf{x}_i\beta + \text{offset}_i)$$

The Negative binomial regression model therefore is:

$$y_i \sim \text{Poisson}\,(\mu_i^*)$$

where

$$\mu_i^* = \exp(\mathbf{x}_i\beta + \text{offset}_i + \mu_i)$$

and

$$e^{ui} \sim \text{gamma}(1/\alpha,\ 1/\alpha)$$

Over-dispersion in the data can occur when there is a likelihood of repeat events (Campbell MJ2001). Poisson regression is a special case of negative binomial regression, which assumes that the data are not overly dispersed. If there is over-dispersion then the Poisson model will not fit the data well and so will lead to mis-interpretation of the findings. To test for this, the mean and the variance for the key variable, in this case the pregnancy rate associated with the practice, can be calculated, and if they are different then the data is likely to be over-dispersed. The software package STATA can also test the goodness of fit of the Poisson model; by using the command 'poisgof' immediately after running the Poisson regression analysis, STATA will test the goodness of fit and give a P value. If this value is significant (i.e. <0.05) then the model does not fit the data and an alternative method of analysis should be sought.

Taking into account the fact that repeat pregnancies could not be identified in the data file, but were likely to have occurred, Poisson, though not initially discounted, was considered to be potentially inappropriate for the analysis. The data presented in this chapter have been analysed using both Poisson analysis (with a test for goodness of fit) and also using negative binomial regression analysis. The overall aim of this analysis is to test the main findings of the initial analysis, which found that even when potentially confounding factors such as Townsend score were taken into account; practices with younger GPs, female GPs and more nursing hours had significantly lower teenage pregnancy rates.

6.5.2 Significance level

A two-tailed significance level of 0.05 was chosen, and for multivariate analysis, variables that reached 0.10 significance in univariate analysis, were entered into the multiple regression model. Variables included in the multivariate analysis as potential confounders were Townsend score of deprivation, fundholding status, list size, rurality, training status and partnership size, whether there was a teenage clinic in the practice area and whether there was a family planning clinic within a mile of the practice.

6.6 Results

6.6.1 Univariate associations for women aged 13 to 19 years

As shown in Table 22, the results for univariate Poisson analysis, do in the majority of cases, mirror the findings of the original Trent-wide analysis, in that significant associations were observed for age of GP (at least one GP aged under 36 years), number of WTE Practice Nurses, and rurality. However, the test for goodness of fit was significant for all variables and so the Poisson analysis method was not appropriate in this instance. In addition, the mean pregnancy rate was significantly different to the variance, and so the data were over dispersed, meaning that the assumptions for using Poisson analysis were violated.

In terms of the findings where the more appropriate method was used (negative binomial regression), in univariate analysis, significant associations were found for three variables. Lower incidence rate ratios (this being lower teenage pregnancy rates) were associated with rural practices (OR 0.66 CI 0.56 to 0.79, P<0.001) and practices who were identified through the survey of practice managers as having a teenage specific initiative running (OR 0.81 CI 0.66-0.99, P=0.04). As expected, Townsend score of deprivation was significantly associated with higher rates of teenage pregnancy (OR 1.13 95%CI 1.11-1.15, P<0.001).

Table 22. Univariate analysis of practice characteristics associated with teenage pregnancies (13-19 years)

Practice Characteristic	Unadjusted OR Poisson	P Value	Unadjusted OR NBREG	P Value	Goodness of fit P value
At least one female GP	0.95 (0.90 – 1.00)	0.06	0.99 (0.85-1.15)	0.875	<0.001
At least one GP under 36 years old	0.84 (0.80-0.88)	<0.001**	0.91 (0.78-1.05)	0.19	<0.001
Teenage specific initiative	0.76 (0.71-0.81)	<0.001**	0.81 (0.66-0.96)	0.04*	<0.001
Confidentiality policy	1.16 (1.05-1.28)	0.003**	1.21 (0.90-1.61)	0.21	<0.001
No. of WTE practice nurses	0.96 (0.94-0.99)	0.004**	1.047 (0.95-1.16)	0.38	<0.001
Training status	0.96 (0.90-1.01)	0.123	1.06 (0.87-1.28)	0.57	<0.001
Research Practice	0.85 (0.79-0.93)	<0.001**	1.06 (0.87-1.23)	0.57	<0.001
Townsend Score	1.13 (1.12-1.14)	<0.001**	1.13 (1.11-1.15)	<0.001**	<0.001
Rural Practice	0.73 (0.68-0.77)	<0.001**	0.66 (0.56-0.79)	<0.001**	<0.001
Single handed practice	0.87 (0.81-0.95)	<0.001**	0.99 (0.82-1.19)	0.65	<0.001
Ever fund-holding	1.07 (1.02-1.13)	0.003**	1.03 (0.89-1.20)	0.65	<0.001
List size per WTE GP	1.00 (0.99-1.00)	0.75	1.00 (0.99-1.00)	0.65	<0.001
Teenage Clinic in the practice area	0.78 (0.71-0.81)	<0.001**	0.81 (0.66-0.99)	0.04*	<0.001
Family planning clinic less than 1 mile for practice	1.10 (1.05-1.16)	<0.001**	1.23 (1.03-1.47)	0.02*	<0.001

* Significant at P<0.05
**Significant at P<0.01

6.6.2 Multivariate associations (13-19 years)

In adjusted multivariate Poisson analysis, age of GP (aged under 36) was significantly associated with lower teenage pregnancy rates (OR 0.93 95%CI 0.87 to 0.98, P=0.01). Practices running a teen specific initiative also had lower teenage pregnancy rates (OR 0.87 95%CI 0.81-0.94, P=<0.001). However, in negative binomial regression analysis, these factors were not significantly associated with teenage pregnancy rate (see Table 23).

Table 23. Multivariate analysis of practice characteristics associated with teenage pregnancies (13-19 years)

Practice Characteristic	Adjusted OR Poisson	P Value	Adjusted OR NBREG	P Value	Goodness of fit P value
At least one female GP	1.06 (1.04 – 1.17)	0.001**	1.12 (0.97-1.29)	0.11	<0.001
At least one GP under 36 years old	0.93 (0.87-0.98)	0.01*	0.97 (0.84-1.12)	0.66	<0.001
Teenage specific initiative	0.87 (0.81-0.94)	<0.001**	0.88 (0.74-1.05)	0.17	<0.001
No. of WTE practice nurses	1.03 (0.98-1.07)	0.25	1.11 (0.98-1.26)	0.11	<0.001
Confidentiality policy	1.07 (0.98-1.18)	0.15	1.07 (0.85-1.35)	0.54	<0.001

Adjusted for: Townsend score, fundholding status, list size, partnership size, rurality, and training status.
* Significant at P<0.05
**Significant at P<0.01

6.6.3 Univariate associations for women aged 13 to 15 years

For women aged 13-15 years, there were more significant associations between practice characteristics and pregnancy rate (see Table 24).

In unadjusted negative binomial regression analysis, practices with younger GPs (aged under 36 years) had significantly lower teenage pregnancy rates in women aged 13 to 15 years (OR 0.65 95%CI 0.49-0.85, P<0.001). Practices with teenage specific initiatives also had significantly lower teenage pregnancy rates (OR 0.59 95%CI 0.39-0.88, P<0.001). In line with the results reported for all women aged 13-19 years, Townsend score was significantly associated with pregnancy rates for women aged 13 to 15 years (OR 1.14 95%CI 1.09-1.19, P<0.001), as was rurality (OR 0.56 95%CI 0.39-0.81, P=0.002). In addition, practices where there was a family planning clinic within one mile of the practice, had a significantly higher teenage pregnancy rate (OR 1.41 95%CI 1.04-1.92, P=0.03).

Table 24 Univariate analysis of practice characteristics associated with teenage pregnancies (13-15 years)

Practice Characteristic	Unadjusted OR Poisson (95% CI)	P Value	Unadjusted OR NBREG (95%CI)	P Value	Goodness of fit P value
At least one female GP	0.77 (0.62-0.96)	0.021*	0.77 (0.57-1.03)	0.08	<0.001
At least one GP under 36 years old	0.62 (0.51-0.77)	<0.001**	0.65 (0.49-0.85)	0.002**	<0.001
Teenage specific initiative	0.61 (0.45-0.84)	0.003**	0.59 (0.39-0.88)	0.001**	<0.001
Confidentiality policy	1.64 (1.14-2.36)	0.007**	1.91 (1.14-3.19)	0.01*	<0.001
No. of WTE practice nurses	0.94 (0.83-1.06)	0.28	0.94 (0.79-1.12)	0.49	<0.001
Training status	0.86 (0.67-1.11)	0.25	0.99 (0.69-1.42)	0.96	<0.001
Research Practice	0.69 (0.46-1.04)	0.07	0.73 (0.43-1.22)	0.23	<0.001
Townsend Score	1.13 (1.09-1.17)	<0.001**	1.14 (1.09-1.19)	<0.001**	<0.001
Rural Practice	0.59 (0.44-0.79)	<0.001**	0.56 (0.39-0.81)	0.002**	<0.001
Single handed practice	1.32 (0.93-1.86)	0.12	1.31 (0.88-1.97)	0.19	<0.001
Ever fund-holding	0.94 (0.76-1.16)	0.54	0.92 (0.69-1.22)	0.55	<0.001
List size per WTE GP	1.00 (1.00-1.00)	0.02*	1.00 (0.99-1.00)	0.06	<0.001
Teenage Clinic in the practice area	1.17 (0.94-1.45)	0.16	1.14 (0.85-1.54)	0.38	<0.001
Family planning clinic less than 1 mile for practice	1.31 (1.05-1.63)	0.02*	1.41 (1.04-1.92)	0.03*	<0.001

* Significant at P<0.05
**Significant at P<0.01

6.6.4 *Multivariate associations (13-15 years)*

The results for multivariate analyses for women aged 13-15 are shown in Table 25. In multivariate negative binomial regression analysis, practices with younger GPs (aged under 36 years) had significantly lower teenage pregnancy rates (OR 0.67 95%CI 0.49-

0.93, P=0.02). Practices running a teenage specific initiative also had lower rates for women aged 13-15 years (OR 0.61 95%CI 0.41-0.91, P=0.02).

Table 25 Multivariate analysis of practice characteristics associated with teenage pregnancies (13-15 years)

Practice Characteristic	Adjusted OR Poisson	P Value	Adjusted OR NBREG	P Value	Goodness of fit P value
At least one female GP	0.92 (0.71-1.18)	0.52	0.87 (0.68-1.12)	0.28	<0.001
At least one GP under 36 years old	0.68 (0.53-0.88)	0.003**	0.67 (0.49-0.93)	0.02*	<0.001
Teenage specific initiative	0.71 (0.51-0.98)	0.04*	0.61 (0.41-0.91)	0.02*	<0.001
Confidentiality policy	1.39 (0.97-2.00)	0.07	1.49 (0.94-2.37)	0.09	<0.001

Adjusted for: Townsend score, fundholding status, list size, partnership size, rurality, and training status.
* Significant at P<0.05
**Significant at P<0.01

6.6.5 *Univariate associations for women aged 16 to 19 years*

In unadjusted Poisson regression analysis, lower teenage pregnancy rates for women aged 16-19 years were observed in practices with at least one female GP (OR 0.97 95%CI 0.94-0.99, P=0.02), practices with at least one GP aged under 36 years (OR 0.87 95%CI 0.83-0.91, P<0.001), and practices running a teenage specific initiative (0.73 95%CI0.68-0.78, P<0.001). In addition, practices with more nursing hours (OR 0.97 95%CI 0.94-0.99, P=0.02) and training practices (OR 0.91 95%CI 0.86-0.97, P<0.001) had lower teenage pregnancy rates.

Higher rates were associated with fundholding status (OR 1.07 95%CI 1.02-1.13, P=0.005) and Townsend score of deprivation (OR 1.14 95%CI 1.13-1.17, P<0.001). However in negative binomial regression analysis, only Townsend score and rurality were associated with teenage pregnancy rates (see Table 26).

Table 26. Univariate analysis of practice characteristics associated with teenage pregnancies (16-19 years)

Practice Characteristic	Unadjusted OR Poisson	P Value	Unadjusted OR NBREG	P Value	Goodness of fit P value
At least one female GP	0.97 (0.94-0.99)	0.02*	0.97 (0.83-1.15)	0.75	<0.001
At least one GP under 36 years old	0.87 (0.83-0.91)	<0.001**	0.91 (0.78-1.07)	0.26	<0.001
Teenage specific initiative	0.73 (0.68-0.78)	<0.001**	0.85 (0.68-1.05)	0.13	<0.001
Confidentiality policy	1.15 (1.04-1.27)	0.01*	1.09 (0.81-1.48)	0.57	<0.001
No. of WTE practice nurses	0.97 (0.94-0.99)	0.02*	1.05 (0.95-1.17)	0.33	<0.001
Training status	0.91 (0.86-0.97)	0.003**	1.05 (0.86-1.29)	0.63	<0.001
Research Practice	0.87 (0.79-0.95)	0.001**	0.84 (0.63-1.11)	0.22	<0.001
Townsend Score	1.14 (1.13-1.14)	<0.001**	1.13 (1.10-1.15)	<0.001**	<0.001
Rural Practice	0.78 (0.73-0.83)	<0.001**	0.69 (0.58-0.83)	<0.001**	<0.001
Single handed practice	0.74 (0.68-0.81)	<0.001**	0.99 (0.82-1.21)	0.97	<0.001
Ever fund-holding	1.07 (1.02-1.13)	0.005**	1.04 (0.89-1.21)	0.63	<0.001
List size per WTE GP	0.99 (0.99-1.00)	0.07	1.00 (0.99-1.00)	0.66	<0.001
Teenage Clinic in the practice area	0.74 (0.69-0.79	<0.001**	0.85 (0.69-1.05)	0.14	<0.001
Family planning clinic less than 1 mile for practice	1.04 (0.99-1.10)	0.11	1.20 (1.00-1.45)	0.05	<0.001

* Significant at P<0.05
**Significant at P<0.01

6.6.6 Multivariate associations for women aged 16 to 19 years

In multivariate Poisson regression analysis, practices with younger GPs (OR 0.93 95%CI 0.88-0.99, P=0.02) and practices with a teenage specific initiative (OR 0.88 95%CI 0.81-0.95, P<0.001) had significantly lower pregnancy rates for women aged 16-19 years. Higher rates were found in practices with at least on female GP (OR 1.09 95%CI 1.03-1.16, P=0.004).

However, again the test for goodness of fit suggested that Poison was not an appropriate analysis method, and in negative binomial regression analysis, these observations were not repeated (Table 27).

Table 27 Multivariate analysis of practice characteristics associated with teenage pregnancies (16-19 years)

Practice Characteristic	Adjusted OR Poisson	P Value	Adjusted OR NBREG	P Value	Goodness of fit P value
Confidentiality policy	1.09 (0.99-1.21)	0.09	1.01 (0.78-1.30)	0.94	<0.001
At least one GP under 36 years old	0.93 (0.88-0.99)	0.02*	1.00 (0.78-1.29)	0.98	<0.001
Teenage specific initiative	0.88 (0.81-0.95)	0.001**	0.92 (0.76-1.11)	0.41	<0.001
WTE of practice nurses	1.02 (0.97-1.06)	0.51	1.11 (0.97-1.28)	0.13	<0.001
At least one female GP	1.09 (1.03-1.16)	0.004**	1.11 (0.95-1.29)	0.21	<0.001

Adjusted for: Townsend score, fundholding status, list size, partnership size, rurality, and training status.
* Significant at P<0.05
**Significant at P<0.01

6.7 Discussion

6.7.1 Summary of the main findings

In terms of associations between practice characteristics and pregnancy rate for women aged 13 to 19 years, in Poisson regression analysis, practices with at least one GP aged under 36 years, practice running a teenage specific initiative, and those with increased practice nurse time had significantly lower teenage pregnancy rates. Lower pregnancy rates were also observed in rural practices. Significantly higher rates were found in practices with a specific confidentiality policy for women aged under 16, and also in practices that had ever been fund-holding. Increasing levels of deprivation according to Townsend score was also associated with higher pregnancy rates. The analysis using negative binomial regression analysis found lower rates to be associated with practices running a teenage specific initiative and higher rates to be associated with higher levels of deprivation. In multivariate negative binomial regression analysis, no associations were observed between the key variables and the overall teenage pregnancy rate, though in Poisson analysis lower rates were observed in practices with at least one GP aged under 36 and practices running a teenage specific initiative.

Significant findings were observed in the analyses looking specifically at pregnancy rate for women aged under 16. In this analysis, in adjusted Poisson and negative binomial regression analysis, lower teenage pregnancy rates were associated with practices with at least one GP aged under 36 years and also with practices running teenage specific initiatives.

6.8 Methodological considerations

6.8.1 Data quality

As discussed in section 3.5, the pregnancy data collected for this analysis does not include every teenage pregnancy in the study period. The data for abortive outcomes is not complete in that it does not include terminations of pregnancy done within the private and charity sectors. This may have a confounding effect for this analysis, especially as numbers of referrals for private terminations for each practice are unlikely to be evenly distributed across practices. Practices in more affluent areas could be more likely to refer more privately funded terminations and if so, then this would give a falsely low pregnancy rate for these practices. Similarly, the data pertaining to deliveries may have missed up to 30% of all cases for Trent (when compared to data produced by the Office of National Statistics). As with the case of missing data for terminations of pregnancy, missing data for deliveries is more likely to impact some practices than others. Practices in more deprived areas could have artificially low rates, as these are more likely than practices in affluent areas to have patients who opt for a maternity rather than a termination.

The practice characteristics data collected for the four health authority areas (Barnsley, Doncaster, Sheffield and Lincolnshire) were largely complete when compared with the data-sets provided by all Health Authorities in Trent (see Table 13, page 112). The only exception was weighted Townsend score, which was not provided by Barnsley health authority. Therefore the unweighted Townsend score was assigned to practices within this health authority areas. However as shown in Table 14 on page 117, the weighted and un-weighted scores did not differ greatly, with the overall mean score being 1.31 (standard deviation = 3.48) according to weighted scores, and 1.74 (standard deviation = 3.70) for unweighted scores, and so this issue should not impact upon the interpretation of the findings.

6.8.2 Statistical method

The findings have been reported using two statistical methods (Poisson and negative binomial regression analysis). The results for both methods were reported as the initial analysis published in 2000 (Hippisley-Cox J et al 2000), used Poisson regression analysis. The results displayed for each method are different and more significant where Poisson regression has been employed, as compared to Poisson, negative binomial regression analysis will give a higher standard error and more conservative P values. The test for goodness of fit showed that Poisson regression was not an appropriate test for this data. In addition, as discussed in section 6.5.1, although Poisson regression analysis is useful when the chance of an event in a population is small, it does not take into account the fact that some events, such as teenage pregnancy, are more likely to occur in some people than others, and that this may be a repeat event. With these issues in mind, the findings of the negative binomial regression analysis should be considered over those presented using Poisson regression analysis.

It is also important to note, that although the analyses presented here help to explain some variation in teenage pregnancy rate, and can help in identifying associations between practice characteristics, sociodemographic variables and pregnancy rate, the findings cannot infer a causal relationship.

6.8.3 Teenage pregnancy rates and younger GPs

In the initial analysis published in 2000, lower teenage pregnancy rates were associated with practices with at least one young GP aged under 36 years. Although this was not found in multivariate analysis for women aged 13-19 in this study, it was found to be significantly associated with lower pregnancy rates in women aged 13-15 years. In a recent study published in 2004, young GPs (in this case, those aged under 40 years) were found to be associated with, on a local authority level, significantly lower teenage pregnancy rates for women aged 13-17 years. With the oldest group as the reference category, the youngest group of GPs had an odds ratio of 0.86, which is similar to the odds ratio of 0.65 reported in the present study (Clements S et al 2004).

6.8.4 *The impact of the sex of GP*

The findings of the original study, found a significant association between practices with female GPs and lower teenage pregnancy rates. This association was not found in this analysis, and in-fact in the sub analysis of young people aged 16-19 years, in Poisson analysis, practices with female GPs were associated with slightly higher rates. This association has also been found in a study published in 2004, which aimed to explain variations in numbers of teenage abortions and maternities. This study conducted by the Centre for Sexual Health Research, found that local authority areas with greater numbers of female GPs had significantly higher abortion rates for women aged 16-17 years (the result was not significant for teenagers aged under 16 years) (Lee E et al 2004). The difference observed however, though statistically significant, was small, with an odds ratio of 1.01. The authors state that this result should be treated with caution as it may be that within some local authority areas, independent sector abortion services were in place, that were not controlled for in the analysis. They also suggest that some cultural or socio-economic factors may have impacted upon the results.

6.8.5 *Teenage specific initiatives and family planning clinics*

In univariate negative binomial regression analysis, teen specific initiatives were associated with lower teenage pregnancy rates for women aged 13-19 years, though this was only a borderline significance (OR 0.81 95%CI 0.66-0.99, P=0.04). In adjusted negative binomial regression analysis, this variable was associated with significantly lower teenage pregnancy rates in women aged under 16 years (OR 0.61 95% CI 0.41-0.91, P=0.02). This association has not previously been reported, and suggests that such initiatives may be more effective in younger teenagers as opposed to those age over 16 years.

Distance to the nearest family planning clinic was included in the multivariate analysis as a potential confounder. Distance was determined by a variable indicating whether the nearest clinic was less than or more than one mile from the practice. This is a crude measure and should be interpreted with caution, as discussed in section 4.8.4 , it reflects the practice managers' perception of the distance, rather than actual distance. However in line with previous research (Clements S et al 2004; Paton D 2002), it does suggest that proximity to a family planning clinic is associated with higher teenage pregnancy rates.

CHAPTER 7 GENERAL PRACTITIONER SURVEY OF ATTITUDES AND BEHAVIOUR: AIMS, OBJECTIVES AND METHODOLOGY

In order to further explore the findings of chapter six, a questionnaire was designed to elicit information concerning GPs attitudes and behaviour relating to the care of young people aged under 16 years. For clarity this element of the thesis has been split into four chapters. This chapter presents the aims and objectives of the survey and describes the development of the questionnaire within the context of issues pertinent to questionnaire design. This chapter also describes the analysis methods adopted for both the quantitative and qualitative data generated through the survey.

7.1 Aims of the survey:

The primary aim of the questionnaire was to further explore the initial findings of chapter 6, which found associations between the age and sex of the GP and the pregnancy rate of the practice. The primary analysis presented in this chapter aims to describe GPs behaviour and attitudes towards key issues, such as the prescribing of contraception to young people aged under 16 years, and relate them to the age and sex of the respondent. The primary analysis also examines the relationship between response to the questionnaire items and the pregnancy rates of the practice.

A series of sub analyses then go further to present the results for single handed GPs and a practice level analysis will look specifically at practices with predominantly older and younger GPs, and report aggregated responses to the questionnaire, as well as any association between the pregnancy rate of the practice and the age categorisation of the practice (predominantly older or younger).

7.2 Primary objectives of the survey:

- To identify any association between age of the respondent and responses to key questions including prescribing of contraception for young women aged under 16 years.

- To identify any association between the sex of the respondent and responses to key questions including prescribing of contraception for young women aged under 16 years.
- To determine any association between responses to key questions and the pregnancy rate of the respondent's practice.

Secondary objectives

Predominantly older and younger practices

- To look specifically at practices with predominantly older and younger GPs and determine whether age category (predominantly older or younger) has any association with the pregnancy rate of the practice.
- To determine any associations between aggregated practice level analysis of the responses to the questionnaire items and the pregnancy rate of the practice.

Single Handed GPs

- To report differences between characteristics and responses of single-handed respondents and multi-partner practices.
- To identify any association between teenage pregnancy rate and single-handed status.

7.3 Methodology

7.3.1 The study population

A cross sectional survey of GPs in four health authority areas of the former Trent region was undertaken. These areas were chosen to represent areas with high (Barnsley and Doncaster) moderate (Sheffield) and low (Lincolnshire) pregnancy rates. Three practices in the Sheffield health authority area were excluded as they were University practices and so did not have any patients aged under 16.

The data pertaining to practice characteristics of the responders to the questionnaire came from data files of practice characteristics provided by the corresponding health authorities. Missing data on age and sex was obtained through hand searching questionnaire responses and also through health authority lists of practising GPs.

Missing data for information relating to number of whole time equivalent GPs were obtained from the survey of practice managers.

Data available for non-responders were as follows:

- Health Authority Area
- Age of GP
- Sex of GP
- Training status of the practice
- Townsend score associated with the practice
- Average list size per whole time equivalent
- Whether the practice was part of a regional research network.

Information for names and addresses of practising GPs was obtained from the appropriate health authority immediately prior to postage, this ensured that lists were as up to date as possible. A questionnaire was posted to every GP in each of the areas and then follow up questionnaires were posted three weeks later to non-responders.

7.3.2 The data collection instrument

A brief two-sided questionnaire was designed for GPs and aimed to elicit information about key activities and issues that could be linked with the variations in teenage pregnancy rates observed in chapter 6. A copy of this questionnaire can be found in appendix 6. The activities and issues to be explored are given below:

7.3.3 Contact with young teenage patients.

The GP participants were asked to answer the following question:

Approximately how many patients aged 12-15 years do you expect to see (for contraception or any other reason) per month?

This question aimed to determine how much exposure GPs had to young people in this age group, and whether this was associated with characteristics such as age and sex of the GP. It is already known that teenage patients are sensitive to some characteristics of their health care provider, and young women in particular are likely to prefer to see a female GP (Little L 1997, Burack R 2000). Young people in this age group do not attend frequently compared to the adult population, and a study of 11-14 year olds found that the average annual consultation rate of young men and women in this age group was 2.54 and 2.74 respectively, compared to an overall rate for the practice of 4.01 (Jacobson LD & Owen PA 1993). Another study found that only 53.5% of 13-16 year old patients had attended in the previous year (Kramer T et al 1997).

7.3.4 Prescribing of contraception to young people aged under 16 years.

The questionnaire aimed to investigate the provision of contraception to young people aged under 16 years, by asking respondents whether they prescribe contraception to young people under the age of 16 with or without parental consent. The response options included, yes, yes but preferably with proof of parental consent, yes but only with proof of consent and no,never.

Respondents were also asked if they believed it was legal to prescribe contraception to young people aged under 16 years without consent, this question was posed for two reasons. Firstly to identify how many GPs thought it was illegal to do so, and then to identify the characteristics of these GPs (i.e their age and sex).

This question was included as there is some confusion around the legalities of prescribing contraception to young people aged under 16. Twenty years ago there were a series of high court judgements, which changed how health professionals deal with young people under 16 years of age. Prior to the case bought by Victoria Gillick in 1984, GPs could prescribe contraception to their patients aged under 16 years at their discretion. However after a high profile legal battle, the courts issued a ruling where by GPs and other health professionals could only issue contraception to under 16s in an emergency, or with leave of the court. If they did issue contraception outside of this requirement, they were doing so illegally. This lead to a public outcry as it was feared that this would lead to an increase in unwanted pregnancies. In 1986, the Fraser Guidelines (Department of Health and Social Security1986) were issued. These state that a young person aged under 16 can be provided with contraception if they are likely to continue with sexual intercourse with or without contraception, if their physical or mental health would suffer without treatment, or if the health professional is satisfied that the young person is able to understand the implications of their actions. These guidelines also suggest that health professionals should try and persuade young people to discuss the issue with their parent or guardian.

7.3.5 Referral for termination of pregnancy for young women aged under 16 years.

Approximately 50% of conceptions to teenagers result in a termination of pregnancy (Office of National Statistics 1997). Termination of pregnancy is legal in the UK if there is a risk to the life or mental well being of the woman or foetal abnormality, and it is estimated that 75% of terminations of pregnancy are funded by the NHS (Family Planning Association 1998). Young women aged under 16 can be referred by their GP for a termination without parental consent as long as the doctor considers them competent to understand the implications of their actions (Family Planning Association 1998). As with the issue of prescribing contraception to young people aged under 16 years, the questionnaire asked whether the respondent would refer young women under 16 years for a termination of pregnancy, with or without parental consent. The response options were identical to those used in the question about prescribing contraception to young people aged under 16 (see 7.3.4). Again, response to this question is reported and analysed in terms of the age and sex of the respondent.

7.3.6 Confidentiality and young people.

Studies have shown that confidentiality in health care provision is seen as important by teenage patients (Churchill R et al 2000; Kari J et al 1997). Young people are unsure as to whether their consultation with their GP is confidential, and one study found that just under half either did not know if their consultation with the GP was confidential, or thought that their consultation was not confidential (Kari J et al 1997). A young person's consultation with their GP is confidential and as in usual circumstances, the content of the consultation cannot be divulged to a third party, for example a parent. However, here as with the issue of providing contraception to under 16s, some exceptions and special circumstances are in place. Information can be disclosed if non-disclosure is likely to lead to physical or mental harm to the patient, or if the patient is not deemed competent to make a decision re disclosure. Guidance produced jointly by amongst others, the British Medical Association, the Family Planning Association and the Royal College of General Practitioners, states that:

"The duty of confidentiality owed to a person under 16 is as great as that owed to any other person. Regardless of whether or not the requested treatment is given, the confidentiality of the consultation should still be respected unless there are convincing reasons to the contrary." (BMA et al. 1996)

As this issue is seen as important by young people, and could possibly be linked with a young person's decision to consult with their GP for contraception, the questionnaire was designed to include the issue of access to information by a third party, in this case a parent or guardian. The questionnaire also asked whether or not the respondent actively discussed the issue of confidentiality with patients aged under 16 years.

7.4 Questionnaire design

Questionnaires can be used, when, as in this case, initial findings need to be further explored (Boynton P & Greenhalgh T 2004). Using a questionnaire to collect data has some distinct advantages, compared to for example interviews, and also has some limitations. In practical terms, this method is efficient and cost effective (McAleer S 1994), and also if a representative sample is chosen, has the potential to produce findings that can be generalised to the larger population. As this approach does not involve direct contact with the respondent, then some ethical issues can be avoided, as it does not involve any action or treatment (Mathers N, Fox N, & Hunn A 1998). A significant disadvantage to this method is that it cannot be used to explore in any great detail why people behave in a certain way, and perhaps as importantly, the responses obtained through this method are only as good as the questions posed in the questionnaire itself. Thus, questions need to be precise and carefully worded to elicit a useful response (Stone DH 1993). A further disadvantage, relevant to the present study, is that self-reported behaviour may not reflect actual behaviour. A general practice based study found that self-reported behaviour on management of clinical conditions, differed significantly to actual practice (Garratt A et al 2002).

In terms of what constitutes a good questionnaire, Stone states that a good questionnaire is a tool that appropriately represents the respondents' views, and answers the questions that the researcher has (Stone DH 1993). The basic principles of a good questionnaire according to Stone, are that it should be appropriate, intelligible, unambiguous, unbiased and ethical. The appearance of a questionnaire is also important. This does not only mean the font, spacing used and so on, it also includes the use of tick boxes rather than circling numbers, and using interesting and simple initial questions to draw the respondent into completing the questionnaire (McAleer S1994).

Studies which have sought to further explore why some GPs do not respond to postal surveys; have found that factors such as being 'swamped' by questionnaires and the length of questionnaire are associated with the decision not to respond (MacPherson I & Bisset A 1995). Also, the perceived impact of the information that is returned and also how this is disseminated, has an effect on whether or not the questionnaire is completed (MacPherson I & Bisset A 1995; Peto V, Coulter A & Bond A 1993). In a study where GPs who did not respond were followed up by telephone, a third stated that they did not respond because they had lost the original questionnaire, and 90% of these then asked for another (Kaner EFS, Haighton CA, & McAvoy BR 1998). Questionnaires sent from Universities, rather than from other, for example commercial organisations, have also been shown to have better response rates (Edwards P et al. 2002).
Therefore several issues need to be considered in the design stage. In terms of the length of the questionnaire, one-page questionnaires have been found to yield a response rate of 90% (Cartwright A 1988). However, it is important to consider how much information has to be omitted in such a short survey and whether this might outweigh the potential pitfalls of response bias. Lund et al concluded that the benefits of a lengthy postal questionnaire with a reduced response rate, out-weighed those of a short survey providing less data but with a higher response rate (Lund E & Gram IT 1998).

Incentives have been used as a way of increasing likelihood of response. Monetary incentives have been found to increase response rates to survey based studies (Churchill R et al 1997, Tambor ES et al 1993), as have offering health professionals continuing medical education credits (Tambor et al 1993). A systematic review of 292 Randomised Controlled Trials found that the odds of response were doubled when a monetary incentive was offered. Similar results were found for shorter questionnaires and also where recorded delivery was used (Edwards P et al 2002).

Researchers have adopted other methods to improve response rates. In a study of stress in general practice, Myerson was disappointed with an initial response rate of 59% and so changed her approach for the second mailing. A hand written letter accompanied the second mailing, it was personal and included details of the researcher's husband who was a retired GP, it included a letter written by the researcher which had been published in the BMJ and also mentioned GPs' problems in a sympathetic manner. This approach increased the response rate to 74% (Myerson S 1993). Such a personal approach may work well with a small sample, but is not practical with a large sample such as the sample used in this study. Similarly, personal follow-up telephone calls have been found to improve response rates (Kaner EFS, Haighton CA, & McAvoy BR1998), but with time and funding constraints, this may not be possible.

Taking into consideration the previous research relating to response rates for health care based questionnaire studies the questionnaire used in this study was designed so that it could be completed within five minutes. This was to reflect the fact that gaining access to GPs for research purposes can be difficult, as they have restricted time and are frequently approached by both commercial and non-commercial organisations for participation in a wide range of research. The questionnaire was also sent with a short personally signed letter (see appendix 5) and a freepost envelope for the return of the completed questionnaire. A second mailing to non-responders was sent three weeks after the initial contact. It was not possible for financial reasons to further chase non-responders, nor was it possible to offer respondents a monetary incentive.

7.4.1 Response rates and response bias

Response rate is vital in assessing the generalisability of findings of a questionnaire-based study. In such studies, a response rate of 75% or above has been described as good (Bowling A1997). However, even if such a response rate is achieved, it is important to consider that the non-responders still make up a further 25 %, and may well be significantly different from those who do choose to respond, and may therefore introduce a bias into the results. There have been several studies to identify how responders differ from non—responders and some important differences have been reported. Response appears to decrease with age (Kaplan S & Cole P 1970; Myerson S1993; Sheikh M & Mattingly S 1981; Smith C & Stiff J 1985) with older respondents being less likely to return a completed questionnaire.

It is therefore important to include some analysis of non-responders and responders in order to assess any potential non-response bias. In the event that responders and non-responders are not found to differ significantly, this should still be treated with some caution and not necessarily interpreted as being free from non-response bias. An example is given by Vestbo and Rasmussen (Vestbo J & Rasmussen FV 1992). They found that although participants in a respiratory study were similar to non-responders in terms of lung function and smoking habits, a follow up study showed that non-responders were significantly more likely to be admitted to hospital because of respiratory disease than responders.

Bias is most problematic when it is linked to a particular variable of interest, for example a study of dental problems found that the children of non-respondents were more likely to have poor dental hygiene (Prendergast MJ & Williams SA 1993). In terms of this study, it was important that not only the attitudes and behaviours of GPs from affluent areas with low levels of material and social deprivation were represented, as teenage pregnancy is so closely linked with increasing levels of deprivation. To address this, analysis of responders and non-responders was done to identify any potential bias.

7.4.2 Response Error

Response error can occur when respondents either omit to answer questions or when they answer questions incorrectly. Omission (item non-response) can be due to inadequate design, so that instructions become unclear, or because the question posed is difficult or too time consuming to answer. The effect of this can be determined by calculating the item non-response rate. If this rate is significant then omission is not random and bias needs to be considered (Lynn P 1995). Incorrect responses may be due to the respondent misunderstanding the question or because they are unwilling to answer, for example if the question is of a sensitive nature. To minimise the potential of response error, the questionnaire designed for this study was carefully piloted to identify any questions that could have been mis-leading or poorly worded.

Response error was considered by looking specifically at missing data from the completed questionnaires, to determine if any items were more likely to be omitted (see Table 28). The number of missing cases for each item ranged from 3 cases for the question regarding the legality of prescribing to under 16s, to 19 for the question regarding referral for termination of pregnancy. This difference is unlikely to be due to the wording or presentation of the question, as the question concerning prescribing to under 16s was worded very similarly and the response options were identical and for this item only 7 (1.1%) missing cases were recorded. It is possible that the contentious nature of the issue of termination of pregnancy led to this slightly higher non-response, though the number of missing cases was still not considered enough to impact on the interpretation of the main results of the study.

Table 28. Missing values for specific questionnaire items

Questionnaire item		Number or missing values (%) N=621
How many young people aged 12-15 years do you expect to see per month		8 (1.29)
How often do you see young people aged 12-15 without a parent present		4 (0.64)
With how many of your patients aged 12-15 years do you discuss confidentiality?		6 (0.97)
Do you prescribe contraception to young people aged 12-15 years?		7 (1.13)
Do you refer young women aged 12-15 years for a TOP?		19 (3.06)
If a patients aged under 16 came to see you alone, would the parent or guardian of that patient have the right to know the content of the consultation without the patients' consent?		8 (1.29)
Can GPs legally prescribe contraception to young people aged under 16 years of age without parental consent?		3 (0.48)
Has the following qualifications:	FPCERT	1 (0.16)
	DRCOG	0 (0.00)
	MRCGP	0 (0.00)
	FRCGP	0 (0.00)
	DPCH	0 (0.00)
Are you on the obstetrics list?		1 (0.16)

7.4.3 Validity

Validity is an important issue in questionnaire design. The researcher needs to be sure that the tool that has been developed measures what it has been designed to measure, and that the responses collected are as far as possible a true representation of the respondents views or behaviours. The aim of validity testing is to ensure that correct inferences can be made from the data. Streiner gives an example; a student who does well on an exam about lung function can be expected to have a wider knowledge of the area than a student who does not do well, even though the exam only addressed some aspects of respirology (Streiner DL 2003). In the case of the present study, the most important issues are whether the questionnaire makes sense to the respondent, and seems to be measuring what it was designed to measure (face validity), and whether the data collected gives a true representation of actual behaviour (criterion validity). These issues are discussed in detail below.

7.4.4 Face validity

Face validity is essentially concerned with whether the survey used in a study seems to be measuring what it has been designed to measure (Jackson CJ & Furnham A 2000). If a questionnaire has good face validity then it makes sense to the respondent. This issue is important as if a survey has good face validity, it is more likely to be completed, and completed correctly. However, Jackson states that questions with high face validity can be easily 'faked' to give the correct answer, or the answer that is considered to be correct, thus not truly representing the respondents real beliefs or opinions. Jackson concludes that this can be avoided in anonymous surveys or surveys where there is no perceived reward from giving the 'right' answer (Jackson CJ & Furnham A2000).

In relation to the present study, face validity was determined through a pilot study (see section 7.5), where academic GPs were given the opportunity to give written comments on the wording of the questions, and were asked to highlight any ambiguity in meaning.

Although the questionnaire used in the study was not anonymous, the respondents could choose to anonymise their response by removing the unique identifier. It was not possible to make the questionnaire completely anonymous as the responses needed to be linked with the practice pregnancy rate for some analyses. However, by providing this option, respondents would be more likely to give answers that truly reflected both their opinions and behaviour. An analysis of those who chose to remove the identifier is given in section 8.3. These respondents were more likely than those who could be identified to state that either they did not know whether parents could have access, or that parents could have access to the content of their childs' consultation without the consent of the child. Hopefully by giving these respondents the option to remain anonymous, both the likelihood of response, and also the likelihood of giving a response reflecting actual beliefs, was maximised.

7.4.5 Content Validity

Content validity is concerned with the extent to which the questionnaire items represent the issue they are measuring (Jackson CJ & Furnham A2000). Put simply, do the questions adequately cover all of the relevant issues in order to best answer the research question? The most rigorous way of assessing content validity is to recruit an expert panel, whose role it is to identify the appropriate questions and issues through a structured discussion Jackson CJ & Furnham A 2000; Bowling A 1997). For this study, the pilot study included asking a group of academic practicing GPs to consider the questionnaire items, they were asked to consider issues relating to face validity (clarity of meaning and so on) but also given the opportunity to suggest alternative questions. Although this method is not as rigorous as a formal expert panel, it did allow members of the professional group (GPs) surveyed in this study to consider the questionnaire items in relation to the research question.

7.4.6 Criterion Validity

Criterion validity is concerned with the extent to which a tool correlates with an accepted gold standard. For example, a tool developed for the measurement of anxiety, might be measured against a depression scale. Criterion validity covers both predictive and concurrent validity. Concurrent validity is where as with the example of the depression scale, a new tool is measured against an existing validated instrument. Predictive validity uses other measures to determine how predictive the instrument is, for example if a GP stated that they measure blood pressure in all diabetic patients, then their response could be measured against medical records to determine whether the respondent was accurately reporting their true behaviour.

It can be difficult to determine criterion validity, particularly in attitudinal surveys as there is often no gold standard against which a tool can be measured (Bowling A 2001). However in health care research, this is sometimes done through comparison with patient records or through observation. Studies have found that self-reported behaviour is not necessarily a true reflection of actual behaviour (Eccles M et al 1999, Garratt A et al 2002). Eccles et al, in a study of the management of hypertension, compared self-reported action of GPs to information recorded in patients' records. They found significant differences between what GPs reported that they recorded, and what was actually recorded in the records. This difference was observed both in the nature of the activities – e.g. enquiring about smoking or salt intake, and also the frequency of these activities (Eccles M et al 1999).

With reference to the present study, it was not possible to measure actual behaviour, as this would have had to be done by either by studying patient records, or observing consultations between practicing GPs and their teenage patients. Ethically, both of these methods would be problematic. To gain access to the medical records of young people aged under 16 years, the researcher must gain consent from the parent or guardian of the teenage patient. This would have obvious time and financial implications, and would also mean contacting the parent about a study relating to contraception and pregnancy, which may potentially cause some conflict between parent and child. In terms of observing the GP, this would in itself introduce the potential for bias, as it is likely that participants would behave differently under observation. It is also likely that teenage patients who may already have fears over confidentiality would not agree to be observed. Therefore this chapter presents results of self-reported behaviour which cannot be for the reasons given above, validated against a 'gold standard' (the medical notes of young people or direct observation).

7.4.7 Reliability

If a questionnaire is reliable, it is able to generate information that is consistent. This means that repeated samples will produce consistent data, even if the researcher administering the tool is different (Boynton P & Greenhalgh T 2994; Bowling A 2001). Therefore, any differences observed in the data are due to true differences rather than due to respondents interpreting the questions differently. Validity is linked strongly with reliability in that the more reliable a measure, then the higher the maximum validity for the measure is (Streiner DL2003).

Reliability can be tested in several ways. Inter-rater agreement looks at the reliability of scores from different raters (respondents) at the same point in time. Intra-rater agreement looks at the reliability of the same raters at different points in time (this is often termed as test-retest reliability). Intra-rater reliability can be tested easily by administering the questionnaire to the same respondents repeatedly and then looking for a test re-test correlation of 0.85 or more. This level allows the researcher to be satisfied that the tool has a low level of random measurement error. However, it may be that there have been real changes in the period between measurements – for example guidelines or press coverage could have an effect on attitudinal measures, or for surveys measuring health, health status might have actually improved (Bowling A 2001). In this case, the instrument appears to be unreliable when it may not be, and so interpretations of the test re-test correlation needs to be considered carefully.

Ideally intra-rater reliability would have been measured by asking the respondents to complete another questionnaire sometime after they had returned the first. However, not long after the questionnaire phase of the study was completed, the government announced its plans for the Teenage Pregnancy Unit and the social exclusion report outlined its main objectives, which included making guidance around prescribing contraception to under 16s clearer. The large amount of national press interest may well have had an effect upon how respondents would answer some of the questions, and this would have made interpretation of the test re-test data difficult.

7.5 The Pilot Study

A pilot study was conducted to identify any structural problems with the questionnaire, for example ambiguous questions, and also to provide data for use in a sample size calculation. A total of 30 questionnaires were distributed to academic GPs working within the Department of General Practice at the University of Nottingham. They were asked to include any written comments if they found questions ambiguous or the choice of response inappropriate. GPs were specifically chosen to take part in the pilot study phase to reflect the target sample (Boynton P 2004).

Most of the respondents (n = 27) did not add any comments or suggestions re wording or possible changes to the overall structure of the questionnaire. However, it was clear from the comments made by two respondents, that the question about parental access to the content of their child's consultation was ambiguous as it did not include whether or not the child had given consent. Therefore the question was changed from:

If a patient who was aged under 16 came to see you alone, would the parent or guardian of that patient have the right to know the content of the consultation?

To:

If a patient who was aged under 16 came to see you alone, would the parent or guardian of that child have the right to know the content of the consultation without the patients' consent?

7.6 Administration of the questionnaire

The questionnaire was presented on a single sheet of A4 paper, with questions on both sides. At the top right hand corner, a unique identifier was added which linked directly to the name and address of the respondent on a data management database. If the respondent wished to remain anonymous, they were able to remove this identifier.

A database was constructed which included address details and telephone numbers for all GPs in Sheffield, Barnsley, Doncaster and Lincolnshire. These addresses were obtained from the relevant local health authority offices. General Practitioners do move practices or retire and so partnerships can change. Bearing this in mind the lists were not requested until shortly before the questionnaire was due to be mailed. This would hopefully have avoided non-response due to out of date address details. Indeed, only seven questionnaires were returned by practice staff stating that the addressee was no longer working at the practice.

The questionnaire was mailed along with a brief hand singed letter (appendix 5) and a freepost envelope. Returned questionnaires were marked on the database to show response and then the data were entered initially into an Epi-Info file and then transferred to SPSS version 9 and STATA version 8 for analysis. Three weeks after the initial mailing, a second questionnaire was mailed to all non-responders, with a brief hand signed letter, and a freepost envelope.

7.7 Statistical analysis

7.7.1 Sample size

The sample size calculation was based on the outcome of how male and female GPs responded to the question regarding prescribing contraception to young people aged under 16, collected through the pilot study (N=27). From this pilot data 53% of males and 85% of females responded that they would prescribe contraception to this age group without parental consent. To detect this difference with a two-sided significance level of 0.01 and 90% power, 131 males and 100 females respondents were needed. However a significantly larger number of GPs (951) were sent postal questionnaires to both allow for a potentially low response rate, and also to allow for the identification of a smaller difference between the groups of (15 % compared to 32%).

7.7.2 Quantitative Analysis

The data were manipulated in Microsoft Access and then analysed using SPSS version 9 and STATA version 8. For each question, descriptive analysis utilising statistical tests for categorical data (chi-square) were carried out and univariate and multivariate unconditional logistic regression was used to identify factors influencing dichotomous outcomes, allowing for clustering of GPs by practice. Continuous data (where homogeneity of variance could be assumed) were analysed using the independent samples T-test.

STATA version 8 was used to determine any relationship between responses to the questionnaire and the pregnancy rate associated with the practice. The primary analysis uses negative binomial regression , and adjusted and unadjusted results are given. As in chapter 5, these practice level analyses are also presented using Poisson regression analysis, to further highlight the different results that each method generates.

7.8 Data manipulation

7.8.1 Primary Analysis

For the primary analysis some manipulation of the data was needed for analysis purposes. Age was collected as a continuous variable but categorised for analysis, to reflect the categories adopted in previous chapters. These were identified by splitting the variable into quartiles according to the ages of all GPs, practising in Trent in 1997. The original continuous variable therefore became four categories (under 36 years, 36-41, 42-48 and 49 years and over).

It was necessary to dichotomise some variables for analysis purposes. How these variables were dichotomised is shown below in Table 29.

Table 29. Manipulation of variables for analysis purposes

Question	Coded as 1 if responded:	Coded as 0 if responded:
Approximately how many patients aged 12-15 years do you expect to see (for contraception or any other reason) per month?	More than 40 or 25-40	10-24 or less than 10
Of those patients aged between 12-15 that you do see, how often do you see them without a parent or guardian being present?	Very rarely or never	Always, often or occasionally
Of those patients aged 12-15 that you do see, with how many do you discuss the issue of confidentiality?	Few or none	Some, most or all
Do you prescribe contraception to girls aged under 16 years of age?	Yes	Yes but preferably or only with proof of consent and no, never.
Do you refer girls aged under 16 years for termination of pregnancy?	Yes	Yes but preferably or only with proof of consent and no, never.
If a patient who was aged under 16 came to see you alone, would the parent or guardian of that patient have the right to know the content of the consultation without the patients' consent?	Yes	No or don't know
Can GPs legally prescribe contraception to young people aged under 16 years of age without parental consent?	Yes	No or don't know

7.8.2 Secondary analysis

In order to create a practice level file from the individual GP level file used in the primary analysis, key variables needed to be aggregated. The aggregated file needed to represent the responses from each practice, whilst taking into consideration that not all GPs from each practice had responded. If the data file had included how many respondents from each practice had, for example reported that they would prescribe contraception without parental consent, then it would have been difficult to analyse and interpret. Therefore, a variable was computed for each questionnaire item to indicate if at least one respondent from the practice had for example stated that they would prescribe contraception without parental consent.

7.8.3 Qualitative analysis

An open question was included in the questionnaire. This was added to allow respondents to share their views and opinions, and to expand upon the quantitative data (Boynton P & Greenhalgh T2004). The open question asked respondents how they felt contraceptive services might be improved for young people. The responses were collated and printed, and also entered into the software package NUD*IST version 4 for management purposes.

Using a software package for coding and managing data has distinct advantages as it can reduce the time needed to assign codes and manage large data-sets. However qualitative researchers have stated that by using this approach researchers may be missing the meaning of the text as there may be a loss of context and 'closeness' to the data.(Murphy E et al. 1998) To avoid this, the text was coded both by hand and also within the computer software package.

Template analysis (thematic analysis), as described by King was used and themes were identified, for example the theme of morality, and then sub themes added as they emerged (King N 1998). This hierarchical coding approach is typically used in template analysis, where the initial template is applied to the textual data and then sub themes are identified and applied during the coding process. This approach is different from content analysis as in this case, the coding scheme is developed, applied to the data and then quantitative data is collected for the analysis process (Flick U 2002; King N1998). Although content analysis has been used widely, it is also criticised for being inflexible and missing the meaning behind the text (Flick U 2002).

The advantages of using template or thematic analysis is that it is flexible and does not rely heavily on procedures, associated with for example, explicative content analysis (Flick U 2002; King N 1998). However, King states that in the literature, there is a lack of description of the coding and interpretation process, which can lead to templates that are too simple or conversely, too complex, to produce useful and meaningful interpretations. To avoid this, further information on the method was provided directly by Dr Nigel King in the form of conference proceedings material, papers reporting the use of the technique and personal communication concerning the analysis of the data presented in this chapter.

7.8.4 Data entry and validation

The quantitative data were entered into EPI-INFO and then transferred into SPSS versions 9 and 11.5 and STATA version 8 for analysis. A sample of 1 in 4 was checked by hand for errors in data entry. The error rate was 4% (6 questionnaires with a single error in data entry out of 155) and so the data entry was accepted as having high levels of accuracy and completeness. Where errors were identified, they were rectified prior to analysis.

7.8.5 Missing data

The data files used in both GP level and practice level analysis in this chapter did include some missing values. The number of missing values for both GP and practice level characteristics are shown in Table 30 (missing values for individual questionnaire items are shown in table Table 29). The amount of missing data is an important issue, as it will have an effect upon the interpretation of the data. If a data file has 20% or 30% missing data, then the conclusions drawn from the data may be flawed (Crombie IK and Davies HTO 1996). Also, regression analysis has been used extensively in this study, and here missing data is particularly important as in multivariate analyses, the computer program may throw out cases where there are missing values, thus decreasing the number of cases included in the analysis (Oppenheim AN 1992). However, this pitfall was avoided in the analyses presented in this chapter, as there were very few missing cases within the data set.

Table 30. Missing values for GP level and practice level files.

Practice characteristic	Number of missing values (%). N= 294	Number of missing values for practices where at least one GP responded (%) N=243
Townsend Score	3 (1.02)	1 (0.41)
Number of registered women aged 13-15 years old	1 (0.34)	1 (0.41)
Number of registered women aged 16-19 years old	1 (0.34)	1 (0.41)
Number of registered women aged 13-19 years old	1(0.34)	1 (0.41)
Number of pregnancies in women aged 13-15 years	1(0.34)	1 (0.41)
Number of pregnancies in women aged 16-19 years	1 (0.34)	1 (0.41)
Number of pregnancies in women aged 13-19 years	1 (0.34)	1 (0.41)
Training status	1 (0.34)	1 (0.41)
Research practice	1 (0.34)	1 (0.41)
Number of whole time equivalent (WTE) GPs	6 (2.04)	3 (0.41)
GP characteristic	**N=951**	**N = 621**
Age	24 (2.52)	0 (0)
Sex	48 (5.04)	4 (0.64)
Average list size per WTE	24 (2.52)	13 (2.09)

CHAPTER 8 GENERAL PRACTITIONER SURVEY OF ATTITUDES AND BEHAVIOUR: RESULTS OF PRIMARY AND SECONDARY ANALYSES

The initial Poisson analysis presented in chapter six found that practices with young GPs and practices with female GPs had lower teenage pregnancy rates, even when potential confounders such as the Townsend score of deprivation was included in the model. This chapter aims to further explore possible reasons why such practices have lower teenage pregnancy rates by asking GPs about key issues relating to young people aged under 16. These include, whether they will prescribe contraception to young people in this age group without parental consent, and whether they discuss confidentiality with their patients aged under 16 years.

The results section begins with an over-view of the findings of the main analysis and then goes on to present the findings of the primary and sub analyses. These are presented descriptively by question or group of questions, for example questions relating to the provision of contraception to young people aged under 16 years. An analysis of the responses given to an open-ended question is also included in the results section.

8.1 Analysis of respondents and non-respondents.

A total of 951 questionnaires were sent to GPs in the four health authority areas. After 2 mail-outs, a total of 667 (70%) were returned. Of these 621 could be identified as the responder had not removed the code linking them to identifying information Table 31, shows response by area, age and sex. There was no difference in the response rate by health authority area. ($X^2 = 0.02$ df = 2 P = 0.99). Of the 951 GPs identified, 29% (n= 279) were female. The sex of the GP was missing for 44 non-responders and for 4 who did respond. As shown in table 1, female GPs were significantly more likely to respond than male GPs ($X^2 = 10.94$ df 1 P < 0.01 OR 1.71 (CI 1.23 to 2.39)), and GPs aged under 36 years were also more likely to respond than GPs aged over 49 years (P < 0.001 OR 3.18 (CI 2.00 to 5.06)).

Table 31. Response by area, age and sex.

Area	Overall no. (%) responders	No. (%) of females responding	No. (%) of males responding	No (%) of GPs aged <36 years responding	No. (%) of GPs aged > 49 years responding
Barnsley & Doncaster (High)	175 (65.3)	49 (74.2)	124 (64.6)	29 (85.3)	55 (52.9)
Sheffield (Moderate)	221 (65.4)	107 (77.5)	112 (65.1)	44 (78.6)	49 (51.6)
Lincolnshire (Low)	225 (65.2)	56 (74.7)	169 (65.0)	47 (78.3)	53 (63.9)
Total	621	212	405	120	157

26.4% of respondents were from training practices compared to 17.5% of non – respondents and this difference was statistically significant ($X^2 = 9.82$ df = 1 P= 0.002 OR 1.53 (CI 1.116 – 2.001)). Similarly 11.7% of responders were from practices who were part of a regional research network compared to 7.5 % of non- responders, and again this was finding was significant ($X^2 = 4.32$ df = 1 P= 0.04 OR 1.591 (CI 1.018 – 2.486)).

The Townsend score associated with the practice was used as a measure of deprivation. The mean Townsend score for responders (0.79 sd 3.3) did not differ significantly from the non-responders (0.47 sd 3.1), suggesting that responders were not from more affluent areas (t = 1.32 df 790 P=1.87).

Workload for responders was estimated by using average list size per whole time equivalent GP. The median list size for responders was 1863 (sd 418.4) and 1854 (sd 497.9) for non-responders. No statistically significant differences were observed between responders and non-responders in terms of workload (Z -.907 P = 0.36)

8.2 Results of the primary analysis

8.2.1 Over view of main findings of the unconditional logistic regression analysis

The results of the univariate and multivariate analysis are given below in Table 32. In unconditional logistic regression, allowing for clustering of GPs by practice and including terms for age of GP, sex of GP, practice training status and Townsend score of the practice in the model, the following significant results were found:

- GPs aged 49 years and over were more than twice as likely as those aged under 36 years to report that either a parent can have access to content of a consultation, or does not know if access can be granted without the consent of the young person (OR 2.35 95%CI 1.07 to 5.18)

- GPs aged 49 years and over were less likely than those aged under 36 years to state that they prescribe contraception to young women aged under 16years without parental consent (OR 0.55 95%CI 0.33 to 0.93)

- GPs aged 49 years and over were four times as likely as those aged under 36 years to report that either it was illegal to prescribe contraception to young women aged under 16 years of age, or that they did not know if it was legal to do so (OR 4.27 95%CI 1.50 to 12.22)

- GPs aged over 36 years were less likely to report to seeing more than 25 young people aged 12-15 years in a month (see Table 32).

- GPs aged over 41 years were more likely than those aged under 36 to state that they see young people in this age group alone very rarely or never (GPs aged 42-48: OR 1.90 95%CI 1.06 to 3.39, GPs aged >48: OR1.97 95%CI 1.10-3.53).

- In multivariate analysis, sex of respondent was not significantly associated with any of the questionnaire items (see Table 33) .

Table 32. Response to questionnaire items by age of GP

Response	Age group	N (%)	OR (95% CI)	Adjusted OR (95% CI)†
Expects to see more than 25 patients aged 12-15 in a month	<36	34 (29.6)	1.0	1.0
	36-41	33 (18.6)	0.49 (0.28- 0.88)*	0.48 (0.26-0.85)*
	42-48	34 (20.2)	0.55 (0.30-1.00)	0.50 (0.27-0.94)*
	>48	29 (18.0)	0.49 (0.27-0.89)*	0.39 (0.21-0.74)*
Sees patients aged 12-15 alone, rarely or never	<36	18 (15.7)	1.0	1.0
	36-41	41 (23.2)	1.42 (0.76-2.62)	1.46 (0.79-2.69)
	42-48	45 (26.8)	1.87 (1.04-3.38)*	1.90 (1.06-3.39)*
	>48	47 (29.2)	1.91 (1.06-3.43)*	1.97 (1.10-3.53)*
Discusses confidentiality with patients aged 12-15 rarely or never	<36	25 (21.7)	1.0	1.0
	36-41	47 (26.6)	1.27 (0.72-2.24)	1.34 (0.75-2.39)
	42-48	49 (29.2)	1.45 (0.81-2.61)	1.49 (0.81-2.74)
	>48	46 (28.6)	1.38 (0.78-2.43)	1.47 (0.83-2.67)
Agrees that parent can have access to content of a consultation, or does not know if access can be granted	<36	9 (7.8)	1.0	1.0
	36-41	26 (14.7)	1.94 (0.86-4.37)	1.88 (0.83-4.27)
	42-48	18 (10.7)	1.25 (0.53-2.92)	1.15 (0.48-2.75)
	>48	33 (20.5)	2.82 (1.31-6.05)*	2.35 (1.07-5.18)*
Prescribes contraception to patients aged under 16 years without parental consent	<36	62 (53.9)	1.0	1.0
	36-41	96 (54.2)	1.00 (0.63-1.58)	1.02 (0.63-1.63)
	42-48	85 (50.6)	0.88 (0.55-1.41)	0.90 (0.56-1.46)
	>48	59 (36.6)	0.50 (0.30-0.82)*	0.55 (0.33- 0.93)*
Believes it is illegal, or does not know whether it is legal or not to prescribe contraception to under 16s.	<36	4 (3.5)	1.0	1.0
	36-41	6 (3.4)	0.91 (0.24-3.36)	0.88 (0.24-3.25)
	42-48	7 (4.2)	0.96 (0.26-3.57)	0.94 (0.26-3.40)
	>48	24 (14.9)	4.49 (1.54-13.10)*	4.27 (1.50-12.22)*
Refers patients aged under 16 for a termination of pregnancy without parental consent	<36	40 (34.8)	1.0	1.0
	36-41	49 (27.7)	0.74 (0.44-1.23)	0.74 (0.44 –1.24)
	42-48	45 (26.8)	0.72 (0.42-1.26)	0.71 (0.40 – 1.25)
	>48	40 (24.8)	0.64 (0.37-1.11)	0.61(0.34-1.08)

* P <0.05
† Adjusted for sex, training status and Townsend score

Table 33. Response by sex of GP

Response	Males (%)	Females (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)†
Expects to see more than 25 patients aged 12-15 in a month	93 (23.0)	36 (17.0)	0.71 (0.45-1.13)	0.64 (0.39-1.04)
Sees patients aged 12-15 alone, rarely or never	99 (24.6)	52 (24.8)	0.99 (0.66-1.49)	1.07 (0.71-1.62)
Discusses confidentiality with few or none of patients aged 12-15	114 (28.4)	52 (24.8)	0.86 (0.60-1.23)	0.89 (0.62-1.28)
Agrees that parent can have access to content of a consultation, or does not know if access can be granted	67 (16.8)	19 (9.0)	0.52 (0.31-0.86)*	0.61 (0.36-1.04)
Prescribes contraception to patients aged under 16 years without parental consent	185 (45.7)	115 (54.2)	1.44 (1.02-2.05)*	1.25 (0.88-1.79)
Believes it is illegal, or does not know whether it is legal or not to prescribe contraception to under 16s.	29 (7.2)	12 (5.7)	0.74 (0.37-1.46)	1.16 (0.57-2.38)
Refers patients aged under 16 for a termination of pregnancy without parental consent	113 (27.9)	60 (28.3)	0.99 (0.68-1.43)	0.91 (0.63-1.32)

* $P < 0.05$

† Adjusted for age, practice training status, Townsend score and clustering by practice.

8.3 Response for individual questionnaire items

8.3.1 Exposure to young people

The respondents were asked to state how many young people aged 12-15 years of age they expected to see on a monthly basis. Overall, 7% (42 of 613) respondents estimated that they expected to see more than 40 a month, the majority (328, 53%) expected to see less that 10. The results for this are presented in Table 34.

To determine whether respondents in any particular area were more likely to see more or less patients in this age group, a chi-square test was conducted. To allow for small numbers in some cells, the categories were collapsed to under and over 25 patients per month in this age group. There was no significant difference observed between the areas ($\chi^2 = 1.69$ df 2 P= 0.43).

Further analysis was then carried out to determine whether the GPs age or sex was associated with seeing more or less young people. In logistic regression analysis (adjusted for age, training status, Townsend score and clustering by practice), female GPs were not more likely than males to report to seeing more than 25 young people aged under 16 years in a month (OR 0.64 95%CI 0.39 to 1.04, P=0.07). However, age of the respondent was significantly associated with this question. GPs aged over 36 years were less likely than GPs aged under 36 years to report seeing more than 25 young people in a month (see Table 34).
Respondents were also asked to estimate how many of their patients aged 12-15 they saw alone (i.e. without a parent or guardian being present). A total of 10 (1.6%) reported that they always saw young people in this age group alone, and 297 (48%) reported that they see young people in this age group alone occasionally. Only 12 (1.9%) of respondents reported that they never saw young people alone (see Table 35).

For analysis purposes, categories were collapsed from always, often, occasionally, very rarely and never to: always or often, occasionally and very rarely or never. In terms of area (high, moderate or low), there was no significant difference observed ($\chi^2 = 1.39$ df = 4 P=0.85). Older GPs (49 years and over) were significantly more likely than the youngest age group to report seeing young people alone "very rarely or never" (30% of GPs aged 49 and over compared to 14% of GPs aged under 36 years OR 1.97 95% CI 1.10 to 3.53, P = 0.03). In terms of sex of the respondent, female GPs were no more likely than males to see young people without a parent or guardian present (OR 1.07 95%CI 0.71 to 1.62, P=0.73).

Table 34. Response to the question: *Approximately how many patients aged 12-15 years do you expect to see (for contraception or any other reason) per month?*

No. teenagers expected to be seen in one month	Overall response (%)	Male responders* (%)	Female responders (%)	Responders aged under 36 years (%)	Responders aged 49 years or over (%)
More than 40	42 (6.8)	31 (7.7)	11 (5.2)	9 (7.5)	11 (7.0)
25-40	88 (14.2)	61 (15.2)	23 (11.8)	26 (21.7)	17 (10.8)
10-24	155 (25.0)	89 (22.1)	65 (30.7)	34 (28.3)	32 (20.4)
Less than ten	328 (52.7)	218 (54.2)	106 (50.0)	51 (42.5)	95 (60.5)
Missing	8 (1.3)	3 (0.8)	5 (2.4)	0 (0)	2 (1.3)
TOTAL	621 (100)	402 (100)	212 (100)	120 (100)	157 (100)

*Variable of sex missing for 7 respondents.

Table 35. Response to the question: *Of those patients aged between 12-15 who you do see, how often do you seem without a parent or guardian being present?*

How often see teenagers without parent present	Overall response (%)	Male responders (%)	Female responders (%)	Responders aged under 36 years (%)	Responders aged 49 years or over (%)
Always	10 (1.6)	9 (2.2)	1 (0.5)	3 (2.5)	4 (2.5)
Often	160 (25.8)	101 (25.1)	58 (27.4)	35 (29.2)	40 (25.5)
Occasionally	297 (47.8)	192 (47.8)	100 (47.2)	65 (54.2)	67 (42.7)
Very rarely	138 (22.2)	92 (22.9)	45 (21.2)	16 (13.3)	39 (24.8)
Never	12 (1.9)	6 (1.5)	6 (2.8)	1 (0.8)	7 (4.5)
Missing	4 (0.7)	2 (0.5)	2 (0.9)	0 (0)	(0)
TOTAL	621 (100)	402 (100)	212 (100)	120 (100)	157 (100)

8.3.2 Confidentiality

The respondents were asked to estimate with how many of their patients aged 12-15 years they discussed confidentiality (Table 36). In all three areas, approximately half reported that they discussed confidentiality with all or most of their patients in this age group. A total of 27% (167 of 615) GPs reported that they discussed this issue with few or none of their patients. There was no significant difference in response to this question between area (χ^2= 5.18 df = 4 P=0.27). Similarly, there was no association between response to this question and the age or sex of the respondent.

Table 36. Response to the question: *Of those patients aged 12-15 that you do see, with how many do you discuss the issue of confidentiality?*

With how many teenagers discuss confidentiality	Overall response (%)	Male responders (%)	Female responders (%)	Responders aged under 36 years (%)	Responders aged 49 years or over (%)
All	191 (30.8)	130 (32.3)	60 (28.3)	27 (22.5)	54 (34.4)
Most	121 (19.5)	80 (19.9)	41 (19.3)	32 (26.7)	26 (16.6)
Some	136 (21.9)	76 (18.9)	57 (26.9)	37 (30.8)	25 (15.9)
Few	150 (24.2)	99 (24.6)	48 (22.7)	23 (19.2)	44 (28.0)
None	17 (2.7)	13 (3.2)	4 (1.9)	1 (0.8)	5 (3.2)
Missing	6 (1.0)	4 (1.1)	2 (0.9)	0 (0)	3 (1.9)
TOTAL	621 (100)	402 (100)	212 (100)	120 (100)	157 (100)

The responders were also asked about the issue of parental access to a young persons medical information without the young persons consent (Table 37). When asked if a parent has the right to know the content of their child's consultation, 85% (527 of 613) of the respondents stated that without the patient's consent, a parent could not demand to know the content of a consultation. In multivariate analysis, GPs aged 49 years older were more than twice as likely as younger GPs (under 36 years) to report either that parents could have access to that information, or that they didn't know (21% versus 8% OR 2.35 95% CI 1.07 to 5.18, P<0.01). In univariate analysis, female GPs were less likely than male GPs to report that parents could have access to the content of consultation, or that they did not know (91% versus 82% OR 0.52 95%CI 0.31 to 0.86, P<.0.01), though this significance was not observed in multivariate analysis (OR 0.61 95%CI 0.36 to 1.04, P=0.07).

Table 37 Responses to the question: *If a patient who was aged under 16 came to see you alone, would the parent or guardian of that patient have the right to know the content of the consultation without the patients consent?*

	Overall response (%)	Male responders (%)	Female responders (%)	Responders aged under 36 years (%)	Responders aged 49 years or over (%)
Yes	44 (7.1)	34 (8.5)	10 (4.7)	3 (2.6)	20 (12.7)
No	527 (84.9)	329 (81.8)	192 (90.6)	109 (90.8)	122 (77.7)
Don't know	42 (6.7)	32 (8.0)	9 (4.2)	7 (5.8)	13 (8.3)
Missing	8 (1.3)	7 (1.7)	1 (0.5)	1 (0.8)	2 (1.3)
TOTAL	621 (100)	402 (100)	212 (100)	120 (100)	157 (100)

8.3.3 Prescribing contraception to young women aged under 16 years of age.

The GPs responding to the questionnaire were asked about their prescribing behaviour (Table 38). They were specifically asked whether they prescribe contraception to young girls aged under 16 years without parental consent. Overall, 302 (49%) of respondents reported that they do prescribe contraception to young women aged under 16 without parental consent and 275 (44%) stated that they would prescribe but *preferably* with parental consent. Only 7 (1%) reported that they never prescribe contraception to this age group. Table 38 shows these results by age, and older GPs (49 years and older) are shown to be more likely than younger GPs to prescribe contraception **only** with parental consent (13% of older GPs compared to 1.7% aged under 36 years). The responses to this question were collapsed to form a dichotomous outcome of Yes (using responses from the yes option) or No (using responses from all other options). In multivariate analysis, GPs aged over 49 years were significantly less likely than those aged under 36 years to report they prescribe contraception without parental consent (OR 0.55 95% CI 0.33 to 0.93, P<0.001).

Table 38. Responses to the question: *Do you prescribe contraception to girls aged under 16 years of age?*

	Overall response (%)	Male responders (%)	Female responders (%)	Responders aged under 36 years (%)	Responders aged 49 years or over (%)
Yes	302 (48.6)	183 (45.5)	115 (54.2)	65 (54.2)	53 (33.8)
Preferably with consent	275 (44.3)	181 (45.0)	91 (42.9)	52 (43.3)	75 (47.8)
Only with consent	30 (4.9)	29 (7.3)	1 (0.5)	2 (1.7)	21 (13.4)
No	7 (1.1)	6 (1.5)	1 (0.5)	1 (0.8)	4 (2.5)
Missing	7 (1.1)	3 (0.7)	4 (1.9)	0 (0)	4 (2.5)
TOTAL	621 (100)	402 (100)	212 (100)	120 (100)	157 (100)

The respondents were also asked whether they thought it was illegal to prescribe contraception to girls aged under 16 years (Table 39). The majority of responders (93%) stated that it was legal to prescribe contraception to this age group and 7% either thought it was not legal or did not know. Older GPs were more likely than the youngest group to respond that they either did not know whether it was legal to prescribe to this age group, or that it was illegal to do so (3% aged under 36 years V 15% aged 49 and over, OR 4.27 95% CI 1.50 to 12.22, P<0.001). The sex of the respondent was not significantly associated with this issue (OR 1.16 95% CI 0.57 to 2.38, P = 0.68).

Table 39. Response to the question: *Can GPs legally prescribe contraception to young people aged under 16 years of age?*

	Overall response (%)	Male responders (%)	Female responders (%)	Responders aged under 36 years (%)	Responders aged 49 years or over (%)
Yes	599 (93.2)	372 (92.6)	200 (94.3)	116 (96.6)	132 (84.0)
No	21 (3.4)	16 (4.0)	5 (2.4)	2 (1.7)	11 (7)
Don't know	20 (3.2)	13 (3.2)	7 (3.3)	2 (1.7)	13 (8.4)
TOTAL	621 (100)	402 (100)	212 (100)	120 (100)	157 (100)

8.3.4 *Referral for termination of pregnancy (TOP)*

When asked about referral for termination of pregnancy, 29% of respondents stated that they do refer young women aged under 16 for a TOP without parental consent, and a further 47% refer but preferably with parental consent (Table 40). Responses to this question were collapsed into Yes (for responses of Yes, would refer) and No (for all other responses). GPs aged over 49 years were less likely to state that they would refer for TOP than GPs aged under 36 years (23% versus 34%) but this difference was not statistically significant (OR 0.61 95% CI 0.34 to 1.08, P=0.11). Female respondents were not more likely than males to state that they refer for termination of pregnancy without parental consent (OR 0.91 95% CI 0.63 to 1.32, P = 0.63).

Table 40. Responses to the question: *Do you refer young women aged under 16 years for termination of pregnancy?*

	Overall response (%)	Male responders (%)	Female responders (%)	Responders aged under 36 years (%)	Responders aged 49 years or over (%)
Yes	174 (28.0)	112 (27.9)	60 (28.3)	41 (34.2)	36 (22.9)
Preferably with consent	284 (47.02)	174 (43.2)	105 (49.5)	54 (45.0)	69 (43.9)
Only with consent	106 (17.1)	80 (19.9)	24 (11.4)	16 (13.3)	43 (27.5)
No	40 (6.4)	26 (6.5)	14 (6.6)	5 (4.2)	4 (2.5)
Missing	19 (3.1)	10 (2.5)	9 (4.2)	4 (3.3)	5 (3.2)
TOTAL	621 (100)	402 (100)	212 (100)	120 (100)	157 (100)

8.4 Analysis of respondents who removed the unique identifier

Forty six (7%) of respondents chose to remove the unique identifier. This option was given to maximise response rate as the questionnaire asked questions concerning potentially contentious issues. As these respondents could not be linked to the practice characteristics data, they could not be included in the main logistic regression analysis. Therefore, to determine if they were significantly different in terms of their known characteristics or in their responses, a sub analysis of these responses was undertaken. As shown in Table 41, the median age of the anonymous respondents was 44, and 20 (43.5%) were female. The respondents who chose to be anonymous, were not significantly different in terms of age, sex or qualifications, though slightly more of the identifiable respondents were on the obstetrics list (92.9% compared to 82.6% $X^2 = 4.43$ df=1 P=0.04)

Table 41. Characteristics of not identifiable and identifiable respondents

Characteristic	Not identifiable N = 46	Identifiable N = 621	P Value
Median age	44 (30-66)	42 (23-68)	0.98
Female	20 (43.5)	212 (34.1)	0.19
Has MRCGP	18 (39.1)	325 (51.4)	0.14
Has FPCERT	20 (43.5)	314 (49.7)	0.49
Is on the obstetrics list	38 (82.6)	587 (92.9)	0.04*

*P >0.05

Differences in response to the questionnaire items are shown in Table 42. The GPs who removed the identifier were more likely to state that either they did not know if parents could have access, or thought that they could have access to the content of their child's consultation (26.1% compared to 13.8% X^2= 5.28 df=1 P=0.02). GPs who removed the identifier were also more likely to state that either they did not know if it was legal to prescribe, or that it was illegal to prescribe contraception to young women aged under 16 years of age, though this difference was not statistically significant (13.0% compared to 6.6% $X^2 = 2.88$ df-1 P=0.09). For all other items, the GPs who could not be identified responded similarly to those who did not remove the code that identified them. Therefore it can be concluded that the exclusion of these 46 cases from the main analysis does not impact on the conclusions drawn from the main analysis of the questionnaire data.

Table 42 Responses to questionnaire items for identifiable and non-identifiable respondents

Response	Not identifiable (%) N = 46	Identifiable (%) N = 621	P value
Expects to see more than 25 patients aged 12-15 in a month	10 (21.7)	130 (20.9)	0.83
Sees patients aged 12-15 alone, rarely or never	9 (19.6)	151 (24.3)	0.45
Discusses confidentiality with patients aged 12-15 rarely or never	12 (26.1)	167 (26.9)	0.86
Agrees that parent can have access to content of a consultation, or does not know if access can be granted	12 (26.1)	86 (13.8)	0.02*
Prescribes contraception to patients aged under 16 years without parental consent	18 (39.1)	302 (48.6)	0.21
Believes it is illegal, or does not know whether it is legal or not to prescribe contraception to under 16s.	6 (13.0)	41 (6.6)	0.09
Refers patients aged under 16 for a termination of pregnancy without parental consent	9 (19.6)	174 (28.0)	0.21

*P<0.05

8.5 Analysis of response associated with practice pregnancy rate

8.5.1 Analysis Method

To determine any relationship between the characteristics of the respondents and the responses given and the pregnancy rate of the practice, a negative binomial regression analysis, allowing for clustering by practice, was conducted in STATA version 8. This method was used for two reasons. Firstly, in this instance, it is not appropriate to perform analysis that simply relates the responses of individual GPs to the pregnancy rate that has been assigned to their practice, without accounting for the clustered nature of the data. Most general practitioners do not work in isolation, policies that are practice and or locality wide may affect their behaviour and the analysis method therefore needs to take this into account. This can be achieved by including a variable that represents the clusters within individual level analyses. In this case, the GPs were assigned a code and then this was linked to each practice.

Secondly, this regression method takes into account the possibility of repeated events. If Poisson regression analysis is employed in this instance, it is likely that the model will not perform well as it will not take into account that recurrent events, in this case pregnancies, are more likely to occur in some people than in others(Glynn RJ & Buring JE1996). Negative binomial regression analysis will provide a higher standard error and more conservative P value than Poisson regression analysis, but will avoid inappropriate inference from the data (Glynn RJ & Buring JE1996).

8.5.2 Results

In adjusted negative binomial regression analysis, the age of the respondent was not significantly associated with the pregnancy rate assigned to the practice (OR 1.00 95%CI 0.99 to 1.01, P = 0.47), though sex of the respondent had a borderline association (OR 1.08 95%CI 0.1.00-1.15, P = 0.03). The Townsend score of the practice was significantly associated with the practice pregnancy rate (OR 1.13 95% CI 1.09-1.16, P <0.01).

As shown in table 43, when categorised in quintiles, to indicate increasing deprivation, practices in the most deprived category (Townsend score more than 3.99) had pregnancy rates that were more than twice those of practices in the least deprived category (OR 2.63 95%CI 2.10-3.29 P<0.001). The results for the Poisson regression analysis were similar, though age was significant in this analysis, with the oldest age group of respondents (those aged 49 years and over) having higher teenage pregnancy rates compared to respondents aged under 36 years (OR 1.13 95%CI 1.01-1.25, P=0.03).

Table 43. Individual respondent and practice characteristics associated with practice pregnancy rate.

Characteristic		Adjusted OR (95% CI)† Poisson	Unadjusted OR (95% CI) NBREG	Adjusted OR (95% CI)† NBREG
Age	<36	1.0	1.0	1.0
	36-41	0.99 (0.88-1.10)	1.05 (0.92-1.19)	0.99 (0.89-1.10)
	42-48	0.94 (0.81-1.09)	0.94 (0.82-1.08)	0.90 (0.80-1.00)
	>48	1.13 (1.01-1.25)*	1.11 (0.97-1.26)	1.08 (0.98-1.19)
Age overall		1.00 (0.99 –1.01)	1.00 (0.99 –1.01)	1.00 (0.99 –1.01)
Sex		1.02 (0.95-1.10)	1.06 (0.98-1.16)	1.08 (1.00-1.15)
Training Practice		1.14 (0.93-1.39)	1.12 (0.93-1.35)	1.16 (0.99-1.34)
Townsend Score	<-2.00	1.0	1.0	1.0
	-2.00- -.200	1.17 (0.85-1.62)	1.09 (0.83-1.43)	1.09 (0.84-1.41)
	-0.201-1.900	1.76 (1.22-2.54)*	1.71 (1.34-2.17)*	1.70 (1.34-2.16)*
	1.901 – 3.99	2.35 (1.73-3.19)*	2.12 (1.68-2.67)*	2.12 (1.69-2.66)*
	>3.99	2.88 (2.15-3.88)*	2.64 (2.09-3.34)*	2.63 (2.10-3.29)*
Townsend score overall		1.13 (1.09-1.16)*	1.13 (1.10-1.15)*	1.13 (1.09-1.16)*
Research Practice		0.79 (0.61-1.02)	0.83 (0.64-1.07)	0.80 (0.63-1.02)

†Adjusted for age, sex, training status and Townsend score

*P<0.05

As shown in Table 44, pregnancy rate was not significantly associated with any of the questionnaire items. This means that although a respondent may state that they prescribe contraception without parental consent, this did not have any association with the pregnancy rate of the practice, i.e. the pregnancy rate of the practice was not significantly lower.

Table 44. Responses to questionnaire items associated with pregnancy rate

Response	Adjusted OR (95% CI)† Poisson	Unadjusted OR (95% CI) NBREG	Adjusted OR (95% CI)† NBREG
Expects to see more than 25 patients aged 12-15 in a month	1.05 (0.96-1.15)	1.06(0.95-1.18)	1.02 (0.94-1.11)
Sees patients aged 12-15 alone, rarely or never	0.94 (0.86-1.04)	0.92 (0.83-1.02)	0.96 (0.87-1.05)
Discusses confidentiality with patients aged 12-15 rarely or never	0.98 (0.91-1.05)	0.99 (0.91-1.09)	0.99 (0.92-1.07)
Agrees that parent can have access to content of a consultation, or does not know if access can be granted	1.09 (0.98-1.21)	1.08 (0.94-1.23)	1.02 (0.92-1.34)
Prescribes contraception to patients aged under 16 years without parental consent	0.99 (0.90-1.09)	0.97 (0.88-1.06)	1.01 (0.93-1.09)
Believes it is illegal, or does not know whether it is legal or not to prescribe contraception to under 16s.	1.08 (0.92-1.28)	1.08 (0.89-1.31)	1.03 (0.87-1.21)
Refers patients aged under 16 for a termination of pregnancy without parental consent	0.95 (0.85-1.06)	0.99 (0.89-1.08)	0.81 (0.93-1.09)

†Adjusted for age, sex, training status and Townsend score

8.6 Sub analysis of practices with predominantly older and younger GPs

8.6.1 Aim of the analysis

Previous analysis exploring responses to questionnaire items and pregnancy rate have looked for associations between GP response and the pregnancy rate of the practice. Although this analysis did take clustering by practice into account, it was not a practice level analysis. Therefore, the aim of this analysis was to develop a practice level file, derived from the GP level data, which categorised practices into predominantly young, and predominantly older practices.

Specifically, this analysis will aim to:

- Determine any relationship between age category (predominantly young or older) and the pregnancy rate of the practice, taking into account potential confounders such as the Townsend score associated with the practice.
- Determine any relationship between age category and aggregated response to questionnaire items
- Identify any associations between aggregated response to questionnaire items and the pregnancy rate of the practice

8.6.2 Data manipulation

To construct a practice level file, derived from the GP level file used in the questionnaire analysis, each practice was assigned a unique code. Using the aggregate command in SPSS version 11.5, a new data-file was developed, including some existing practice level variables (e.g. the pregnancy rate) and some variables computed from GP level data. The aggregated file gave the percentage of responders who had given a specific answer, for example what percentage of respondents from each practice had reported that they prescribe contraception to young people aged under 16 without parental consent. A new variable was computed to identify if at least one respondent from each practice had given a specific response, i.e. at least one respondent has reported that they would prescribe contraception without parental consent.

The variable of age was aggregated to identify practices where at least 50% were aged under 42 years (predominantly young), or where at least 50% were aged 42 years and over (predominantly older). Practices that did not fit into either of the age categories were coded as being mixed. This categorisation is in line with that used in all analyses in this thesis, i.e. calculated according to the quartiles associated with age of all GPs in the Trent region. The difference here is that the quartiles have been collapsed into halves (aged under 42 years and 42 years and over). This has been done because if the categorisation had been at least 50% aged under 36 years and so on, numbers in some groups, including this youngest group, would have been too small for meaningful analysis.

The variables included in this file were:

For each practice:

- Unique practice code
- Number of 13-19 year old women registered with the practice
- Number of pregnancies in women aged 13-19
- Aggregated age category (coded as predominantly young: more than 50% of GPs age under 42 years, predominantly older: more than 50% aged over 42 years, and mixed: an equal mix of older and younger GPs)
- Townsend score associated with the practice
- Number of whole time equivalents
- Number of GP partners
- If at least one respondent reported that they prescribe contraception to young women aged under 16 years without parental consent
- If at least one respondent reported that they refer young women aged under 16 years for a TOP without parental consent
- If at least one respondent stated that discuss confidentiality with their patients aged under 16 years rarely or never.
- If at least one of the respondents stated that either they did not know whether a parent or guardian could have access to the content of their child's consultation or that access could be given without consent.
- If at least one of the respondents stated that they either did not know if it was legal to prescribe contraception to this age group or thought that it was illegal to do so.

Practices where no GPs had responded were excluded from the analysis (n = 51)

Statistical analysis of the practice level file:

The data file was analysed using STATA version 8. Negative binomial regression analysis was used to identify practice level and aggregated GP level characteristics associated with variation in teenage pregnancy (13-19 years) rates. As with previous practice level analyses, the results for both negative binomial and Poisson regression analysis are presented.

8.7 Results

8.7.1 Characteristics of older, younger and mixed practices

Of 292 practices, a total of 241 practices were identified for inclusion in the analysis as at least one GP had responded to the questionnaire. For a total of 51 practices, there were no completed questionnaires returned for analysis, and 29 of these practices were single-handed.

Of practices where at least one GP had responded, 27.4% (n=66) were practices categorised as being practices with predominantly younger GPs 53.9% (n=130) were practices with predominantly older GPs, and 18.7% (n=45) were mixed (see Table 45). Practices categorised as being predominantly older had a higher frequency of non-response compared to the predominantly younger practices (24.9% compared to 4.3%) and the predominantly older practices were also less likely to have more than 50% of the GPs returning completed questionnaires (X^2 = 6.33 df=1 P=0.01).

Table 45. Response by age mix of practice

% of GPs responding / |Age category of practice	0	1-25% (%)	26-50% (%)	51-75% (%)	76-100% (%)	Total (%)
Younger (50%)	3 (4.3)	4 (5.8)	12 (17.4)	17 (24.6)	33 (47.8)	69 (100)
Older(%)	43 (24.9)	5 (2.9)	30 (17.3)	30 (17.3)	65 (37.6)	173 (100)
Mix	4 (8.2)	1 (2.0)	13 (26.5)	11 (22.4)	20 (40.8)	49 (100)

Practice characteristics by age category are shown in Table 46. The predominantly young practices were more likely to be training practices (X^2 = 7.98 df=1 P<0.01) and research practices (X^2 = 8.39 df =1 P<0.01). However, the predominantly older practices did not have a higher mean number of pregnancies (t = -6.16 df = 194 P=0.54), and did not have a significantly higher Townsend score than practices categorised as predominantly young (t=-0.41 df =164 P=0.68).

Table 46. Practice characteristics by age category

Practice Characteristic	Young (50% or more aged under 36 years)	Older (50% or more aged over 49 years)	Difference (P)
Training practice	21 (31.8%)	19 (14.6%)	<0.01*
Member of research network	13 (19.7%)	8 (6.2%)	<0.01*
Mean number of pregnancies 13-15 years	1.24 (sd 1.45)	1.40(sd 25.48)	0.54
Mean number of pregnancies 13-19 years	27.39 (sd 17.29)	25.48 (sd 21.66)	0.53
Mean Townsend score	1.15 (sd 3.43)	1.36 (3.08)	0.68

*P>0.05

8.7.2 Response to questionnaire items by age category

Response to the questionnaire items was aggregated to indicate if at least one respondent from the practice had given a certain response, for example if at least one GP respondent had reported that they would prescribe contraception to young women aged under 16 without parental consent. Table 47 gives the frequency of response by age category, and Table 48 gives the results of a logistic regression analysis with age group defined as a categorical variable. The predominantly older practices were less likely than the youngest category to have at least one respondent stating that they would prescribe contraception to young women aged under 16 years without parental consent (49.2% compared to 87.9% OR 0.16 95% 0.71to 0.38, P <0.01). Similarly, the predominantly older practices were less likely to have at least one GP respondent stating that they refer young women in this age group for a termination of pregnancy without parental consent (37.7% compared to 60.6% OR 0.46 95% CI. 24-0.86, P = 0.02).

Respondents from predominantly older practices were more likely to have at least one GP respondent who either thought it was illegal to prescribe contraception to under 16 or does not know whether it is legal or not to prescribe contraception to this age group, though in multivariate analysis this difference was not statistically significant (20.8% compared to 9.1% OR 2.67 95% CI 1.02-7.05, P = 0.05).

Table 47. Response to questionnaire items by age category

Response	Young (50% or more aged under 36 years) N=66	Older (50% or more aged over 49 years) N=130	Mixed N=45
At least one respondent expects to see more than 25 patients aged 12-15 in a month	32 (48.5)	47 (36.2)	17 (37.8)
At least one respondent reports to seeing young people alone rarely or never	28 (42.4)	61 (46.9)	20 (44.4)
At least one respondent discusses confidentiality with patients aged 12-15 always or often	52 (78.8)	93 (71.5)	32 (71.1)
At least one respondent agrees that parent can have access to content of a consultation, or does not know if access can be granted	20 (30.3)	42 (32.3)	10 (22.2)
At least one respondent prescribes contraception to patients aged under 16 years without parental consent	58 (87.9)	64 (49.2)	35 (75.8)
At least one respondent believes it is illegal, or does not know whether it is legal or not to prescribe contraception to under 16s.	6 (9.1)	27 (20.8)	6 (13.3)
Refers patients aged under 16 for a termination of pregnancy without parental consent	40 (60.6)	49 (37.7)	27 (60.0)

Table 48. Association between questionnaire items and age category

Response	Age category	Unadjusted OR (95% CI)	Adjusted OR (95% CI)†
At least one respondent expects to see more than 25 patients aged 12-15 in a month	Young	1.0	1.0
	Older	0.60 (0.33-1.09)	0.71 (0.38-1.32)
	Mixed	0.65 (0.30-1.40)	0.72 (0.33-1.59)
At least one sees patients aged 12-15 alone, rarely or never	Young	1.0	1.0
	Older	1.17 (0.64-2.13)	1.52 (0.80-2.87)
	Mixed	1.06 (0.50-2.27)	1.04 (0.47-2.31)
At least one discusses confidentiality with patients aged 12-15 rarely or never	Young	1.0	1.0
	Older	0.68 (0.33-1.37)	0.90 (0.43-1.89)
	Mixed	0.66 (0.28-1.59)	0.82 (0.33-2.05)
At least one agrees that parent can have access to content of a consultation, or does not know if access can be granted	Young	1.0	1.0
	Older	1.09 (0.57-2.01)	2.65 (1.02-6.96)*
	Mixed	0.64 (0.27-1.55)	1.63 (0.44-5.94)
At least one prescribes contraception to patients aged under 16 years without parental consent	Young	1.0	1.0
	Older	0.13 (0.06-0.30)*	0.16 (0.71-0.38)*
	Mixed	0.48 (0.17-1.34)	0.47 (0.17-1.35)
At least one believes it is illegal, or does not know whether it is legal or not to prescribe contraception to under 16s.	Young	1.0	1.0
	Older	2.62 (1.02-6.71)*	2.67 (1.02-7.05)*
	Mixed	1.54 (0.46-5.11)	1.66 (0.49-5.61)
At least one refers patients aged under 16 for a termination of pregnancy without parental consent	Young	1.0	1.0
	Older	0.39 (0.21-0.72)*	0.46 (0.24-0.86)*
	Mixed	0.98 (0.45-2.11)	0.98 (0.45-2.19)

†Adjusted for age, sex, training status and Townsend score

8.7.3 Analysis of age category and pregnancy rate

A regression analysis was done to identify any association between age category (predominantly younger, mixed or predominantly older) and the pregnancy rate of the practice. Table 49 shows the findings of this analysis. As in previous analyses, the results are presented for both Poisson and negative binomial regression analysis. In adjusted Poisson regression analysis, the predominantly older GPs had a significantly higher pregnancy rate (OR 1.14 95%CI 1.07 to 1.21, P <0.001). However this difference was not observed in negative binomial regression analysis (OR 1.07 95%CI 0.92 to 1.23).

Table 49. Association between pregnancy rate and age category

Age group	Adjusted OR (95% CI)† Poisson	Unadjusted OR (95% CI) NBREG	Adjusted OR (95% CI)† NBREG
Younger	1.0	1.0	1.0
Older	1.14 (1.07- 1.21)*	1.04 (0.87-1.24)	1.07 (0.92-1.23)
Mixed	1.00 (0.93-1.09)	0.88 (0.70-1.10)	1.11 (0.92-1.33)

*** *P<0.05***

8.8 Sub-analysis of single handed General Practitioners

In chapter 4, the analysis of access to family planning services for young people of school age, showed that clinic opening times are not always appropriate for this age group. In all of the geographical areas included in this study there were clinics which did not offer any hours that were easily accessible to school aged teenagers as they were open only during the school day. Considering that general practice and family planning clinics are the main source of contraception and contraceptive advice for young people, and that in a single handed practice a young person cannot elect to see a different GP; a sub analysis was done to determine if single handed GPs self reported behaviour was different to GPs who were part of multi-partner practices. Specifically:

- Are single-handed GPs less likely to prescribe contraception or refer for a termination of pregnancy without parental consent?

- Are single-handed GPs less likely to discuss confidentiality with their teenage patients?

- Are single-handed GPs more likely to believe that a parent or guardian can have access to the content of their child's consultation without their consent.

- Are single-handed GPs more likely to believe that it is illegal to prescribe contraception to under 16s?

8.8.1 *Analysis of the characteristics of single handed GPs*

In the areas of interest, a total of 62 GPs were identified as being single-handed, and of these 56.5% (35) returned a completed questionnaire. These figures differ slightly from those given in Table 14 shown on page 117. This is because three single handed practices in the Sheffield health authority area were excluded from the questionnaire phase of the study as they were University practices who did not routinely provide care for young people aged under 18.

The number if respondents in each of the areas, with the percentage of family planning clinics not providing any accessible hours for young people aged under 16 is given in Table 50. The characteristics of single-handed responders compared to non single-handed practices are shown in table 50.

Table 50. Number of single handed GPs by area.

	Doncaster/Barnsley	Sheffield	Lincolnshire
Total No. of practices	84	109	103
No (%) of single handed GPs	26 (31.0)	19 (14.4)	18 (17.5)
No (%) single handed GPs responding to questionnaire	17 (65.4)	8 (42.1)	10 (55.6)
No (%) of clinics not providing any teenage accessible hours	4 (31.0)	5 (62.5)	1 (7.0)

The GPs from multi-partner practices were not more likely than the single handed GPs to respond to the questionnaire ($X2 = 5.49$ df=2 $P=0.06$), though the single handed GPs were significantly older (mean age of 51.28 years compared to 42.80 years, $t = -5.98$ df = 614 $P<0.01$), and had higher deprivation scores associated with their practice (mean Townsend score of 0.90 compared to 2.54 $t = -2.93$ df=599 $P<0.01$). The average list size was also greater for single-handed GPs (2179 compared to 1893, $t = -3.86$ df=606 $P<0.01$). The median pregnancy rate for women aged 13-15 years, for single handed GPs was significantly lower for than the rate for non-single handed practices (median= 0.00 IQR 0.00-10.59 compared to: median 3.25 IQR 0.00-6.46, $P=0.01$) . The characteristics of single handed and non-single handed respondents are given in Table 51.

Table 51. Characteristics of single and non single-handed respondents.

Characteristic	Single handed GPs N = 35	Non-single handed GPs N = 581	P value
Male	27 (77.1%)	378 (65.1%)	0.16
Training Practice	1 (2.9%)	169 (29.1%)	N/a
Research Practice	1 (2.9%)	76 (13.1.%)	N/a
Mean average list size per WTE	2179 (sd 504.68)	1893 (sd 408.03)	<0.01*
Mean Townsend score (Standard Deviation)	0.90 (sd 3.25)	2.54 (2.52)	<0.01*
Mean age (standard deviation)	51.28 (sd 7.91)	42.80 (sd 8.12)	<0.01*
Median pregnancy rate13-15 years (IQR)	0.00 (0.00-10.59)	3.25 (0.00-6.46)	0.01*
Median pregnancy rate 13-19 years (IQR)	30.65 (16.08-52.99)	34.27 (20.30-47.82)	0.17

P<0.05

8.8.2 Analysis of questionnaire items

Table 52 compares the response for each questionnaire item for single and non-single handed GPs. The single-handed GPs were more likely to state that either they did not know whether a parent or guardian could have access to the content of their child's consultation without consent or that access could be granted (40% compared to 12.4% X2=21.67 df=1 P<0.01). Single-handed GPs were also less likely to state that they would prescribe contraception to young people aged under 16 without parental consent (25.7% compared to 50.3% X^2=7.96 df=1 P<0.01) and more likely to state that either they did not if it was legal to prescribe contraception to young people aged under 16 or that it was illegal to do so (25.7% compared to 5.5% X^2=21.64 df=1 P<0.01). There was no reported difference in terms of how many young people the GP expected to see, or how often they saw them alone or discussed the issue of confidentiality.

Table 52. Response to questionnaire items for single and non-single handed respondents.

Response	Single handed respondents	Non-single handed respondents	P value
Expects to see more than 25 patients aged 12-15 in a month	7 (20.0)	122 (21.0)	0.89
Sees patients aged 12-15 alone, rarely or never	7 (20.0)	142 (24.4)	0.56
Discusses confidentiality with patients aged 12-15 rarely or never	8 (22.9)	158 (27.2)	0.77
Agrees that parent can have access to content of a consultation, or does not know if access can be granted	14 (40.0)	72 (12.4)	<0.01*
Prescribes contraception to patients aged under 16 years without parental consent	9 (25.7)	292 (50.3)	<0.01*
Believes it is illegal, or does not know whether it is legal or not to prescribe contraception to under 16s.	9 (25.7)	32 (5.5)	<0.01*
Refers patients aged under 16 for a termination of pregnancy without parental consent	4 (11.4)	170 (29.3)	0.02*

*P<0.05

Table 53 gives the responses given by single-handed GPs according to area. Although the numbers are too small for any meaningful statistical analysis, the table shows that in Sheffield, an area where less than half of family planning clinics are accessible to under16s, none of the single-handed GPs who responded stated that they would prescribe contraception without any parental consent. In addition, half of the respondents from this area either did not know whether a parent or guardian could have access to the content of their child's consultation or that access could be given without consent. Further, half of the single-handed respondents from Sheffield also either did not know if it was legal to prescribe contraception to this age group or thought that it was illegal to do so.

Table 53. Response to questionnaire items for single-handed respondents by area.

Response	Doncaster/Barnsley (high)	Sheffield (moderate)	Lincolnshire (low)
Expects to see more than 25 patients aged 12-15 in a month	3 (17.6)	2 (25.0)	2 (20.0)
Sees patients aged 12-15 alone, rarely or never	3 (17.6)	3 (37.5)	1 (10.0)
Discusses confidentiality with patients aged 12-15 rarely or never	4 (23.5)	3 (37.5)	1 (10.0)
Agrees that parent can have access to content of a consultation, or does not know if access can be granted	6 (35.3)	4 (50.0)	4 (40.0)
Prescribes contraception to patients aged under 16 years without parental consent	5 (29.4)	0 (0.0)	4 (40.0)
Believes it is illegal, or does not know whether it is legal or not to prescribe contraception to under 16s.	3 (17.6)	4 (50.0)	2 (20.0)
Refers patients aged under 16 for a termination of pregnancy without parental consent	3 (17.6)	0 (0.0)	1 (10.0)

CHAPTER 9 General Practitioner survey of attitudes and behaviour: Analysis of textual responses.

The questionnaire included an open question, which asked the respondent if they could suggest any ways of improving contraceptive services for their teenage patients. This chapter presents an analysis of these textual comments, utilising the Template analysis approach. This chapter provides a description of the approach, and how it was applied to the data generated through the questionnaire.

9.1 Development and application of the Template

The following open question was included in the questionnaire:
Can you suggest any ways of improving contraceptive services for your teenage patients?

The data collected for this question was managed using NUD*IST version 4, following the template analysis approach described by Dr Nigel King (King N 1998). This approach involves the development of a template, representing a coding scheme, which is applied to the textual data. This method of analysis involves defining some codes *a priori,* and others through the analysis process. King (King N1998), concludes that this method lies between grounded theory (Glaser B & Strauss AL 1967), where there is no a priori definition of codes and content analysis (Weber RP 1985), which uses a list of predetermined codes for analysis of text. This method of analysis is described in more detail in section 7.8.3.
An initial template was developed to represent the main themes that would develop from the data (Figure 7). This template was developed following a review of the literature as well as informal discussions with GPs about their views on the provision of contraception to young people. Using NUD*IST version 4, the template was applied to the textual comments, and new themes and sub themes were then added to better represent the opinions and ideas of the respondents. The final template developed through this process is shown in figure 8.

The final template differs quite markedly from the initial template. This is because although many of the respondents specifically addressed the issue of contraception, many also used this opportunity to discuss the broader issue of teenage pregnancy and how to reduce pregnancy rates. It therefore became clear whilst applying the initial template that although contraception was an issue which was commonly commented on, many of the respondents placed this within the context of education, not only in the context of primary care and health promotion, but also in terms of school based education and the role of parents in providing sex education.

Figure 7: Initial Template developed for the analysis of textual data

1. Contraception

1. Provision in primary care

1.1 Doctor/patient relationship

11.1. Special needs of teenagers

1.1.2. Communication

1.2. Importance/value of confidentiality

1.3.Provision of emergency contraception

1. 3.1. Over the counter emergency contraception

1.3.2.Understanding of emergency contraception by teenagers

1. 4. Provision of contraception specifically to under 16s

1. 4.1. Legal issues (competency)

1.5. Moral/religious issues

2. Accessible service

2.1Teen clinic

2.1.1. Experiences of running teen clinics

2.1.2.Lessons learned/positive features of teen clinics

2.1.3.Use of nursing team

2.2 Open/drop-in surgery

3. Confidentiality

3.1 Importance in teenage health care

3.1.1. Relaying issue to teenage patients/parents

3.1.2. Impact on consultation

3.1.3Access to medical information by others

3.2 Practice statements/policies

3.2.1. Explicit statements – Practice

3.2.2. Explicit statements – Individual GPs

Figure 8: Final Template for the analysis of the textual data

1. **Education**

   1.1. ***Role of school based sex education***

   1.1.1 Age at first sex education

   1.1.2 Content/quality of education

   1.1.3 Linking in with schools

   1.1.4 Education of parents

   1.1.4.1 Communication between parent/child

   1.2. Religious/moral/social education

   1.2.1. Abstinence

   1.2.2. Outcomes of teenage sex

   1.2.2.1 Social implications of young parenthood

   1.3. Service Providers

   1.3.1 Communication with teenagers

   1.3.1.1 'What happens' in a consultation

2. **Contraception**

   2.1.Drop in/teen clinics

   2.2 Staff

   2.2.1.Use of Nurse Practitioner

   2.3. Contraception - condoms

   2.3.1. Ability to prescribe condoms

   2.4. Provision of emergency contraception

   1. 3.1. Over the counter emergency contraception

   1.3.2.Understanding of emergency contraception by teenagers

   2.5. Legal issues

   2.6. Radical view points

   2.7. No

   2.7.1 Services are already as good as they can be

   2.7.2 Teenage pregnancy is not a medical problem

   2.7.3 Teenage pregnancy seen as acceptable

Figure 8 continued

3. **Confidentiality**
    3.1 Importance in teenage health care
    3.1.1. Relaying issue to teenage patients/parents
    3.1.2. Impact on consultation
    3.1.3. Legal issues

9.2 Education

9.2.1 School based sex education

A quarter (81 of 356) of those who gave a textual response made reference to the need for education. This was largely within the context of school based education. Improving sex education in school was seen as important by most of the respondents, and providing sex education at an earlier age was also suggested:

".. as a father of three children (12-15), I'd support contraceptive services being available in schools. I would wish for more sex education starting in primary school for the future." Male GP, 41 years.

Only one respondent stated that the amount of sex education in schools should be reduced:

"Reduce sex education. Discourage under age sex and pregnancy- poverty for life. Teenagers should be encouraged to find other ways of occupying their time and not taking on adult responsibilities." Male GP 59 years.

It was also suggested that not only was better sex education needed, but better schools were necessary if teenage pregnancy was to be avoided:

"Better schools to encourage higher aspirations/ambition. If they had something to aim for they wouldn't get pregnant." Male GP 36 years

In terms of the content of sex education, it was frequently stated that sex education should have an element relating to the importance of self-esteem, taking responsibility and also the importance of relationships:

"Sex education at school must start much earlier with an emphasis on self esteem and the right to say no. Most girls who I see appear to be looking for the love they have not found at home and as a GP for 26 years I know the family set up. Female GP 52 years

and

"Educational, with content mirroring not only contraceptive practices but sexual responsibilities social responsibilities and moral responsibilities to self and society." Male GP 59 years.

9.2.2 Linking in with schools

Many of the respondents who gave a written response, thought that by linking in with schools they might more effectively access young people. Some were currently involved in working with schools within an educational context, and some had met with problems when attempting to do this:

"Open access to schools - I would love to get into the local comprehensive but previously some had resistance from teachers (previous headmaster) and one is always concerned about opposition from parents and making headline news in the media." Male GP,43 years.

In terms of how they might link in with schools, some respondents saw this as an opportunity to share important messages about primary care based services, in particular the confidential nature of the consultation. It would also be an opportunity for the young people to meet the health care providers in the school setting:

"Getting the agreement of parents/support of parents to increase information road-shows at school- would help if local health centre went into local schools so that faces were familiar to the teenagers." Female GP, 36 years

and

" Increasing advertising in schools about confidential nature of GU consultations i.e. parents do not necessarily need to know." Male GP 59 years.

It was also suggested that they might link in not only in a purely educational context, but also through providing condoms to young people at special clinics, or by being able to prescribe contraception in this setting:

"Better access to contraception/ sex education. Improvement of sex education. Outreach clinic in school/ youth centre." Male GP 36 years.

and:

"In school drop in clinics in the school nurse or doctor. Provision of morning after contraception in the school setting or over the counter PC contraception." Male GP 50 years old.

9.2.3 Parental responsibility and education

The respondents also saw a role for the provision of education programmes aimed at parents *and* young people, and also a need for parental support in the provision of sex education and contraception for young people:

"Improved school teaching to youngsters and their parents on sexual health.." Female GP 47 years.

and:

"Getting the agreement of parents/support or parents to increase information road-shows at school." Female GP 36 years.

One respondent made an interesting comment regarding the lack of communication that can exist between young people and their parents:

"Many girls think their parents would object to them having contraception when the parents would prefer it by far to pregnancy (and may have told me but obviously haven't told the teenager)." Female GP 45 years.

9.2.4 Religious, moral and social education:

Morality was reported within the context of the promotion of abstinence and religious, family and societal values:

"Add morality and abstinence when we give children reproductive (not sex) education: this is a not a medical issue but a societal problem" Male GP 52 years.

and:

"It is already excellent (contraceptive services). Can be improved by showing that fornication is immoral – can give quotes from the bible – otherwise them, you, society and I have to pay the price" Male GP 44 years.

and:

"focus education in school and home on family relationships, personal responsibilities and the huge benefits to teenage boys and girls of keeping their sexuality for one person for life." Male GP 43 years.

and:

" Better moral and family values. There is no point in prescribing under 16 years. Not a medical problem" Male GP 48 years.

There was a need expressed for improved parental guidance and a greater emphasis on parents taking responsibility for their children:

"*Parents of teenagers should show a greater responsibility to their children in moral and economic terms*" Male GP 59 years.

and:

"*Better parental supervision and better parenting. Less easy acceptance that all teenagers need contraceptives rather than maturity and wisdom.*" Male GP 44 years.

Not all of the text coded as being based on moral issues was anchored within the promotion of abstinence and religious or moral values:

" *Less hypocrisy and morality in the adult world which makes advice/help about sex, pregnancy, contraception etc difficult for the younger teens to obtain. There are too many mixed messages and not enough clear guidelines...*" Female GP 38 years.

In terms of social outcomes of teenage pregnancy, respondents thought that young people should be educated about how early parenthood impacts their life and society as a whole:

" *Don't just tell them their rights alone. Tell them their responsibility to them self. Society and Nation and then the whole world.*" Male GP 57 years

and:

"*decrease the attractiveness of pregnancy- point out they won't automatically get a council house, DSS grants etc etc.*" Female GP 44 years

9.2.5 Education relating to service provision and health care providers

Training and awareness of issues pertinent to the treatment of young people were given by few respondents as a way of improving services for young people. Some of the respondents who did mention this issue had already attended training aimed at improving the patient/health care provider relationship:

"More staff to have training in dealing with adolescents. I know one of our practice nurses has been on a course and it helped a lot." Male GP 43 years

More respondents commented on the wider relationship with their teenage patients:

"Contraception should not be seen in isolation but as part of teenage health generally. Doctors should not be judgmental." Male GP 49 years

and:

"Continue to increase approachability of GPs and decrease the moralising aspect- by then its too late to preach to teenagers, but friendly advice is always needed." Female GP 44 years

and:

"Easy access to GP or family planning clinic, friendly and confidential service and to be taken seriously and not talked down to...... biggest problem is for them to identify a professional that they feel they can trust and have easy access to." Male GP 40 years.

9.2.6 What primary care provides and what to expect

What services are available to young people, and perhaps just as importantly, what will happen to them if they use these services were seen as important issues. Strongly associated to these issues was a need to inform young people about the confidential nature of GP consultations, and the ability to see a GP independently:

"Education in schools with emphasis that GPs can prescribe with or without parental consent. Explanation that a vaginal examination is not needed teenage pregnancy prescribe OCP." Male GP 34 years

and:

"Advice centres at schools- in particular to advise teenagers about their confidentiality rights with their GP even if younger than 16." Female GP 42 years.

One respondent did highlight the issue that what teenagers can expect form their GP, may vary depending on the individual GP:

"Becoming more user friendly. Better publicity- we are working on it but have a wide difference of opinion on contraception between the 2 partners which makes it very difficult to advance!" Male GP 41 years

9.2.7 Contraception and education

Although most respondents discussed contraception within the context of ways of improving access and services, some did suggest that sex education should include some key information. This included appropriate use of contraception, ability to be prescribed contraception if aged under 16, and the importance of timing in the use of emergency contraception:

"Ensure teenagers are aware confidentiality will be maintained and contraception is available subject to Gillick criteria. Publicise true length of time MAP is effective." Female GP 31 years.

9.3 Ways of improving contraceptive services for teenagers

9.3.1 Drop-in / teen clinics

The availability of contraception and advice in a teen centred 'drop in clinic' was suggested by many as a good way of improving contraceptive services. Several different approaches were suggested, these included clinics offered at school or at the practice, staffed by young staff, who might be GPs, Nurses or Health Visitors:

" Current appointment systems and teenagers' perception of the surgery as a place of family care may be a disincentive to attend. Drop in centres with younger staff would probably help but (are) difficult to set up within individual practices". Male GP 48 years.

This approach had been tried by some of the respondents, some teen clinics had failed due to lack of interest but others had been successful and had been well attended. Finding ways to fund these ventures was the biggest problem facing the respondents:

"We currently run a drop in centre for lifestyle advice including contraception but funding is difficult despite the service being well used and of benefit to our patients" Female GP 38 years.

Others used open invitations for routine good health checks, where teenagers were given the opportunity to discuss sex and contraception:

"...we call all our 15 yr olds in for a health check to check immunisation status etc- and to give them a chance to meet nurse and talk over contraception issues. Parents are sent out of the room!" Female GP 43 years

and:

"Our practice invites all fifteen year olds for an adolescent clinic appointment where all issues including contraception are raised. This is carried out by practice nurse. Attendance rates are high. Exit satisfaction is good. Over 50% attend independently of parents. Confidentiality is confirmed." Male GP 49 years.

"Our last two pregnancies were in girls who didn't attend our teen screen invite where we discuss contraception, but many still don't take contraception seriously." Male GP 44 years.

9.3.2 Staff

The use of Nurse Practitioners or providing nursing staff with appropriate training to prescribe contraception was also given as a way of improving contraceptive services for young people:

"Introducing a teenage health worker – most likely a nurse to deal with all aspects of health that are important to this age group.. would allow better relationships to develop

(i.e. professional) within which sexual matters could be broached more freely" Male GP 42 years.

It was suggested that female patients in particular might benefit from seeing a same sex GP, and that having more time within the consultation might improve services:

"I would like to offer our younger girls the opportunity to have a female GP always if they wished. Spend more time discussing the issue. " Male GP 33 years.

And:

"Having more time for consultation" Male GP 50 years.

9.3.3 Provision of Condoms

The ability to either prescribe condoms or to have a supply at the surgery was seen as a way of improving contraceptive services to young people. However, lack of funding was seen as a major obstacle to the provision of this service:

"Having a regular supply of free condoms. They open up the discussion and enable either issues such as protection from disease as well as pregnancy avoidance." Female, GP 40 years.

And:

"condoms available at primary care on a regular basis, not just as part of special projects." Male GP 53 years.

9.3.4 Provision of emergency contraception

The provision of emergency contraception as an over the counter item, or available from school-based clinics was also suggested as a way of improving contraceptive services:

" ..School drop in clinics with the school nurse or doctor. Provision of morning after contraception in the school setting or over the counter PC contraception." Male GP 50 years.

and:

"While we encourage all patients to attend for PCC (post-coital contraception) and provide some morning/afternoon appointments for this but it does not work. Perhaps the only answer is OTC (over the counter) provision of PCC." Male GF 57 years.

9.3.5 Legal issues.

Although the majority of respondents who discussed contraception discussed ways of improving services, not all thought that prescribing contraception to under 16's was appropriate or in some cases, legal:

"I believe that legally I should not prescribe without parental consent but my professional bodies support strongly such action." Male GP 43 years.

And:

"My younger partners are now asking me to prescribe to under 16s without parental consent. If the law permits, I will." Male GP 59 years.

One respondent commented on the current system of competency in the provision of contraception to young people aged under 16 years:

"This a grey area in prescribing legally. Law should be clean cut when to prescribe legally." Male GP 63 years

Several respondents reported that young people needed to have the message that they could come to the GP and get contraception legally, without their parents' knowledge or consent, relayed to them either through media advertisement, through statements at the practice or through communication with their GP:

"Media publicity of the fact that GPs can see and prescribe for this age group without parental knowledge or consent." Female GP 41 years.

9.3.6 Radical view points

There were also a small number of responses (n = 10) which suggested more radical ways of improving contraceptive services:

"Ovranette in the tap water?" Male GP 45 years.

"Steralise the lot of them" Male GP 42 years.

"..other than compulsory depo-provera.." Male GP 59 years.

9.3.7 Services cannot be improved

Not all of the respondents who gave a written answer thought that there was room for improvement in the provision of contraceptive services to young people. These responses fell into two broad themes. Some thought that services were already as good as they could be, and could not understand how unwanted pregnancies could occur with the current availability of contraception; and others thought that teenage pregnancy was not linked with contraceptive services, but was more about young people not seeing teenage pregnancy as problem:

"No - I am baffled by the fact that unwanted pregnancies still occur in teenagers (and others) when contraception services are so accessible. " Female GP 55 years.

and:

"Despite what the politicians say some teenagers perceive certain socio-economic advantages in single teenage pregnancy. Since the 1950s effective contraception has been available and the unwanted teenage pregnancy rate was lower before this date." Male GP 59 years.

Most of those who thought that they could not improve their services felt that they had already attempted to address the issue:

"No- we have just undertaken change in our use of computers to ensure that contraception can never come up on screen during a consultation or on a repeat prescription. We have thoroughly reviewed our practice, availability and information,

practice leaflet/ waiting room, posters on confidentiality and I can't think of anymore" Female GP 43 years.

Some felt that other issues, such as teenage pregnancy being seen as acceptable, or teenage pregnancies actually being wanted by their young patients, were more influential than the provision of contraception:

"Pregnancy in teenagers may have become socially acceptable, which I think is the main source of the problem." Male GP 40 years.

And:

"A significant number of our teenage pregnancies are either wanted or due to contraceptive failure." Female GP 34 years.

9.3.8 Confidentiality

This issue was raised by over 50% of the respondents. The respondents were aware that confidentiality is an important issue for young people and the need to re-affirm the confidential nature of a GP consultation was frequently raised:

"Advertise on surgery notice board that confidentiality is maintained. Tell this to teenagers attending alone for other reasons." Female GP 36 years.

and:

"Convince them not to be afraid to see their GP/Practice Nurse particularly with respect to confidentiality" Male GP 49 years.

It was suggested that a perceived lack of confidentiality actually prevented some young people from consulting with primary care professionals. Many of the respondents who gave a written response, including the issue of confidentiality, suggested ways of relaying the confidential nature of a consultation to young people. These included a written statement in the surgery waiting room, including this in school based sex education and discussing the issue with young people when they attended for any reason:

"Advertise in surgery notice board that confidentiality is maintained. Tell this to teenagers attending alone for other reasons." Female GP 36 years.

The respondents also recognised that although confidentiality within the consultation was important, the issue of anonymity and being seen by neighbours or friends in the surgery waiting room were also obstacles to accessing primary care services:

"Confidentiality – they do not seem to believe that it is possible. Possibly because they know the reception staff and are often neighbours of them" Female GP 46 years

and:

"Difficult in a village practice to ensure anonymity. We have a poster campaign to publicise the right to confidentiality." Female GP 38 years.

9.3.9 Legal Issues

The questionnaire asked the respondents whether they believed that the parent or guardian could have access to the content of their child's consultation without the consent of the child. Several respondents from an individual practice used the open text section of the questionnaire to relay their own experiences relating directly to this issue. They stated that they had had a situation where a parent had demanded to have access to the medical notes of a female patient aged 15 years, and that they had been advised by the MPS that they should allow the parent access:

"With regard to question 6, a parent did request access to her 15 year old daughters records (she had found the pills) The MPS advised that the parent could legally have access to the notes" female GP 38 years.

And:

"Advertising -can ensure 100% confidentiality but can't in view of guardians legal right of access to notes." Female GP 31 years.

CHAPTER 10 GENERAL PRACTITIONER SURVEY OF ATTITUDES AND BEHAVIOUR: DISCUSSION AND CONCLUSIONS

This chapter presents the limitations and weaknesses of the methodology and also discusses the main findings in relation to existing literature and policy.

10.1 Limitations and weaknesses

10.1.1 Response rate and non-responders

The topic in question can sometimes determine response rate, particularly if the subject is particularly relevant to the respondents or if the respondent believes that their response may have some impact upon policy (Oppenheim AN 1992). Certainly the high response rate to the questionnaire suggests that the subject matter sparked interest from the respondents, and this is reinforced by the high number of written comments provided. What is not certain is whether there was any selection bias that might have impacted upon the interpretations of the results. For example it might be the case that although the response rate was high, the respondents might have differed significantly to non-respondents, which might impact upon the interpretation of the study findings. The analysis of non-responders and responders did conclude that younger General Practitioners (under 36) were more likely to respond. This may have an impact upon some of the findings reported, particularly in terms of the sub-analyses and practice level analysis of response associated with practice pregnancy rate. If the older GPs who did respond were from practices that had lower rates, and the non-responders were older GPs from practices with higher rates, then these analyses will not have provided truly representative findings. This potential selection bias would also explain why age though strongly associated with pregnancy rate in the analyses presented in chapter six, was not associated in the analysis presented in section 8.6.

The analysis of non-responders also found that GPs from training practices and GPs from practices who are part of a regional research network were more likely to respond. Though there were no differences in terms of the deprivation score associated with the practice or estimated workload. In terms of practices that are part of a research network, it is important to consider whether these practices differ significantly from non-research active practices. A recent study by Hammersley et al (Hammersley V et al. 2002) has found that these practices do have similar patient populations compared to non-research practices, but differ in terms of some key practice characteristics. However, relevant to this study, these practices do not have lower teenage pregnancy rates or levels of deprivation when compared to non-research practices and so have a similar exposure and experience of teenage pregnancy in their practice population. It may be that GPs from these practices have greater exposure to research and so are more willing to take part in studies such as this. It may also be that because these practices are reported as having smaller list sizes, they have more time available to complete questionnaires such as this.

The response rate was 70%. Many postal surveys do not gain more than a 50% response rate (Jackson CJ & Furnham A2000) and so 70% could be considered a good response. This response rate also compares favourably to that reported by Lee et al. They asked GPs similar questions regarding confidentiality and young people, and received only a 35% response after two mailings (Lee E et al 2004). It is likely that the response rate would have been further improved by offering a financial incentive. Indeed, several questionnaires were returned unanswered though accompanied with a note stating that it would only be completed if payment were offered. However, providing a financial incentive is not considered good practice ethically, though reasonable reimbursement to cover time taken to participate in research is considered appropriate. In this case however, the questionnaire would have taken only a few minutes to complete making reimbursement inappropriate and difficult to administer. Offering the potential respondents a summary of the results can improve response rates (Jackson CJ & Furnham A2000), and if this study were to be repeated, then the respondents would be given the option of receiving a summary of the results at the end of the study period.

10.1.2 Study Design

This study was a cross sectional survey. This method can generate large amounts of descriptive data, but cannot easily demonstrate causality (Jackson CJ & Furnham A2000). However, this study is not intended to prove a causal link. Rather it is intended to further explore the findings of the initial study, which found that practices with young and female GPs had lower teenage pregnancy rates, and the method chosen is appropriate for this purpose.

The questionnaire designed for this study was piloted using the target population and scrutinised by academic GPs for clarity. However, if this study were to be repeated, more attention would be given to the reliability and validity of the data collection instrument. As discussed earlier, test re-test analysis can be difficult to interpret, though the findings of this study would be strengthened if a test for reliability showed that there was a low level of random measurement error.

Although the questionnaire was piloted to ensure face and to an extent, content validity, criterion validity was not assessed. This problem is the main limitation to surveys that rely entirely on self-reported behaviour, because this is often not an accurate reflection of actual practice. In an ideal situation, self-reported behaviour would be compared to a 'gold standard', which in this case could be an examination of the medical notes of the respondents young patients aged 12-15 years. This method was used by Churchill et al, who carried out a cross sectional survey of young teenage patients in the primary care setting, and corresponded information generated through the survey to that held in the medical records. This was a general health survey and the parents of the young people had to be contacted to give consent for their child to take part. This worked well, but this method could not easily be adopted for this study. Firstly, the subject matter is different and more contentious than that of a general health survey. The parents may wonder why their child has been selected for a study related to teenage pregnancy and contraception, even if the purpose of the case note review is made clear. Also, the medical notes would be being reviewed purely to validate responses given by the GPs, which would undoubtedly reduce the amount of GPs willing to take part, probably to a number that would seriously affect the generalisability of the findings.

As discussed in section 7.4.5, content validity was assessed during the pilot study phase. Ideally, this would be a distinct and separate phase that would precede the development of questionnaire items. If the study was repeated, this phase would utilise a formal consensus method that has been shown to be appropriate for use in the primary care setting (Allen J et al 2004), which would aim to generate both the questionnaire items and response options.

As discussed in chapter 7, data entry was validated by checking a one in four random sample for errors. It could be argued that a larger number of entries should have been checked to ensure that the datafile was accurate, and it would have been possible to use the double entry facility in EPI-INFO to identify all of the errors in data entry. However, the impact of checking one in four should be minimal as only 4% (6 out of 155) of the entries validated contained an error.

10.1.3 Statistical analysis of practice level data

The practice level analyses utilised practice level data files aggregated from individual level data. To minimise the impact of differing numbers of respondents from each practice, a variable was computed that indicated whether at least one respondent from the practice had given a certain response, for example whether at least one GP from a practice had responded that they prescribe contraception to young people aged under 16 without parental consent. However, this approach is not sensitive to variation within practices, which is likely to be significant taking into account work done by Asworth which suggests that although GPs in group practices tend to have high levels of agreement on managerial issues, they do not tend to have high agreement on attitudinal or behavioural measures (Ashworth M & Armstrong D 2003). A sub analysis of practices where all of the GPs had responded would have been more sensitive, though very few such practices were identified, thus making the numbers too small for meaningful analysis.

10.2 Discussion of findings

10.2.1 Summary of the main findings

Significant differences related to age of respondent were observed for most questionnaire items. Older male GPs reported to seeing fewer young people aged under 16 years, and were less likely than younger GPs to see them without a parent or guardian present. They were less likely to prescribe contraception without parental consent and were also more likely to think that it was illegal to prescribe contraception to young women aged under 16 years of age.

In negative binomial regression analysis, none of the questionnaire items or GP characteristics were associated with the pregnancy rate of the practice. This was true for the primary and sub analyses for practices with mainly older and younger GPs. However, as one would expect, increasing deprivation (measured by the Townsend score of the practice) was significantly associated with higher teenage pregnancy rates.

As in chapter 6, the analysis using Poission regression analysis, did show significant associations between age and the practice teenage pregnancy rate. This difference is due to the fact that negative binomial regression analysis takes into account the potential for recurrent events, and gives a higher standard error and more conservative P values (Glynn RJ & Buring JE1996), and may also be due to selection bias, i.e. fewer older GPs responded to the questionnaire.

10.2.2 Age of the GP: Possible reasons for significant observations

The reasons behind the significant differences observed between older and younger respondents are not clear, but is possible that these differences are due at least in part to training. Undergraduate training in adolescent health varies from University to University and in many there is little formal primary care training on adolescent health issues. The Royal College of General Practitioners has recently set up a task group which aims to improve the quality of general practice based medical services for young people aged 11-19 years. This includes raising awareness of primary care staff and promoting training for GPs and medical students in the field of adolescent health care (Royal College of General Practitioners 2003). The Task Group run training events aimed at primary care staff, which in line with their overall aims and objectives, aim to increase awareness of relevant issues and improve services available to young people. Although specific data on age and sex of the delegates is not recorded, through personal communication with the course organiser and also by attending the course itself, it seems that the majority of those who attend are younger professionals and female professionals. This may be because older male GPs are more likely to be single- handed and so find it more difficult to take time out of the surgery, or it may be because within practices it is seen as more appropriate for younger and female GPs to take a lead role in adolescent care.

Age of GP has been linked in previous studies, with various outcomes. In a study of Australian GPs' views and use of tests in the detection of early prostate cancer, older GPs were significantly more likely to consider that tests that did not have any evidence to suggest that were effective, were effective in detecting cancer and preventing premature mortality (Ward J & Young J1998). Older GPs have also been found to be less likely than younger GPs to use management and referral guidelines (Watkins C, Harvey I, Langley C, Gray S, & Faulkner A1999). However, in a study of patient satisfaction, Sixma et al concluded that neither differences in age or sex between patient and GP had any effect on patient satisfaction. They found no evidence to suggest that patients who were over 20 years different in age to their GP were less satisfied with their care, and they also found that women who consulted with a male GP were no less satisfied than women who consulted with a female GP (Sixma HJ 1998).

10.2.3 Contraception

Overall, approximately half of the respondents to the survey, stated that would prescribe contraception to young people under 16 years of age without parental consent, a further 44% stated they would prescribe to this age group but preferably with proof of parental consent. Whilst this is encouraging, it should also be considered that the sub-analysis of single-handed GPs showed that this group were less likely to prescribe contraception without parental consent and were also more likely to believe it was illegal to do so. If this is related to the findings of chapter 5, which found that family planning clinics are not always accessible to young people, it could be that some young people may have difficulty gaining access to contraception. Young people can see any GP, not only the GP they are registered with, for contraception, and this message should be relayed to teenagers to ensure that they are aware of their choices in accessing contraceptive care.

10.2.4 The legalities of prescribing to under 16s

The respondents were asked whether they believed it was legal to prescribe contraception to young people aged under 16 years of age. Although the majority of respondents thought that it was legal to prescribe to this age group, 15% of older GPs reported that either they didn't know if it was legal to prescribe to under 16s or thought it was illegal to do so. This issues was also raised several times in the open ended question, with some respondents being either unsure of the legalities of prescribing to this age group, or calling for more clear guidance on the matter.

This confusion may be due to the fact that the Fraser guidelines (Department of Health and Social Security1986) introduced in 1986 are not clear-cut. The issue of competency, and the onus being upon the health care provider to determine competency, lays a heavy responsibility upon the clinician. This is not helped by media coverage, which can scandalise the provision of services to under 16s. Also of course the case of Victoria Gillick, which prompted the introduction of the Fraser guidelines, caused enough controversy to see initially a complete ban on prescribing contraception to under 16s without parental consent.

10.2.5 Confidentiality

The respondents who took part in this study did in the main report that they discuss the issue of confidentiality with at least some of their patients aged 12-15 years. This is encouraging, especially since the findings of the practice managers' questionnaire suggest that few practices have explicit policies regarding confidentiality and young people aged under 16. In addition to this finding, Lee et al found that at least a third of practices who do have such a policy do not actually advertise the fact (Lee E et al 2004). However, if it is considered that young people have been found to have significantly shorter consultations than adults, and that young people who attend alone have even shorter consultations, then it is difficult to see how this message can be effectively transmitted during such a limited time period (Jacobson LD et al 1994). This is compounded by the fact that GPs do not actually see their young teenage patients frequently (Jacobson LD & Owen PA 1993; Churchill R et al 2000), and so may not get the opportunity to talk on a one to one basis about the issues around confidentiality. This may explain why so many of the respondents who gave a textual comment in the questionnaire saw a need for the issue of confidentiality to be included in sex education and to be advertised in the school and primary care settings.

Most of the respondents were also willing to see young people in this age group without a parent or guardian present. This is encouraging as in a study of 1045 young people aged 13-15, Burack found that only 11% of males and 16% of females would want to be accompanied by their parent when the visited their GP (Burack R 2000).

The GPs who gave a textual response reported that the young people who they see are not always aware of issues around confidentiality, and that confidentiality was a very important issue for young people which might effect their decision to attend. This reflects previous work in this area, with studies reporting that up to 55 % of young people are unsure whether their consultations are confidential (Churchill R e al 2000; Kari J et al 1997) . However, how this effects actual behaviour is more complex, and it may be that worries over embarrassment rather than confidentiality actually impact on a young person's decision to consult with their GP (Churchill R et al 2000).

10.2.6 Access to medical information

Confidentiality was also discussed in terms of whether the respondent believed that the content of a consultation with a young person could be divulged to the parent or guardian without the patients' consent. The majority of respondents thought that access could not be given without consent, although older GPs were more likely to report that either they did not know whether access could be given or that a parent or guardian could gain access without consent. This issue is similar to the competency guidelines associated with prescribing and referral in under 16s. If the young person is deemed competent then information can only be disclosed if non-disclosure would cause risk of death or serious harm to the patient or to another individual. However, respondents from one practice returned questionnaires outlining a case where the parent of one of their patients aged under 16 had insisted on gaining access to her child's records after finding her oral contraceptive pills. After discussion with the Medical Protection Society the practice were advised to allow the parent access. This has implications for how the issue is discussed with young people, as if this can happen, then their consultation may not be truly confidential.

10.2.7 Ways of improving contraceptive services

10.2.8 Education

The majority of the respondents who gave comments about sex education, thought that more sex education was needed, and gave suggestions as to how this should be delivered. The suggestions included school-based initiatives, which would involve input from primary care professionals. The importance of relationships and giving teenagers' skills to say no to sex were also seen as vital components to sex education, and very few respondents thought that current sex education was adequate or unnecessary. There has been a considerable amount of research into the value of sex education, and some critics consider the provision of sex education a catalyst for early sex. However, studies have shown that the provision of sex education and health promotion advice does not increase the likelihood of actual sexual activity (Swann C1998). Young people who receive the majority of their knowledge from schools are also more likely to use contraception at first intercourse and less likely to have early sexual intercourse (Wellings K et al 1995).

Interestingly, very few respondents suggested peer led education programmes as a way of providing sex education. This is surprising as such initiatives have been found to be an effective way of delivering key information about safe sex practices. A study in Devon used a team made up of a GP, a teacher and peer leaders to deliver safe-sex messages. They found that young people who had not received the intervention, were 1.45 times more likely to have had sex compared to teenagers in the intervention group (Mellanby AR 1995).

10.2.9 Promotion of abstinence and social/moral values

The promotion of abstinence and moral and social values were strong themes in the analysis of the textual data. The inclusion of the value of relationships within sex education and providing young people with the skills to say no to intercourse were supported. The promotion of abstinence within formal sex education was supported by some respondents, and seen as a way of avoiding teenage pregnancy. Abstinence and the value of virginity is an issue that has gained more popularity in the United States than here in the UK. In the US there are federally funded abstinence programs which give no information on contraception or sex, but instead deal only with the promotion of abstinence. The effectiveness of these programmes in comparison to safe sex programmes has been explored. It has been found that although young people in abstinence only programmes are less likely than those in a safe sex programme to have had sex three months after the intervention, this difference soon disappears (Jermot JB et al 1998). This does raise the question of safe sex practices once the effect of the abstinence programme has ended as without the addition of this knowledge, young people are likely to be at greater risk of unsafe practices leaving them vulnerable to pregnancy and sexually transmitted infection.

10.2.10 Service Provision

The respondents gave some suggestions as to how they think general practice service provision could be improved. The ability to see a same sex GP was suggested, as was the wider use of nurses in the provision of contraception. Studies have shown that young women in particular would like to see a same sex GP, and similarly young people have stated that they would like to see the nurse more often for their care (Churchill R et al 2000, Little L 1997).

One of the most frequently suggested ways of improving services for teenagers was the use of teen clinics. Teenage clinics do seem to represent what young people want from health services, this being that they welcome young people aged under 16 years, are informal and confidential and offer a drop-in service (Churchill R et al 1997; Cook R et al 1993; Little L 1997) . Teen clinics have been tried with mixed results, and this is reflected in the comments given by the respondents to the survey, some of whom had set up clinics that had failed and some were running teen specific sessions that were well attended and well received. As discussed in section 2.13.1, the outcomes used to measure the success of these initiatives will in themselves define their success. A study based in Nottingham looked at the impact of a clinic set up specifically for teenagers, which primarily offered contraception and contraceptive advice. The evaluation of this service showed that although uptake of this service was high, it did not have any effect upon teenage pregnancy rates (Wilson S et al 1994).

10.2.11 Provision of condoms and availability of emergency contraception

The provision of emergency contraception as an over the counter item was given as a way of improving contraceptive services for young people. At the time that this questionnaire was distributed, emergency contraception was only available through family planning clinics, primary care and in some cases, hospital accident and emergency departments. Since January 2001 pharmacists have been able to sell emergency contraception to women aged 16 and over. By making emergency contraception more accessible, the government hopes to reduce unwanted conceptions (The Social Exclusion Unit1999). This decision raised the question of whether teenagers would now rely on emergency contraception, rather than using barrier methods of other forms of prescribed contraception. However, a study based in Finland, found that young people aged under 16 who had used emergency contraception did not appear to use it regularly or as a substitute for other forms of contraception, as only 17% had used it twice and 5% had used it three or more times (Kosunen E et al. 1999).

However, it is not clear whether better access to emergency contraception by teenagers in the UK will lead to a fall in teenage pregnancy cases. In a case control study, Churchill et al found that young women who become pregnant are significantly more likely to have consulted for emergency contraception in the year prior to conception (Churchill D et al 2000). This suggests that it could be a risk indicator in young women, and these women who could be identified in primary care as high risk and given appropriate advice, would be missed if they chose to access emergency contraception through a pharmacy.

CHAPTER 11 CONCLUSIONS AND IMPLICATIONS OF THE FINDINGS

11.1 Summary of main findings

The main findings have been presented in each chapter, along with the relevant methodological issues that need to be considered. The methodological issues are not repeated here, though in order to summarise the main findings, each of the original research questions posed in chapter one are re-visited below, and the implications of these findings are discussed. The overall conclusion, in line with the primary aims is given in section 11.7 along with recommendations for future research.

11.2 What is the incidence of teenage pregnancy in Trent, and what factors are associated with variations in outcomes of teenage pregnancy?

A total of 18692 pregnancies were identified for the three year study period, and 957 (5.1%) of these were to women aged under 16 years at the time of admission to hospital. The highest teenage pregnancy rates, in line with figures published by the Office for National Statistics were for Barnsley and Doncaster, where the pregnancy rate for women aged 13-19 years was 42.7 per 1000 women and 49.2 per 1000 women respectively.

A total of 10554 (56.5%) conceptions resulted in a delivery, and 7092 (37.9%) ended in an abortive outcome. An additional 1046 (5.6%) conceptions resulted in a miscarriage. In line with previous research, the outcome of the pregnancy (delivery or abortive outcome) was significantly associated with deprivation status. 70.3% of conceptions in the most deprived areas of Trent resulted in a delivery, compared to 44.6% in the least deprived areas, and this pattern was observed for all of the health authority areas within the former Trent region.

In terms of obstetric outcomes, of the 10554 deliveries reported in this study, 2334 (22.1%) were assisted in that they resulted in either an emergency or elective caesarean section, or a ventouse or forceps delivery. Risk of experiencing as assisted delivery was associated with neither age nor deprivation, but was associated with place of treatment (hospital), with women delivering in two hospitals having an increased risk of an assisted delivery. There was also a significant amount of variation between hospital and type of assisted delivery, with women delivering in 3 of the hospitals, having an increased risk compared to the overall effect, of having a forceps or ventouse delivery compared to any type of abdominal delivery, and women delivering in 2 other hospitals having an increased risk of a caesarean section over a vaginally assisted birth.

11.2.1 Implications of the findings

The findings of this research suggests that teenage pregnancy is influenced greatly by socio-economic factors, and that the decision to continue with the pregnancy is also associated with deprivation status. This finding adds to a growing evidence base, that shows this factor to be the biggest predictor of risk of teenage pregnancy (Babb, P. 2003; Boulton-Jones & McInneny 1995; McLeod, A. 2001; Smith, T 1993; Wilson SH, Brown TP, & Richards RG 1992). The government has recognised this disparity and have set a target to reduce the inequalities in conception rates between wards with the highest rates and the average ward rate, by at least 25% by the year 2010 (The Social Exclusion Unit. 1999). Whether or not this target will be achieved is uncertain. The relationship between socio-economic disadvantage and increased risk of teenage parenthood is complex, and almost certainly involves issues around life chances and expectations. The work by Lee et al demonstrates this well, as those women who chose to terminate their pregnancy were more likely to have plans to go to University and thought that having a child at such a young age would impact heavily on their future plans for work and study. In contrast the women who continued with their pregnancy were more likely to see the pregnancy as a positive event that in some cases helped them avoid involvement in crime and drugs (Lee, E., et al 2004).

The findings of the analysis of obstetric outcomes suggests that the hospital in which a young woman delivers, is associated with her risk of having an assisted delivery. Previous research has suggested that individual health professional's practice has an effect upon obstetric outcome (Berkowitz, GS, et al 1989, Poma, PA 1999, Goyert GL et al 1989) and in order to test this hypothesis, further work into both ward policies and individual practice would need to be conducted. However, this element of the study has added to the evidence base that shows that neither age or deprivation status is associated with risk of delivery (Lubarsky, SL et al 1994, Smith, GC & Pell, JP 2001, Gould, JB., Davey,B & Stafford, RS 1989) . This is particularly important for the issue of the impact of deprivation status on risk of intervention, as there is very little UK based research in this area, particularly in the teenage population.

11.3 What primary care based services are available to young people living within Trent?

In terms of the characteristics of the practices in Trent during the study period, overall 316 practices (38.5%) had at least one GP aged under 36 years, and 477 (58.1%) practices had at least one female GP. There was some variation between health authority area, and practices in Rotherham for example had fewer practices with at least one female GP and fewer practices with at least one GP aged under 36 years.

The survey of practice managers from the four health authority areas focused upon in this thesis, found that 21% of practices in these areas were running a teen specific initiative, and up to 74% of practice managers reported that their practice was considering setting up some sort of teen specific service. Of those practices that were running an initiative, 26% were running a teen clinic, and 26% invited young people to a health check at age 15. A further 19% of practices provided free condoms.

A smaller number of practices (11%) reported that they had a specific written policy on confidentiality for patients aged under 16 years. However, a number of practices reported that although they did not have a specific written policy, they did have a verbal agreement between staff that young patients aged under 16 should have the same right to confidential as older patients.

11.3.1 Implications of the findings

The survey of practice managers found that approximately one fifth of practices in the four health authorities were running a teenage specific initiative. Although teenage clinics have been found to be seen by teenagers as a good way of receiving health care and advice (Little, L 1997) , there is little evidence that providing advice and care in this way is actually associated with changes in behaviour (Walker Z et al 2002). However, the findings of chapter 5 suggest that these initiatives may have a positive impact on conception rates, particularly in women aged under 16 years.

11.4 What family planning services are available to teenagers in Trent and how accessible are they?

The survey of family planning services found that there were 108 clinics in existence in 1997, and these provided a total of 498 hours of service per week, 260.5 hours of which were accessible to school aged teenagers. There was a great deal of variation between health authority areas, with only 34% of hours provided by clinics in Sheffield for example, being accessible to school aged teenagers. Conversely, 80% of the hours provided by clinics in Lincolnshire were accessible to young people in this age group.

11.4.1 Implications of the findings

Teenagers have identified family planning clinics as an appropriate venue for the discussion of contraception and sexual health issues (Pearson, VAH et al 1995) . However, research also shows that young people are not willing to travel far to access these services, and most walk to their nearest clinic rather than use public transport (Stone, N & Ingham, R 2000). With this in mind, the findings of this element of the thesis suggest that in many health authority areas, much of the provision, particularly that provided by large centrally based clinics may not be accessible to young people who are still at school. This is particularly an issue for young people who perceive barriers to care from their GP. As reported in chapter six, there are some single-handed GPs in Trent who do not prescribe contraception to under 16s without parental consent. Since most contraception is provided by GPs or family planning clinics, it does raise the question of where young people who do not want their parents to know about their sexual activity, access contraception.

The government has highlighted the accessibility of contraceptive services as an important element in their strategy to reduce the number of teenage conceptions (The Social Exclusion Unit. 1999). This study pre-dates the government strategy and so it may be that since the publication of the Social Exclusion Unit report, clinics have made efforts to address the issue and have made more clinics accessible to this age group. Although there is some evidence that proximity to family planning provision is associated with higher teenage pregnancy rates (Paton, D, 2002), it is undoubtedly the case that these clinics provide an important service that have a role in providing advice and services which help protect young people against unwanted pregnancy and sexually transmitted infection.

11.5 Are there any potentially modifiable practice characteristics associated with variations in teenage pregnancy rates?

The initial analysis of the Trent wide dataset, published in 2000, found that lower teenage pregnancy rates for women aged 13-19 years, were associated with practices with female GPs, younger GPs (aged under 36 years) and increased practice nurse time. Using data from the four health authority areas focused upon in this thesis, and using the more appropriate method of analysis (negative binomial regression) these findings were not repeated for women aged 13-19 years. However, for young women aged under 16 years, lower teenage pregnancy rates were found to be associated with practices with younger GPs and lower rates were also observed in practices who had reported in the survey of practice managers that they were running a teenage specific initiative. In line with the initial Trent wide analysis, lower rates were observed in rural practices and higher rates were associated with increasing levels of deprivation.

11.5.1 Implications of these findings

There is very little research that examines the differences between younger and older GPs, and how they differ as practitioners. Although younger GPs have been associated with higher uptake of smear tests, and also vaccinations (Baker D & Klein R 1991), there is no evidence to suggest that they have a different approach to teenage health. This finding is then difficult to interpret in the light of little previous or subsequent research. The findings of chapter six do however, suggest that younger GPs are more likely to prescribe contraception to young teenagers without parental consent and are also more likely to think that it is legal to do so, and so this may account for some of the difference observed.

The association between teenage specific initiatives should be interpreted with care, as the number included in the analysis was small (47 practices) and data were missing for approximately 15% of practices. However, in adjusted negative binomial regression analysis, practices with these initiatives did have lower rates, independently of socio-economic factors. This finding has not previously been reported, and does suggest that by providing teenage specific services, practices may well be able to impact upon the incidence of teenage pregnancy in their patients. To further explore this issue, research would be needed to identify whether specific types of services, for example teenage clinics, have a greater or lesser impact compared to other initiatives such as providing free condoms. This could be achieved by examining in detail the services provided and then conducting a clustered Randomised Controlled Trial to assess their effectiveness.

11.6 How do General Practitioners view issues around the care of young teenagers, and what practitioner characteristics are associated with these beliefs and opinions?

The survey of GPs aimed to further explore the findings of chapter five and to explore how GPs view key issues around the care of young people aged under 16 years. The results of this cross-sectional survey of GPs found that half of the respondents would prescribe contraception to young people aged under 16 without parental consent, and approximately a further 40% would do so but preferably with proof of parental consent. However, in the sub analysis of responses from single-handed GPs, this group were less likely to prescribe contraception to young people aged under 16 without parental consent and were also less likely to believe it was legal to do so.

Most of the respondents did discuss the issue of confidentiality with their young patients aged under 16, and most believed that parents could not have access to the content of their child's consultation without the young persons consent. There were however age differences, with older GPs being more likely to believe that parents could access information without the consent of the young person. Older GPs were also less likely to prescribe contraception without parental consent and more likely to believe it was illegal to do so. However, response to questionnaire items was not found to be significantly associated with pregnancy rate.

11.6.1 Implications of the findings

The findings of this survey were encouraging as most of the respondents reported that they saw young people alone at least some of the time, and most did discuss the issue of confidentiality with their young patients. This is a particularly important issue as teenagers have been reported as having serious concerns as to how confidential general practice services are (Churchill R et al 2000, Burack R 2000, Kari, J et al 1997) . In addition, the findings of chapter four suggest that most practices do not have an explicit written confidentiality statement for young people and other research has shown that even if practices do have such statement it is often not advertised (Lee, E et al 2004).

The survey did find significant differences between older and younger GPs and how they approach issues that are highly relevant to the care of young patients aged under 16. However, responses to questionnaire items were not associated with practice pregnancy rate. This may be due to mix of professionals within practices, or to the fact that in most cases not all of the GPs from each practice responded. It may be however due to the fact that differences in reported activity do not actually have any impact on variation in pregnancy rates. What is clear however, is that younger GP have significantly different attitudes and behaviours compared to older GPs and unravelling this issue would need further research. In-depth interviews with older and younger GPs could be used to further explore the issues presented in this chapter, though finding enough GPs willing to take part in such a time consuming and potentially contentious study may be difficult.

11.7 Overall conclusion and recommendations for future research

Primary care is very much on front line in the delivery of health promotion and preventative care, though the role of primary care in the prevention of teenage pregnancy has not been widely discussed or researched. The primary aim of this thesis was to investigate teenage pregnancy from a primary care perspective by identifying any potentially modifiable primary care characteristics associated with variations in teenage pregnancy, and then to explore these further through a study of GPs perceptions and attitudes towards key issues associated with the care of young people.

The conclusions related to this primary aim are that there are potentially modifiable characteristics, including age of GP that are associated with variation in teenage pregnancy rates. Practices with at least one GP aged under 36 years for example had a pregnancy rate for women aged under 16 that was 33% lower than in practices who did not have a young GP, even when potential confounders such as deprivation score were adjusted for. The possible reasons behind this significant difference were further explored through the survey of GPs, and the findings suggest that this difference may be due to differences in the attitudes and perceptions of GPs towards key issues, such as the prescribing of contraception to young women aged under 16.

Placing these findings within clinically relevant recommendations is difficult. The paper published in the British Medical Journal in 2000 (Hippisley-Cox et al 2000), reporting the initial analysis of the data presented in chapter 6, recommended that PCTs and practices with high rates should consider attracting and recruiting staff with characteristics found to be associated with lower rates (i.e. younger GPs). This recommendation was however criticised for being discriminatory against older GPs (Leung WC 2000). Although it should be recognised that some older GPs did report for example that they prescribe contraception to under 16s without consent; the findings of the questionnaire survey, considered in conjunction with the findings of the analysis presented in chapter 6, do suggest that young patients may benefit from seeing a young GP, as they are more likely to prescribe contraception without parental consent and are also more likely to believe that the content of the consultation is confidential. Perhaps as an alternative to recommending that younger GPs should be recruited as a way of lowering teenage pregnancy rates, an emphasis should be placed on engaging older GPs in adolescent health training, such as that offered by the RCGP task group, as perhaps through initiatives such as this, important and sometimes confusing issues such as the legalities of prescribing contraception to young people could be clarified.

In addition, further research is needed to fully understand the impact of age, and reasons why older and younger GPs have such different perceptions and attitudes. This would best be explored further through the use of qualitative methods, though as discussed above; recruiting busy GPs to a qualitative study may be difficult. Involving adolescents in the research may help to further explain both the relationship between age of GP and variations in teenage pregnancy rates, and other issues related to variations in rates, such as the provision of teen specific services. It is possible for example that young people themselves see younger GPs as more approachable and more able to empathise with them. It may also be that younger GPs are more likely to bring up issues around sexual health and contraception with their patients, and so this might explain some of the observed variation.

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APPENDICES

APPENDIX 1: INTERNATIONAL STATISTICAL CLASSIFICATION OF DISEASES AND RELATED HEALTH PROBLEMS DIAGNOSTIC CODES (ICD, VERSION 9 AND 10), AND OFFICE OF POPULATION, CENSUSES AND SURVEYS - CLASSIFICATION OF SURGICAL OPERATIONS AND PROCEDURE CODES (OPCS) USED TO IDENTIFY TEENAGE CONCEPTIONS

Codes associated with abortive outcomes:

ICD9 code	ICD10 code	Condition
630	**O01** O01.0 O01.1 O01.9	**Hydatidiform mole** Classical hydatidiform mole Incomplete and partial hydatidiform mole Hydatidiform mole, unspecified
631	**O02** O02.0 O02.8 O02.9	**Other abnormal product of conception** Blighted ovum and nonhydatidiform mole Other specified abnormal products of conception Abnormal products of conception unspecified
632	**O02.1**	**Missed abortion**
633	**O00**	**Ectopic pregnancy**
633.0	**O00.0**	**Abdominal pregnancy**
633.1	**O00.1**	**Tubal pregnancy**
633.2	**O00.2**	**Ovarian pregnancy**
633.8	**O00.9**	**Other ectopic pregnancy**
633.9	**N/A**	**Unspecified ectopic pregnancy**
634	**O03**	**Spontaneous abortion**
634.0	O03.5 O03.0	Complicated by genital tract and pelvic infection Incomplete, complicated by genital tract and pelvic infection
634.1	O03.6 O03.1	Complicated by delayed or excessive haemorrhage Incomplete, complicated by delayed or excessive haemorrhage
634.2	N/A	Complicated by damage to pelvic organs or tissues
634.3	N/A	Complicated by renal failure
634.4	N/A	Complicated by metabolic disorder
634.5	N/A	Complicated by shock
634.6	O03.7 O03.2	Complicated by embolism Incomplete, complicated by embolism
634.7	N/A	With other specified complications
634.8	O03.8 O03.3	With unspecified complication Incomplete with other unspecified complication
634.9	O03.9 O03.4	Without mention of complication Incomplete without complication

635	**004**	**Legally induced abortion (medical abortion)**
635.0	O04.5 O04.0	Complicated by genital tract and pelvic infection Incomplete, complicated by genital tract and pelvic infection
635.1	O04.6 O04.1	Complicated by delayed or excessive haemorrhage Incomplete, complicated by delayed or excessive haemorrhage
635.2	N/A	Complicated by damage to pelvic organs or tissues
635.3	N/A	Complicated by renal failure
635.4	N/A	Complicated by metabolic disorder
635.5	N/A	Complicated by shock
635.6	O04.7 O04.2	Complicated by embolism Incomplete, complicated by embolism
635.7	N/A	With other specified complications
635.8	O04.8 O04.3	With unspecified complication Incomplete with other unspecified complication
635.9	O04.9 O04.4	Without mention of complication Incomplete without complication
636	**N/A**	**Illegally induced abortion**
636.0	N/A	Complicated by genital tract and pelvic infection
636.1	N/A	Complicated by delayed or excessive hemorrhage
636.2	N/A	Complicated by damage to pelvic organs or tissues
636.3	N/A	Complicated by renal failure
636.4	N/A	Complicated by metabolic disorder
636.5	N/A	Complicated by shock
636.6	N/A	Complicated by embolism
636.7	N/A	With other specified complications
636.8	N/A	With unspecified complication
636.9	N/A	Without mention of complication
637	**O06**	**Unspecified abortion**
637.0	O06.5 O06.0	Complicated by genital tract and pelvic infection Incomplete, complicated by genital tract and pelvic infection
637.1	O06.6 O06.1	Complicated by delayed or excessive haemorrhage Incomplete, complicated by delayed or excessive haemorrhage
637.2	N/A	Complicated by damage to pelvic organs or tissues
637.3	N/A	Complicated by renal failure
637.4	N/A	Complicated by metabolic disorder

637.5	N/A	Complicated by shock
637.6	O06.7 O06.2	Complicated by embolism Incomplete, complicated by embolism
637.7	N/A	With other specified complications
637.8	O06.8 O06.3	With unspecified complication Incomplete with other unspecified complication
637.9	O06.9 O06.4	Without mention of complication Incomplete without complication
638	**007**	**Failed attempted abortion**
638.0	O07.5 O07.0	Complicated by genital tract and pelvic infection Incomplete, complicated by genital tract and pelvic infection
638.1	O07.6 O07.1	Complicated by delayed or excessive haemorrhage Incomplete, complicated by delayed or excessive haemorrhage
638.2	N/A	Complicated by damage to pelvic organs or tissues
638.3	N/A	Complicated by renal failure
638.4	N/A	Complicated by metabolic disorder
638.5	N/A	Complicated by shock
638.6	O07.7 O07.2	Complicated by embolism Incomplete, complicated by embolism
638.7	N/A	With other specified complications
638.8	O07.8 O07.3	With unspecified complication Incomplete with other unspecified complication
638.9	O07.9 O07.4	Without mention of complication Incomplete without complication
639	**O08**	**Complications following abortion and ectopic and molar pregnancies**
639.0	O08.0	Genital tract and pelvic infection
639.1	O08.1	Delayed or excessive hemorrhage
639.2	O08.6	Damage to pelvic organs or tissues
639.3	O08.4	Renal failure
639.4	O08.5	Metabolic disorders
639.5	O08.3	Shock
639.6	O08.2	Embolism
639.8	O08.8	Other specified complications following abortion and ectopic and molar pregnancies
639.9	O08.9	Unspecified complication following abortion and ectopic and molar pregnancies
N/A	O08.7	Other venous complications following abortion and ectopic and molar pregnancies
N/A	**O05**	**Other abortion**
N/A	O05.0	Incomplete, complicated by genital tract

	O05.5	and pelvic infection Complicated by genital tract and pelvic infection
	O05.1 O05.6	Incomplete, complicated by delayed or excessive haemorrhage Complicated by delayed or excessive haemorrhage
N/A	O05.2 O05.7	Incomplete, complicated by embolism Complicated by embolism
N/A	O05.3 O05.8	Incomplete, with other unspecified complications Other unspecified complications
N/A	O05.4	Incomplete without complication Without complication

ICD9 and ICD10 codes associated with delivery

ICD9 code*	ICD10 code	Condition
650	O80 O80.0 O80.1 O80.8 O80.9	Delivery in a completely normal case Spontaneous vertex delivery Spontaneous breech delivery Other single spontaneous delivery Single unspecified spontaneous delivery
651	**084**	**Multiple gestation**
651.0 (0,1,3)	N/A	Twin pregnancy
651.1 (0,1,3)	N/A	Triplet pregnancy
651.2 (0,1,3)	N/A	Quadruplet pregnancy
651.3 (0,1,3)	N/A	Twin pregnancy with fetal loss and retention of one fetus
651.4 (0,1,3)	N/A	Triplet pregnancy with fetal loss and retention of one or more fetus(es)
651.5 (0,1,3)	N/A	Quadruplet pregnancy with fetal loss and retention of one or more fetus(es)
651.6 (0,1,3)	N/A	Other multiple pregnancy with fetal loss and retention of one or more fetus(es)
651.8 (0,1,3)	N/A	Other specified multiple gestation
651.9 (0,1,3)	O84.9	Unspecified multiple gestation
652	**064**	**Malposition and malpresentation of fetus**
652.0 (0,1,3)	N/A	Unstable lie
652.1	N/A	Breech or other malpresentation successfully

(0,1,3)		converted to cephalic presentation
652.2 (0,1,3)	O64.1	Breech presentation without mention of version
652.3 (0,1,3)	O64.0	Transverse or oblique presentation
652.4 (0,1,3)	O64.2 (Face) O64.3 (Brow)	Face or brow presentation
652.5 (0,1,3)	N/A	High head at term
652.6 (0,1,3)	**N/A**	Multiple gestation with malpresentation of one fetus or more
652.7 (0,1,3)	O64.4	Prolapsed arm
652.8 (0,1,3)	O64.8	Other specified malposition or malpresentation
652.9 (0,1,3)	O64.9	Unspecified malpresentation or malposition
660	**N/A**	**Obstructed labour**
660.0 (0,1,3)	N/A	Obstruction caused by malposition of fetus at onset of labour
660.1 (0,1,3)	N/A	Obstruction by bony pelvis
660.2 (0,1,3)	N/A	Obstruction by abnormal pelvic soft tissues
660.3 (0,1,3)	N/A	Deep transverse arrest and persistent occipitoposterior position
660.4 (0,1,3)	O66.0	Shoulder dystocia
660.5 (0,1,3)	066.1	Locked twins
660.6 (0,1,3)	O66.4	Failed trial of labour, unspecified
660.7 (0,1,3)	O66.5	Failed forceps or vacuum extractor, unspecified
660.8 (0,1,3)	O66.8	Other causes of obstructed labour
660.9 (0,1,3)	O66.9	Unspecified obstructed labour
N/A	**O65**	**Obstructed labour due to maternal pelvic abnormality**
N/A	O65.0	Deformed pelvis
N/A	O65.1	Generally contracted pelvis
N/A	O65.2	Pelvic inlet contraction
N/A	O65.3	Pelvic outlet and mid-cavity obstruction
N/A	O65.4	Fetoplevic disproportion unspecified
N/A	O65.5	Abnormality of maternal pelvic organs

N/A	O65.8	Other maternal pelvic abnormalities
661	**O62**	**Abnormality of forces of labour**
661.0 (0,1,3)	O62.0	Primary uterine inertia
661.1 (0,1,3)	O62.1	Secondary uterine inertia
661.2 (0,1,3)	O62.2	Other and unspecified uterine inertia
661.3 (0,1,3)	O62.3	Precipitate labour
661.4 (0,1,3)	O62.4	Hypertonic, incoordinate, or prolonged uterine contractions
661.9 (0,1,3)	O62.8 O62.9	Unspecified abnormality of labour Abnormality of forces of labour, unspecified
662	**O63**	**Long labour**
662.0 (0,1,3)	O63.0	Prolonged first stage
662.1 (0,1,3)	063.9	Prolonged labour, unspecified
662.2 (0,1,3)	O63.2	Prolonged labour second stage
662.3 (0,1,3)	O63.2	Delayed delivery of a second twin, triplet, etc
663	**O69**	**Umbilical cord complications**
663.0 (0,1,3)	O69.0	Prolapse of cord
663.1 (0,1,3)	O69.1	Cord around neck with compression
663.2 (0,1,3)	O69.2	Other and unspecified cord entanglement, with compression
663.3 (0,1,3)	N/A	Other and unspecified cord entanglement, without mention of compression
663.4 (0,1,3)	O69.3	Short cord
663.5 (0,1,3)	O69.4	Vasa previa
663.6 (0,1,3)	O69.5	Vascular lesions of cord
663.8 (0,1,3)	O69.8	Other umbilical cord complications
663.9 (0,1,3)	O69.9	Unspecified umbilical cord complication
664	**O70**	**Trauma to perineum and vulva during delivery**
664.0 (0,1,4)	O70.0	First degree perineal laceration
664.1 (0,1,4)	070.1	Second degree perineal laceration

664.2 (0,1,4)	O70.2	Third degree perineal laceration
664.3 (0,1,4)	O70.3	Fourth degree perineal laceration
664.4 (0,1,4)	O70.9	Unspecified perineal laceration
664.5 (0,1,4)	N/A	Vulval and perineal haematoma
664.8 (0,1,4)	N/A	Other specified trauma to perineum and vulva
664.9 (0,1,4)	N/A	Unspecified trauma to perineum and vulva
665	**O71**	**Other obstetrical trauma**
665.0 (0,1,3)	O71.0	Rupture of uterus before onset of labour
665.1 (0,1)	O71.1	Rupture of uterus during labour
665.2 (0,2,4)	O71.2	Inversion of uterus
665.3 (0,1,4)	O71.3	Laceration of cervix
665.4 (0,1,4)	O71.4	High vaginal laceration
665.5 (0,1,4)	O71.5	Other injury to pelvic organs
665.6 (0,1,4)	O71.6	Damage to pelvic joints and ligaments
665.7 (0,1,2,4)	O71.7	Pelvic haematoma
665.8 (0-4)	O71.8	Other specified obstetrical trauma
665.9 (0-4)	O71.9	Unspecified obstetrical trauma
666	**O72**	**Postpartum haemorrhage**
666.0 (0,2,4)	O72.0	Third stage haemorrhage
666.1 (0,2,4)	O72.1	Other immediate postpartum haemorrhage
666.2 (0,2,4)	O72.2	Delayed and secondary postpartum haemorrhage
666.3 (0,2,4)	O72.3	Postpartum coagulation defects
667	**O73**	**Retained placenta or membranes, without haemorrhage**
667.0 (0,2,4)	O73.0	Retained placenta without haemorrhage
667.1 (0,2,4)	O73.1	Retained portions of placenta or membranes, without haemorrhage

668	**O74**	**Complications of the administration of anaesthetic or other sedation in labour and delivery**
668.0 (0-4)	O74.1	Pulmonary complications (0-4)
N/A	O74.0	Aspiration pneumonitis due to anaesthesia
668.1 (0-4)	O74.2	Cardiac complications
668.2 (0-4)	O74.3	Central nervous system complications
668.8 (0-4)	O74.8	Other complications of anaesthesia or other sedation in labour and delivery
668.9 (0-4)	O74.9	Unspecified complication of anaesthesia and other sedation
N/A	O74.4	Toxic reaction to local anaesthesia-induced headache during labour and delivery
N/A	O74.5	Spinal and epidural anaesthesia-induced headache during labour and delivery
N/A	O74.7	Failed or difficult intubation during labour and delivery
669	**O75**	**Other complications of labour and delivery, not elsewhere classified**
669.0 (0-4)	O75.0	Maternal distress
669.1 (0-4)	O75.1	Shock during of following labour and delivery
669.2 (0-4)	N/A	Maternal hypotension syndrome
669.3 (0,2,4)	N/A	Acute renal failure following labour and delivery
669.4 (0,1,2,4)	O75.4	Other complications of obstetrical surgery and procedures
669.5 (0,1)	N/A	Forceps or vacuum extractor delivery without mention of indication
669.6	N/A	Breech extraction
669.7 (0,1)	N/A	Caesarean delivery, without mention of indication
669.8 (0-4)	O75.8	Other complications of labour and delivery
669.9 (0-4)	O75.9	Unspecified complication of labour and delivery
N/A	O75.2	Pyrexia during labour
N/A	O75.3	Other infection during labour
N/A	O75.5	Delayed delivery after artificial rupture of membranes
N/A	O75.6	Delayed delivery after spontaneous or artificial rupture of membranes
N/A	O75.7	Vaginal delivery following previous caesarean section

N/A	**O81**	**Single delivery by forceps and vacuum extraction**
N/A	O81.0	Single delivery by low forceps
N/A	O81.1	Single delivery mid-cavity forceps
N/A	O81.2	Single delivery mid-cavity with rotation
N/A	O81.3	Other forceps delivery
N/A	O81.4	Vacuum extraction delivery
N/A	O81.5	Delivery by combination of forceps and vacuum extraction
N/A	**O82**	**Single delivery by caesarean section**
N/.A	O82.0	Elective caesarean section
N/A	O82.1	Emergency caesarean section
N/A	O82.2	Caesarean hysterectomy
N/A	O82.8	Other single caesarean section
N/A	O82.9	Unspecified caesarean section
N/A	**O83**	**Other assisted single delivery**
N/A	O83.0	Breech extraction
N/A	O83.1	Other assisted breech
N/A	O83.2	Other manipulation-assisted
N/A	O83.3	Delivery of viable fetus in abdominal pregnancy
N/A	O83.4	Destructive operation for delivery
N/A	O83.8	Other assisted delivery
N/A	O83.9	Assisted single delivery, unspecified
N/A	**O84**	**Multiple delivery**
N/A	O84.0	Spontaneous multiple delivery
N/A	O84.1	All forceps and vacuum extractions
N/A	O84.2	All by caesarean section
N/A	O84.8	Other multiple delivery
N/A	O84.9	Multiple delivery unspecified

*For cases 650-669.9, the following subclassifications are used:

0 = Unspecified as to episode of care or not applicable

1 = Delivered, with or without mention of antepartum condition

2 = Delivered, with mention of postpartum complication

3 = Antepartum condition or complication

4 – Postpartum condition or complication

Office of Population, Censuses and Surveys - Classification of Surgical Operations and Procedure codes (OPCS):

OPCS code	**Procedure**
Q09.1	Open removal of products of conception from uterus
Q10.1	Dilation of cervix uteri and curettage of products of conception from uterus
Q10.2	Curettage of products of conception from uterus nec
Q11	**Other evacuation of contents of uterus**
Q11.1	Dilation of cervix uteri and vacuum aspiration of products of conception from uterus
Q11.2	Dilation of cervix uteri and evacuation of products of conception from uterus nec
Q11.3	Evacuation of products of conception from uterus nec
Q11.4	Extraction of menses
Q11.8	Other specified
Q11.9	Unspecified
Q14	**Introduction of abortifacient into uterine cavity**
Q14.1	Intraamniotic injection of prostaglandin
Q14.2	Intraamniotic injection of abortifacient nec
Q14.3	Extraamniotic injection of prostaglandin
Q14.4	Extraamniotic injection of abortifacient nec
Q14.5	Insertion of prostaglandin pessary
Q14.6	Insertion of abortifacient pessary nec
Q14.8	Other specified
Q14.9	Unspecified
Q31.1	**Removal of products of conception from fallopian tube**
R03	Selective destruction fetus
R03.1	Early selective feticide
R03.2	Late selective feticide
R03.8	Other specified
R03.9	Unspecified
R14	**Surgical induction of labour**
R14.1	Fore water rupture of amniotic membrane
R14.2	Hind water rupture of amniotic membrane
R14.8	Other specified
R14.9	Other unspecified

APPENDIX 2: OFFICE OF POPULATION CENSUSES AND SURVEYS – CLASSIFICATION OF SURGICAL OPERATIONS AND PROCEDURE CODES (OPCS) USED TO IDENTIFY ASSISTED DELIVERIES

OPCS code	Procedure
R17	**Elective caesarean delivery**
R17.1	Elective upper uterine segment caesarean section
R17.2	Elective lower uterine segment caesarean section
R17.8	Other specified
R17.9	Unspecified
R18	**Other caesarean delivery**
R18.1	upper uterine segment caesarean section
R18.2	lower uterine segment caesarean section
R18.8	Other specified
R18.9	Unspecified
R21	**Forceps cephalic delivery**
R21.1	High forceps cephalic delivery with rotation
R21.2	High forceps cephalic delivery nec
R21.3	Mid forceps cephalic delivery with rotation
R21.4	Mid forceps cephalic delivery nec
R21.5	Low forceps cephalic delivery
R21.8	Other specified
R21.9	Unspecified
R22	**Vacuum delivery**
R22.1	High vacuum delivery
R22.2	Low vacuum delivery
R22.3	Vacuum delivery before full dilation of cervix
R22.8	Other specified
R22.9	Unspecified

APPENDIX 3: LETTER TO PRACTICE MANAGERS ASKING THEM TO COMPLETE THE PRACTICE MANAGER QUESTIONNAIRE

42058

jane.allen@nottingham.ac.uk

Dear XXXX

The Trent Teenage Pregnancy Study: A Survey of Practice Managers

Please find enclosed a short two sided questionnaire that has been sent from the Division of General Practice at The University of Nottingham. The questionnaire is part of a study which is aiming to look at the issue of teenage pregnancy in a primary care context and has been sent to all Practice Managers in your area.

I would be very grateful indeed if you could complete the questionnaire and return it in the FREEPOST envelope that has been provided.

Many thanks for your consideration.

Yours truly,

Jane Allen

Researcher.

APPENDIX 4: PRACTICE MANAGER QUESTIONNAIRE

The Trent Teenage Pregnancy Project.
A survey of Practice Managers.

We are asking for your help with a study which is taking place at the University of Nottingham. We have sent this confidential questionnaire to all Practice Managers in your Health Authority area and we would be very grateful if you could complete it and then return it in the FREEPOST envelope that has been provided.

Thank you for your help.

1) How many GPs *(including assistants and registrars)* work at the practice? ☐

2) How many whole time equivalent partners work at the practice? ☐

2) How many GPs *(including assistants and registrars)* at the practice fit Intra-uterine Devices *(IUDs, coils)*? ☐

4) How many GPs at the practice are on the obstetrics list? ☐

5) Does the practice run any teenage specific initiatives?

❒ Yes ❒ No, but we intend to ❒ No

If the practice does run any teenage specific initiative or intends to, please give a written description of the service:

____

____

____

____

____

PTO ☞

6) Does the practice have a written policy on confidentiality for patients aged under 16 years of age?

❒ Yes ❒ No

If YES please give a written description of that policy or enclose a copy of your written policy

7) Approximately how many miles from the practice is the nearest family planning clinic?

❒ The clinic is in the practice building ❒ Less than one mile ❒ 1-3 miles

❒ 4-6 miles ❒ More than 6 miles ❒ Don't know

8) Apart from the services that your practice provides, are there any teenage health clinic[s] in the practice area?

❒ Yes ❒ No ❒ Don't know

Thank you for completing this confidential questionnaire. Please return it in the FREEPOST envelope that has been provided.

Please return by:

....

Jane Allen
Researcher
The University Of Nottingham
The Division of General Practice
Queen's Medical Centre
Nottingham
NG7 2UH

APPENDIX 5: LETTER TO GENERAL PRACTITIONERS ASKING THEM TO COMPLETE THE GP QUESTIONNAIRE

42058

jane.allen@nottingham.ac.uk

Dear Dr XXX

The Trent Teenage Pregnancy Study: A Survey of General Practitioners

Please find enclosed a short two sided questionnaire that has been sent from the Division of General Practice at The University of Nottingham. The questionnaire is part of a study which is aiming to look at the issue of teenage pregnancy in a primary care context. A copy has been sent to all General Practitioners in your area.

I would be very grateful indeed if you could complete the questionnaire and return it in the FREEPOST envelope that has been provided. You will notice that a code has been assigned to the questionnaire which makes it identifiable. Naturally all of the information gathered through this study will be treated as confidential but if you would prefer to return an anonymous questionnaire then please cut the code off.

Many thanks for your consideration.

Yours truly,

Jane Allen

Researcher.

7) Compared to the national teenage pregnancy rate, do you think that the rate for your practice population is: *(please tick one box)*

❑ Higher ❑ Average ❑ Lower ❑ Don't know

8) Can GPs legally prescribe contraception to young people aged under 16 years of age without parental consent? *(please tick one box)*

❑ Yes ❑ No ❑ Don't know

9) Can you suggest any ways of improving contraceptive services for your teenage patients? *(please write your answer)*

____

____

____

____

About you:

Are you : ❑ Male ❑ Female

Please give your age in years: [ ] years

Do you have any of the following qualifications? *(please tick all those that apply)*

❑ FPCERT

❑ DRCOG

❑ MRCGP

❑ FRCGP

❑ Diploma of Child Health

Are you on the Obstetrics list?

❑ Yes ❑ No

Thank you for taking the time to complete this confidential questionnaire. Please return it in the FREEPOST envelope that has been provided. Please return this questionnaire by:

....

Jane A
Researc
The University Of Nottingh
The Division of General Prac
Queen's Medical Cen
Nottingh
NG7 2

APPENDIX 6: GP QUESTIONNAIRE

code

The Trent Teenage Pregnancy Study.
A survey of General Practitioners.

e are asking for your help with a study which is taking place at the University of Nottingham. We ve sent this confidential questionnaire to all GPs in your Health Authority area and we would be ry grateful if you could complete it and then return it in the FREEPOST envelope that has been provided.

Thank you for your help

pproximately how many patients aged **12-15** years do you expect to see (for contraception or other reason) per month? *(please tick one box)*

lore than 40 ❑ 25 - 40 ❑ 10 - 24 ❑ Less than 10

)f those patients aged between **12-15** that you do see, how often do you see them without a ent or guardian being present? *(please tick one box)*

lways ❑ Often ❑ Occasionally ❑ Very rarely ❑ Never

)f those patients aged **12-15** that you do see, with how many do you discuss the issue of fidentiality? *(please tick one box)*

ll ❑ Most ❑Some ❑Few ❑None

)o you prescribe contraception to girls aged under 16 years of age? *(please tick one box)*

'es ❑ Yes, but preferably with proof of parental consent
'es, but only with proof of parental consent ❑ No, never

)o you refer girls aged under 16 years of age for termination of pregnancy? *(please tick one box)*

'es ❑ Yes, but preferably with proof of parental consent
'es, but only with proof of parental consent ❑ No, never

f a patient who was aged under 16 came to see you alone, would the parent or guardian of that ient have the right to know the content of the consultation without the patients' consent?

'es ❑ No ❑ Don't know

PTO ☞

APPENDIX 7: DIRECTLY RELATED PUBLISHED PEER-REVIEWED JOURNAL PAPERS:

I. **ALLEN, J** & HIPPISLEY-COX, J. (2001) Teenage pregnancy in the UK: where are we going wrong? *International Journal of Adolescent Medicine and Health.* 12, 261-273.

II. HIPPISLEY-COX, J., **ALLEN, J.**, PRINGLE, M., EBDON, D., MCPHERSON M., CHURCHILL, D & BRADLEY, S. (2000) Association between teenage pregnancy rates and the age and sex of general practitioners: cross sectional survey in Trent 1994-7. *British Medical Journal.* 320,842-845.

III. **ALLEN, J** & BRADLEY, S. (2001) Family planning provision in the Trent health region: Is it accessible to school aged teenagers? *The Journal of Family Planning and Reproductive Health Care.* 27, 13-15.

IV. **ALLEN, J.**, HIPPISLEY-COX, J., PRINGLE, M & GROOM, L. (2003) Assisted delivery in the teenage population: the effect of inter-hospital variation, deprivation and age. *International Journal of Adolescent Medicine and Health.* 15, 341-347.

Int J Adolesc Med Health 2000;12(4):261-273.

Teenage pregnancy in the UK: Where are we going wrong?

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Division of General Practice, School of Community Health Sciences, The University of Nottingham, Queen's Medical Centre, Nottingham, United Kingdom

ABSTRACT

Young people in the United Kingdom (UK) are experiencing sex at an earlier age than ever before and many of these are putting themselves at risk of pregnancy and or sexually transmitted diseases. United Kingdom has a rate of teenage pregnancy at present at 9 per 1,000 for women under 16 years, which is double that of some countries in Europe.

This review provides background information on teenage pregnancy in the UK, characteristics of the young women who become pregnant, health and social outcomes, options, the legal aspects, contraception, service aspects, interventions and educational aspects.

There is a need for further studies into the differences between the attitudes and sexual behaviour in the UK and other European countries in order to learn, where and how intervention and prevention should take place.

Key words: Teenage pregnancy, United Kingdom

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Int J Adolesc Med Health 2000;12(4):261-273.

INTRODUCTION

Teenage pregnancy is hotly debated in the UK and barely a day goes by without a newspaper headline reporting the case of another young teenage pregnancy. This interest is perhaps not surprising as the UK has the highest rates of conceptions to under 16 year olds in Western Europe and also ranks highly on an international scale (1). The rate at present is approximately 9 per 1,000 for women aged under 16 years of age and this is double that of some countries in Europe (2).

This article aims to provide a broad overview of teenage pregnancy in the UK and gives some background into the problem of teenage pregnancy and strategies, which aim to reduce the unacceptably high rate.

THE PROBLEM OF TEENAGE PREGNANCY

In 1997 there were 7,700 conceptions to young women aged under 16 years and approximately 50% of these ended in abortion (3). Data for the period 1974 to 1997 (Office of National Statistics Data) suggests that conception rates to young people aged under 16 years have not fluctuated significantly; staying at about 8-9 per 1,000 women. However, rates for women aged under 18 years of age have shown more fluctuation with rates declining in the early 1970s and then rising sharply in the mid 1980s and again in the mid 1990s to a peak of 50 per 1,000 women. Whilst it is difficult to account for these fluctuations, they are likely to be due, at least in part, to pill scares. In October 1995 there was a scare over the safety of some brands of the contraceptive pill and subsequently the pregnancy rate for women aged under 16 years rose by 11%, from 8.4 per 1,000 in 1995, to 9.4 per 1,000 in 1996 (4). There was a particularly high rise in the number of terminations of pregnancy in this age group in this time period, with rates increasing by 14.5% (5).

Successive governments have set targets to reduce conception rates to teenagers, but numbers do not appear to be declining. In 1992 the Conservative Government published 'The Health of the Nation', which set targets to reduce conceptions to under 16 year olds by half to 4.4, which would bring the UK into line with most other European countries (6). This has not been achieved and a change in government has bought about another initiative. In 1999 the Labour government published the report by the Social

Exclusion Unit (SEU) (7). The Social Exclusion Unit aims to achieve two main goals; these being the reduction of conception rates in under 18 year olds by half by the year 2010 and also to re-introduce more teenage parents back into education, training or employment.

CHARACTERISTICS OF YOUNG WOMEN WHO BECOME PREGNANT

Pregnancy rates in the UK appear to be associated with deprivation in the socio-economic area (8,9,10). A study based in Scotland found that in women aged under 16 years, the pregnancy rate in deprived areas was three times higher than those in areas described as most affluent. The young women from more affluent areas were also more likely to terminate their pregnancy with two out of three taking this route as opposed to only one in four in deprived areas (9).

There are several other factors associated with increased risk of teenage pregnancy. Young women, whose mother who was a teen mother, are at increased risk of becoming a teenaged mother themselves (11). Drug use, alcohol use and having multiple sexual partners have been associated with increased risk of young men becoming teen fathers (12). An interesting study identified several factors significantly associated with an increased likelihood of becoming a teen parent. Young women, whose family had suffered financial hardship, who had low levels of educational attainment, had emotional problems in childhood or adolescence and had a mother who had a teenage pregnancy were at significantly greater risk of early pregnancy (13).

HEALTH AND SOCIAL OUTCOMES OF TEENAGE PREGNANCY

A substantial amount of the controversy in the UK around the issue of teenage pregnancy is concerned with adverse health and social outcomes. Younger teenagers (<16 years) are more likely than older teenagers to experience problems in pregnancy such as anaemia, gestational hypertension and urinary tract infection (14); and are also more likely to have low birth weight babies (15,16). There is evidence however, which suggests that older teenagers (16-19 years) have better obstetric outcomes than adults (15).

With regard to long term adverse social outcomes, teenage pregnancy is associated with reduced earning potential and education (17), greater reliability on state benefits (18) and increased social isolation (19). Teen parents are also more likely to be in the lowest income bracket when in their thirties (19). Some have suggested that teenagers in the UK become pregnant in order to access state benefits. There is little evidence to support this and a recent study has shown that teenagers are actually quite unsure as to what they can claim (20). The SEU report found that teenaged parents found it very difficult to manage on the benefits they received (approximately £75 a week for a young lone mother aged 16 or 17 years and £115 a week for a couple aged over 18 years with one child) (7). However there is a financial impact of teenage pregnancy as 90% of teenage mothers receive income support from the government and compared to other lone parents they are more likely to be solely reliant on benefits, and tend to stay on benefits for longer (21).

THE OPTIONS OPEN TO YOUNG WOMEN WHO BECOME PREGNANT

Young women who become pregnant have three options, they can continue with the pregnancy and keep the child, they can continue with the pregnancy and then have the child adopted, or they can choose to terminate the pregnancy (though the 1967 Abortion Act was not extended to Northern Ireland and so young women choosing termination in this area tend to travel to England for the procedure).

Adoption is not a commonly chosen path and official figures have shown that in the past twenty years, overall adoption figures have fallen by approximately 75% (22). The reasons for this decline are not clear though it is likely to be due at least in part to the pressure young women were under in the 60s and 70s to have their babies adopted; and also the fact that lone parenting is more acceptable in today's society.

Termination of pregnancy is more common than adoption and in under 16 year olds approximately 50% (roughly 4,000 per annum) of conceptions result in termination (3). Abortion is legal in the UK on the grounds of there being a risk to the life or mental well being of the woman or foetal abnormality; and can be accessed for free through the NHS; or for a fee through private clinics. Overall, approximately three-quarters of terminations in England and Wales are funded by the NHS and nearly all are funded in this way in Scotland (23). Two doctors have to agree for the procedure to be undertaken and young women aged under 16 years can be referred for a termination without parental consent if they are deemed competent to understand the implications of their actions. In practice however many doctors require the consent of a parent before the procedure is carried out.

THE LEGAL POSITION

In terms of the legal age of consent for heterosexual sex , in England, Wales and Scotland; it is illegal for a man to have sex with a young women aged under 16 years (17 in Northern Ireland). Conviction of this crime carries a two year prison sentence (life imprisonment if the girl is aged under 13 years in England, Wales and Scotland and 14 in Northern Ireland) (24). However in reality actual convictions for this crime are low and government figures show that approximately a quarter of reported offences result in a conviction (7).

In the 1980s there were a series of high court judgements that radically changed how health professionals dealt with young people aged under 16 years of age. In 1980 issuing contraception to those under 16 years of age was at the discretion of the doctor, and whilst parental consent was preferred, it was not essential. In 1984 a further ruling stated that health professionals providing contraception to under 16 year olds were acting illegally unless advice was given in an emergency, or with leave of the Court. In 1986, the Fraser Guidelines came into force (25). These state that health professionals can provide contraception to under 16 year olds without parental consent if he or she is satisfied that the young person is mature enough to understand what is involved; that the young person is likely to begin or to continue sexual intercourse with or without contraception and that without treatment or advice the young persons physical or mental health would suffer. The guidelines also state that health professionals should make efforts to persuade the young person to inform their parents of their action.

CONTRACEPTION: WHAT IS ON OFFER AND UTILISED?

The contraceptive pill first became available in the UK in the 1960s to married women, and was subsequently made available to single women in

1970 (26). Under the National Health Service, contraception and contraceptive advice is available free of charge in the UK and prescribed contraception can be obtained through general practice or through family planning clinics. Condoms cannot be obtained free of charge from general practice, but can be obtained for free from family planning clinics, genitourinary clinics and from some specific local initiatives. Emergency contraception is generally available from general practice and family planning clinics on prescription only. Access to emergency contraception is currently being re-thought in the UK and in Scotland 100 general practices are involved in a trial where suitable women are being given packs of emergency contraception to keep at home (27).

Young people who have sex under the age of 16 years are less likely to use contraception at first intercourse compared to young people who experience first intercourse at an older age (28). A study of pregnant teenagers found that of those who had sexual intercourse below the age of 16 years, only a quarter used contraception on a regular basis (29). Numbers of young people engaging in sexual intercourse under 16 years of age are rising; it has been estimated that as many as one in three young people are sexually active before the age of 16 years (30). A recent study of 1,500 school pupils found that 20% of 13 year olds had experienced full, or oral sexual intercourse (31). An interesting comparison of the reasons given for engaging in first intercourse by young people in the UK and the Netherlands, has shown that young people in the UK are more likely to cite opportunity and peer pressure as reasons for first intercourse, whereas young people from the Netherlands reported love and commitment as the biggest reason for first intercourse (32).

Contraception failure is common in this age group and a study of unplanned pregnancies found that 80% were using contraception at the time of conception (33). A recent general practice based study has suggested that most young people who conceive do consult for contraception before they become pregnant. This study also found that young women who have a termination of pregnancy are significantly more likely to have consulted for emergency contraception in the year before the pregnancy compared to age matched controls (34).

Reasons for not using contraception include side effects of the contraceptive pill, embarrassment and sexual intercourse happening unexpectedly (35,36,37). A study of young peoples clinics in England found that using contraception at first intercourse, or at most recent intercourse, was associated with young people discussing it beforehand and also with delaying intercourse beyond four weeks (38). In terms of emergency contraception, awareness appears to be high amongst teenagers, but knowledge about specific issues, such as the time scale in which it can be used, is poor (39). Not utilising this type of contraception may also be due to a lack of advertising and also lack of perceived personal risk (33,35).

WHAT ASPECTS OF SERVICE ARE IMPORTANT?

How services are delivered to this age group is important as they are sensitive to the characteristics of the service, and the staff who deliver the service. Young people might also attend for contraception with a hidden agenda; i.e. they may consult with gynaecological or psychological complaints which mask their intention; and identifying this can be quite a task for health professionals (34,40).

It is possible that certain characteristics of health service delivery have an effect on variations in teenage pregnancy rate. A recent study found that lower teenage pregnancy rates were associated with General Practices with young female GPs and those offering increased practice nurse time (41). Indeed young people themselves have reported that they would like to choose the sex of their GP and would like the opportunity to discuss problems with a Nurse instead of a GP (42). Findings such as these suggest that skill mix is an important characteristic of services offered to young people.

The accessibility and acceptability of services are important issues. In terms of the accessibility of services, findings suggest that services are not always accessible to young people as for example, they are sometimes only open during school hours (43). There have been many studies which have used attitudinal measures to determine the acceptability of services, and it seems fair to conclude that young people favour drop-in services that are informal, confidential and welcome young people aged under 16 years of age (42,44,45).

Confidentiality is a major issue for this age group, and young people consistently rate confidentiality as an important feature of their health care. Young people appear to be confused about how confidential services are, and in one study only 55% of teenagers thought that their consultation with their GP was completely confidential; in another 26% were not sure (42,46). The extent to which this actually affects how young people access health care is not entirely clear. Recent findings have suggested that it is embarrassment, not worries over confidentiality which effects consultation behaviour (47).

INTERVENTIONS AND EDUCATION

In recent years there have been several reviews of the effectiveness of interventions to reduce conception rates to teens in the UK. There are several key indicators for good practice, these include integrating clinic and education based services, ensuring that prevention based programmes are targeted at vulnerable groups and in a way the sensitive to local need, and are in place before the onset of sexual activity (48).

The actual impact of specific interventions is difficult to measure, particularly when the outcome measure is a reduction in pregnancy rate. Effectiveness can be measured by a reduction of pregnancy rate or by the uptake of services, but uptake of services may not lead to a reduction of pregnancy rate. This is illustrated by a study based in Nottingham, where a clinic aimed at teenagers to provide contraception was set up and then evaluated seven years later. The aim was to reduce pregnancy rate, and uptake of services was measured. Although the clinic was successful in terms of the high number of teenagers it attracted for services such as contraception, pregnancy and abortion counselling, the aim of reducing pregnancy rates was not achieved (49).

There have been many efforts to increase teenagers' knowledge of contraception and safe sex practices; these have been largely school based. A large study carried out in Devon aimed to increase pupils' knowledge and also to decrease levels of sexual activity. The intervention consisted of 25-30 one hour sessions delivered to secondary school pupils, and unusually the programme team consisted of a GP, a senior teacher and supervised peer leaders. Compared to controls, the young people involved in the programme demonstrated a greater knowledge of issues such as emergency contraception and also reported more positively in attitudinal questions about early sexual intercourse. Behaviour also appears to have been affected by the programme, with teenagers in the control population being 1.45 times more likely to have had sexual intercourse compared to teenagers in the study group (50).

Sex education is a contentious issue in the UK and although some sex education is mandatory, in reality provision varies across schools. A review by the NHS Centre for Reviews and Dissemination (CRD) has concluded that good sex education is effective in reducing unintended pregnancies, particularly when this education is linked with teen specific services (51). A retrospective study of 18,876 respondents of the national survey of sexual attitudes and lifestyles aimed to explore the relationship between the provision of sex education and early sexual intercourse. The majority of the respondents did not receive the larger part of their sex education from school, but from friends. Those who reported receiving their sex education from school were less likely to have early sexual intercourse, and were more likely to use contraception during first intercourse. The authors point out that opponents of school based sex education have the opinion that sex education promotes early sexual intercourse; the results of this study suggest the opposite (52).

CONCLUSION

Young people in the UK are experiencing sex at an earlier age than ever before and many of these are putting themselves at great risk of pregnancy and or sexually transmitted infections. Young people and parents in the UK also have a different approach towards sexuality compared to countries such as The Netherlands, and it is interesting that this country has half the teen conception rate of the UK.

An evaluation of the latest government strategy is due within the next 2-3 years. Whether or not this strategy has brought about any of the changes needed to facilitate a reduction of teen pregnancy remains to be seen. Changes to service delivery and education appear relatively easy to achieve compared to the changes needed to promote a more open attitude towards sex and sexuality.

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Association between teenage pregnancy rates and the age and sex of general practitioners: cross sectional survey in Trent 1994-7

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BMJ 2000;320:842-5

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Abstract

Objective To examine variations in teenage pregnancy rates in Trent region and to determine possible associations with local general practice characteristics such as the age and sex of the doctors.
Design Cross sectional survey.
Setting All 826 general practices in Trent region in existence between 1994 and 1997.
Subjects All pregnancies of teenagers aged 13 to 19 between 1994 and 1997 that resulted in an admission to an NHS hospital.
Main outcome measures Pregnancy rates for teenagers aged 13 to 19 and general practice characteristics: presence of a female or young doctor (under 36 years old), number of whole time equivalent practice nurses, Townsend score, vocational training status, list size per whole time equivalent doctor, fundholding status, and partnership size.
Results On multivariate analysis, lower teenage pregnancy rates were associated with the presence of a female or young doctor and more nurse time. Practices in deprived areas had higher teenage pregnancy rates.
Conclusion General practices with female doctors, young doctors, or more nurse time had lower teenage pregnancy rates. The findings may have implications for the mix of health professionals within primary care.

Introduction

The United Kingdom has the highest teenage pregnancy rate in western Europe.[1] Teenage conception rates in Trent are among the highest in the United Kingdom.[2] The reduction of teenage pregnancies was a target for the Health of the Nation.[3] High conception rates are associated with having a teenage mother,[4] having divorced parents,[5] poor education,[1] and deprivation.[1 6 w1 w2] Health professionals may reduce the harmful effects of deprivation and poor education on risk of teenage pregnancy by improving access to effective health education and contraceptive services.[7 8 w3-5]

Since over 70% of consultations for contraception occur in general practice[9] and 98% of doctors provide contraceptive services,[10] the role of primary care services in preventing teenage pregnancies is crucial. Although there is evidence that female patients prefer to see female doctors[11 w6 w7 w8] and teenagers report high satisfaction with general practice services,[10] little is known about the characteristics of general practices that have high or low teenage pregnancy rates.

We aimed to determine general practice characteristics associated with variations in teenage pregnancy rates. In particular, we investigated the effect of the sex and age of the doctor and the availability of a practice nurse.

Subjects and methods

Study sample

Ethical approval was obtained from Trent multicentre and local research ethics committees. The study sample consisted of all teenage pregnancies from all 826 general practices in Trent region from 1 April 1994 to 31 March 1997. The teenage pregnancies were identified from the admissions database of Trent regional hospital with both Office of Population Censuses and Surveys procedural codes Q09.1; Q10.1; Q10.2; Q11; Q14; Q31.1; R03; R14; R15; R17 to R30; R32; R34 and international classification of diseases diagnostic codes 630 to 639.9; 660 to 669.9; 650 to 652.9 (9th revision) and O00 through to O08.9; O60 to O75.9; O80 to O84.9 (10th revision) for pregnancies resulting in a live birth, stillbirth, termination, or miscarriage. The database contains all details of all hospital admissions for residents in Trent whether treatment was provided in Trent or not.

Inclusion and exclusion criteria

Patients were included if they were aged 19 or under at the time of the pregnancy related hospital admission and registered with a doctor in Trent region. Patients from Humberside were not included as Humberside had not been part of Trent for the whole study period. It was assumed that admissions with the same date of birth and the same postcode arising within the same six week period related to the same pregnancy, and duplicate entries were removed.

Data collection

We collected the following variables related to teenage pregnancies: the relevant codes from both the Office of Population Censuses and Surveys and the inter-

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national classification of diseases (9th and 10th revisions); admission date; age; postcode; and unique identifying code for the patients' registered general practice. The outcome of the pregnancies was coded as termination, miscarriage, or maternity.

We collected the following general practice variables: national general practice code; main surgery postcode; fundholding status (ever or not fundholding); vocational training status; number, age, sex, and whole time equivalent doctors, number of whole time equivalent practice nurses; total list size; number of registered females aged 13 to 19 years; and Townsend score and rurality score[12] associated with the main surgery's postcode.

The location of all of the family planning clinics in Trent was obtained from the Family Planning Association and local community trusts. The distance between each general practice and the nearest family planning clinic was calculated from the grid references associated with the postcode. This distance is a crude measure of the availability of family planning clinics.

Data validation

To determine the completeness of our data, we compared the total number of NHS terminations performed during 1995 in Trent with data from the Office for National Statistics. Overall, 2472 terminations occurred in females aged 13 to 19 years in 1995 according to data from the Office for National Statistics[13] compared with 1936 (78.3%) from our NHS data. The shortfall is probably owing to pregnancies terminated in the private and charity sectors.

The reproducibility of the clinical coding of the hospital admissions data was tested on a sample of 50 case notes of patients under the care of one consultant (MM) during the study period. Overall, 98% of codes fell within the same two broad categories (maternity or abortive outcome).

Statistical analysis

We aimed to determine the relation between teenage pregnancy rates and general practice characteristics such as the age and sex of the doctor and the availability of a practice nurse. The principal outcome was the total number of terminations and deliveries to females aged 13 to 19 years in each practice. Miscarriages were excluded from the primary analysis as the data were incomplete—not all miscarriages result in hospital admission. We determined the univariate and multivariate associations with Poisson regression analysis[14] in STATA (version 5.0). Variables such as deprivation, list size, partnership size, rurality, general practice training status, and fundholding status were included in the multivariate analysis because of their potential confounding effect. All variables that reached 0.10 significance on univariate analysis were entered into the multiple regression model. Interactions between the variables were examined. We used χ^2 tests to test for differences in categorical variables and the Mann-Whitney test for interval data. Given the number of analyses planned, we chose a two tailed significance level of 0.01.

Results

Study population

During the three year study period there were 19 805 teenage pregnancies of which 18 692 (94.4%) could be allocated to a general practice in Trent. Of these, 10 554 (56.5%) resulted in a delivery, 7155 (38.3%) in a termination, and 983 (5.3%) in a miscarriage. In total, 957 (5.1%) pregnancies were to females under 16 years of age. From our NHS dataset the overall median teenage pregnancy rate in Trent for 13 to 16 year olds was 45.0 per 1000 (interquartile range 25.6-74.1); the rate for 13 to 15 year olds was 1.8 per 1000 (0.0-5.5).

Table 1 Characteristics of 826 study general practices in Trent. Values are numbers (percentages) unless stated otherwise

Characteristic	With valid data	With feature
At least one female doctor	795	474 (57.4)
At least one doctor under 36 years old	723	339 (41.0)
Doctor training	815	145 (17.6)
Single handed	798	192 (23.2)
Fundholding	815	423 (51.2)
Urban	815	627 (75.9)
Median list size (interquartile range)	811	4997 (2862-8112)
Median No of whole time equivalent doctors in practice (interquartile range)	750	3.0 (1.5-4.0)
Median No of whole time equivalent practice nurses (interquartile range)	581	1.1 (0.5-1.6)
Median Townsend score of doctor's electoral ward (interquartile range)	815	1.7 (−1.0-4.1)
Median annual teen pregnancy rate per 1000 13-19 year olds (interquartile range)	721	27.4 (15.1-43.9)

Characteristics of general practices

In 1997 there were 826 general practices in Trent, of which 627 (75%) were wholly, predominantly, or mainly urban according to Carstairs' categories.[12] The study practices (table 1) had similar characteristics to other practices in England and Wales. For example, 350 practices (42.4% of 826) did not have a female doctor, which is comparable to the national figure of 41.7%.

Univariate associations

Lower incidence rate ratios (lower teenage pregnancy rates) were associated with more nurse time or female or young doctors (table 2). A young doctor (under 36 years) was defined as a doctor in the lowest quartile for age calculated from the ages of all the general practitioners in Trent for whom we had data. Higher teenage pregnancy rates were significantly associated with increasing deprivation scores and fundholding status.

Table 2 Univariate Poisson regression analysis for pregnancies (terminations and deliveries)

	Incidence rate ratio (95% CI)	P value
Main variables		
At least one female doctor *v* no female doctor	0.84 (0.81-0.87)	<0.0001
At least one doctor under 36 years old *v* without doctor under 36 years old	0.83 (0.80-0.85)	<0.0001
No of whole time equivalent practice nurses	0.92 (0.90-0.94)	<0.0001
Potential confounders		
Townsend score*	1.08 (1.07-1.08)	<0.0001
Practice ever fundholding *v* not been fundholding	1.29 (1.21-1.29)	<0.0001
Single handed *v* more than one partner	1.08 (1.02-1.14)	0.005
Urban practice *v* rural practice	0.73 (0.70-0.77)	<0.0001
List size per whole time equivalent doctor	0.99 (0.98-1.00)	<0.0001
Doctor training practice *v* non-training practice	0.95 (0.91-0.98)	0.004

*Townsend score of ward in which doctor's postcode lies.

Table 3 Multivariate Poisson analysis for pregnancies (terminations and deliveries)

	Adjusted incidence rate ratio* (95% CI)	P value
Main variables		
At least one female doctor*	0.94 (0.90-0.99)	0.01
At least one doctor under 36 years old*	0.83 (0.79-0.87)	<0.0001
Number of whole time equivalent practice nurses	0.95 (0.93-0.97)	<0.0001

*Adjusted for Townsend score, fundholding status, partnership size, list size per whole time equivalent, rurality, and general practice training status.

Multivariate associations
On multivariate analysis, practices with at least one female doctor, a young doctor, or more practice nurse time had significantly lower teenage pregnancy rates (table 3). Deprivation and fundholding remained significantly associated with higher teenage pregnancy rates.

Distance to family planning clinics
The distance (km) from each surgery to the nearest family planning clinic was included in the multivariate analysis, adjusting for each of the variables listed in table 2. Overall, practices that were far from family planning clinics had lower teenage pregnancy rates (adjusted incidence rate ratio 0.98, 95% confidence interval 0.97 to 0.99; $P=0.001$). This was mainly due to the effect of rurality since rural practices were far from family planning clinics and had lower rates (0.98, 0.97 to 0.99; $P=0.003$). In urban practices there was no association between teenage pregnancy rates and distance from family planning clinics (1.01, 0.99 to 1.02; $P=0.15$).

Analysis including miscarriages
We repeated the analyses including the number of miscarriages in the total number of pregnancies per practice. We found no substantial changes in the direction or significance of any of the variables.

Analysis of excluded practices
Table 1 shows the data available for each practice. It was not possible to calculate teenage pregnancy rates in 116 practices (14%) owing to missing denominators. The number of whole time equivalent practice nurses was similarly unavailable for 255 practices (31%). Practices with and without missing data were similar for all practice characteristics under investigation.

Discussion

The recent Government report on teenage pregnancy by the Social Exclusion Unit focuses almost entirely on social and educational interventions. Although these are clearly important, we argue that general practice plays a key part in the delivery of contraceptive services to teenagers. Practices with a female doctor, a young doctor, or more practice nurse time had significantly lower teenage pregnancy rates after adjustment for other factors. For example, practices with a female d-octor had 91% of the teenage pregnancy rate found in other practices; practices with a doctor under 36 years had 84% of the rate; practices with both a female doctor and one under 36 years had 75% of the teenage pregnancy rate. General practices, pilots for primary care medical services, and primary care groups with high teenage pregnancy rates can consider using this information when considering recruitment strategies for medical and nursing staff in primary care.

Methodological issues
Several methodological issues need consideration. Firstly, multiple regression analyses of general practice and sociodemographic data can help to explain variations and unravel complex associations. A causal relation, however, cannot be inferred from a statistical association, particularly in a cross sectional study. Secondly, we have used routinely collected NHS data for our study, which may be limited in terms of accuracy and completeness.[15] We did, however, include two checks for data quality that were reassuring. We were not able to include private terminations as the data were not available at practice level. This may have confounded the results as the proportion of private referrals per practice may be affected by deprivation. Similarly the results may have been confounded by the provision and uptake of school based contraceptive services. Thirdly, we have been unable to identify teenagers with repeat pregnancies in the study period. Repeat pregnancies would have resulted in an underestimate of the standard error. It would not have affected the rate ratio but would have made the results seem unduly significant. As our significance levels were, however, less than 0.001, it is unlikely to have affected our main conclusions. We repeated the analysis for each of the three years of data, since there is less chance of multiple pregnancies occurring to an individual within the same year. The results of the key univariate and multivariate analyses remained unchanged. Strengths of our study include its sample size and duration of sampling.

Teenage pregnancy and female doctors
General practices with a female partner have lower teenage pregnancy rates than those without a female partner. As our study was cross sectional, we do not know whether female doctors had chosen to work in areas with low teenage pregnancy rates or whether the presence of a female doctor influenced such rates. The association between low teenage pregnancy rate and the presence of a female doctor may be because female doctors tend to have longer consultations and handle more problems per consultation[16] and tend to be more communicative[17] and more patient centered.[18] Female doctors report less difficulty in discussing sexual problems with teenagers and are more likely to provide information about the prevention of sexually transmitted diseases[19 20] and the use of condoms.[21] Our findings might be due to differences in case mix between practices with and without a female doctor since patients presenting to female doctors tend to be younger, more often female,[16] and more likely to have female specific problems than those presenting to practices without a female doctor.

Teenage pregnancy and age of doctors
Practices with a young doctor have lower teenage pregnancy rates than those without a young doctor. Although younger doctors may be more interested in teenage health issues, little is known about the effect of the age of the doctor on provision of teenage

contraceptive services. Younger doctors tend to have higher rates for smear uptake and immunisation[22] and order more infertility investigations.[23]

Teenage pregnancy and practice nurses

Practices with more practice nurse time had significantly lower teenage pregnancy rates than those with less practice nurse time. Since 10% of all practice nurse consultations are with teenagers[24] and up to 3% of all nurse consultations are for contraceptive advice, there may be scope for further developing the practice nurse's role in the delivery of contraceptive services to teenagers. We are unable to explain the association between fundholding and higher teenage pregnancy rates.

Family planning services

Practices furthest from a family planning clinic had lower teenage pregnancy rates despite adjustment for other practice characteristics. This was mainly due to the effect of rural practices, which were both far from a clinic and had low teenage pregnancy rates. We found no evidence to support the introduction of more family planning clinics in rural areas since such practices already have lower teenage pregnancy rates.

We thank Howard Chapman and Andy Nicholson from Trent NHS Executive for their help in accessing the hospital admissions data, and the information officers at the health authorities who were able to provide data on general practice characteristics.

Contributors: All authors were part of the project team. JH-C developed the original idea by MP, had a major input into the study design, did some of the data collection and manipulation, designed and did the analysis, interpreted the results, and wrote the paper; she will act as guarantor for the paper. JA contributed to the design of the study, did the literature review and some of the data collection, checked the data analysis, and commented on the paper. MP conceived the idea for the project and contributed to the design, interpretation of the results, and writing of the paper. DE did the geographical data processing and spatial analysis. MM contributed to the interpretation of the results and the data validation. DC commented on the paper. SB was the nurse adviser. Carol Coupland provided advice on the interpretation of the regression analysis and the potential statistical effect of repeated pregnancies to teenagers.

Funding: Grant from Trent NHS Executive.
Competing interests: None declared.

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(Accepted 7 December 1999)

Teenage conception rates in Trent are among the highest in the United Kingdom

Although 70% of consultations for contraception occur in general practice, little is known about the characteristics of general practices that have high or low teenage pregnancy rates

This cross sectional survey investigated the association between teenage pregnancy rates, the age and sex of doctors, and the availability of practice nurses

Practices with a female or young doctor had significantly lower teenage pregnancy rates than those without such doctors

General practices, pilots for primary care medical services, and primary care groups with high teenage pregnancy rates can consider using this information when recruiting medical and nursing staff in primary care

Endpiece

The internet may not be the biggest change in the past 150 years

If I place myself in 1900, and then look forward for 36 years, and backward for as many, I feel doubtful whether the changes made in the earlier times were not greater than anything I have seen since. I am speaking of changes in man's minds, and I cannot in my own time observe anything of greater consequence than the dethronement of ancient faith by natural science and historial criticism, and the transition from oligarchic to democratic representation. Yet the generation whose memories went back another 36 years had seen and felt changes surely as great: the political revolution of 1830, the economic and social revolution produced by the railway and the steamship, the founding of the great Dominions.

G M Young, *Portrait of an Age: Victorian England*. Oxford: Oxford University Press, 1953 (second edition).

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amily planning provision in the Trent health region: Is it ccessible to school aged teenagers?

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cepted April 7th, 2000)

mmary

ategies to combat existing high teenage pregnancy rates he UK need to include contraceptive services that can be ily accessed by young people, including those who are l at school. This study concerns the availability of family nning services to young people who are still at school. e hundred and eight family planning clinics in the Trent ion were surveyed to determine their clinic opening urs. Hours accessible to school aged young people were ntified as being services provided during school lunch eaks, after school and at weekends. A total of 498 weekly urs of provision were identified, and 260.5 of these were cessible to school aged young people. There was a lot of riation between health authority areas both in terms of number of hours accessible to this age group and also terms of the percentage of clinics not offering any service cessible to school aged people.

The recent report from the Social Exclusion Unit ntified accessible contraceptive services as part of its ategy to reduce teenage pregnancy rates in the UK. though these results are descriptive and do not intend to ow any causal relationship, they do show that in all alth authority areas there are clinics that are not oviding any service that is accessible to school aged ung people.

y words

cessibility of services, contraception, teenage pregnancy, ung teenagers

ey message points

At the point of data collection, there were family planning clinics in all of the health authorities studied that did not offer any hours of service that were accessible to school aged teenagers.

In some areas large centrally based clinics provided a substantial amount of the provision, but this may be inaccessible to school aged teenagers from outlying areas.

troduction

espite growing efforts within political and health arenas, nceptions in the under 16 age group have increased from 3:1000 in 1994 to 9.4:1000 in 1996.[1,2] In 1997 almost 00 conceptions were to the under 16s, resulting in 3700 rths.[3] The recent major report published by the Social clusion Unit (SEU)[3] describes England as having 'the orst record on teenage pregnancies in Europe', and ghlights again the short- and long-term burden of teenage otherhood, both for young women and for society.

It is clear that many issues influence conception rates in s age group, related to both the individual teenager, and context within which she lives.[1,3,4] For some young omen pregnancy is not necessarily regarded as wanted.[4,5] However, the high rate of therapeutic abortion this age group suggests that many conceptions are unplanned and could have been prevented.[6] There are significant links between deprivation and teenage pregnancy. However, the SEU also identifies issues such as low expectations, ignorance (both about sexual relationships and about services) and the 'mixed messages' of society and the media, as contributing to adolescent conception rates.[3]

Two further factors influencing conception rates are suggested to be the level of education received by young people, and the availability of appropriate contraceptive services.[1,3,7,8] For the under 16s in full time education there are obvious constraints upon their ability to access services. The SEU describes location and opening hours as 'critical for teenagers who may be tied to a school timetable and rely upon public transport'.[3] Use of services may also be limited by embarrassment coupled with fears of exposure, judgmental attitudes and lack of confidentiality.[3,6-8] In rural areas use of GP services may be further restricted by the knowledge that the teenager may possibly be seen by a neighbour or relative.[8,9]

Studies have suggested an inverse link between conception rates in teenagers and the provision of contraceptive services.[7,10,11] The Effective Health Care Review of 1997[1] places great emphasis on the need for contraceptive services to be tailored to local need, and to take into account the particular needs of adolescents. The SEU states that the first step is 'clearly to provide better access to contraception generally',[3] and so key factors in the success of contraceptive services are: availability, accessibility, confidentiality and good publicity.[1,9]

This paper presents results describing the availability of family planning clinics to young people aged less than 16 years living in the Trent region of the UK. As such, it is not seeking to demonstrate cause and effect, but to critique service provision through an analysis of clinic opening hours.

Method

To examine the accessibility of family planning clinics to school aged young people (those aged 12-16 years) in the Trent health region, it was necessary to collect data on all family planning clinics in existence. Data collection took place in the autumn of 1997 and so all information given relates to services offered at that time.

Information was collected for all health authority areas in Trent excluding South Humber, and the researcher obtained the information through either the Community Health Trust or large centrally based family planning clinics. If detailed information on opening times was not made available at this point, then the researcher contacted each clinic by telephone.

The accessibility of a clinic was determined by its hours of service provision. To be accessible to school aged young people (defined as young people aged 12-16 years) a clinic needed to provide service in the periods 12.30 pm to 1.30

\ of 3

to cover school lunch times, and 4 pm to 9 pm for after ool hours provision. Total hours provision and hours of vision accessible to young school aged teenagers per ek were calculated. Where clinics did not run weekly sions, equivalent weekly hours were calculated. ekend clinics were also identified as being accessible to age group, but these were relatively rare and a total of e Saturday clinics were recorded. Other services widing contraception were not included.

Data on rankings for conceptions to young women in ch health authority area were also obtained for descriptive d contextual purposes. This information was supplied by IS Trent and is derived from Office of National Statistics a.

sults

ta for the year 1994, derived from the Office of National itistics, were used to obtain a national ranking for each alth authority area (Table 1). These data show that on a tional scale, Trent has four areas within its boundaries at are within the top 20 for conceptions to women under years of age. There is a large amount of variation (6th out 100 to 62nd out of 100), with Barnsley and Doncaster ng within the top 10, compared to Lincoln and Leicester ich rank 56th and 62nd, respectively. Trent is a diverse gion as it embraces areas that can be described as urban, ixed, rural, mining and industrial. Table 1 gives the wnsend score for deprivation associated with each of the areas, and again there is a large variation (-4.54 for ncolnshire to + 4.81 for Sheffield).

As these areas are so variable in terms of their under 16 nception rates, further descriptive analysis of family anning provision was undertaken to examine variation in urs of provision for this age group. Data were available r 108 family planning clinics, and these clinics provided total of 498 hours of service. Table 1 gives the number of inics in each health authority area, the total weekly ovision and hours accessible to school aged teenagers, d the percentage of clinics that do not provide any family anning services that are accessible to this age group. gain there is a large difference between areas, and this is iown graphically in Figure 1.

In all 10 areas there were family planning clinics which ere not accessible to school aged teenagers. This ranges om 7% to 62.5%. The number of hours offered at each inic also varied widely. In most areas there were large, ten centrally based clinics offering substantially more en hours. For example, in Sheffield, one clinic provided a total of 19 teen hours per week and the centrally based clinic in Nottingham also offered substantially more teen hours than other clinics in the area.

Discussion

The purpose of this analysis was to describe the accessibility of family planning services to young school aged teenagers through the clinic opening times. The government has highlighted teenage pregnancy as a problem and has produced strategies to combat existing high rates.[3] One such target is to improve the accessibility of contraceptive services to teenagers. This descriptive analysis suggests that there are a number of family planning clinics within each health authority area in Trent that do not provide any accessible service to young people who are still at school. There are, however, other accessible services such as general practice and other specific local initiatives, which have not been considered in this paper. A true picture of the accessibility of school age contraceptive services in Trent would need a substantial audit of these services as well as those offered by family planning clinics. However, as previous research suggests that family planning clinics are a popular choice for young people aged less than 16 years,[12] then their accessibility to this age group is an important issue.

It is important that sweeping judgements are not made on the basis of these data, as it cannot imply a causal relationships between provision of accessible hours to young teenagers by family planning clinics and high and low pregnancy rates. Other factors that are closely linked, such as deprivation, must always be taken into account when considering teenage pregnancy rates.

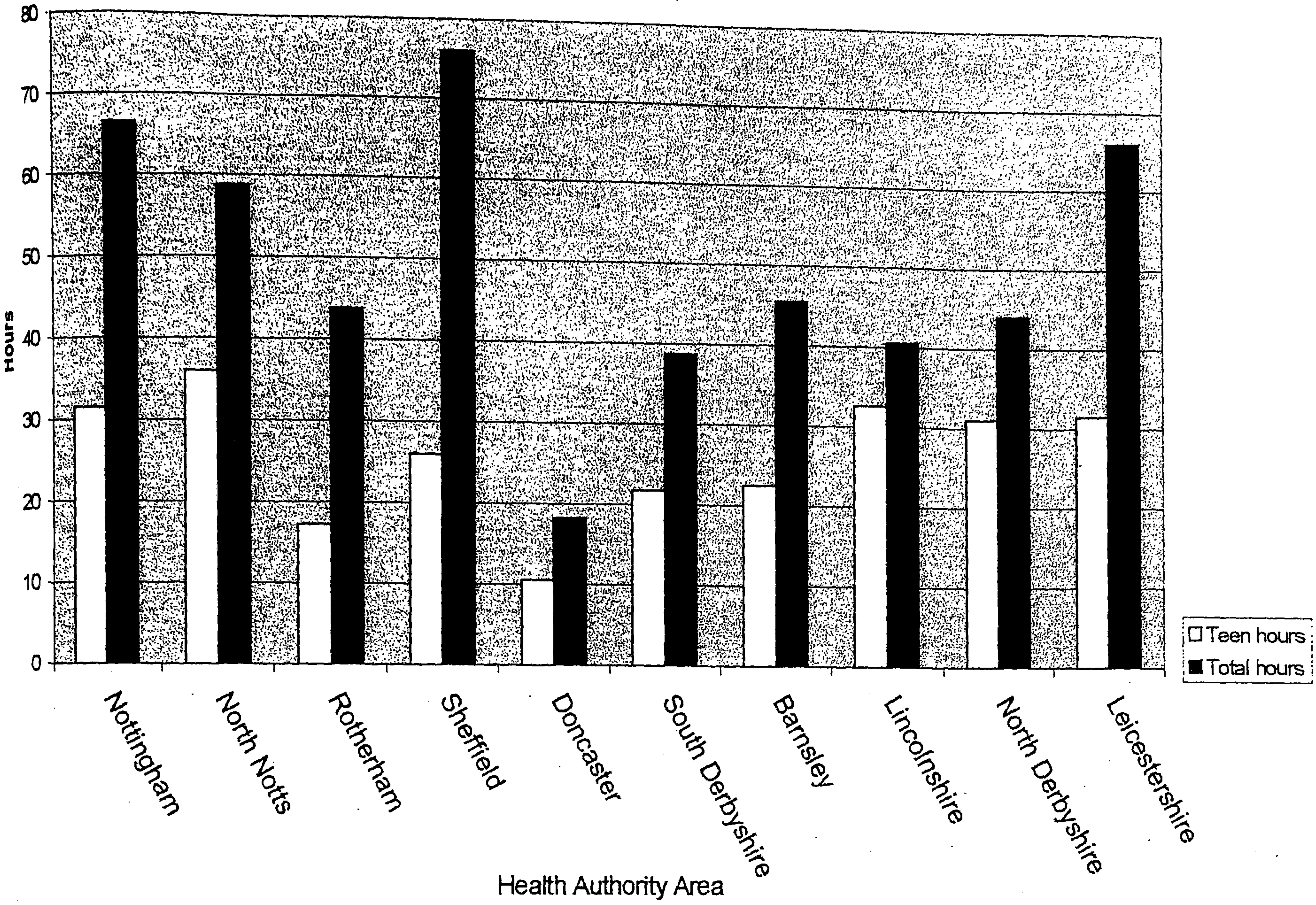
It is interesting that in all of the areas there are large, often centrally based clinics providing much of the service that is accessible to young teenagers. These centrally based clinics are likely to be served by public transport and reach a larger urban population. However, one study found that the distance needed to travel to a service is an important issue for this age group,[13] and so this may isolate a large number of teenagers who do not live near to city centres. It is also interesting to note that there were very few weekend clinics running at the point of data collection and that some sessions were not run on a regular weekly basis. This has implications for the provision of emergency contraception, which requires the fairly rapid intervention of a health professional.[14]

It is well known that many young teenagers are putting themselves at risk of pregnancy and STIs. The data given in

ble 1 *Demographic information and hours of provision for each Health Authority area.*

ealth thority area	Ranking for conceptions in under 16s in England*	Townsend Score**	Approximate population of 12-16 year olds***	No. of clinics	No. (%) of clinics not providing any young teen accessible service	Total hours of provision (per week)	Total hours accessible to young teenagers (per week)
arnsley	6 of 100	3.86	13.500	9	3 (33%)	45.5	22.5
oncaster	9 of 100	3.28	18.500	4	1 (25%)	18.25	10.5
ottingham	14 of 100	0.72	42.500	20	10 (50%)	66.5	31.5
otherham	15 of 100	2.63	16.000	7	1 (14%)	43.75	17.25
ieffield	22 of 100	4.81	34.750	8	5 (62.5%)	76	26
uth Derbyshire	28 of 100	-1.18	34.500	9	2 (22%)	38.75	21.75
orth Nottingham	28 of 100	-1.92	23.500	14	2 (14%)	58.75	36
orth Derbyshire	34 of 100	-3.03	21.000	13	2 (15%)	44	31
incolnshire	56 of 100	-4.54	35.750	15	1 (7%)	40.5	32.5
icestershire	62 Of 100	-2.98	63.000	9	1 (11%)	66	31.5
ital			302 996	108	28	498	260.5

1994 ONS data ** Derived from 1991 census data *** Derived from ONS mid 1996 estimates gure 1 *Total hours of provision and total hours accessible to school aged teenagers*



the SEU report suggests that only 50% of young people use contraception at first intercourse.[3] If family planning clinics are seen by young teenagers as an acceptable venue for receiving contraception and contraceptive advice,[12,15] then it is important that this service is made available to them. The SEU report has made accessible contraceptive services a priority and has identified opening hours as an important factor. It has also made moves towards targeting areas of high need, which is definitely relevant to Trent, which has large variations in conception rates, and also in levels of deprivation across the region. It is important, therefore, that providers are aware of the accessibility of services and it may be that as the government plans to identify high risk areas, then access issues such as opening times can be adapted to meet levels of need at a local and targeted level.

Acknowledgements

The authors would like to thank Dr Julia Hippisley-Cox and Professor Mike Pringle for their help and comments on the final manuscript, and Andy Nicholson from the Trent Regional Office for supplying the national data on conception rates.

Statements on funding and competing interests

Funding. This study was funded by NHS Trent Region R&D as part of the Trent Teenage Pregnancy Study.

Competing interests. None

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Int J Adolesc Med Health 2003;15(4):341-347.

Assisted delivery in the teenage population: The effect of inter-hospital variation, deprivation, and age

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Abstract: The objective was to determine the relationship between the risk of assisted delivery in women aged under 20 years and place of treatment, deprivation and age. *Design*: Cross sectional survey utilising routinely collected hospitals admissions data. *Population:* Teenagers (women aged under 20 years) whose delivery resulted in a hospital admission in the period April 1st 1994 to March 31st 1997 in the Trent Health Region of England. *Methods:* The cases were identified using Office of Population Census and Surveys procedural codes, and International Classification of Diseases diagnostic codes associated with delivery. Variables collected included type of delivery, age at delivery and place of treatment. The data were analysed using the chi-square test for categorical data and the independent samples t-test for continuous data. Logistic regression analysis was used to calculate adjusted odds ratios for the variables of type of assisted delivery and place of treatment. *Main outcome measures:* Factors associated with increased risk of assisted delivery. *Results:* There was variation in rates of instrumental delivery between hospitals, with two having a significantly increased risk of assisted delivery, suggesting that place of treatment may be a factor in the risk of teenage patients experiencing an assisted delivery. There was also a large amount of variation in terms of the risk of experiencing a forceps or vacuum extraction compared to caesarean section. Age (under 16 years and 16-19 years of age) had no effect on the risk of a teenage patient experiencing an assisted delivery ($X^2 = 2.59$ df=1 P=0.11 OR 1.27 (95% CI 0.94 to 1.72)). Similarly, teenagers who experience an assisted delivery were not more likely to come from a more deprived area than teenagers who did not have an assisted delivery (P = 0.189). *Conclusions:* The risk of assisted delivery varied between hospitals, suggesting that this factor is important in terms of a young women's risk of an assisted delivery. The young women in this study who had experienced an assisted delivery were not significantly different to young women who had a normal delivery. They were not more likely to be aged under 16 years of age, and were not more likely to be from a more deprived area.

Keywords: teenage pregnancy, assisted delivery, caesarean section, United Kingdom

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Submitted: May 10, 2003. ***Revised***: August 01, 2003 ***Accepted***: August 02, 2003.

INTRODUCTION

In the United Kingdom, The National Institute for Clinical Excellence (NICE) has recently commissioned a clinical guideline on caesarean section to address rising numbers, and because variations in rates may not be due to differences in case-mix and hospital populations (1). Figures published by the NHS showed that in the year 1995-96, 16% of all deliveries in England were by caesarean section, and a further 9% were by instrumental vaginal delivery (forceps or ventouse extraction). Figures broken down by Health Region, showed similar numbers for the Trent Health Region. There is however, unexplained variation between hospitals, with percentages of all births resulting in a caesarean section ranging from 13-20%. The percentage of births resulting in a vaginally assisted delivery ranges from 5-16%, and of these assisted deliveries, between 17% and 83% are ventouse extractions (2).

Data published by the Office of National Statistics for the years 1994-1996 reported that women aged under 20 were less likely to have a caesarean section compared to women of all ages (10% versus 16%). The percentages for forceps or ventouse extraction were similar (10% for women aged under 20 years compared to 11% for women of all ages)(3).

It is documented that young women who become pregnant are likely to be from areas that are classified as deprived (4-7), and are less likely to be regular and early attendees to antenatal care (8-10). Less is known about what factors may influence their mode of delivery. Lubarsky et al (11) conducted a study of 261 women aged under 15 years, who were matched to women aged 20-29 years, and they concluded that the young women were not at increased risk of an assisted delivery and found that they had a lower incidence of caesarean delivery. Similarly, Smith and Pell (12) found that compared to women aged 20-29; women aged 15-19 years were significantly less likely to experience an emergency caesarean section. However, there are some inconsistencies in research findings and it has also been reported that young teenagers aged 12-15 years have worse outcomes compared to older teenagers and adults. In some studies young teenagers have been reported as having a higher incidence of instrumental delivery and caesarean section (13,14).

In this paper we used routinely collected hospital data to identify factors associated with various methods of assisted delivery in the teenage population of one health region (Trent). The factors included age, (under 16 years and 16-19 years), living in a deprived area and the hospital at which the delivery took place. This study was part of the Trent Teenage Pregnancy study, which aimed to identify factors associated with variations in teenage pregnancy rate and pregnancy outcomes, and the consultation behaviour of teenagers prior to pregnancy (15,16).

METHODS

Ethical approval was obtained from the Trent multi-center research ethics committee. All data related to patients from the Trent area, which is situated in mid-England. Data were collected from the Trent NHS hospitals admissions database, and information was collected for all deliveries for women aged under 20 years that resulted in a hospital admission in the period April 1st 1994 to March 31, 1997. The data relates to patients living in all Trent Health Authority areas and treated in trusts within Trent. Data relating to one area (South Humber) was excluded, since it was not part of Trent Region for the whole study period. Patients who were residents of the Trent region but treated outside of the health region were excluded from the analysis.

10,514 deliveries were identified from the database by use of Office of Population Census and Surveys procedural codes, and international classification of diseases diagnostic codes (9th and 10th revision) associated with delivery. The combination of procedure and diagnosis code was used to ensure that the dataset was as complete as possible. Variables collected included date of delivery, age at delivery, place of treatment, procedure and diagnosis code. Patients who had an elective caesarean (R17 codes), emergency caesarean (R18 codes), forceps delivery (R21 codes), and vacuum delivery (R22 codes) were coded as having had an assisted delivery.

Statistical Methods

The data were analysed using SPSS for Windows 9.0 (SPSS inc.). Categorical data were analysed using the chi-square test and continuous data were analysed using the independent samples t-test. Logistic regression analysis was used to calculate adjusted odds ratios (adjusted for age, deprivation and teaching/secondary referral centre status) with 95% confidence intervals for the variables place of delivery and type of assisted procedure (forceps delivery, vacuum extraction or emergency or elective caesarean section). The deviation change contrast in SPSS version 9 was chosen to display results which compare each category of the predictor variable, except the reference category, to the overall effect.

A post-hoc power calculation showed that a two group continuity Chi-square test with a 0.05 two sided significance level will have 81% power to detect the difference between a Group 1 (aged 16 years and older) proportion of 0.22 and a Group two (under 16 years) proportion of 0.30 (odds ratio of 1.54), when the sample sizes are 10,257 and 233 respectively.

RESULTS

Of the 10,514 deliveries identified, 2,340 (22.3%) were assisted. In young women aged under 16 years, the figures for those having an assisted delivery were similar to older teenagers (26.6% in under 16s vs. 22.2% in over 16s). Table 1 shows the number and type of assisted deliveries for women aged under 16 years of age and 16 to 19 years of age at delivery.

Previous research has suggested that young teenagers (those aged under 16 years) are at increased risk of some procedures compared to older teenagers and so initially a chi-square test was carried out to detect any overall increased risk. Younger teenagers were not at greater risk of assisted delivery compared to older teenagers ($X^2 = 2.59$ df =1 P=0.11 OR 1.27 (95% CI 0.94 -1.72)). For teenagers experiencing any assisted delivery procedure, there was no association between age and type of assisted delivery ($X^2 = 0.62$ df=1 P = 0.43 OR 0.81 (0.47 -1.41)).

The mean Townsend score of women having an assisted delivery was 3.266 and the mean score for those not having this outcome was 3.372. This difference was not significant (independent samples t-test df= 10512 P = 0.189).

Logistic regression analysis was carried out to determine any association between place of treatment and the outcome of assisted or unassisted delivery. Five of the hospitals were identified as being secondary referral centres and teaching hospitals with a direct affiliation to a University Medical School. In univariate logistic regression analysis, teaching/secondary referral centre status was not associated with increased risk of assisted delivery (P = 0.68 OR 1.02 (0.93 – 1.12)). Table 2 gives the odds ratios for each place of treatment adjusted for age, deprivation and teaching/secondary referral centre status. Two hospitals showed that patients had an increased risk of having an assisted delivery (9 and 11) with patients delivering at hospital 9 being 1.5 times as likely to have an assisted delivery (OR 1.57 (CI 1.33-1.84)). Conversely, compared to the other hospitals, three displayed a reduced risk of assisted delivery (2,12,16).

There was a large amount of variation in type of assisted delivery. The percentage of young women who experienced a vaginally assisted birth ranged from 8.4% to 20.1%; and for emergency sections percentages ranged from 4.6% to 9% of births. Logistic regression analysis was used to explore this variation in type of assisted delivery (forceps/vacuum delivery and caesarean section) between place of treatment. Table 2 shows that patients delivering at hospitals 4, 6 and 9 were significantly more likely to experience a forceps or vacuum delivery rather than any kind abdominal delivery. Figures for hospitals 8 and 12 suggested that patients were more likely to have a caesarean section than a vaginally assisted delivery. Teaching/secondary referral centres had a lower incidence of caesarean section, with 39% of assisted deliveries resulting in a c-section compared to 46% of assisted deliveries in other hospitals. However, the secondary referral centres/ teaching hospitals performed more vaginally assisted deliveries, with 61% being either a forceps or vacuum extraction, compared to 54% in other hospitals ($P = 0.002$ $OR = 1.23$ (1.10-1.54)).

DISCUSSION

Younger teenage women (<16 years) were not at increased risk of an assisted delivery compared to women aged 16-19 years. In those teenagers who underwent an assisted delivery, younger women were at no greater risk of a particular mode of delivery than older teen-aged women. The proportion of teenagers having an assisted delivery varied from 18 to 31% between hospitals. There were also differences between hospitals in terms of the patients' risk of experiencing a vaginally assisted delivery rather than an abdominal delivery. Young women who had an assisted delivery in this study lived in areas with similar levels of deprivation to young women who had a normal delivery.

This is the first study to examine the effect of inter-hospital variation and the risk of assisted delivery in teenage women. This study utilised a large data set of routinely collected data and provided a large number of cases for analysis. The Health Region from which the data were drawn is broadly representative of health regions in the United Kingdom, having an overall assisted delivery (both caesarean section and vaginally assisted) rate in line with the average rate for England, thus giving the results a high level of generalisability.

Townsend scores associated with the electoral ward of residence were used as a proxy measure of deprivation (17), since the method of data collection did not allow measurement of the socio-economic status of individual women. There will therefore be some imprecision where the average deprivation score of the electoral ward does not reflect individual circumstances. However, this method of assigning deprivation scores is widely used in health research and has been found to be effective in identifying material disadvantage (18).

The data file utilised in this study did not allow for the recognition of repeat pregnancy and so parity could not be included in the analysis. Approximately 30% of teenagers will have a second pregnancy in the 18 months following first delivery, and the majority of these pregnancies will lead to a maternity (19). However this may not have a confounding effect on the results of this study, as there is evidence that these often rapid repeat second deliveries in teenagers are not associated with increased risk of an assisted delivery. In a large population based cohort study, Smith and Pell found that compared to women aged 20-29, teenage mothers were less likely to experience an emergency caesarean section at both the first and second delivery (20). However, there are other factors not included in the analysis, which have been found to be associated with an increased risk of assisted delivery. Women with a BMI of over 30 (21) and also women of very short stature (22), have both been found to be at increased risk of caesarean section, and neither of these factors has been considered in this analysis.
The findings of this study are significant in that although young teenagers (those aged under 16 years) are reported as having poor outcomes generally and are less likely to

utilise ante-natal services (8-10); they are not at increased risk of experiencing problems during delivery that lead to either an abdominal or instrumental delivery. The findings are similar to other studies, which conclude that young women are not at increased risk of an assisted delivery (11,12,23,24), but goes further to consider other potential risk factors; in this case place of delivery and deprivation score.

The reasons for variations between hospitals are not clear. There is evidence to suggest that inter-hospital variation in caesarean rates cannot be explained by obstetric risk or clinical factors (25), and that individual obstetrician characteristics and practice style may play an important role in explaining variation (26-28). Further research into ward policies and the impact of individuals would possibly provide an explanation as to why such a significant variation exists.

ACKNOWLEDGEMENTS
We would like to thank Carol Coupland, who provided statistical advice and Trent Focus for providing protected time (for JA) for the completion of this article.

FUNDING
This study was funded by NHS Executive Trent as part of the Trent Teenage Pregnancy Study.

COMPETING INTERESTS
None.

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Table 1. *Type of assisted delivery by age*

Age group	Number of deliveries†	Number assisted (%)	Number delivered by forceps or vacuum (%)	Number delivered by emergency section (%)	Number delivered by elected section (%)
Under 16	233	62 (26.6%)	39 (16.7%)	18 (7.7%)	5 (2.1%)
Over 16	10257	2274 (22.2%)	1317 (12.8%)	739 (7.2%)	218 (2.1%)

† Missing data = 24

Table 2. *Risk of assisted delivery and risk of type of assisted procedure by hospital*

Place of treatment	Odds ratio for assisted vs. unassisted delivery (95% CI)†	Unassisted deliveries (%) ††	Emergency sections (%)	Elective sections (%)	Forceps or vacuum extractions (%)	Odds ratio for forceps or vacuum vs. any section (95% CI) †
1	1.06 (.89-1.27)	534 (77.3)	55 (8.0)	9 (1.3)	93 (13.5)	1.48 (.83 – 1.58)
2	.82 (.70-.95)*	870 (81.2)	71 (6.6)	21 (2.0)	110 (10.3)	.89 (.68-1.17)
3	1.19 (.93-1.53)	222 (74.5)	21 (7.0)	6 (2.0)	49 (16.4)	1.33 (.84-2.08)
4	1.12 (.98-1.29)	811 (75.9)	52 (4.9)	27 (2.5)	179 (16.7)	1.69 (1.29-2.20)*
5	.91 (.74 to 1.11)	453 (79.9)	35 (6.2)	11 (1.9)	68 (12.0)	1.14 (.79-1.64)
6	.92 (.73-1.15)	347 (79.8)	20 (4.6)	6 (1.4)	62 (14.3)	1.76 (1.14-2.73)*
7	.94 (.81-1.08)	907 (79.0)	91 (7.9)	22 (1.9)	128 (11.1)	.85 (.66-1.09)
8	.95 (.79-1.14)	504 (78.9)	57 (8.9)	23 (3.6)	55 (8.6)	.52 (.37-.73)*
9	1.57 (1.33-1.84)*	468 (69.2)	53 (7.8)	19 (2.8)	136 (20.1)	1.41 (1.06-1.87)*
10	.97 (.83-1.15)	647 (78.1)	67 (8.1)	14 (1.7)	100 (12.1)	.90 (.67-1.21)
11	1.25 (1.06-1.48)*	510 (74.0)	62 (9.0)	18 (2.6)	99 (14.4)	.94 (.70-1.26)
12	.79 (.63-.99)*	387 (81.6)	40 (8.4)	7 (1.5)	40 (8.4)	.62 (.41-.94)*
13	.92 (.72-1.17)	290 (78.8)	31 (8.4)	7 (1.9)	40 (10.9)	.74 (.48-1.14)
14	1.03 (.88-1.21)	657 (77.1)	54 (6.3)	21 (2.5)	120 (14.1)	1.17 (.88-1.56)
15	.99 (.73 to 1.35)	165 (77.8)	18 (8.5)	7 (3.3)	22 (10.4)	.65 (.38-1.12)
16	.82 (.70-.95)*	402 (81.0)	30 (6.0)	6 (1.2)	58 (11.7)	1.18 (.79-1.76)

†adjusted for age (under or over 16 years), deprivation (Townsend score) and hospital teaching/secondary referral centre status.

* P = < 0.05 †† missing data = 35

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APPENDIX 8. OTHER RELATED PUBLICATIONS IN PEER-REVIEWED JOURNALS

I. **ALLEN, J.** (2002) Does abstinence make the heart grow fonder? Editorial. *International Journal of Adolescent Medicine and Health.* 14 ,89-90

II. CHURCHILL, D., **ALLEN, J.**, PRINGLE, M & HIPPISLEY-COX, J. (2002) Teenagers at risk of unintended pregnancy: identification of practical risk markers for use in general practice from a retrospective analysis of case records in the United Kingdom. *International Journal of Adolescent Medicine and Health.* 14, 153-160

III. CHURCHILL, D., **ALLEN, J.**, PRINGLE, M., HIPPISLEY-COX, J., EBDON, D., MACPHERSON, M & BRADLEY, S. (2000) Consultation patterns and provision of contraception in general practice before teenage pregnancy: case-control study. *British Medical Journal.* 321, 486-489.

IV. CHURCHILL, R., **ALLEN, J.**, DENMAN, S., WILLIAMS, D., FIELDING K & VON FRAGSTEIN, M. (2000) Do the attitudes and beliefs of young teenagers towards general practice influence actual consultation behaviour? *British Journal of General Practice.* 50, 953-957.

Int J Adolesc Med Health 2002;14(2):89-90.

EDITORIAL

Does abstinence make the heart grow fonder?

The battle to decrease teenage pregnancy rates in many countries has raged for some time. In countries like the United States (US) and the United Kingdom (UK), which have high rates of teenage pregnancy, considerable amounts of money have been allocated to this thorny issue. The United Kingdom government has laid out plans to halve conceptions in under 18 year olds by the year 2010, and has allocated sixty million pounds to achieve this goal (1). Part of the strategy is to give young people advice on how to deal with pressures to have sex. This does have a suggestion of the promotion of abstinence, but is in no way as overt as the US government's approach. Klerman (2) outlines the adoption of federally funded abstinence-only programs. These programs give no information on sex and contraception, and indeed the funding depends on this omission. The programs are growing in popularity and the promotion of abstinence has been reinforced by youth idols such as Britney Spears, who are seen to be advocating virginity as a precious commodity.

The big question is of course – is it working? Certainly rates in the US are declining, but it is difficult to determine if this is directly associated with abstinence programs. A study reported in the *Journal of the American Medical Association* found that compared to a safe sex program and a control group, young people in an abstinence program were less likely to have had sex three months after the program ended, but this difference disappeared after this time period. The authors conclude that although both abstinence and safe sex programs can reduce sexual risk behaviours, safe sex interventions may have a longer lasting effect (3).

But by omitting information on contraception are we putting young people at increased risk of unwanted pregnancy and sexually transmitted infections? Research into the effect of providing sex education and health promotion does not show that it increases the likelihood of actual sexual activity (4). Also in countries like the Netherlands, where sexuality is discussed openly between adults and young people, teenage pregnancy rates are markedly lower.

Perhaps an integrated approach should be adopted where young people are encouraged to value and respect sex, but are also armed with the knowledge needed to protect themselves from unwanted outcomes. Research into the teen perspective shows that although young people see a role for the promotion of abstinence it cannot be promoted alone, as sooner or later young people will want to make the leap into a sexual relationship (5). This difficult issue is perhaps best summed up by this analogy, given by a young person taking part in a focus group:

"...you need to drain your swimming pool, 'cause your children are going to want to swim in it no matter how high of a fence you're going to put around it. They are going to get into it so you might as well teach them how to swim." (5)

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Int J Adolesc Med Health 2002;14(2):153-160.

Teenagers at risk of unintended pregnancy: identification of practical risk markers for use in general practice from a retrospective analysis of case records in the United Kingdom

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Abstract: The United Kingdom has one of the highest teenage pregnancy rates in Western Europe with a high proportion of unintended pregnancies resulting in termination. General practice is one source of contraceptive and sexual advice for teenagers but it is difficult to target young women most at risk. This study was performed to determine whether it was possible to identify any markers that could alert general practitioners to the need to give appropriate opportunistic preventive advice. This was a retrospective case-control study in which the general practice medical records of young women with a recorded history of termination of pregnancy resulting from conception between the ages of 13-19 years inclusive were examined for details of consultations and contraceptive provision prior to conception. Where appropriate, comparison was made with an age and practice-matched control group. A total of 53 cases were identified and compared with 159 controls. In the 12 months prior to conception approximately half of the cases had discussed contraception and two-fifths had been prescribed oral contraception. A significantly higher proportion of cases than controls had consulted for emergency contraception and also for urinary tract symptoms. Weaker associations were also found with younger age of starting contraception, and also recorded side-effects or dissatisfaction with contraception. Lapsed contraception and previous pregnancy were noted as other potential markers of risk. The findings from this study may assist primary care professionals in focussing opportunistic sexual health interventions at some teenagers who are at higher risk of unintended pregnancy.

Keywords: Adolescent pregnancy, risk factors, risk markers, general practice, United Kingdom

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Submitted: January 13, 2002. ***Revised:*** January 18, 2002. ***Accepted:*** January 18, 2002.

INTRODUCTION

The United Kingdom has one of the highest rates of teenage pregnancy in Western Europe, against the background of increasingly younger age of first sexual intercourse (1). The potential negative health and social outcomes of teenage pregnancy are well recognised, and so consecutive governments have introduced policies aimed at reducing rates (2). Whilst not all teenage pregnancies are unintended, the fact that up to 50% result in requests for termination demonstrates that a high proportion fall into this category.

Whilst societal, educational, and media influences play a significant part in shaping teenage sexual behaviour overall, primary health care workers have a key role at local and individual level, largely by provision of sexual and contraceptive advice. In the United Kingdom there have historically been two main sources of contraception for teenagers: general practice, and family planning clinics. Although the situation is now changing with the introduction of innovative teenage health initiatives in some areas, these two sources remain the most important.

Documented epidemiological risk factors for teenage pregnancy include social deprivation, low educational achievement, having a mother who was a teenage parent, a history of sexual abuse, and presence of mental health problems (3). Whilst these risk factors might be useful at community and policy level, they are less valuable in the context of individual clinical contact in which the presence or otherwise of the factors may not be known, and they may have only indirect relevance to an individual medical consultation.

As part of a larger study (4) we decided to retrospectively examine the general practice medical records of teenagers whose pregnancy ended in termination in order to determine whether or not they contained any information that might have alerted primary care professionals to the individual being at risk of unintended pregnancy. Such risk markers might potentially allow general practitioners and others to target sexual health promotion opportunistically.

METHODS

We undertook a retrospective analysis of the general practice records of young women identified as having conceived as teenagers (13 to 19 years old inclusive), and whose pregnancy resulted in a termination.

The study was performed in 14 general practices that belonged to a collaborative research network in the English East Midlands. (Practices in the *Trent Focus Collaborative Research Network* have previously been shown to be representative of all practices in the area for process and outcome measures including teenage pregnancy) (5). For this part of the study, cases (registered patients who had a recorded termination resulting from conception before the age of 20, between 1st Jan 1995 and 1st Jan 1998) were identified from computer records, maternity books, and personal knowledge of practice staff. If any case had more than one pregnancy during the study period then the earliest was selected as the index pregnancy. Estimated date of conception was based on the date of the last menstrual period when recorded, or alternatively estimated from the date of outcome. Three age-matched controls per case were identified from within the same practice by selecting young women closest in chronological age from an ordered list, who had no evidence of teenage pregnancy.

Demographic, consultation and contraceptive data were extracted from medical records by a member of each practice (usually the practice nurse). Consultation data were recorded for the same 12-month period before the estimated date of conception for both the case and matched controls. Clinical consultation data were then categorised and coded by one of us (DC). These included details of reasons for consultation, prescriptions, referrals, and investigations.

All data were initially entered onto an EpiInfo 6.01 database (CDC, USA; WHO, Geneva). Principle analyses and calculations of odds ratios were performed using STATA 5.0 (Stata Corporation, Texas) and descriptive analyses were carried out using SPSS for Windows 8.0 (SPSS Inc.). Conditional logistic regression analysis was used to calculate odds ratios (with 95% confidence limits) and probabilities for matched case-control differences.

The study was approved by the Trent Multi-Centre Research Ethics Committee and individual local research ethics committees. A post hoc power calculation revealed that our study had an 80% power at the 5% significance level (two tailed) to detect an odds ratio of 2.8, based on a 20% exposure rate in controls.

RESULTS

Overall, 53 young women were identified who had conceived as teenagers and had a

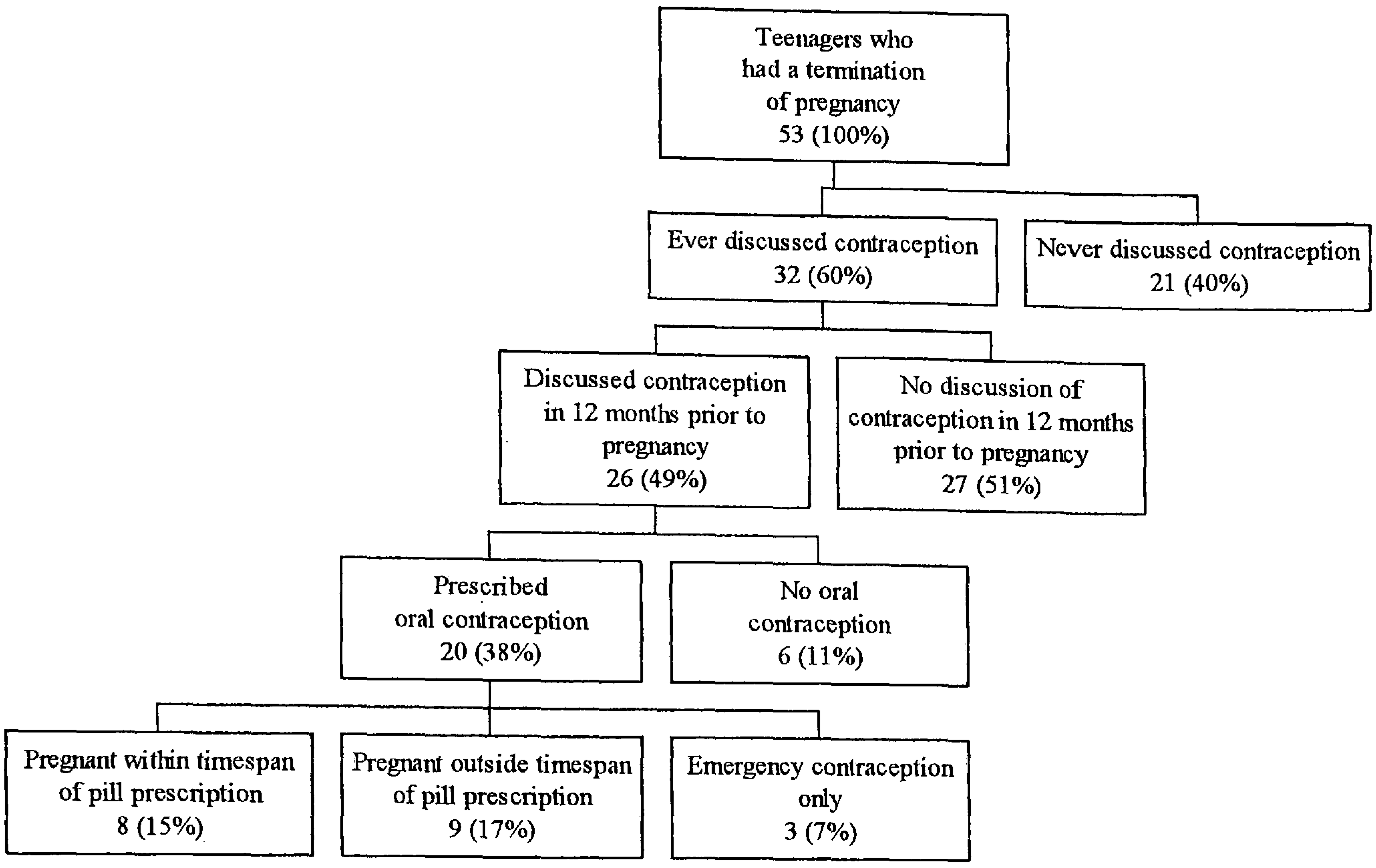

Fig. 1: General Practice Contraceptive Provision Prior to Unintended Teenage Pregnancy

termination of pregnancy. The median age of conception was 17 and ranged from 13 to 19. Nine of the sample had conceived below the age of 16. The control group consisted of 159 young women matched by age and practice.

CONTRACEPTIVE CONSULTATIONS AND PROVISION

Details of general practice consultations in relation to contraception are summarised in Figure 1. Twenty-one cases (40%) had no recorded consultations in which contraception had been discussed. Approximately one-half of cases had discussed contraception in the year prior to pregnancy and two-fifths had been prescribed some form of oral contraception. A similar proportion of controls (48%) had discussed contraception and 40% had been prescribed oral contraception in this period.

Sixteen cases (30.2%) had first consulted about contraception below the age of 16. Although this was higher than the proportion of controls (19.5%), the difference was not statistically significant (OR 2.01, 95% CI 0.90, 4.46, p=0.085).

Of those young women who were prescribed continuous oral contraception in the year prior to pregnancy, approximately half became pregnant whilst the prescription was still current. Amongst the remainder the prescription had elapsed, but in three cases conception had occurred within four weeks of the estimated date at which the prescribed contraception would have been completed. In no cases where contraception had been prescribed was there evidence of concurrent prescribing of antibiotics contributing to contraceptive failure.

Seven subjects (13%) had been prescribed emergency contraception in the year prior to conception compared with nine controls (6%) (OR 2.54, 95% CI 0.90, 7.19, p=0.072). However the proportion of cases that had been prescribed emergency contraception *at any time* prior to conception (21%) was significantly higher than the proportion of controls (8%) (OR 3.21, 95% CI 1.32, 7.79, p=0.007).

Five of the young women who had a termination of pregnancy in this study had a history of previous pregnancy. Two had reported miscarriages, two had delivered, and one had a previous termination. Of these, one had no mention of contraception in her records in the previous 12 months although she had consulted about other health issues on seven occasions. Three of the others had been prescribed the oral contraceptive pill, but all had recorded side effects (break through bleeding or menorrhagia) or expressed dissatisfaction at some stage in the previous 12 months. The remaining teenager had received depo-provera but discontinued this due to recorded concerns about weight gain.

In view of the high frequency of recorded contraceptive side-effects in this subset of cases we explored the frequency amongst all cases and controls. Although five cases (9.4%) and five controls (3.1%) had reported problems, the difference was not statistically significant (OR 3.21, 95% CI 0.89, 11.5, p=0.061).

NON-CONTRACEPTIVE CONSULTATIONS

Of the 21 women who had not consulted for contraception, all except one had consulted at least once during the year prior to conception. The median consultation rate of two was not significantly different from that of the controls.

We examined specific types of reason for consultation that might be indicative of sexual risk: two had consulted for gynaecological problems (dysmenorrhoea); three for psychological problems; and three for urinary tract infections. Table 1 shows the comparison of frequency for consultation for these problems amongst the overall group between cases and controls. There was no significant difference between the proportion of cases and controls consulting for gynaecological and psychological problems, but a significantly higher proportion of cases had consulted for urinary tract infections.

DISCUSSION

In this study we attempted to identify markers that might alert primary care health workers to teenagers who could benefit from an opportunistic sexual health intervention in order to prevent unintended

Table 1. *Consultations for specific (non-contraceptive) reasons in the 12 months prior to conception.*

Consulted at least once for:	Cases (53)	Controls (159)	Odds Ratio	95% Confidence Interval		p-value
Urinary tract infections	7 (13.2%)	5 (3.1%)	8.32	1.68	41.3	0.010
Psychological problems	5 (9.4%)	12 (7.5%)	1.29	0.42	3.96	0.655
Gastrointestinal problems	4 (7.5%)	6 (3.8%)	2.13	0.56	8.08	0.267
Gynaecological problems	9 (17.0%)	29 (18.2%)	0.92	0.41	2.06	0.840

Table 2. *Potential risk markers for unintended pregnancy.*

Risk Marker	Comments
Consultation for contraception	Although this is a marker for sexual activity, rates were no higher for cases than controls.
Younger age of onset of contraceptive use	This may indicate higher risk due to longer duration of sexual activity. The difference did not attain statistical significance in our sample.
Previous teenage pregnancy	This indicates both sexual activity and fertility. Side-effects and dissatisfaction with contraception may be an important factor in this sub-group.
Lapsed oral contraception	Discontinuation because of failure to renew contraception may be important for some teenagers.
Provision of emergency contraception	This association may indicate teenagers who are at higher risk because of failure to use more appropriate longer-term contraceptive methods.
Contraceptive side-effects	Teenagers who experience side-effects may be at higher risk although the association with recorded side-effects did not attain statistical significance in the whole sample.
Consultation for urinary tract infection	This was the only marker identified which could be applied to young women not known to be sexually active.

teenage pregnancy. The retrospective case note methodology has high face validity, and the data should be free of recall bias, since we used clinical records written prior to conception.

We used termination of pregnancy as a proxy for unintended pregnancy. Clearly a proportion of unintended pregnancies also result in delivery, but it is impossible to distinguish these from deliveries resulting from intended conception. Teenagers who chose to have a termination of pregnancy have been shown to differ demographically from those who continue with the pregnancy (6). Thus, our results are only truly applicable to unintended pregnancy resulting in termination. The extent to which risk markers for this group could be extrapolated to a wider group of unintended conceptions would need further investigation.

Our sample may be under-representative of all teenage pregnancies resulting in termination within the study practices, since some may have been undertaken independently of the National Health Service without notifying the general practitioner. The potential effect of misclassification of some 'missed' cases as controls or, indeed, of some controls who were really cases would be to dilute the strength of any associations found.

In this study we only used information available from general practice medical records. Apart from the practicalities of this from a research perspective, this information has good face validity, representing the knowledge base available to the primary care clinicians when dealing with an individual patient, so that any risk markers identified are relevant to clinical practice. As such we did not attempt to adjust for confounding by other known epidemiological risk factors such as socio-economic status, since these are not necessarily known in the clinical setting. In addition we had no information about the use made of Family Planning Clinics and other sexual health services by the teenagers concerned and, as such, our results underestimate contraceptive uptake by them.

In terms of identifying teenagers at risk of unintended pregnancy in practical terms in primary care there are two main groups: firstly those who have discussed contraception and are thus probably sexually active; and secondly those who have never attended for contraceptive or sexual health advice.

Discussion or provision of contraception is an indicator of sexual activity and thus might be considered to be a risk factor for unintended pregnancy. However, we found no difference in the frequency of contraceptive consultations or consultations for oral contraception between cases and controls in the year before pregnancy. This is understandable since the identification of sexual activity is countered by the protective effect of the contraception provided.

Our results suggest that younger age of onset of discussing or being provided with oral contraception might be a risk marker for unintended pregnancy, possibly because it indicates longer duration of sexual activity conferring increased risk. However our sample size was too small to confirm this association statistically.

A proportion of young women became pregnant whilst they had a current prescription for oral contraception. This might be attributed to discontinuation or incorrect use. The extent to which adherence might be increased by improved education by primary health care professionals merits consideration. We found no evidence of any pregnancies resulting from concurrent use of broad-spectrum antibiotics and the oral contraceptive pill in this sample.

A similar proportion of young women conceived after their pill prescription had elapsed. For some this may have been due to a conscious choice, perhaps because of altered relationships. However it may also indicate that the process of contraceptive renewal may present difficulties for some young women. This raises the question as to whether general practice should be more proactive in encouraging teenagers who have consulted for contraception to return for review.

Wider provision of emergency contraception has been advocated as a method of reducing teenage pregnancy. However, in this study we have demonstrated that there is an association between general practice provision of emergency contraception and subsequent termination of pregnancy. This may be because the use of emergency contraception indicates higher level of sexual risk-taking. Our results are consistent with those of Ziebland and colleagues who found a geographical correlation between higher rates of pregnancy termination and higher usage of emergency contraception in the United Kingdom (7). This suggests that primary care professionals need to address the longer-term contraceptive needs of teenagers consulting for emergency contraception.

A history of previous pregnancy is, by its very nature, a strong risk factor for further pregnancy, since it indicates both sexual activity and fertility. Previous unintended pregnancy may be a marker of lack of knowledge or poor use of contraception. Although a relatively small number of teenagers fall into this group, their level of risk is sufficiently high to merit significant attention from primary care professionals. Our results suggest that side-effects and dissatisfaction with conventional contraceptives may be an important contributor to recurring pregnancy amongst this group, and possibly amongst all teenagers. This is consistent with a previous survey of teenagers undergoing termination of pregnancy which found that fear about the side-effects of oral contraception was the commonest reason for failing to use contraception (8). In the USA a large survey of teenage mothers also found a high rate of contraceptive discontinuation and switching in the six-months following delivery (9). Thus the risk of subsequent unintentional pregnancy in this group should not be underestimated.

We identified an association between consultation for urinary tract infection and subsequent termination of pregnancy. This was the only risk marker identified which may apply to teenagers who did not have any contraceptive consultations. The term 'urinary tract infection' is applied loosely since, in some instances, there was no confirmation of diagnosis, and the symptoms might be attributable to other genito-urinary infections including ones sexually transmitted. Thus, any consultation for such symptoms should alert clinicians to enquire about sexual activity and, if appropriate, discuss issues of sexual health and contraception.

CONCLUSIONS

In this study we identified a range of markers that might alert primary care professionals to teenagers at increased risk of unintended pregnancy. Some of these are based on statistical associations, whilst others are based on interpretation of observational data. These are summarised in Table 2.

ACKNOWLEDGEMENT

Marian Macpherson, Susan Bradley, and David Ebdon were part of the project team for the main study. All authors of this paper were part of the project team. DC developed the original idea by MP, had major input into the study design, performed data coding and analysis, interpreted the results, and wrote the paper; he will act as guarantor for the paper. JA contributed to the design of the study, provided training for practices undertaking data collection, and performed data entry. MP conceived the original idea for the project and contributed to the design, interpretation of results, and writing of the paper. JH-C contributed to the development of core ideas, study design, and the paper. We thank the practices and their staff who took part in this study, and also Christine Allen who assisted with some of the case-note review. The study was funded by a grant from the NHSE Trent R & D Programme. There were no competing interests.

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Consultation patterns and provision of contraception in general practice before teenage pregnancy: case-control study

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BMJ 2000;321:486–9

Abstract

Objectives To determine patterns of consultation in general practice and provision of contraception before teenage pregnancy.
Design Case-control study, with retrospective analysis of case notes.
Setting 14 general practices in Trent region.
Subjects 240 registered patients (cases) with a recorded conception before the age of 20. Three controls per case were matched by age and practice.
Main outcome measures Consultations in general practice and provision of contraception in the 12 months before conception and recorded provision of contraception at any time before conception.
Results Overall, 223 cases (93%) had consulted a health professional at least once in the year before conception, 171 (71%) had discussed contraception in this time, and 121 (50%) had been prescribed oral contraception. Cases were more likely to have consulted in the year before conception than controls (odds ratio 2.70, 95% confidence interval 1.56 to 4.66). Most of the difference was owing to consultation for contraception. Overall, 53 cases (22%) resulted in a termination of pregnancy. Cases whose pregnancy ended in a termination were more likely to have received emergency contraception than either their controls (3.21, 1.32 to 7.79) or cases resulting in other outcomes (3.01, 1.06 to 8.51).
Conclusions Most teenagers who became pregnant attended general practice in the year before pregnancy, and many had sought contraceptive advice. The reluctance of teenagers to attend general practice for contraception may be less than previously supposed. The association between provision of emergency contraception and pregnancy ending in termination emphasises the need for continuing follow up of teenagers consulting for this form of contraception.

Introduction

The United Kingdom has the highest teenage pregnancy rate among 15-19 year olds in western Europe,[1] and associated problems have recently been highlighted.[2] Around 35% of teenage pregnancies result in a termination, and continued pregnancy is associated with physical, psychosocial, and educational complications for both the mother and the child.[2] Teenage pregnancy has been identified as a target for health improvement by successive governments.[2 3]

Improving access to health education and contraceptive services is seen as the principal way to reduce teenage pregnancy.[4] General practice is one source of provision of contraception, but it has been suggested that teenagers are reluctant to seek advice because of difficulty in gaining access and fears about confidentiality.[5] However, there is little published evidence concerning the actual use made of general practice services by teenagers who subsequently become pregnant.

We aimed to determine the extent to which teenagers who become pregnant have utilised general practice services before the pregnancy, and also whether there are differences between those whose pregnancy ends in termination (as a proxy for unintended pregnancy) and others. The results might allow identification of potential opportunities for preventing teenage pregnancy.

Subjects and methods

We conducted a case-control study in which characteristics of cases who conceived as teenagers were compared with those of controls matched by age and practice. The study was performed in 14 general practices from the Trent Focus Collaborative Research Network.

Identification of subjects

Cases were registered patients who had a recorded termination, delivery, or miscarriage resulting from conception before the age of 20, between 1 January 1995 and 1 January 1998. Cases were identified from computer records, maternity books, and the knowledge of practice staff. If cases had more than one pregnancy during the study period then the earliest was selected as the index pregnancy. Date of conception was based on the date of the last menstrual period when recorded or estimated from the date of outcome.

Controls were registered patients who had no recorded teenage pregnancy. Three age matched con-

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trols per case were identified from within the same practice by selecting those closest in chronological age from an ordered list. Each control could only act as a control for one case. Twin siblings were excluded.

Data extraction

Data on demography, consultation, and contraception were extracted from medical records by a member of each practice (usually the practice nurse) after standardised training. Data on consultations were recorded for the same 12 month period before the estimated date of conception for both the case and matched controls. Data on clinical consultations were then categorised and coded by one of us (DC).

Consultations in general practice in the year before conception were classified as either related to contraception (contraception provided or evidence that it had been discussed) or not related to contraception (no mention of contraception).

Provision of contraception was recorded, both in the year before conception and also at any time before conception. Postcodes were used to estimate distance of residence from the practice premises, and Townsend score was used as an indicator of deprivation.

Analysis

Data were entered on to an EpiInfo 6.01 database. Principal analyses and calculations of odds ratios were performed with STATA 5.0, and descriptive analyses were performed with SPSS for Windows 8.0.

Separate analyses were performed on all cases and on the subgroup of cases whose pregnancy ended in a termination, in relation to their matched controls. Conditional logistic regression analysis was used to calculate odds ratios (with 95% confidence limits) for matched case-control differences. Absolute differences in interval or continuous data were calculated between case values and the aggregate of matched control values by using Student's *t* test for normally distributed variables and Wilcoxon signed ranks test for other variables. A significance level of 0.05 was selected for the main outcomes. Multivariate conditional logistic regression analysis, incorporating Townsend scores and distance of residence from surgery, was applied to consultation variables to adjust for potential confounding.

Initial target sample size calculations were based on a 2:1 ratio of controls to cases, assuming that 20% of cases were frequent attenders compared with 10% of controls. Such a difference would be detected at a 5% significance level and 80% power with 158 cases and 316 controls. A 3:1 ratio was selected to increase the power and to allow for any shortfall of cases identified, although a shortfall did not subsequently present difficulty. The study was approved by the Trent multicentre research ethics committee and individual local research ethics committees.

Results

Overall, 240 cases, and 719 matched controls, were identified. Overall, 70% of index pregnancies resulted in delivery, 22% in termination, and 8% in miscarriage. The median age of cases at conception was 17 years (range 13 to 19 years). Thirty four cases (14%) were less than 16 years. Forty eight cases (20%) had been pregnant at least once previously.

Table 1 Case-control differences in relation to consultations and provision of contraception (all cases). Values are numbers (percentages) unless stated otherwise

Variable	Cases (n=240)	Controls (n=719)	Odds ratio (95% CI)	P value
Demography				
Lives ≥2 miles from surgery*	57 (24.6)	195 (29.4)	0.67 (0.45 to 0.99)	0.045
Townsend score ≥4†	89 (37.9)	189 (28.8)	2.25 (1.45 to 3.50)	<0.001
Consultation in year before conception				
Any health professional at least once	224 (93.3)	603 (83.9)	2.70 (1.56 to 4.66)	<0.001
Any health professional ≥4 times	128 (53.3)	302 (42.0)	1.68 (1.23 to 2.30)	0.001
General practitioner	219 (91.3)	586 (81.5)	2.37 (1.45 to 3.86)	0.001
Practice nurse	56 (23.3)	170 (23.6)	0.98 (0.69 to 1.39)	0.905
Any health professional, with contraception discussed	148 (61.7)	322 (44.8)	2.15 (1.56 to 2.97)	<0.001
For any non-contraceptive reason	198 (82.5)	547 (76.1)	1.51 (1.03 to 2.22)	0.035
Contraception provided at any time before conception				
Ever consulted for contraception	171 (71.3)	339 (47.1)	3.32 (2.33 to 4.73)	<0.001
Contraceptive pill	156 (65.0)	301 (41.9)	2.96 (2.11 to 4.14)	<0.001
Emergency contraception	27 (11.3)	61 (8.5)	1.35 (0.84 to 2.18)	0.210
Intrauterine device	1 (0.4)	3 (0.4)	1.00 (0.10 to 9.61)	1.000
Injectable progestogens	17 (7.1)	23 (3.2)	2.36 (1.23 to 4.55)	0.010
Condoms	31 (12.9)	38 (5.3)	2.73 (1.64 to 4.54)	<0.001

Data missing for 8 cases and 55 controls* and 8 cases and 62 controls†.

The median number of consultations by cases in the year before conception was 4 (range 0 to 29). Table 1 shows the proportion of cases consulting and also recorded provision of contraception both in the index year and at any time before conception. Of the 92 cases who had not consulted for contraception in the year before conception, 76 (83%) had consulted for another reason at least once and 24 (26%) had consulted on four or more occasions.

Townsend scores were available for 232 cases (97%) and 657 controls (91%). The mean score was 3.2 for cases (SD 3.4) and 2.4 for controls (SD 3.3), with the difference between cases and aggregated matched controls being significant ($t=4.866$, $df=231$, $P<0.001$), indicating that cases were resident in more deprived areas. More cases than controls lived within two miles of the surgery, although the difference only just attained significance (table 1).

In the year before conception, cases were more likely than controls to have consulted any health professional at least once, to have consulted a general practitioner, to have consulted frequently (four or more times), and to have consulted for purposes both related to contraception and not related to contraception (table 1). After multivariate analysis, in the year before pregnancy the only significant association was in relation to consultation for contraception (odds ratio 1.78, 95% confidence interval 1.22 to 2.60; $P=0.003$). Cases were more likely to have consulted for contraception at any time before conception and specifically to have been provided with oral contraception, injectable progestogens, or condoms (table 1).

Table 2 shows consultation rates and uptake of contraception by cases whose pregnancy ended in termination. Of the 27 cases who had not consulted for contraception, all but two (7%) had consulted at least once, and seven (26%) had consulted on four or more occasions in the previous year. There were no significant differences between cases whose pregnancy ended in termination and their 159 matched controls

Table 2 Case-control differences in relation to consultations and provision of contraception (cases resulting in termination). Values are numbers (percentages) unless stated otherwise

Variable	Cases (n=53)	Controls (n=159)	Odds ratio (95% CI)	P value
Demography				
Lives ≥2 miles from surgery*	17 (32.1)	60 (39.2)	0.68 (0.33 to 1.38)	0.280
Townsend score ≥4†	17 (32.1)	32 (21.2)	2.25 (1.45 to 3.50)	<0.001
Consultations in year before conception				
Any health professional at least once	51 (96.2)	139 (87.4)	3.51 (0.81 to 15.37)	0.094
Any health professional ≥4 times	24 (45.3)	72 (45.3)	1.00 (0.50 to 1.99)	0.144
General practitioner	50 (94.3)	137 (86.2)	2.68 (0.77 to 9.33)	0.110
Practice nurse	7 (13.2)	34 (21.4)	0.56 (0.23 to 1.35)	0.192
Any health professional, with contraception discussed	26 (49.1)	76 (47.8)	1.05 (0.57 to 1.96)	0.874
For any non-contraceptive reason	45 (84.9)	129 (81.1)	1.32 (0.56 to 3.13)	0.528
Types of contraception provided at any time before conception				
Ever consulted for contraception	32 (60.4)	73 (45.9)	1.80 (0.95 to 3.38)	0.068
Contraceptive pill	27 (50.9)	64 (40.3)	1.54 (0.83 to 2.88)	0.173
Emergency contraception	11 (20.8)	12 (7.5)	3.21 (1.32 to 7.79)	0.007
Injectable progestogens	2 (3.8)	6 (3.8)	1.00 (0.20 to 5.11)	1.000
Condoms	8 (15.1)	6 (3.8)	4.53 (1.50 to 13.75)	0.004

Data missing for 6* and 8† controls.

Table 3 Comparison of recorded provision of contraception between cases resulting in termination of pregnancy and those with other outcomes. Values are numbers (percentages) unless stated otherwise

	Termination (n=53)	Delivery or miscarriage (n=187)	Odds ratio (95% CI)	P value
Ever consulted for contraception	32 (60.4)	139 (74.3)	0.53 (0.28 to 1.00)	0.048
Consulted for contraception in previous 12 months	26 (49.1)	122 (65.2)	0.51 (0.28 to 0.95)	0.032
Ever prescribed oral contraception	27 (50.9)	129 (69.0)	0.47 (0.25 to 0.87)	0.015
Prescribed oral contraception in past 12 months	20 (37.7)	101 (54.0)	0.52 (0.28 to 0.97)	0.036
Ever prescribed emergency contraception	11 (20.8)	16 (8.6)	2.80 (1.21 to 6.48)	0.013
Prescribed emergency contraception in past 12 months	7 (13.2)	9 (4.8)	3.01 (1.06 to 8.51)	0.031
Ever used injectable progestogen	2 (3.8)	15 (8.0)	0.45 (0.10 to 2.03)	0.376*
Ever used condoms	8 (15.1)	23 (12.3)	1.27 (0.53 to 3.02)	0.593

*Fisher's exact test.

for overall consultation rate, consultations with a general practitioner, or consultations related to contraception or not related to contraception. Cases were less likely than controls to have consulted a practice nurse, although the difference did not attain significance. Cases resulting in termination of pregnancy were significantly more likely to have been provided with emergency contraception or condoms at any time before conception.

Consultation rates of cases whose pregnancies ended in termination were compared with those with other outcomes. There were no significant differences in terms of overall consultation rate or the proportion consulting any health professional at least once, consulting the general practitioner at least once, or consulting frequently. Cases resulting in a termination were, however, half as likely to have consulted the practice nurse than others, with seven (13%) having done so compared with 49 (26%) others ($\chi^2=3.899$, df=1, P=0.048).

The use of contraception by teenagers whose pregnancy resulted in a termination was compared with that of other outcomes (table 3). Cases resulting in a termination of the pregnancy were less likely to have consulted for contraception and less likely to have been prescribed oral contraception at any time but were more likely to have been prescribed emergency contraception.

Discussion

This is the first study to compare the consultation patterns of teenagers who become pregnant with those of age matched peers. There is little published research about the uptake of services for contraception in general practice by teenagers before pregnancy. Such research is difficult to undertake and is subject to ethical constraints.

Our study involved general practices from the Trent Focus Collaborative Research Network. Although research practices may potentially provide different standards of care for teenage patients, pregnancy rates in the study practices were similar to those of other practices in the region. The proportion of pregnancies resulting in a termination in this study (22%) was lower than expected from national data (35% among teenagers aged 15-19 in 1994[2]) suggesting that we may not have identified all such cases, particularly if the terminations were performed in the private sector or referred directly from family planning services without notifying the general practitioner.

Our data were based solely on general practice records. This was appropriate since our interest was in the use made of general practice services. Our results therefore provide an underestimate of the total provision of contraception to teenagers because a proportion access family planning or specific teenage services. The extent of use of other services is likely to vary with locality, but one study found that 60% of pregnant teenagers had accessed services for contraception in general practice compared with 30% who had attended family planning clinics.[6]

Consultation patterns before pregnancy

Our results show that most teenagers who become pregnant do access general practice for both general medical services and contraceptive advice before their pregnancy. This suggests that for most teenagers fears about confidentiality and embarrassment is less of a barrier than previously supposed.[5] These issues may, however, still be important for the minority who did not consult.

At least four fifths of the pregnant teenagers who had not discussed contraception had consulted for other reasons. Although these represent potential "missed opportunities" for contraceptive advice, it was not possible to identify such teenagers as a distinct "at risk" group. It has been suggested that teenagers may have a hidden agenda when consulting, which includes the desire to discuss sexual health issues.[7,8] However, teenagers have also been reported to have shorter consultations than adults, which provides less opportunity for raising such concerns.[9]

We found that teenagers who become pregnant consulted more frequently in general practice than did their peers. Most of the difference was owing to consultation for contraception, with sexual activity acting as a confounding variable. Among this group, however, consultation rates were also marginally higher overall for reasons not related to contraception. Frequent con-

Teenage pregnancy rates in the United Kingdom are among the highest in western Europe

General practice is a potential source of provision of contraception for teenagers but may not be fully utilised by them

Most teenagers who become pregnant do access general practice in the year before pregnancy, suggesting that potential barriers to care are less than often supposed

Teenagers who become pregnant have higher consultation rates than their age matched peers, and most of the difference is owing to consultation for contraception

Teenagers whose pregnancies end in termination are more likely to have received emergency contraception before conception, emphasising the need for adequate follow up

sultation among teenagers is also associated with higher rates of psychological morbidity.[10] Thus general practitioners need to be aware of the complex issues that may need addressing among teenagers who consult frequently.

Unintended pregnancy

A separate analysis was performed on cases whose pregnancy ended in a termination, as this group excludes those teenagers in whom the pregnancy was planned or wanted. Most teenagers in this group were still likely to have consulted in general practice in the year before pregnancy, and half had discussed contraception during this time.

Recorded provision of emergency contraception in general practice was associated with an increased risk of termination. Teenagers who had a termination were also more likely to have had emergency contraception and less likely to have had regular oral contraception than teenagers who had a pregnancy resulting in delivery or miscarriage. Similar results were reported by Pearson et al, who found that teenagers who requested a termination of pregnancy were significantly more likely to report having used condoms and less likely to have used oral contraception than teenagers attending antenatal care.[11]

Improved knowledge of, and access to, emergency contraception is often advocated as a means of reducing teenage pregnancy.[12] Teenagers who choose this method, however, may be more at risk of unintended pregnancy, possibly because it is a marker of "risk taking" in sexual activity. This emphasises the importance of appropriate follow up to address long term needs for contraception whenever a teenager consults for emergency contraception. It also raises questions about the possible supply of emergency contraception by agencies who are unable to provide such follow up.

We thank the practices from the Trent Focus Research Network and their staff who took part. Since this paper was written, Dave Ebdon has died.

Contributors: All authors were part of the project team. DC developed the original idea by MP, had major input into the study design, performed data coding and analysis, interpreted the results, and wrote the paper; he will act as guarantor for the paper. JA contributed to the design of the study, undertook the literature review, provided training for practices undertaking data collection, performed data entry, and commented on the analysis and the paper. MP conceived the original idea for the project and contributed to the design, interpretation of results, and writing of the paper. JH-C contributed to the development of core ideas, study design, data analysis, interpretation of results, and the paper. DE analysed postcode data for deprivation and spatial analysis. MM and SB commented on the design, interpretation of results, and the paper. Data collection was performed by staff in participating practices. Carol Coupland provided advice on statistical analysis.

Funding: Trent NHS Executive.

Competing interests: None declared.

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(Accepted 5 July 2000)

Endpiece

Artie Shaw's philosophy on life

Artie Shaw, composer, arranger, bandleader, and clarinet virtuoso, is now 90, living in California. His version of Cole Porter's "Begin the Beguine" made him world famous, and his 1940s original theme "Nightmare" was also widely acclaimed. His composition "Gloomy Sunday" was banned in Hungary in the 1930s, because it allegedly led to a rise in suicides among those who heard it.

I wrote to Mr Shaw and asked him for a brief message embodying his successful ageing and life philosophy.

This is what he replied: "I believe it can be summed up this way. Try to leave things a little better than you found them. Note the words 'little better'—anyone who tries to make a really major difference stands a chance of becoming a Hitler, a Stalin, or a Milosevic. As William Blake put it some 200 years ago: 'If you wish to do good, be sure to do so only in minute particulars.'"

Mr Shaw is also a writer and has published three novels, the best known of which is *The Trouble with Cinderella*.

Submitted by Fred Charatan
retired geriatric physician, Florida

)o the attitudes and beliefs of young teenagers owards general practice influence actual onsultation behaviour?

CHARD CHURCHILL

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ackground. *Teenagers are believed to have health oncerns that are not adequately addressed in primary care ecause of perceived barriers that inhibit them from consult-g a general practitioner (GP). We report the results of a udy examining links between potential attitudinal barriers d actual help-seeking behaviour.*

im. *To determine whether the attitudes of teenagers wards general practice are associated with differences in onsultation patterns.*

lethod. *Results of a postal questionnaire survey of atti-ides to general practice, performed among teenage atients aged 13 to 15 years registered with five general ractices in the East Midlands, were analysed in relation to onsultation data from retrospective casenote analysis for e preceding 12 months.*

esults. *Matched questionnaire and consultation data were vailable for 678 teenagers. We found few significant differ-nces in overall consultation rates between teenagers xpressing differing attitudes about aspects of general prac-ce. Differences did exist in relation to perceived difficulty in etting an appointment, feeling able to confide in a GP, and erception of adequate time being given in the consultation. ear of embarrassment was associated with lower consulta-on rates for gynaecological problems and contraception.*

onclusions. *Negative perceptions of general practice by enagers may have less of an influence on actual consulta-on behaviour than previously believed. However, there are ome aspects of care that merit further attention if teenagers re to feel able to consult their GP more easily.*

eywords: adolescent health; adolescent attitudes; consul-tions.

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bmitted: 2 February 2000; Editor's response: 9 May 2000; final accep-nce: 13 September 2000.

British Journal of General Practice, 2000, **50**, 953-957.

Introduction

Teenagers are recognised as having health concerns that are not adequately addressed by healthcare professionals.[1-4] There has therefore been growing interest in understanding perceived barriers to accessing services so that alternative models of health care can be provided. Potential barriers include the attitudes and beliefs of the teenagers themselves, the characteristics of the services provided, and the attitudes and behaviour of health professionals involved. Aspects of care that have been shown to be important to teenagers in previous surveys include the perceived attitudes of reception staff, privacy of the reception area, difficulty getting an appointment, waiting times before being seen, duration of the consultation, attitudes of the doctor, concerns about confidentiality, and fear of embarrassment.[5-7]

Previous research into teenagers and general practice has been conducted in one of two ways: cross-sectional surveys or interviews with teenagers providing evidence of the opinions that they hold and insight into their concerns;[1,5-8] or analysis of consultation patterns, offering insight into actual general practice utilisation.[9,10] The aim of the current study was to combine both strategies in an attempt to gain a greater understanding of the impact of teenagers' attitudes on consultation behaviour. Specifically, we wanted to know whether teenagers expressing opposite attitudes differed significantly in their overall consultation patterns.

Method

Study design

A cross-sectional postal questionnaire survey was performed among 13- to 15-year-old teenagers registered with general practices in the East Midlands. Consultation data for these teenagers for the previous 12 months were obtained from medical records. The study received local research ethical committee approval.

Practices and patients

The study was carried out in five group practices in the East Midlands that were selected opportunistically on the basis of personal contact and willingness to participate. None of the practices had current health promotion initiatives aimed specifically at young people and all were located in different settings: two in inner-city areas, one in a rural setting, and the other two in semi-urban settings. All registered patients aged between 13 and 15 years, inclusive, at the sampling date were included, with the exception of patients known to have significant learning difficulties or special needs.

Postal questionnaire survey

The postal questionnaire incorporated a range of questions about health attitudes, behaviours, and concerns. Attitudinal questions consisted of statements to which responses of 'agree', 'disagree', and 'not sure' were invited. Some statements were adapted from the Surgery Satisfaction Questionnaire.[11] The questionnaire was piloted among 13- to 14-year-old pupils in a mixed comprehensive school, with minor modifications incorporated into the final ion as a result. Prior to the survey, parents or guardians were a letter explaining the purpose of the study and allowing them equest further information or 'opt out' if desired. A £4 gift cher was offered for all returned completed questionnaires.

nsultation rates

ails of all recorded face-to-face contacts between the teenager l a primary health care professional working in the general ctice setting over the previous 12 months were extracted from nual and computerised records. Specified reasons for consulon were coded into broad categories. In order to account for ltiple consultations for the same problem, and for multiple blem categories in the same consultation, analysis of consulions according to category was performed on an 'ever' or ver' basis.

ta entry and analysis

ta were numerically coded and double entered onto an EpiInfo tabase, with cross-file verification. Analyses were performed ng SPSS for Windows (Release 6.1.3) and Stata (Version 5.0). Principal analyses consisted of comparison of overall consultan rates against sex, practice, and attitudinal responses. All tistical tests were two-sided and carried out at the 5% signifince level. Ninety-five per cent confidence intervals were callated where appropriate. A chi-squared test was used to comre categorical data. Poisson regression analysis was used to lculate incidence rate ratios (IRR) comparing annual consultan rates of groups of teenagers giving different attitudinal sponses, adjusting for sex and practice as potential confoundg variables. An IRR greater than 1 demonstrates that a particur group had a higher annual consultation rate than the comparin group and vice versa. Logistic regression analysis was used compare groups in relation to whether or not they had ever tended for specific conditions during the index year, with sults presented as odds ratios (ORs).

esults

ostal questionnaire response rate

ight hundred and eighty-six teenagers were sent questionnaires d 713 (80.5%) responded. Of the remainder, seven were turned because the patient was no longer at the registered ldress. Three parents declined permission for their child to parcipate. The response rate from girls was 85% compared with 6.1% from boys (difference = 8.9%, 95% CI = 3.7%–14.1%). esponse rates from different practices ranged from 70.4% to 5.1% (χ^2= 17.6, df = 4, P = 0.001).

onsultation data

he medical records of 836 (94.4%) teenagers were examined, ith the remainder being unavailable or incomplete for the releant 12-month period. Matched consultation and questionnaire ata were available for 678 teenagers (76.5%). There were no gnificant differences in overall consultation rates between uestionnaire responders and non-responders.

Table 1 shows the distribution of annual consultation rates nong those teenagers whose medical records were examined: e median consultation rate was 1; 27.8% of teenagers had no corded consultations; and 20.3% had four or more consultans over the 12-month period, with a maximum of 18. Girls had gnificantly higher annual consultation rates than boys. Table 2 ows recorded reasons for consultation with respiratory and rmatological problems being the most common. Among 'uronital conditions', 23 (5.2%) girls had consulted for contracepve purposes.

Table 1. Annual consultation frequency in relation to gender.

Number of consultations	Boys n (%)	Girls n (%)	All n (%)
0	132 (30.8)	100 (24.5)	232 (27.8)
1	121 (28.3)	90 (22.1)	211 (25.2)
2	62 (14.5)	74 (18.1)	136 (16.3)
3	50 (11.7)	37 (9.1)	87 (10.4)
>4	63 (14.7)	107 (26.2)	170 (20.3)
Total	428	408	836

Difference between males and females: c^2 = 22.9, df = 4, P<0.001.

Attitudes to the practice and medical care

Responses to attitudinal questions about the practice and medical care provision are shown in Table 3. The most negative attitudes concerned privacy of the reception area and the ability to confide in the general practitioner (GP) about very personal things. Girls expressed more negative attitudes to their practice than boys. They were significantly less likely to agree that:

- they were satisfied with the care provided (difference = 9%, 95% CI = 2.4%–15.8%);
- they could talk to the doctor about very personal things (difference = 10.5%, 95% CI = 4.1%–16.9%); or
- the doctor took them seriously (difference = 15.3%, 95% CI = 8.8%–21.7%).

They were more likely to report that getting to the doctor could be difficult for them (difference = 6%, 95% CI = 1.3%–10.7%).

Table 3 also shows the overall consultation rates of teenagers in relation to their expressed attitudes. The association between uncertainty ('not sure') and lower consultation rates for a number of factors reflects lack of experience on which to base perceptions and is to be expected. Statistically significant differences in consultation rates between teenagers expressing opposing views ('agree' versus 'disagree') were found in relation to difficulty getting an appointment, feeling able to talk to the doctor about personal things, and perceived adequacy of time in the consultation.

We performed separate analyses of self-reported attitudes against consultation for potentially sensitive problems. Girls who consulted for contraception were more likely to agree that it was difficult to get an appointment (OR = 3.03, 95% CI = 1.06–8.33, P = 0.037) and were also less likely to report being satisfied with care (OR = 0.32, 95% CI = 0.12–8.33, P = 0.029) than those who did not. There were no other statistically significant associations.

Attitudes to confidentiality and embarrassment

Teenagers were asked to indicate their agreement or otherwise with a series of statements about confidentiality. Confidentiality was explained as follows: 'What you tell your doctor should not be discussed with other people without you knowing.' Six hundred and forty-nine (91.8%) responders agreed with the statement that doctors should keep everything they are told confidential. However, only about two-thirds believed that their GP did actually keep everything they are told confidential, with most of the remainder being uncertain. Responses to the remaining questions are shown in Table 4.

The only significant difference between sexes was in relation to the question about embarrassment: 206 (46.9%) girls agreed that they might not be able to talk to a doctor about problems because of embarrassment compared with 176 (39.3%) boys (difference = 7.8%, 95% CI = 0.5%–15.0%).

Table 4 also shows overall consultation rates in relation to question responses. There were no significant associations ble 2. Reasons for consultation: teenagers consulting at least once for particular conditions (n = 836).[a]

nsultation category	n (%)
spiratory conditions (including asthma and upper/lower respiratory tract infections)	293 (35.1)
rmatological conditions (including acne and eczema)	242 (28.9)
usculoskeletal conditions (including trauma, sports injuries, and joint problems)	185 (22.1)
orhinological conditions (including rhinitis, otalgia, and ear infections)	147 (17.6)
ogenital conditions (including menstrual disorders, urinary disorders, and contraception)	82 (9.8)
astrointestinal conditions (including abdominal pain, diarrhoea, and vomiting)	70 (8.4)
sychological conditions (including emotional, behavioural, and sleep problems)	38 (4.5)
phthalmic conditions (including conjunctivitis and visual problems)	35 (4.2)
iscellaneous conditions (any not covered elsewhere)	118 (14.1)

ased on all teenagers for whom consultation data were available.

able 3. Associations between attitudinal responses to statements about general practice and mean annual consultation rates controlling for x and practice.[a]

			ACR[b]				
tatement (n)	Response	Percentage	Mean	Median	IRR[c]	95% CI	P-value
y doctor's surgery is modem and up-to-date (675)	Agree	76.6	2.2	1	1	-	-
	Disagree	4.3	2.6	2	1.17	0.92–1.48	0.194
	Not sure	19.1	2	1	0.91	0.79–1.05	0.186
he receptionists at the surgery are always friendly and helpful (675)	Agree	67.6	2.3	1	1	-	-
	Disagree	12.6	2.4	2	1.06	0.92–1.24	0.403
	Not sure	19.8	1.7	1	0.75	0.65–0.87	<0.001
he surgery is private enough to talk to the receptionist (674)	Agree	16.5	2.3	1	1	-	-
	Disagree	60.7	2.1	1	0.93	0.8–1.07	0.307
	Not sure	22.8	2.2	1	0.95	0.8–1.12	0.514
f I go to the surgery I will always have to wait a long time (673)	Agree	38.3	2.2	1	1	-	-
	Disagree	38.3	2.2	1	0.96	0.85–1.08	0.475
	Not sure	23.3	2.1	1	0.88	0.76–1.01	0.061
t can be difficult to get through to the surgery by telephone (673)	Agree	17.2	2.5	1.5	1	-	-
	Disagree	51.6	2.2	2	0.96	0.83–1.1	0.555
	Not sure	31.2	1.9	1	0.83	0.71–0.96	0.016
am always satisfied with the care I get at my doctor's surgery (672)	Agree	69.7	2.1	1	1	-	-
	Disagree	14.9	2.5	2	1.15	1–1.33	0.051
	Not sure	15.5	2.1	1	0.94	0.81–1.08	0.377
t can be hard to get an appointment to see the doctor (671)	Agree	31.2	2.6	2	1	-	-
	Disagree	43.9	2.1	1	0.84	0.75–0.94	0.004
	Not sure	24.9	1.7	1	0.68	0.59–0.78	<0.001
Getting to my doctor's surgery can be a problem for me (674)	Agree	11.6	2	1	1	-	-
	Disagree	83.4	2.2	1	1.14	0.97–1.35	0.115
	Not sure	5	1.7	1	0.83	0.62–1.13	0.239
feel able to talk to the doctor about very personal things (674)	Agree	26	2.5	2	1	-	-
	Disagree	40.9	2.1	1	0.82	0.72–0.93	0.002
	Not sure	33.1	2	1	0.8	0.7–0.91	0.001
I feel the doctor takes me seriously (674)	Agree	71.1	2.2	1	1	-	-
	Disagree	6.2	2.6	2	1.12	0.92–1.37	0.266
	Not sure	22.1	2	1	0.87	0.76–0.99	0.032
When I see the doctor I am given enough time to talk about everything I want (673)	Agree	63.3	2.3	1	1	-	-
	Disagree	16	1.9	1	0.8	0.68–0.93	0.003
	Not sure	20.7	1.9	1	0.8	0.7–0.92	0.002

[a]Poisson regression analysis; [b]annual consultation rate; [c]incidence rate ratio, adjusted for sex and practice.

etween positive or negative attitudes and overall consultation ates. Further analysis was performed to determine whether such ttitudes influenced consultation for potentially sensitive probems, as above. Teenagers who consulted for psychological probems were more likely to agree that they 'might not be willing to ell their GP about some health problems because they were fraid of other people finding out' (OR = 2.5, 95% CI = .15–5.26). A similar, but non-significant, trend was observed in relation to discussion of emotional problems. Girls who expressed concern about embarrassment were less likely to have consulted for any gynaecological problem (including contraception) (OR = 0.49, 95% CI = 0.25–0.97, P = 0.040) with a similar trend in relation to consultations specifically for contraception. There were no other statistically significant associations between consultations for sensitive problems and attitudes towards confidentiality and embarrassment.

ıble 4. Associations between attitudinal responses to statements about confidentiality and embarrassment and mean annual consultation tes controlling for sex and practice.[a]

tatement (n)	Response	Percentage	ACR[b]		IRR[c]	95% CI	P-value
			Mean	Median			
might not tell my GP about some health problems because I would worry about other people finding out (673)	Agree	22.3	2.1	1	1	-	-
	Disagree	60.8	2.1	1	0.97	0.85–1.11	0.656
	Not sure	16.9	5.5	2	1.12	0.95–1.31	0.167
might not want to tell my GP about emotional problems because I would worry about other people finding out (670)	Agree	21.3	2	1	1	-	-
	Disagree	54.9	2.2	1	1.11	0.98–1.28	0.1
	Not sure	23.7	2.2	1	1.08	0.92–1.26	0.340
might be too embarrassed to talk to my GP about my problems (673)	Agree	43.1	2.2	1	1	-	-
	Disagree	33	2.1	1	0.96	0.85–1.08	0.465
	Not sure	23.9	2.2	1	0.96	0.84–1.09	0.499
I might not go see my doctor about all my healthproblems because I do not trust him/her (650)	Agree	6.1	1.7	1	1	-	-
	Disagree	82.9	2.2	1	1.2	0.93–1.53	0.154
	Not sure	11	2.5	2	1.3	0.98–1.72	0.073

[a]Poisson regression analysis; [b]annual consultation rate; [c]incidence rate ratio, adjusted for sex and practice.

Discussion

To our knowledge, this is the first published study to attempt to evaluate the influence of the attitudes of teenagers with respect to general practice on actual consultation behaviour. The purpose was to try to determine the extent to which particular attitudes or beliefs act as barriers to primary health care. Our findings suggest that they may be less of an actual barrier than previously believed among this population.

The study was conducted among teenagers aged 13 to 15 years, since people in this age group are believed to have significant health concerns that are not addressed. They are also developing in terms of personal autonomy, while not yet being fully autonomous with respect to the law.[12]

We acknowledge that there are a number of potential limitations to the study design. First, among the age group studied parental influence may be an overriding factor that could not be directly taken into account. However, we performed an analysis based on the 143 (20%) responders who reported that they had gone into the consultation alone on the most recent occasion and there were no significant differences in attitudes or consultation patterns between this subgroup and the whole sample.

The practices in the study were selected opportunistically. Although they were not undertaking specific teenage interventions over the period studied, a prior interest in teenage health was evidenced by their willingness to participate. Thus, the views expressed by their teenage patients may be unrepresentative of the whole teenage population: these practices could be providing better teenage care than average practices with consequent satisfaction higher and the effect of any potential 'barriers' diminished. However, the fact that a wide range of attitudes were expressed by the teenagers, and many had only limited contact with the practices over the period of the study, might suggest that such an effect would be minimal.

To undertake the study it was necessary to use general practice registered lists as the sampling frame and carry out a postal questionnaire survey. This approach has potential disadvantages in terms of problems of differential response bias and lack of control over the setting in which the questionnaire is completed. To reduce the former problem an inducement in the form of a gift voucher was used to maximise response rates. The potential effect of such an inducement on individual responses to questions must be acknowledged, particularly as it may have encouraged more positive attitudinal responses than otherwise. However, the results obtained in our survey (for example, with respect to self-reported smoking rates) were similar to those from surveys performed in other settings, suggesting that such an effect was minimal. We also examined consultation patterns of questionnaire responders and non-responders and found no significant differences between the groups. In addition, we examined questionnaire responses of those who reported having received help in completing it with those who did not and found no significant differences in reported attitudes between the groups.

Finally, the retrospective nature of the study means that the associations found cannot necessarily be interpreted as demonstrating causality between attitudes and behaviours. However, we have attempted to interpret our findings in this context. Further research could be performed to determine the stability of teenagers' attitudes over time and the influence of experience on them.

Our findings confirm the concerns that teenagers have expressed in previous research. The most prevalent negative views about general practice in this study concerned privacy of the surgery reception area and waiting times to be seen for appointments. However, the fact that there was no association between the expression of these concerns and actual consultation behaviour suggests that they are only a minimal or theoretical barrier to health care.

The association between perceived difficulty getting an appointment and consultation rates does not reflect a barrier to health care since the association is in the opposite direction to that which would be expected. Instead it is consistent with the probability that teenagers who attend more frequently are more likely to have had difficulty obtaining an appointment in the past and their belief is therefore based on experience. Perceived difficulty getting an appointment may act as a barrier to health care for specific problems and our findings suggest that this might be true in relation to contraception, where the need for emergency contraception requires accessible health care.

In contrast, the finding that teenagers who disagreed that they were given enough time within a consultation had lower consultation rates than others could be consistent with this belief acting as a barrier overall. It is also consistent with previous evidence that teenagers are actually given less time in general practice consultations than adults.[13] Alternative explanations also exist; for example, teenagers who consult more frequently may develop a better relationship with their GP resulting in improved satisfaction with the consultation and the perception that more time is given. A similar argument can be applied to the association between willingness to confide in a GP and higher consultation rates. The importance of developing a good doctor–patient relationship with teenagers has been emphasised in other studies reporting that many teenagers believe their GP to be unsympathetic[1,5] or that they feel uncomfortable in the consultation.[8]

While teenagers' concerns about confidentiality are frequently cited as barriers to consultation,[1] such concerns were not associated with differences either in overall consultation rates or consultation for sensitive issues. 'Embarrassment' was a more widespread concern, especially among girls, and such concerns were shown to be associated with reduced consultation for sensitive problems such as gynaecological and contraceptive reasons. The importance of 'embarrassment' as a potential barrier has been emphasised in previous surveys.[5] This may have implications for the gender mix of health care professionals accessible for teenagers in primary care, although this issue was not specifically addressed in the current study.

Previous authors have suggested that teenagers might need specific health care interventions to address their concerns and make primary health care more accessible and acceptable.[1,14-16] Our findings suggest that the expressed attitudes of teenagers may be less of a barrier to routine general practice care than previously believed, which accords with results from another recent survey that suggested that most teenagers are generally satisfied with the care that they receive.[17] Specific concerns might better be addressed within the context of routine care rather than providing separate special services for this age group. However, where special services are being proposed it will be important to carry out proper evaluation for evidence of added benefit to justify significant diversion of resources.

Conclusion

Previously reported negative attitudes of teenagers towards general practice appear to have limited inhibitory effect on their use of services. However, our study confirms the need for GPs to try to develop trusting relationships with their teenage patients so that they are more likely to confide, and be less embarrassed to do so, when they do have health concerns.

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Acknowledgements

The study was supported by a grant from the NHS R&D Mother and Child Health Programme. We are grateful to the five practices and the teenagers who took part in it and to Kath Bennett who provided advice with the analysis.

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