Understanding differences in conception and abortion rates among under 20s in Britain and France:

Examining the role of disadvantage

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STATEMENT OF OWN WORK

I, Rachel H.V. Scott, confirm the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signed: ……  Date: …16.12.2016……

ABSTRACT

Context Conception and abortion rates among women aged under-20 in Britain are high compared to those of other European countries. Conception and abortion rates among women aged under-20 are lower in France. In both countries, women from disadvantaged backgrounds are more likely to report a conception before age 20, and less likely to terminate the pregnancy with abortion if they do. A significant body of research has explored conception and abortion among young people in Britain, but fewer studies have capitalised on the potential of cross-national research to increase our understanding of the British situation. The aim of this research is to examine how proximal and contextual factors, particularly disadvantage, shape conception and abortion rates among under-20s by comparing two countries, Britain and France.

Methods Routinely-collected data on births and abortions are used to describe rates, trends, and area-level variation in conception and abortion rates within and between the two countries, and associations between disadvantage and conception and abortion at area-level. Nationally-representative survey data from both countries are used to examine differences between the two countries in behaviours and outcomes at each stage in the pathway to abortion (sexual activity, contraceptive use, pregnancy and recourse to abortion), and the associations with socioeconomic characteristics at each stage.

Results The proportion of young women sexually active is greater in Britain but differences between the two countries in contraceptive use are smaller. There are differences in the timing and circumstances of first sex between Britain and France. Associations between socioeconomic characteristics and each stage in the pathway to abortion in individual level analyses are similar in Britain and France. The correlation between disadvantage and conception and recourse to abortion is stronger in Britain.

Discussion The findings indicate that differences in conception rates between Britain and France are driven proximately by differences in the proportion of young women that is sexually active, and, to a lesser extent, differences in contraceptive use. Motivations to avoid pregnancy may play a key role in shaping behaviours at each stage of the pathway to abortion. A cross-national comparison has enabled the role of country-level social context to be explicitly examined. These empirical findings lend weight to arguments that differences in behaviour are shaped by nation-specific compositional and contextual factors including the level of social inequality and proportion of the population that is disadvantaged, the timing and pace of the transition to adulthood, prevailing norms relating to gender and young people's sexuality and capacity for parenthood, and the opportunities that are available to, and perceived to be accessible by, young people.

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1 INTRODUCTORY COMMENTS

This PhD came about following discussions with Nathalie Bajos at Inserm, the French National Institute of Health and Medical Research, about stark, yet not well understood, differences in abortion rates among young women between Britain and France. Up to that time my research background was in demography and population health, and my previous research had focused on sexual and reproductive health: male circumcision for HIV prevention in sub-Saharan Africa; sexual behaviour change following voluntary counselling and testing for HIV in Tanzania; attitudes to abortion and its legalisation in West Africa; and recourse to abortion, and post-abortion contraceptive use, in three south London boroughs. A project exploring differences in abortion rates among young women between Britain and France fit with my research background and my desire to pursue more research in industrialised country contexts. Having spent some time living and working in France, and being a French speaker, this was also a project that I was well placed to undertake.

I wrote a short proposal outlining the rationale, aims and scope of the PhD research, with input from my supervisors, Emma Slaymaker, Nathalie Bajos and Kaye Wellings, and my advisor Cath Mercer, and was subsequently awarded doctoral funding from the Economic and Social Research Council.

The first year of the PhD was spent developing the project: further reviewing the literature, refining the aims and objectives, obtaining the data from various sources, developing a work plan, and running some preliminary analyses. Following my upgrading seminar, I was advised not to include in the PhD a qualitative component that I had planned; given that the quantitative component included the analysis of both routine and survey data from two countries, I would not have had time to also incorporate a sophisticated qualitative component, with data collection in two countries. Following the upgrading process, and as the PhD progressed, I also drew further on sociological theory to inform the way I interpreted and situated my findings.

Over the course of my PhD I took opportunities to undertake research abroad. I first spent three months in Paris, working more closely with Nathalie Bajos and attending meetings and seminars in the Department of Gender, Health and Sexuality at Inserm. This time was invaluable as it allowed me to discuss my ideas and results with colleagues and other doctoral students in the department, and I received useful feedback from new perspectives when I presented my research at the departmental seminar. Through conversations with French colleagues I gained new insights into the social and contextual factors shaping young people's sexual behaviour, contraceptive use, and abortion decision-making.

I was also able to spend three months working with Laura Lindberg at the Guttmacher Institute in New York. Most of my time there was spent examining underreporting of abortions in the US National Survey of Family Growth. The analyses considered how survey methodology might influence reporting of abortions in surveys. That project informed my approach to examining underreporting of abortions in Britain and France in my PhD research, in that I incorporated a greater focus on survey methodology that I had initially proposed. I also spent some time analysing the Abortion Patient Survey (APS), a nationally representative sample of abortion patients in the US. This was an invaluable opportunity to work with a very high quality dataset on abortion in a third country context. The APS survey collects some information not collected in the British and French surveys that I analysed for my PhD research, such as the experience of disruptive life events and the amount of time taken to make the decision to have an abortion. Although I could not study these using my data, working with this US data helped me to better understand the complexity of the many factors involved in abortion decision making. Learning about reproductive health in the US, which is a very different context to my comparison, helped me to better understand the specificities of the Franco-British contexts and gave me a more comprehensive understanding of the cultural and institutional context in a third industrialised country. I was able to present my PhD research to the Guttmacher team, and again, received constructive comments and fresh perspectives on my findings and interpretation.

Upon my return from both overseas visits, I was equipped to undertake the final stretch of the PhD with a more comprehensive knowledge of all the disciplines I was drawing on and the particularities of the social contexts I was working in, gained from conversations, feedback from colleagues on work I had presented, and from being immersed in new environments.

2 INTRODUCTION

It has long been recognised that conception and abortion rates among women aged under 20 in Britain are high compared to those of other European countries (Sedgh et al. 2015; Kane & Wellings 1999). Across Europe, the conception rate among young people began to decline in the 1970s, but whilst in many other Western European countries this decline continued through subsequent decades, this trend was not seen in Britain until the mid-2000s (Wellings et al. 2016; Kane & Wellings 1999; Social Exclusion Unit 1999). Whilst a significant body of research has examined factors associated with conception and abortion among young people in Britain, fewer studies have capitalised on the potential of cross-national research to increase our understanding of the British situation (Bajos et al. 1995; Singh et al. 2001; Darroch et al. 2001). In this PhD research, Britain and France were chosen for comparison because whilst they are similar in many ways, they have very different rates of conception and abortion among under 20s, and also differ in some important ways that affect young people's lives.

The conception rate among under 20s in France is closer to the average among Western European countries (Avery & Lazdane 2008). The conception rate among women aged 15-19 was 25 per 1,000 in France in 2011, compared to 47 per 1,000 in England and Wales (Sedgh et al. 2015). Among those who do become pregnant, young women in Britain are less likely to have an abortion than those in France; 42% of conceptions to 15-19 year-olds in 2011 were terminated with abortion in England and Wales compared to 61% in France (Sedgh et al. 2015). The higher conception rate in England and Wales means that the abortion rate is higher than in France, despite the lower proportion of conceptions that end in abortion. Comparing separate trend analyses for each country shows that the difference in conception rates between the two countries widened between the 1970s and 1990s, and only began to show signs of narrowing from the mid-2000s onwards (Prioux & Barbieri 2012; Kafé & Brouard 2000; Kane & Wellings 1999; Wilkinson et al. 2006).

In both countries, disadvantage is associated with experiencing conception and abortion aged under 20. Young people with a lower level of education, and with parents from a lower socioeconomic group have been found to be more likely to experience conception before age 20 (Wellings 2001; Le Van 2006; Kneale et al. 2013; Bonell et al. 2005), and less likely to terminate such a pregnancy with abortion (Lee et al. 2004b; Sihvo et al. 2003; Le Van 2006). Area-level disadvantage is also important. In Britain, conception rates are higher, and the proportion of conceptions that end in abortion is lower, in more deprived areas (Wilkinson et al. 2006; Conrad 2012; McLeod 2001; Diamond et al. 1999). In France, less research has been published on this. Abortion rates among women of all ages have been shown to vary by region (Vilain et al. 2010; Mazuy et al. 2014), but little is known about area-level variation in conception rates and abortion rates among young people, or about whether conception and abortion rates are specifically associated with area-level deprivation.

Individual, community and societal health status is affected not just by individual characteristics and behaviours, but by the social, economic and political environment (Sommer & Parker 2013). Structural factors also shape and constrain individual decisions, and therefore shape health behaviours and health outcomes; individuals' decisions are bounded by structural constraints and available resources – at the individual, familial and community level – and by opportunities (Pavis et al. 1998). Otherwise said, decisions do not exist in a social or cultural vacuum, or reflect unconstrained individual choice. Comparative studies are well suited to examining the effects of such social contextual factors. A cross-national comparison enables the role of country-level social context to be explicitly examined, something that is more limited when comparing groups within a country. Differences in sexual health status across countries both reveal and can tell us much about the role of social contextual factors and how they might influence and shape experiences of sexuality in different settings, an area which has been less well documented in the literature to date (Parker & Aggleton 2007; Wellings et al. 2006; Simon & Gagnon 1986).

The choice of countries in this comparison is theoretically informed. Britain and France are in many ways similar. They are geographically close and are share economic and socio-demographic similarities. The size of their economies, in terms of Gross Domestic Product, is similar, both at around 35,000 USD per capital in 2010 (OECD 2010). The health systems in both countries aim to provide universal health care coverage. In Britain, the National Health Service (NHS), funded largely by taxes, provides universal free-of-charge healthcare (Cylus et al. 2015), whilst France operates a health insurance system with contributions from employers and employees, and free public coverage for individuals whose incomes fall below a certain level (Chevreul et al. 2015). However, Britain and France also differ in some important ways that affect young people's lives. Although the two countries are very similar in terms of the size of their economies, income inequality is greater in Britain than it is in France. The ratio of the average income of the richest 10% compared to that of the poorest 10% is 9.1 in France compared to 13.8 in Britain (in the US it is 15.9) (UNDP 2009). Income inequality has been increasing in many OECD countries, however its increase has been less marked in France than in Britain. In most countries the wages of the 10% best paid workers have risen relative to those of the 10% lowest paid, but France was one of the few exceptions (OECD 2011a). In addition, redistributive strategies aiming to reduce socioeconomic inequality are considered to have been pursued more effectively in France than in Britain (OECD 2011a). Socioeconomic inequality could be important in explaining between-country differences in conception and abortion rates. Where income inequality is greater, so are social differences and so social stratification becomes more evident (Wilkinson & Pickett 2009).

The focus of this research is on the teenage years, a time when young people make the transition into adulthood. This transition is experienced differently in Britain and France, with the focus in Britain being on a rapid transition to independence, whilst in France youth is considered as a period of investment, with a focus on education (Van de Velde 2008). We can consider these country-level differences in the context of young parenthood and socioeconomic disadvantage. Parenthood can be an alternative means of attaining an adult social status among young people

for whom more traditional routes, through education and employment, seem less evident (Le Van 1998; Arai 2008). Young people may therefore be more motivated to avoid pregnancy if they have a reasonable expectation of their opportunities for inclusion in society. In a context where there is a wide gap between the richest and the poorest, these expectations may become less reasonable among the more disadvantaged. In the British context of a rapid transition to adulthood, which encourages early independence, early parenthood can be compatible with the goal of attaining an adult social status, whereas in France it goes very much against the prescribed social order.

Sexual behaviours and reproductive decision-making take place in the context of gendered power relations; gender norms and expectations of young men and women can therefore be expected to have a significant impact in shaping these processes in young people's lives (Marston & King 2006). Differences between countries in social norms, macro-level gender equality and gender roles – the expectations that apply to individuals based on their socially-identified gender (Eagly 1987) – might therefore lead to differences in men and women's behaviours. Previous research on men and women's reporting of sexual behaviours in European social surveys suggests that at a country level, where gender inequality is greater there is a stronger sexual double standard between men and women, and reported sexual behaviours show greater divergence between the sexes (Bajos & Marquet 2000). Gender differences in reported sexual behaviours might therefore be important markers of the state of gender relations.

Bajos et al. (2003) and Rossier et al. (2007) highlight the importance of considering recourse to abortion as a pathway, taking into account both the determinants of unintended pregnancy and the determinants of recourse to abortion. Differences in the conception rate will therefore be determined in part by the proportion of young people that is sexually active, and the prevalence and effectiveness of use of contraception. Differences in the abortion rate will be further determined by young women's decisions regarding abortion and their ability to access such

services. Examining each stage in the pathway to abortion from a comparative perspective allows us to do three things: firstly, from a purely 'technical' perspective, it enables us identify at which stage(s) (sexual behaviour, contraceptive use, (unplanned) pregnancy and recourse to abortion) differences between the two countries are driving the differences in conception and abortion rates. At a broader level, this approach allows us to explore the background behind these disparities in terms of individual level social characteristics, taking into account that social characteristics may exert different effects at different stages, in different countries, and in men and women. Finally, considering how this might differ between the two countries allows us to reflect on what this means in terms of the roles of social-contextual factors in shaping these processes.

This is important because we know that sexual health outcomes show significant variation between countries. In a comparative study of five developed countries, Singh et al. (2001) found substantial differences in adolescents' sexual behaviour and reproductive health outcomes between France, Great Britain, the US, Canada and Sweden; the proportion of 18-19 year-olds reporting ever having had sex ranged from 67% in France to 80% in Sweden, and non-use of contraception at first sex ranged from 25% in the US, 22% in Sweden, 21% in Britain to 11% in France. Socioeconomic characteristics can come into play at each stage in the pathway to abortion. In Britain and France, certain socioeconomic characteristics are known to be associated with sexual activity, contraceptive use, pregnancy, and abortion decision-making among young people (Bonell et al. 2006; Wight et al. 2002; Wight et al. 2006; Wellings et al. 2001; Bozon 2012a; Moreau et al. 2006; Lee et al. 2004a; Le Van 1998).

We do not know whether associations between socioeconomic characteristics and sexual and reproductive behaviours are the same in Britain and France. Singh et al's five country comparative study, using national-level aggregated data, found between-country differences in variations in sexual health outcomes according to socioeconomic characteristics. For example, non-use of contraception at first intercourse differed according to socioeconomic indicators in

Britain and the US, but not in France (Singh et al. 2001). This suggests that the effects of socioeconomic characteristics may not be the same in different country contexts. This, combined with the differences in levels of socioeconomic inequality between Britain and France, makes a compelling case for examining this further. It is possible that in a context of greater socioeconomic inequality, where the gap between the richest and the poorest is large, being disadvantaged has a greater impact on sexual and reproductive health outcomes than in a more equal context, possibly through motivations to avoid pregnancy. It is also possible that differences in prevalence of sexual and reproductive health outcomes are the consequence of a 'compositional' effect, whereby greater income inequality would lead to greater prevalence of these sexual and reproductive health outcomes simply because of the relatively larger proportion of the population that is disadvantaged.

Differences between countries may also reflect other elements of the social context besides levels of income inequality. Cultural norms related to the transition to adulthood shape attitudes to, and acceptability of, young parenthood, and consequently may shape behaviours and motivations to avoid pregnancy and parenthood. More unequal gendered power relations might translate into a greater social control over young women's sexuality (Bozon 2012a), including societal representations of their capacity for motherhood (Durand et al. 2002), and these norms will also shape young people's behaviours, motivations to avoid pregnancy and recourse to abortion. We might expect to see greater gender differences in either the prevalence of sexual and reproductive health outcomes, or in their associations with socioeconomic characteristics, in contexts where gendered social norms are stronger.

This PhD research seeks to explore how proximal and contextual factors shape conception and abortion rates among under 20s by comparing two countries, Britain and France. I will draw on two sources of data: routinely-collected data on births and abortions, and nationally-representative survey data. I will use the routine data to describe rates, trends, and area-level variation in conception and abortion rates within and between the two countries. I will use the

survey data to examine differences between the two countries in behaviours and outcomes at each stage of the pathway to abortion (sexual activity, contraceptive use, pregnancy and recourse to abortion), and the associations with socioeconomic characteristics at each stage. This research takes a multi-disciplinary perspective, drawing on the approaches of demography, sociology and public health research to come to a fuller and more nuanced understanding of these aspects of teenage sexual and reproductive health. Although much of the data that I draw on are at individual level, the comparative nature of this research allows me to interpret the results with reference to the wider social context, reflecting on what similarities and differences between countries in results from individual-level analyses can tell us about what is happening in the social context in which these events are taking place.

SPECIFIC AIMS AND RESEARCH QUESTIONS

1. Assess the extent of under-reporting of abortions in surveys in Britain and France by comparing with routine data:
    - To what extent were abortions under-reported in Britain and France in the 2010 surveys?
    - Does reporting of abortions in surveys differ between Britain and France?
    - Does survey methodology affect abortion reporting?
2. Estimate and describe variation and trends in conception and abortion rates among under 20s within and between Britain and France:
    - How do contemporary conception rates, abortion rates and abortion ratios among under 20s compare between Britain and France?
    - How have these rates changed over time in Britain and France?
    - How do the rates vary geographically within and between Britain and France?
3. Describe differences between Britain and France at each stage in the pathway to abortion:
    - How do differences in sexual activity and contraceptive use contribute to differences in the conception and abortion rate?
    - How do differences in the propensity to have an abortion in the event of conception contribute to differences in the abortion rate?
4. Examine the association of socioeconomic characteristics with outcomes at each stage of the pathway to abortion (sexual activity, contraceptive use and recourse to abortion):
    - What are the socioeconomic correlates of each stage of the pathway to abortion in Britain and France?
    - Do these associations differ between the two countries?

5. Explore how country-level social contextual factors, and particularly social inequality, shape sexual behaviour, contraceptive use and recourse to abortion:
    - How might structural and social contextual factors shape sexual behaviour, contraceptive use and recourse to abortion among under 20s?
    - To what extent might differences in country-level social contextual factors contribute to between-country variation in conception and abortion rates among under 20s?

STRUCTURE OF THIS THESIS

The data sources and methodology used to address the aims and objectives of this research are presented in Chapter 4.

Objective 1 is addressed in Chapter 5, where I assess the extent of underreporting of abortions in Britain and France, and consider how this might be affected by differences in survey methodology. The first two parts of Objective 2 are addressed in Chapter 7, in which I describe current rates and trends over time in conception and abortion among under 20s in Britain and France, and the third part of Objective 2, to consider differences in area level variation in conception rates and the abortion ratio in Britain and France, is addressed in Chapter 10. Objective 3 is considered in Chapter 7, where I describe differences between Britain and France in sexual activity, contraceptive use and recourse to abortion and discuss how these might contribute to the differences between the two countries in conception and abortion rates among under 20s. Objective 4 is addressed in Chapter 9, where I examine the association between socioeconomic characteristics and each stage of the pathway to abortion, and assess whether this differs between Britain and France. Finally, Objective 5 is considered throughout this thesis. Chapters 7-10 each reflect on how social and contextual factors might shape young people's behaviours and decisions at each stage in the pathway to abortion, and discuss how country level differences between Britain and France might be implicated in the differences in conception and abortion rates among under-20s between the two countries.

The majority of the results sections of this thesis (Chapter 5 and Chapters 7-10) follow the research paper style, with research articles prepared for publication incorporated into broader Chapters. Some detail that will not be included in the papers submitted for publication has been retained in these Chapters, and some results that will not be presented in the papers submitted for publication are presented in Appendices. The exception to this is Chapter 6, which presents results that are not intended to be published but are important in setting the scene for the

comparison between Britain and France. Inherent in this style of thesis is some repetition in the Introduction and Methods sections of some Chapters.

Finally, Chapter 11 brings together the results from each of the preceding Chapters, and provides an overview of the implications of the findings for research and practice.

One reference list is used for the whole thesis, rather than for each Chapter.

A note on country terminology: The Abortion Act of 1967 covers England, Wales and Scotland but not Northern Ireland, and for that reason I do not consider the case of Northern Ireland in this research. As abortion statistics are collected by a different body in Scotland to in England and Wales, most published statistics and analyses include England and Wales only. Some other indicators, for example OECD country indicators, are for the United Kingdom, and include England, Wales, Scotland and Northern Ireland. In my analyses, the survey data that I use covers England, Wales and Scotland, but the routine data covers only England and Wales. The interest of this research is in Britain, and so throughout the thesis I refer to Britain when discussing the research in its broader context. However, in all instances where I present data or reference other research, I refer to the specific country/ies that it relates to.

3 BACKGROUND

3.1 RATES AND TRENDS IN CONCEPTIONS AND ABORTIONS IN BRITAIN AND FRANCE

Abortion rates among under 20s are higher in Britain than they are in France. The abortion rate among women aged 15-19 was 20 per 1,000 in England and Wales in 2011, compared to 15 per 1,000 in France (Sedgh et al. 2015). The abortion rate among under 20s in England and Wales is the highest in Europe (Sedgh et al. 2015). Not only are the abortion rates very different in Britain and France, but trends over time in abortion rates among under 20s have also been different. A number of studies in each country have examined trends in abortion rates over different periods of time. In each of these analyses, the data used to examine trends were obtained either directly from the departments of health or statistics in each country, or compiled from official sources such as the United Nations Statistical Division's Demographic Yearbook, and the French Ministry of Social Affairs and Health. Abortions are notifiable in both Britain and France, and the data provided by these sources are considered reliable. Together, those studies show that in Britain, the abortion rate has fluctuated; it increased slightly between 1980 and 1990, was in decline until 1995 and subsequently increased again. It was relatively stable throughout the late 1990s and early 2000s, and decreased from the late 2000s until 2012, the most recent data published in the literature (Wellings & Kane 1999; Sedgh et al. 2015; Sedgh et al. 2012; Kane & Wellings 1999; Girma & Paton 2015). In France, the abortion rate among 15-19s declined gradually but steadily in the 1970s and 1980s, showed a slight upturn in the mid-1990s (Rossier et al. 2009), and levelled off from 2006 (Prioux & Barbieri 2012).

The abortion rate cannot be considered alone; it is determined by both the conception rate and the abortion ratio (the proportion of conceptions that end in abortion). Differences between countries and over time, therefore, may be due to differences in the conception rate, differences in the abortion ratio, or both. For example, in France, the upturn in the abortion rate among under 20s since the early 1990s, rather than reflecting an increase in unplanned pregnancies,

reflects a period during which the conception rate among under 20s stabilised but the propensity to terminate a conception with abortion continued to increase (Kafé & Brouard 2000). Among those who do become pregnant, young women in Britain are less likely to have an abortion than those in France; 42% of conceptions to 15-19 year-olds in 2011 were terminated with abortion in England and Wales compared to 61% in France (Sedgh et al. 2015). The differences in the abortion ratio and conception rates are such that the abortion rate among under 20s is higher in Britain than in France.

3.2 PREVIOUS RESEARCH CONSIDERING CONCEPTION, PARENTHOOD AND ABORTION AMONG UNDER 20S IN BRITAIN AND FRANCE

A systematic review in 2007 of individual-level factors associated with teenage pregnancy in the European Union found that the most consistent factor associated with pregnancy before age 20 was low socioeconomic status (Imamura et al. 2007). Social disadvantage refers to a range of social and economic difficulties that an individual can face — such as unemployment, poverty, and discrimination — and is distributed unequally on the basis of sociodemographic characteristics such as socioeconomic position, employment, educational level, and place of residence (Harden et al. 2009), but also non-economic aspects such as gender, age and ethnicity (World Health Organization 2010). Among young people, education can a useful measure of disadvantage, although it is limited by the fact that many young people won't yet have completed their educational trajectories. Young people's socioeconomic status can be more difficult to measure as they will not fully establish their socioeconomic position until they are older. For this reason, studies interested in social disadvantage among young people often use parental characteristics, such as income, socioeconomic position or housing tenure, as an indicator of the young person's socioeconomic position. Information on young people's socioeconomic position adds to our understanding of disadvantage because it tells us about social background, which may influence health over and above its influence though educational level. Lower educational level, along with disrupted family structure and low aspirations, were

also associated with pregnancy before age 20. Other factors examined in the review were risk-taking behaviours, sexual health knowledge, attitudes and access to services, but these independent effects of these variables on pregnancy before age 20 were less clear. Of the 20 studies that met the inclusion criteria, most (twelve) were conducted in the UK, seven in the Nordic countries and one in Hungary.

Educational measures have consistently – across studies and over time – been found to be associated with conception and parenthood at young ages in Britain. An early analysis by Kiernan (1997) used data from the National Child Development Study, a longitudinal study of children born in 1958 (and so aged 20 in 1978), to examine social characteristics associated with becoming a mother before age 20, or a father before age 22. This analysis found that both men and women with lower educational attainment scores at age 16 were more likely to become young parents, after adjusting for potential confounding factors including whether their mother had a first child under 20, their social class at age seven, and their family-level financial situation at age seven and 16 (as reported by their parents). This data has the advantage of containing life history information that is not retrospectively reported, but the data were collected in a different context from today and pertains to individuals who were teenagers nearly thirty years ago. More recent studies have also found an association between educational measures and conception and abortion in Britain. Bonell et al. (2005) also used longitudinal data, from girls in two school-year cohorts in 27 mixed-sex comprehensive schools in central and southern England within a cluster trial of sex education. Baseline data were collected in 1997 when the respondents were 13 to 14, and were followed up one year and two years later. Their analysis found that girls who reported disliking school, but not those who were ambivalent about school, were more likely to report a pregnancy by the end of the follow-up period. This association remained significant after adjusting for socio-economic status based on accommodation (whether the family lived in non-privately owned housing) but not employment (whether or not neither parent was in full time employment). A potential limitation of this study is bias in the selection of the sample if pupils who did not take part because they were not at school are more

likely to dislike school; however, this would lead to an under-, not an overestimate of the association between dislike of school and pregnancy. A recent analysis of two birth cohort studies and a school year cohort study (the National Child Development Study, NCDS, respondents born in 1958; the British Cohort Study, BCS70, born in 1970, and the Longitudinal Study of Young People in England, LSYPE, born in 1989-90) found that in the first two cohorts, but not the youngest cohort, dislike of school was associated with becoming a mother as a teenager (Kneale et al. 2013). This same analysis found that, in all three cohorts, girls who expected to leave school at the minimum age, as reported at age 16, were also more likely to report becoming a mother before age 20. A limitation of this analysis, noted by the authors, is that loss to follow-up meant that the women in the analytical sample were more advantaged and more likely to be engaged with school than the population as a whole. If those that were lost to follow-up were also more likely to have become mothers, this bias may have resulted in an underestimate of the associations found with educational indicators. Fertility rates for each cohort were also lower than official estimates, which may also reflect the composition of the sample, or may be indicative of under-reporting of births. Analysis of the second National Survey of Sexual Attitudes and Lifestyles (Natsal-2), a nationally representative probability survey conducted in 1999-2000, found that among women aged 18-24, those who left school at age 16 were more likely than those who left school aged 17 or over to report motherhood before age 18 (Wellings et al. 2001). In this data, educational level was not associated with reporting an abortion before age 18. This cross-sectional data, in which all exposures and outcomes are self-reported, may suffer from both recall and social desirability bias. However, reporting of abortions in Natsal-2, and so likely reporting of pregnancies too, has been shown to be good compared to official estimates (Copas et al. 2002) and limiting the analytical sample to 18-24 year olds minimises the impact of recall bias on reporting.

Indicators of socioeconomic status based on parental characteristics have been found to have a less consistent association with pregnancy, parenthood and abortion before age 20 in Britain. A number of analyses have found that if there is an association, it is no longer significant after

adjusting for respondent level of education. This is informative to the extent that it suggests that much of the influence of socioeconomic status may be working through its association with education, however a lack of statistical significance in adjusted analyses does not render the crude association with socioeconomic status unimportant in real terms. Although in population level analyses we can estimate associations 'all things being equal', the very fact that socioeconomic status is complex and multidimensional, and that indicators of socioeconomic characteristics are heavily intertwined means that in reality we cannot 'remove' the association, and therefore crude associations, particularly with regard to social characteristics, remain very relevant (see Peretti-Watel, 2004). Kiernan's (1997) analysis of the NCDS found that, after adjusting for educational attainment and mother's age at first birth, becoming a mother before age 20 was associated with family financial difficulties when the respondent was aged seven or 16 (as reported by their parent at that time) but not with father's social class (derived from his school leaving age and his occupation when the respondent was aged seven). Becoming a father before age 22, however, was associated with both family financial difficulties and father's lower social class. Bonell et al's (2005) longitudinal analysis found that young women resident in social housing and where neither parent was in full time employment were more likely to report a pregnancy by the end of the follow up period, after adjusting for dislike of school, expectations for the future, confidence, and knowledge about sex and contraception. Kneale et al.'s (2013) analysis of three cohort studies found the same association between residence in social housing and reporting of motherhood before age 20, but that father's social class was a weak and inconsistent predictor of motherhood before age 20 across the three cohorts. Wellings et al. (2001) found that parent socioeconomic status (derived from occupational type) was not associated with either motherhood before age 18 or abortion before age 18. The less consistent association of parental characteristics with pregnancy, parenthood and abortion before age 18, particularly in more recent data, may reflect the declining influence of the family in contemporary society, relative to the growing influence of peers and the media (Bozon 2013). It may also reflect difficulties in capturing information on parent socioeconomic status,

particularly where this information is reported by respondents, not their parents. In the NCDS, the BCS70 and the LSYPE cohorts, this information was collected directly from the parents when the respondent was a child, and so is more likely to be accurately recorded. However, the cross-sectional nature of the Natsal-2 data means that this information was collected from respondents, not their parents, based on questions about their parents' occupation when the respondent was aged 15. This may suffer from misclassification if the respondent is unable to accurately report this or does not know their parent's occupation. Older respondents may not remember what their parent's occupation was when they were a child. Even if this misclassification is random, this would still likely result in an underestimate of the association between parental socioeconomic characteristics and pregnancy outcomes.

Compared to Britain, there are fewer studies that have examined the socioeconomic characteristics associated with conception, parenthood and abortion among under 20s in France. Sihvo et al. (2003) found in an analysis of a nationally-representative population survey that among women aged under 25 who had had an unintended pregnancy that ended in either birth or abortion, those with a higher level of education or whose partner had a higher level of education were more likely to have terminated the pregnancy with abortion. In an analysis of the 2007 French national abortion statistics, Vilain et al. (2010) found that among 15-19 year-olds, young women who were not currently in education were overrepresented. An analysis of 62 women aged under 18 delivering at one hospital in Paris found that women with no education were over-represented in this sample compared to the wider population (Faucher et al. 2002). Another small study described the characteristics of fourteen young women aged 16-21 – seven who had carried a pregnancy to term and seven who had had an abortion – recruited from family planning centres, children's homes and abortion providers, and of eighteen women of the same age who had never been pregnant, recruited from secondary schools. More of the women who had been pregnant had encountered difficulties in their schooling than the women who had never been pregnant. The small and geographically-limited sample sizes of these descriptive studies means that their generalisability to other settings is limited, and the absence of formal

statistical testing means that the results must be interpreted with caution. Two qualitative studies in France have shed some light on the social characteristics shaping pregnancy and abortion among young women. A key theme that emerged in Le Van's (1998) semi-structured interviews with 28 women aged between 16 and 29 in Calvados, Northern France, who fell pregnant before age 20 was the social recognition conferred by pregnancy and parenthood. Both pregnancy and motherhood were more common among young women who had more limited educational opportunities and who came from more disadvantaged communities. This was also highlighted by Durand et al. (2002) in a qualitative study exploring recourse to abortion among thirteen young women aged between 18 and 20. Women who were more invested in their educational trajectories expressed greater motivations to delay parenthood, and so terminate a pregnancy with abortion. These qualitative studies allow a more in depth exploration than quantitative analysis of how and why social characteristics affect pregnancy and abortion decision making among young women. They will be discussed in more detail later in this Chapter.

Other individual level factors besides socio-economic characteristics have also been shown to be associated with pregnancy, parenthood and abortion among under 20s. Analysis of the Labour Force Survey in the United Kingdom found that birth rates among 15-19s were higher among Caribbean, Pakistani and Bangladeshi women, and lower among Indian women, compared to white women (Berthoud 2001). In England, a study of area level variation in conception and abortion rates among under 20s found that areas with high proportions of ethnic minorities had higher rates of teenage conceptions in 1994-6 and 1997-9, but that this association was not significant after controlling for area level deprivation (Bradshaw et al. 2005). Differences observed in pregnancy and abortion rates between ethnic groups may be related to cultural attitudes. A qualitative study of seventy five Indian, Jamaican and Bangladeshi young people living in London, Birmingham and Manchester, found that attitudes to pregnancy, parenthood and abortion varied between ethnic groups (French et al. 2005). Although sex before marriage is becoming more common among Indian and Bangladeshi young people, there

remained a strong social norm against unmarried parenthood and abortion, whereas young parenthood was more accepted among Jamaican young people. In France information pertaining to racial or ethnic origin is not routinely collected, and as such it is difficult to know whether ethnicity is associated with pregnancy and pregnancy outcomes before age 20. Few studies in Britain or France have explored the association of religious affiliation, practice or importance with reproductive outcomes among young people, but some have examined the association between religion and sexual behaviours and contraceptive use (Moreau, Trussell, et al. 2013; Coleman & Testa 2008). These are described in Section 3.5. In Britain, young women whose own mothers were young when they had them were more likely to become young mothers themselves (Kneale 2009). Wellings et al. (2016) found that young women who did not live with both their natural parents until age 15 were more likely to report a conception before age 18 than those who did.

Area-level disadvantage is also associated with conception and abortion rates among young people. Numerous studies in Britain show consistently that young women living in deprived areas are more likely to become pregnant before age 20 than those living in more affluent areas (Conrad 2012; Diamond et al. 1999; McLeod 2001; Wilkinson et al. 2006; Humby 2013; Uren et al. 2007). Wilkinson's analyses also show that the proportion of conceptions that end in abortion is higher in more deprived area. These studies, using data from between 1981 and 2010, show an association between area-level deprivation and conception and abortion among young people that has persisted over time. Fewer studies have examined area-level differences in conception or abortion rates explicitly in France, but researchers have noted regional disparities in contemporary abortion rates among all women (Mazuy et al. 2014; Vilain et al. 2010) and among 15-17 year-olds (Vilain 2015). It is unknown whether this regional variation is due to differences in conception rates, or in the propensity to have an abortion or accessibility of abortion services. In Britain, deprivation is unevenly distributed at a geographical level. In England, areas of high deprivation are found in extended urban areas, areas that historically relied on industry, manufacturing or mining, coastal towns, and some areas in London

(Department for Communities and Local Government 2015). Deprivation is also spatially patterned in France. Northern France is more deprived than the rest of the country and the Paris area is relatively less deprived (Rey et al. 2009).

3.3 CONSIDERING ABORTION AS A PROCESS

Early work on the determinants of fertility by Davis and Blake (1956) and Bongaarts (1978), discussed the proximate determinants of fertility, both behavioural and biological. Bongaarts lists nine proximate determinants of fertility: percentage of women in union, frequency of sexual intercourse, postpartum abstinence, lactational amenorrhea, contraceptive use, induced abortion, spontaneous intrauterine mortality, natural sterility, and pathological sterility. The contribution of many of the above listed factors in determining fertility among young women in Britain and France, where early marriage is rare, natural and pathological sterility are very low among young people, and pregnancy prevention among those sexually active is more likely to be through contraceptive use than post-partum abstinence and lactational amenorrhea, is likely to be negligible. However, sexual activity, contraceptive use and the propensity to have an abortion are all both implicated and measurable.

Abortion is the final point in a multistage process, which starts with sexual intercourse and contraceptive use or non-use on this and later occasions, continues with the occurrence of an unintended pregnancy, and ends with a woman's decision to end the pregnancy and access abortion services (Bajos, Guillaume, et al. 2003; Rossier, Michelot, Bajos, et al. 2007). Considering abortion as a conditional sequence of events takes into account that differences in teenage pregnancy rates may be partly due to the proportion that is sexually active, as well as in the steps that sexually active women take to prevent pregnancy (including contraceptive use, choice of method(s) and the effectiveness with which they are used). The abortion rate is further determined by the fact that those who do become pregnant differ in their likelihood of resolving the pregnancy by abortion (Darroch et al. 2001). Two countries could have high abortion rates for different reasons; if country A had a low conception rate but almost all these conceptions

were terminated with abortion, it could have a similar abortion rate to country B, which has a very high conception rate of which a small proportion end in abortion. Two countries could have similar abortion rates for different reasons, for example a country might have a low conception rate, of which the majority are terminated in abortion, a high conception rate of which few are terminated in abortion, a high proportion of young people sexually active and widespread contraceptive use, a low proportion sexually active but poor contraceptive use among those who are, and so on. This highlights the importance, in understanding variation in conception and abortion rates, to model abortion as a pathway rather than a discrete event.

3.4 DIFFERENCES BETWEEN BRITAIN AND FRANCE IN SEXUAL ACTIVITY, CONTRACEPTIVE USE, PREGNANCY AND PROPENSITY TO HAVE AN ABORTION

A number of cross-national comparative studies have examined differences in sexual behaviours across many countries using national-level aggregated data (Wellings et al. 2006; Madkour et al. 2014), and found differences between countries in both age at first sex and condom use. One key study in this area is a five-country study comparing sexual activity and contraceptive use among under 20s in the US, Canada, Britain, France and Sweden (Darroch et al. 2001). This ecological study, using individual-level survey data from 1986-1996 aggregated to the national level, found substantial differences in adolescents' sexual behaviour and contraceptive use between France, Great Britain, the US, Canada and Sweden. The proportion of 18-19 year-old women reporting ever having had sex ranged from two thirds in France to four fifths in Britain and Sweden, and non-use of contraception at first sex ranged from 25% in the US, 22% in Sweden, 21% in Britain to 11% in France. An analysis of cross sectional survey data from twelve European countries found that variation in age at first sex between countries, ranging from 16.3 in Iceland to greater than 19 in Portugal (Bozon & Kontula 1998). A comparison of sexual behaviours – including condom use, number of sexual partners, and prevalence of sexual practices – in the early 1990s in the context of understanding differences in HIV incidence between Britain and France found only small differences between the two countries (Bajos et

al. 1995), one of which was higher condom use in Britain than in France, among the whole population. However, among young people the findings were less clear; among men, condom use at last intercourse was higher in France, whilst among women, it was slightly higher in Britain. Between-country differences have been found in contraceptive failure rates. Contraceptive failure rates have been found to be lower in France than in the US , suggesting that differences in contraceptive practices between countries may exist (Moreau et al. 2007). Choice of method is also important in pregnancy prevention; nationally representative survey data shows that use of long acting reversible contraception (LARC) is low among young women in France, although it has increased in recent years, from 4.6% in 2000 to 6.4% in 2010 among 15-29 year-olds at risk of pregnancy (Moreau, Bohet, et al. 2013). LARC use is higher in Britain; survey data shows that 18% of sexually active women aged under 20 were using LARC in 2010 (Natsal, unpublished data). As described in detail above, national statistics show that women aged under 20 are more likely to become pregnant in Britain, and the propensity to have an abortion among those that do become pregnant is lower (Sedgh et al. 2015).

3.5 ASSOCIATION BETWEEN SOCIOECONOMIC CHARACTERISTICS AND EACH STAGE IN THE PATHWAY TO ABORTION IN BRITAIN AND FRANCE

Considering abortion as a pathway also allows us to take into account that socioeconomic characteristics can act on any of the stages on the pathway. There is an extensive body of literature, a substantial proportion of which is based on analyses of nationally-representative survey data, on socioeconomic characteristics associated with sexual activity and contraceptive use in developed countries. This section summarises the key studies in Britain and France, focusing on socioeconomic characteristics.

Sexual activity: In a school-based follow up study of young men and women aged 13-14 at baseline in England, respondents were less likely to report sexual initiation at the two year follow-up if they were living in privately-owned compared to non- privately-owned accommodation, and young women were less likely to report this if neither parents were

unemployed compared to one or more (Bonell et al. 2006). Analysis of baseline data from the SHARE study, a school-based randomised controlled trial of sex education in Scotland, found that among 14 year old boys and girls, those whose parents were of lower social class were more likely to have ever had sex (Henderson 2002). This is a particularly young sample, so while it was representative of Scottish 14 year-olds (relative to census data on social class and one parent households) and gives an indication of characteristics associated with 'early' first sex, it may not be representative of the wider population's experiences of first sex. In an analysis of follow-up data at two years of the SHARE study, Wight et al. (2006) found that among 15-16 year-old girls, those whose mother had a higher level of education were less likely to report ever having had sex, after adjusting for socioeconomic and family characteristics. No association was found between reporting ever having had sex and housing tenure, parents' social class, and father's level of education among boys or girls. Wellings et al. (2001) found, in an analysis of Natsal-2 data, that British men and women aged 16-24 with lower educational attainment were more likely to retrospectively report sexual debut before age 16, and that association remained significant after adjusting for parents' social class. Parents' social class was associated with sex before 16, after adjusting for education and other variable, among men but not women. In France, analysis of nationally-representative survey data show that age at first sex was later among more educated groups among all cohorts of men and women, but variations according to parents occupation were much smaller (Bozon 2012a).

Contraceptive use: In Britain, young women with a higher level of education, and living in privately-owned rather than rented or council-owned accommodation have been found to be more likely to use contraception at first intercourse, and to use emergency contraception (Wellings et al. 2001; Wight et al. 2006; Henderson 2002). In Scotland, baseline data from the SHARE study showed that among 14 year old girls, those living in privately-owned rather than rented housing were more likely to report condom use at first sex, and that this remained significant after adjusting for family and socioeconomic characteristics, but no association was found between condom use at first sex and either parent's social class (Henderson 2002). There

was no association between housing tenure, parent social class or parent qualifications and condom use at first sex among boys. Using follow-up (at two years) data from the same study, Wight et al. (2006) found that after adjusting for family and socioeconomic characteristics, girls aged 15-16 whose father had a degree qualification were more likely to report always using condoms or other contraception, and boys whose mother had a higher level of education were more likely to report always using condoms. There was no association between contraceptive use and housing tenure or parents' social class. Wellings et al. (2001) showed using Natsal-2 data that after adjusting for parental socioeconomic status and other family variables, women and men in Britain aged 16-24 were more likely to retrospectively report condom use at first sex if they had a higher level of education. In England, Bonell et al. (2006) found that neither housing tenure nor parental employment were associated with reporting of contraceptive use at first sex among 15-16 year old boys or girls. In France among women of all ages, more disadvantaged women, women living in rural areas or with low education have been shown to more frequently report non-use of contraception. Nationally-representative survey data showed that among women of all ages, 6.5% of manual workers used no contraception compared to 1.6% of executives (Bajos et al. 2012; Rossier, Michelot, Bajos, et al. 2007). Moreau et al. (2010) found, also using survey data, that among women of all ages who had had an abortion, those with contraceptive trajectories of mainly less effective methods were more likely to have a lower level of education, less likely to have private health insurance and more likely to be unemployed than women using highly effective methods. Data from a population-based health survey in France showed that among women aged 15-24, those with a higher level of education were more likely to use emergency contraception than those with a lower level of education (Moreau et al. 2006), and among women aged 18-44, nationally-representative survey data showed that those who reported ever using emergency contraception had a higher educational profile than those who did not (Bajos, Goulard, et al. 2003). Retrospectively-reported condom use at first sex has been found to be lower in France among those with a lower level of education among women aged 15-44, but not men, using nationally-representative survey data collected in 2000

and 2005 (Moreau & Bajos 2005). Data from a nationally-representative survey of women having an elective abortion in France in 2007, collecting data using one questionnaire completed by the midwife or physician and one completed by the women, found that among those aged 13-19, there were no differences in pre-abortion contraceptive use by social and demographic characteristics (Moreau et al. 2011). The non-response rate was 34%, which may have led to bias in the sample, however the authors suggest that the fact that a substantial proportion of the non-response was due to non-response of providers rather than refusal of women, and post stratification to correct for potential non-response bias, helped to improve the representativeness of the sample.

Recourse to abortion: In both Britain and France, qualitative studies have found that among young women who become pregnant, those from more disadvantaged backgrounds were less likely to have an abortion (Jewell et al. 2000; Le Van 2006; Lee et al. 2004a). This is also apparent in Britain at an area level; among those who become pregnant before age 20, a smaller proportion of conceptions are terminated with abortion in more disadvantaged than more affluent areas (Diamond et al. 1999; Conrad 2012; Wilkinson et al. 2006; Uren et al. 2007).

Other characteristics have also been found to be associated with sexual activity and contraceptive use. In Britain, young men and women who reported that their main source of information about sex was school were less likely to report first sex before 16, and more likely to use contraception at first sex (Wellings et al. 2001). Greater parental supervision has been found to be associated with later age at first sex among men and women (Wight et al. 2006), and the same has been found among women in the US (Rosenthal et al. 2001). Natsal-2 data showed that men who reported that they discussed sex with their parents were more likely to report using contraception at first sex, but no association was found among women or with reporting first sex before age 16 among 16-24 year-olds (Wellings et al. 2001). However, analysis of data from the SHARE study in Scotland found that among boys aged 15-16, those who reported that they were very comfortable talking to their father about sex were less likely than

those who felt uncomfortable to report always using condoms or other contraception (Wight et al. 2006). There was no association between ease of communication with mother about sex and condom use or contraceptive use among men or women. In France, analysis of the nationally representative population survey FECOND found that women who reported difficulty discussing contraception and sex with their mothers at age 15 were more likely than those with easier communication to use less effective methods of contraception, after adjusting for social and demographic characteristics and frequency of intercourse (Vigoureux et al., unpublished analyses). Not living with both natural parents whilst growing up has also been found to be associated with earlier first sex in Britain (Wellings et al. 2001; Henderson 2002; Lenciauskiene & Zaborskis 2008; Bonell et al. 2006).

Ethnicity has been shown to be associated with age at first sex in Britain. Wight et al's (2006) analysis of data from the SHARE study in Scotland found that among 15-16 year-olds girls, those of Asian ethnicity were less likely to report ever having had sex than those identifying as White, but that there was no association between ethnic origin and condom or contraceptive use. Natsal-2 data shows that a greater proportion of Black-Caribbean women and men, and a lower proportion of Asian women and men reported first sex aged before 16 than the general population (French et al. 2005). In terms of contraceptive use at first sex, a greater proportion of Black-Caribbean women and men reported that neither partner used any method of contraception at first intercourse compared to the general population (French et al. 2005). In a school-based survey of sexual behaviour, Coleman and Testa (2007) found that among students aged 16-18, Asian boys and girls were least likely to report sex before age 16, but there was no clear association between ethnicity and unprotected sex. Data on ethnicity is not routinely collected in France. Data collected at part of a population health survey in France showed that women and men aged 15-29 reporting regular religious practice at the time they started having sex were more likely to report later first sex and less likely to report using a condom at first sex than those reporting that they had no religion (Moreau & Bajos 2005; Moreau, Trussell, et al. 2013). These associations remained significant after controlling for age and level of education.

For both age at first sex and condom use at first sex, the association with religion was stronger among women than among men. Bozon (2012a) also found, in analyses of data from a different nationally representative survey in France, that among women, those who stated that religion was important in their lives were more likely to report later first sex across all age cohorts, although in this data no association was found between religiosity and age at first sex among men. Coleman and Lester (2008) found a similar pattern in England. Among 3,007 15-18 year-olds who completed a self-administered school-based questionnaire in London, a greater proportion of respondents with no religious affiliation reported ever having had sex, and that this proportion was lower among Hindu and Muslim respondents than Christian respondents. Contraceptive use at first intercourse was lowest among Muslim young women and young men, and was similar between those with no religious affiliation and Christian respondents.

3.6 SOCIAL AND STRUCTURAL DETERMINANTS OF HEALTH

Individual, community and societal health status is affected not just by individual characteristics and behaviours, but by the social, economic and political environment (Sommer & Parker 2013). Social scientists have debated the relative contributions of agency (the capacity of individuals to act independently and make their own free choices), and structure (the recurrent patterned arrangements which limit or influence the choices and opportunities available to them) (Barker, 2005: p448), in determining health behaviours and health outcomes. Structural factors can be broadly defined as the social, economic, political and environmental factors (i.e. those factors that are external to the individual) which influence individual decisions and exposure to risk factors for health outcomes. Considering the influence of structural outcomes on health recognises that 'broad macro-economic processes and social structural inequalities such as class, race or ethnicity, and gender shape the vulnerability of different groups to a range of health conditions' (Sommer & Parker 2013, p.3). At a national level, these structural factors include inequitable power structures, absolute and relative poverty and differential access to resources, the legislative context, public policy and provision, and social norms underpinned by

laws. Social norms are also relevant at a community level, as are inequalities in wealth and resources, access to services and area-level deprivation (Collumbien et al. 2012).

Structural factors shape and constrain individual decisions, and therefore shape health behaviours and health outcomes; individuals' decisions are bounded by structural constraints and available resources – at the individual, familial and community level – and opportunities (Pavis et al. 1998). Otherwise said, decisions do not exist in a social or cultural vacuum, or reflect unconstrained individual choice; individuals act both *on* and *within* that world that they inhabit. Asserting the importance of structure does not render agency passive; Cockerham (2005) argues that individuals 'align their goals, needs and desires with the probabilities for realising them and choose a lifestyle according to their assessments of the reality of their resources and class circumstances'. This is particularly relevant with regard to young parenthood; young people may feel, based on their circumstances and the social context in which they live, that young parenthood is a positive experience.

Scripting theory is a framework that can help us to understand how and why behaviours are shaped by the social context. Gagnon and Simon argued that all social behaviours, including sexual behaviours, are socially scripted, in ways that are specific to particular cultural and historical settings. Social scripts are conceptualised as the representations that individuals construct and use to make sense of their experience (Wiederman 2015).

> '*Scripts are a metaphor for conceptualizing behaviour within social life. Most of social life most of the time must operate under the guidance of an operating syntax, much as language is a precondition for speech. For behaviour to occur, something resembling scripting must occur on three distinct levels: cultural scenarios, interpersonal scripts, and intra- psychic scripts*'. (Simon & Gagnon 1986, p.98)

The level farthest from the individual is the cultural scenario, which sets the context for behaviours. Simon and Gagnon describe cultural scenarios as 'the instructional guides that exist at the level of collective life' (Simon & Gagnon 1986). Cultural scenarios are conveyed through

mass media as well as through cultural institutions such as government, law, education and religion. However, most sexual behaviour is not performed by an individual alone and in the absence of others – sexual behaviour is social. Interpersonal scripts are the 'structured patterns of interaction in which individuals as actors engage in everyday intrapersonal conduct' (Laumann et al. 1994). As such, individuals acquire patterns of sexual conduct that they learn to be appropriate to their own culture or group (the cultural scenario), and at the same time make small adaptations to suit their own needs, preferences and individual and relational situations (in Laumann, Gagnon, Michael, & Michaels, 1994). Sexual conduct involves a reflexive individual interacting socially with others, guided in part by a meaningful system of individually interpreted cultural instructions. Sexual scripts specify with whom people have sex, when and where, what they should do sexually, and why they should do sexual things.

Gagnon and Simon also suggested that men and women inhabit different social locations and so learn different sexual scripts within the same cultural scenario, which places different meanings on the same actions among men and women (in Frith & Kitzinger, 2001). Similarly, this can apply to different social groups, and so can help us to understand why sexual behaviours are often socially stratified. Taken together, sexual scripting theory can help us to understand people's behaviour as it occurs in a specific social and relational context.

The focus in much of the existing research on sexual behaviour, in keeping with much health behaviour research, has been on the individual determinants of sexual behaviour and behaviour change (Parker & Aggleton 2007; Sommer & Parker 2013). Yet this kind of risk-factor epidemiology, in assuming that individuals are free to make choices with regard to their behaviour, risks ignoring the structural factors that shape behaviours and decision-making (Peretti-Watel 2004). Over the latter decades of the twentieth century, the importance of social structural factors in shaping health status became increasingly recognised, with some shift in the focus of public health interventions from behaviour change to structural change (Sommer & Parker 2013). There has been an increasing focus on the 'structural determinants of health'

(Sommer & Parker 2013). However, despite the importance of contextual factors in explaining differences in sexual behaviour within and between populations, there have to date been few empirical attempts to explore the strength and origin of their influence (Madkour et al. 2014). If we consider sexuality to be a product of social and historical influences and behaviours as socially learned, then behaviours, and differences in behaviours between groups, can be revealers of the aspects of the social context that shape them. Considering differences between countries, therefore, which enables the role of social context to be explicitly examined, is likely to be valuable in shedding light on the role of social contextual factors in the context of sexual health.

Considering the role of structural factors is particularly important in research on young people's sexual health, and in particular pregnancy and abortion, because norms, attitudes, expectations and opportunities all play a part. The environment can shape young people's sexual and reproductive behaviours through the presence or absence of future opportunities, levels of socio-economic disadvantage, and social norms (Kotchick et al. 2001). For example, qualitative research by Lisa Arai in England and Charlotte Le Van in France has shown that the meaning of young parenthood is very different between young women from deprived and more affluent backgrounds, and that young women's behaviours were shaped by community norms and attitudes surrounding abortion and young parenthood, and their expectations for their futures (Arai 2008; Le Van 2006). At a national level, differences in the extent of inequality and disadvantage, and opportunities for and expectations of young people, might therefore contribute to cross-national variations in sexual health status and conception and abortion rates. Within Britain, conception rates among under-18s are highest in the most deprived areas (Conrad 2012; Wilkinson et al. 2006; Diamond et al. 1999).

Norms relating to gender also influence young people's sexual health, among both men and women. The social expectations placed on men and women may limit their ability to experience good sexual health, for example through the valorisation of casual unsafe sex among men, or

lower ability to negotiate condom use among women (Marston & King 2006). Considering context is also important in order to understand outcomes as taking place in a specific social and demographic moment. Bajos et al's (2014) study on trends over time from the late 1970s through to 2010 in contraceptive prevalence and the abortion rate in France highlights the importance of considering abortion rates against a background of changing social norms surrounding childbearing, which have taken place in the context of important changes in attitudes to family and sexuality, higher educational achievement among women and increased female participation in the work force. The average age at first birth has increased in France, and changing social expectations of the context of childbearing mean that children are to be 'planned' to fit into the right time in the parents' educational and professional trajectory. Alongside increased socioeconomic instability, particularly among young women, this means that although contraceptive prevalence has increased and unplanned pregnancy decreased, this has not led to a decline in abortion rates, as women increasingly delay first birth (Bajos et al. 2014). This is an example of how macro-level social context and norms shape reproductive behaviours. The influence of specific structural factors on sexual and reproductive behaviours will be discussed in more detail later in Section 3.8.

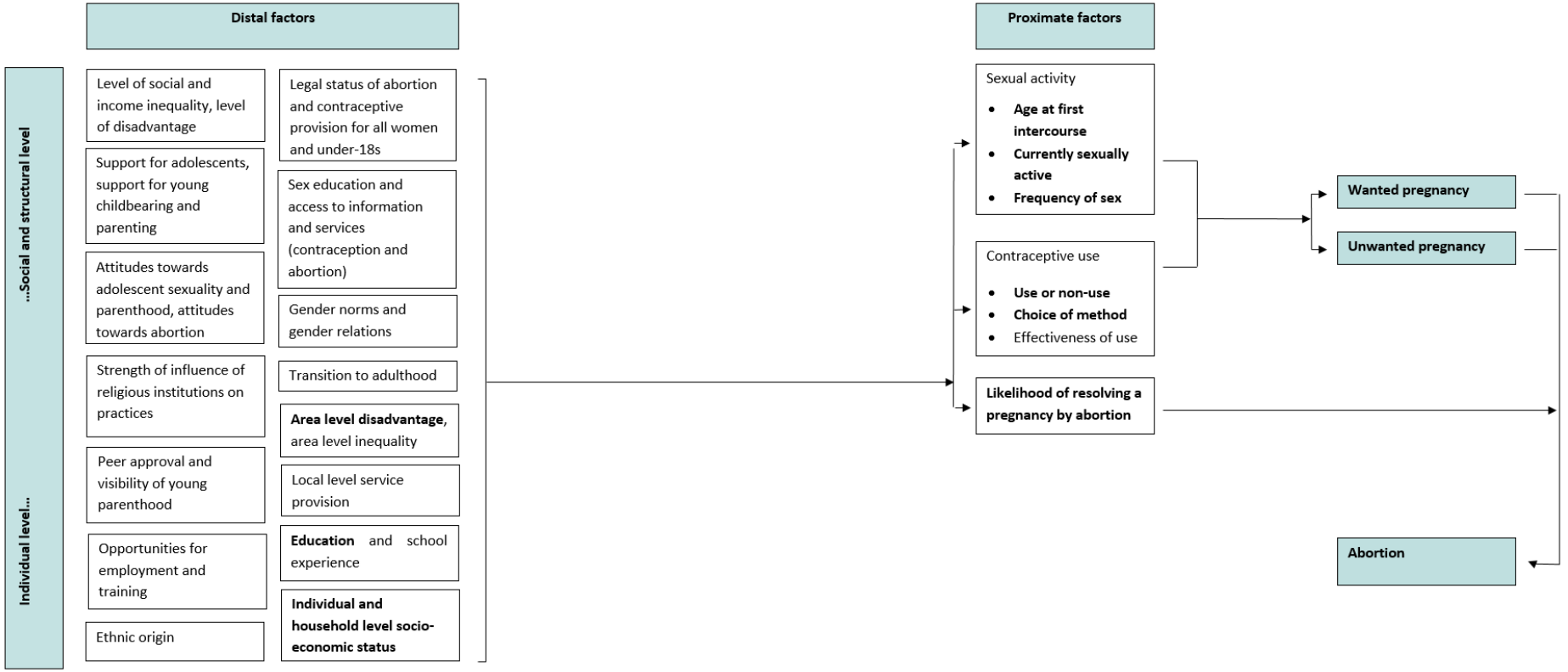
3.7 CONCEPTUAL FRAMEWORK

A framework that considers abortion as being the end-point in a multistage process is a sensible approach to a comparative analysis because it allows us to consider whether different processes might drive variation in conception and abortion rates in different countries. The conceptual framework presented in Figure 3.1 below draws on a model of structure and agency, and makes clear that individual behaviours and decisions are shaped by social contextual factors occurring at the familial, community, societal and legislative level.

This framework captures the double methodological approach of this PhD. I consider abortion as a conditional sequence of events, and take an explicitly comparative perspective in order to

examine differences between countries at each stage. Individual characteristics and social and structural factors may have different impacts at different stages in a pathway towards a particular sexual health outcome. For example, women from more advantaged backgrounds may be at greater risk of sexually transmitted infections or unplanned pregnancy through a greater number of sexual partners, but this risk may be mitigated by the increased likelihood that sex will be protected, and in the event of pregnancy or infection, that health care will accessed. Britain and France may show differences in both the proximate factors driving conception and abortion rates, and in the ways that behaviours are shaped at each stage in the pathway to abortion.

Figure 3.1: Conceptual framework showing factors shaping sexual and reproductive health outcomes among young people. Those influences that can be explicitly examined using the available data are highlighted in bold.



3.8 COUNTRY LEVEL DIFFERENCES BETWEEN BRITAIN AND FRANCE

Income inequality, poverty and social mobility

Average household incomes in Britain and France are similar. The average net-adjusted disposable income (the amount of money that a household earns, or gains, each year after taxes and transfers, representing the money available to a household for spending on goods or services) is 27,029 USD in Britain and 28,799 USD in France (OECD 2013). However, income distribution in the two countries is very different. Several measures are used to define poverty and income inequality. I describe them each in detail below.

Poverty rate: The most commonly used measure of income poverty in Britain and the rest of the European Union is the proportion of individuals in households with an income less than 60% of the median. As this threshold moves in line with the median year on year, it is a measure of 'relative poverty'. This allows the measure to change over time, alongside changes in minimum acceptable living standards which increase as the resources available to a society increase. This measure also allows easy comparison across countries with different income levels (Institute for Fiscal Studies 2015).

Inter-decile ratio: The inter-decile ratio is the ratio of the income of the richest to the income of the poorest (OECD 2011b). It is usually expressed as either the S90/S10, the ratio of the richest 10% of the population to that of the poorest 10%, or the S80/S20, the ratio of the richest 20% of the population to that of the poorest 20%. The higher the ratio, the more unequal the income distribution.

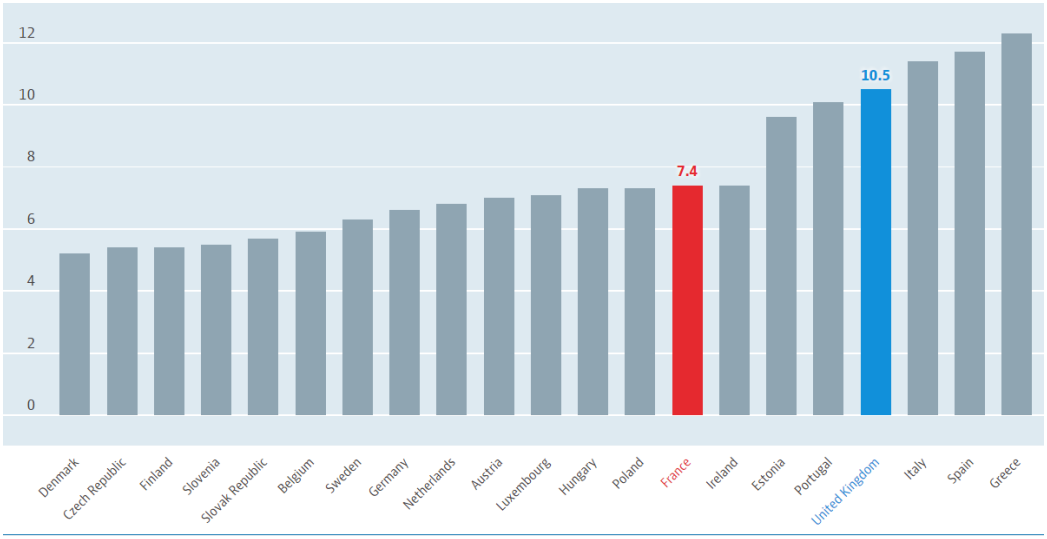
Gini coefficient: The Gini coefficient is the most commonly used measure of income inequality. It takes a value of between 0 and 1, with 1 being complete inequality (one person in a population has all the income, the rest have none) and 0 being complete equality (income is distributed evenly between all members of the population) (OECD 2011b). It is calculated by plotting a Lorenz curve, which maps cumulative income share on the y-axis against the cumulative population share on the x-axis. If each person in a population had exactly the same income, the

plot would be shown as a straight line. The Gini-coefficient is the area between the Lorenz curve and the hypothetical line of total equality, divided by the area underneath the line of total equality (World Bank). It is considered the gold-standard measure of inequality in economics research. It has the advantages of being easy to compute, transparent, and easy to interpret, and readily available for almost all countries.

Despite similar average household incomes in Britain and France, differences in income distribution between the two countries mean that the poverty rate in Britain is higher than the European Union average, at 10.5% whereas in France it is lower, at 8.1% (OECD 2011b). Looking specifically at young people, there are more under-18s growing up in households with incomes less than 60% below the national median in Britain than in France (UNICEF 2014). Note that for consistency across the thesis, I refer throughout this section to Britain, which consists of England, Wales and Scotland. However, the figures presented here are for the United Kingdom, rather than Britain alone. The inclusion of Northern Ireland may increase the poverty rate compared to figures showing Britain alone.

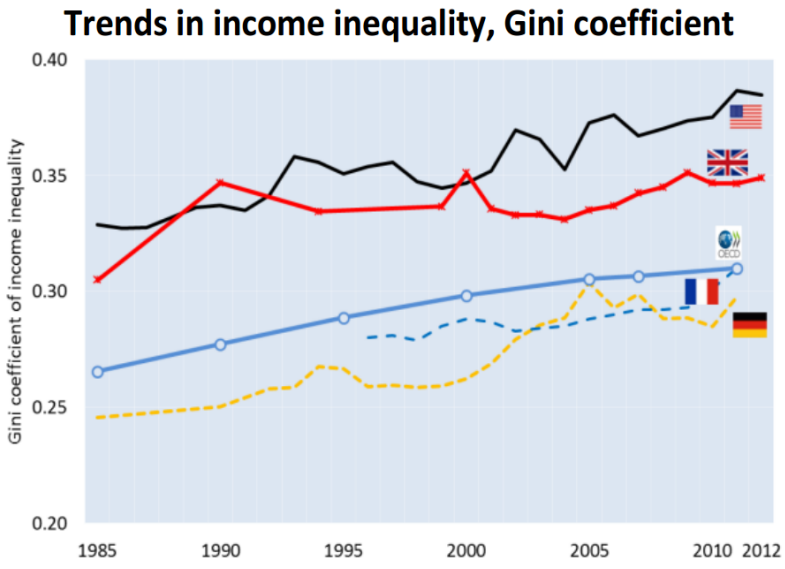
The ratio of the income of the richest 10% of the population to that of the poorest 10% in Britain is 10.5, among the highest of the European Union countries, compared to 7.4 in France (Figure 3.2). The Gini-coefficient in European Union countries ranges from 0.25 in Denmark to 0.35 in Britain. In France the Gini-coefficient lies somewhere in the middle, at 0.31. Income inequality has increased over time in both countries, but has consistently been notably higher in Britain than France. Indeed, when comparing Britain and France to the OECD average, Britain is more unequal than the OECD average, while France is less unequal (Figure 3.3).

Figure 3.2: Income inequality in Britain and France (interdecile S90/S10 ratio) compared to other European Union countries, 2012.



Data source: OECD income distribution database, https://data.oecd.org/inequality/income-inequality.htm

Figure 3.3: Trends in income inequality (GINI coefficient), selected European countries, 1985-2012



Reproduced from: OECD (2015). Income inequality data update and policies impacting income distribution: United Kingdom

These differences in inequality may be linked to social mobility. Social mobility is lower in Britain than in France (Corak 2013); data on 'intergenerational income elasticity', or the likelihood that what a person earns in relation to the rest of the population will differ from what their parents earned, suggest that it is less likely today in Britain than in France that a person's earnings in relation to the rest of the population will be higher than that of their parents. Social mobility has

been found to be greater in countries where income inequality is lower (Corak 2013). Corak (2013) shows that in countries like Norway, Denmark and Finland, where income inequality is among the lowest in developed countries, less than one fifth of any economic advantage or disadvantage that a father may have had relative to the rest of the population is passed onto a son, compared to close to one half of this advantage or disadvantage in Britain and the United States where inequality is high.

We can consider this relationship between income inequality and social mobility alongside the role of young people's aspirations and their perceptions of the opportunities available them in shaping their motivations to avoid pregnancy, in order to better understand cross-national differences in conception rates among young people. In a more unequal context, where opportunities for social mobility are more limited, young people from more disadvantaged backgrounds may perceive fewer opportunities and reasons to invest in their education and employment, and therefore be less motivated to avoid pregnancy than their wealthier counterparts (Le Van 2006; Lee et al. 2004b; Arai 2008).

Transition to adulthood

The transition to adulthood is a time of key decisions – surrounding education and employment, independence and parenthood – and is a time during which young people '[construct] a personal and social identity' (Pavis et al. 1998). Country-level social contextual differences are reflected in the way the transition to adulthood is experienced differently in different countries. Van de Velde (2008) argues that social contextual factors, particularly the role of the state and of social norms, are very important in defining the timing and pace of the transition to adulthood. Using both data from the European Community Household Panel (ECHP) and in-depth interviews, she suggests that the British context favours a shorter period of youth, with the aim of attaining an adult social status, from both a professional and a familial standpoint. Young people in Britain leave home early relative to other European countries, with 30% of 18-20 year olds no longer living with their parents in the United Kingdom compared to 13% in France (Van de Velde 2008,

ECHP data), and often using their own financial resources. Higher education is funded through a combination of state loans and help from parents, and the focus on financial independence from one's parents encourages individual responsibility at a young age. In France, the period of youth is considered much more as a period of investment in the future; the focus is on education, and the diploma achieved is very strongly linked to future social status. There is therefore strong pressure to succeed during this period of one's life, in order to obtain the diploma that will shape one's future prospects, in a context where education is difficult to return to once it is completed. A greater proportion of young people in France than in Britain are in education at age 18: 77% of 18 year olds in France were currently in education in 2010, compared to 57% in the United Kingdom (Eurostat, data code tps00060). The proportion of 'early leavers' from education and training (aged 18-24 with at most lower secondary education and not in further education or training) is also greater in the United Kingdom than in France (Eurostat, data code tgs00106). Young people in France remain 'semi-dependent' on their parents for longer; they leave home relatively early but professional security comes later than in Britain (Van de Velde 2008).

The differences in the way young people live the transition to adulthood in Britain and France mean that in Britain the transition is accelerated; young people leave home early, usually with their own resources, and rapid entry into the labour market is encouraged (Van de Velde 2008; Galland 2001). Young people also become parents earlier in Britain; average age at first birth is similar in the two countries (27.7 in Britain and 28.1 in France (UNECE, 2010)), but this masks an early childbearing 'hump', and later onset of childbearing among more educated women in Britain (Rendall et al. 2005). The differences in the timing and pace of the transition to adulthood may also shape, in part, the timing and circumstances of many life events. These might include age at first sex, pregnancy and abortion decision-making.

Gender

In France, country-level evidence suggests that gender inequality may be greater than in Britain; women's early working careers are more precarious than those of men, more women experience a long term period of unemployment, and fewer are on permanent contracts (Hamel & Rault 2014). In France, women's participation in the labour force is high, facilitated by comprehensive childcare provision (Yeandle 1999), however this was a policy driven largely by pro-natalist rather than pro-equality aims (Morgan 2003). In the Global Gender Gap report of 2013, France ranks 43rd of 136 in gender equality, compared to the United Kingdom's much higher ranking of 18 (World Economic Forum 2013), with France ranking particularly low for wage equality for the same work between men and women. Few researchers have examined gender roles and attitudes in Britain and France from a comparative perspective, but qualitative research has found a greater gender hierarchy in French, compared to English, home contexts (Chevalier 2002).

These country-level differences in gender norms and gender relations have consequences for young people's sexual and reproductive behaviour. Previous research has found that in countries where gender inequality is greater, there is a stronger sexual double standard between men and women, and sexual behaviour patterns showed more divergence between the sexes (Bajos & Marquet 2000). The sexual double standard, where restraint is expected of women, whereas excess is tolerated of men, often means that non-exclusive sexual relationships are more acceptable, and sometimes encouraged, among men (Collumbien et al. 2012; Marston & King 2006), with consequences for the risk of sexually-transmitted infections. At the same time, women report more often than men that they would have preferred their first sexual experience to be later (Bozon 2012a; Palmer 2014), reflecting the way in which different sexual socialisation and expectations of men and women have consequences for their sexual health. These differences in socialisation, and the social expectation that for women, sex is expected to be an emotional experience, whereas for men the focus is on pleasure, are also reflected in their

conceptualisations of sexuality and their own expectations of sex. Analysis of survey data in France has shown women's reasons for first sex centred around their feelings for their partner, whereas among men the main reasons given for first sex were pleasure and curiosity (Bajos et al. 2008). Power imbalances between men and women may limit women's ability to negotiate sex and contraception (Collumbien et al. 2012; Marston & King 2006), and where women more often have older partners, their sexual experiences may be less egalitarian than in contexts where partners are closer in age (Bozon 2012a).

Religion

Young people's knowledge, attitudes and decisions regarding sex, contraception and abortion may also be influenced by their or their parents' attachments to religious beliefs and institutions. Young people who report that religion is important to them have been found to be more likely to report later first sex and less likely to use contraception at first sex (Moreau, Trussell, et al. 2013; Coleman & Testa 2008). However, the differences between Britain and France with regard to religious participation are minimal. Data from the World Values Survey (Wave 5: 2005-2009) show that the proportion reporting that religion is very or rather important to them is similar in Britain and France (33.6% and 35.5% respectively among respondents aged under-30) and that religious participation and frequency of prayer is slightly lower in France than in Britain (Norris & Inglehart 2004). Historically, France is a predominantly Catholic country whereas Britain is predominantly Protestant; these two branches of Christianity differ in their approaches to contraception and abortion (Schenker, 2000), which may translate into differences in norms and behaviours.

Legislative context

Abortion was made legal in England, Wales and Scotland in 1967, under certain broad criteria, but is not available on request. The Abortion Act of 1967 states that abortion is legal up to 24 weeks gestation if 'the continuation of the pregnancy would involve risks, greater than if the pregnancy were terminated, of injury to the physical or mental health of the pregnancy women

or any existing children of her family'. If abortion 'is necessary to prevent grave permanent injury to the physical or mental health of the pregnant woman; there is a risk to the life of the pregnant woman, greater than if pregnancy were terminated; or there is substantial risk that if the child were born, it would suffer from such physical or mental abnormalities as to be seriously handicapped', termination of pregnancy is allowed with no time limit. Two registered medical practitioners must agree that these criteria are fulfilled. Young women aged under-16 are not required to inform their parents of an abortion if both doctors agree that she has sufficient understanding of what is involved.

Abortion was legalised in France in 1975, allowing all women to have an abortion in a medical centre upon request (Le Guen & Bajos 2014). Two important modifications were made to this law in 2001. Firstly, the legal gestation limit was extended from 12 to 14 weeks of amenorrhea. Secondly, whilst prior to 2001 all women aged 18 required parental consent to obtain an abortion, since 2001 they now need the consent of any adult of their choosing, not necessarily a parent.

In England and Wales, contraceptive provision for under-16s is subject to the Fraser Guidelines. These guidelines to practitioners make clear that contraceptive, abortion and STI advice and treatment can be provided to young people aged under-16 without parental knowledge or consent if:

> '*they understand all aspects of the advice and its implications; you cannot persuade the young person to tell their parents or to allow you to tell them in relation to contraception and STIs; the young person is very likely to have sex with or without such treatment; their physical or mental health is likely to suffer unless they receive such advice or treatment; and it is in the best interests of the young person to receive the advice and treatment without parental knowledge or consent*'

The 1967 Neuwirth Law, which legalised contraception in France, stipulated that minors could not be prescribed contraception without parental consent (Le Guen & Bajos 2014). In 1974 this

law was changed to allow minors access to contraception without parental consent only at government sponsored Family Planning and Education Centres (Kane & Wellings 1999). In 2001, the law underwent another modification and under-18s could legally be prescribed contraception without parental consent, including outside of Family Planning and Education Centres (Bajos & Durand 2001).

Past policy on young people's sexual health/pregnancy prevention

The Teenage Pregnancy Strategy in England, launched in 1999, aimed to halve conception rates among under-18s by 2010, and to reduce the social exclusion experienced by teenage parents (Wilkinson et al. 2006). A key feature of the strategy was its recognition that teenage pregnancy is multi-factorial. As such, it consisted of multiple components. The first was a national media awareness campaign, whose key messages were about resisting peer pressure to have sex early, use of contraception, and the availability of confidential advice on sex and relationships and free contraception. Secondly, it aimed to improve sex and relationships education, and access to health education for young people. A third component was joint action to ensure national and local coordination across relevant statutory and voluntary agencies. Finally, the strategy provided support for teenage parents with the aim of increasing the proportion that returned to education, training and employment. By 2010, the under-18 conception rate had shown a sustained decline, but had not halved (Office for National Statistics 2012). Early analyses of the strategy indicated a modest but uncertain effect in reducing conceptions (Wilkinson et al. 2006). Under-18 conception rates fell to a greater extent in more deprived areas and where investment of strategy related resources was higher (Wilkinson et al. 2006). However, by 2014, the under-18 conception rate in England had fallen by 51% compared to 1998 (Wellings et al. 2016, APPENDIX F). Analysis of more recent data showed that again, the most marked decline in conception rates occurred in areas of greater deprivation and those that received more strategy resources (Wellings et al. 2016, APPENDIX F). The association between under-18 conceptions and deprivation had been partially attenuated, and the association between conception before

age 18 and level of education had also weakened. Other, non-strategy related changes also took place during that period, notably the National Institute of Clinical Excellent recommendation to increase access to long acting reversible methods of contraception (LARC) in 2005, and the rise in educational attainment among young people(Connolly et al. 2014; Department for Education 2011). The authors suggest that, taken as a whole, the evidence supports the importance of long term, sustained, multi-faceted prevention strategies to tackle public health challenges. Another key policy development with regard to sexual health was the UK Government's 2001 National Strategy for Sexual Health and HIV. The strategy aimed to improve access to information on sexual health and HIV and reduce inequalities in access to services (Department of Health 2001). One of the objectives of the strategy was to reduce unintended pregnancy.

The first sexual health campaigns were launched in France from the late 1980s, initially with a focus on contraception. In the early 1990s, there was a shift in focus to HIV prevention. The 1992-3 'Low Price Condoms' campaign aimed to raise awareness of, and encourage people to use, condoms. It consisted of a mass media campaign and subsidised condom costs (Bajos & Durand 2001). In 1997, when screening for HIV began to be encouraged, many initiatives focused on young people, through awareness campaigns at sports events and music festivals. In 1998, the 'Ligne Azur' service, a sexual health helpline, was launched with the aim of supporting and listening to young people (Bajos & Durand 2001). In 2003, campaigns aimed to destigmatise and normalise the use of condoms, and the 2010-2014 National Plan for Combatting HIV/AIDS and STIS had a particular focus on young people, women, and people with disabilities (Le Guen & Bajos 2014). The first government campaign on contraception took place in 1982, and included a component addressed at young people in schools and colleges. In 1992, a campaign aimed at encouraging adolescents to discuss contraception was launched ('La contraception, ca devient simple quand on en parle') and in 2000 was followed by a new campaign encouraging communication about sexuality and the rights of women to choose the contraceptive method most suited to them ('La contraception, à vous de choisir la votre'). The most recent contraception campaigns have also focused on encouraging women to choose the method of

contraception that best fits into their sexual and emotional life. One component of this campaign, aimed at young people, also included men in the conversation about unintended pregnancy, with the materials based around the slogan 'if boys could get pregnant, would we be more interested in contraception?' (Le Guen & Bajos 2014). Data from the French national surveys on sexual behaviour suggest that school-based education is young people's first source of information on sexual information, but that these campaigns were cited by more than half of young people in France as a source of information, and therefore play an important role in providing access to information about sex (Le Guen & Bajos 2014).

Contraceptive provision

Contraceptive service provision differs between Britain and France, in particular with regard to services for young people. In Britain, contraception, including condoms and emergency contraception, is provided free to women of all ages and without the requirement for parental consent for minors, from general practitioners or family planning clinics (Wellings 2001). Family planning clinics do not require registration, and many have extended opening hours to allow people to attend on evenings and weekends. In France there is a consultation fee and partial reimbursement of the cost of contraception though a patient's health insurance (Bajos & Durand 2001). Not all methods are reimbursed. The pill, copper and hormonal IUD, implant, injection, and sterilisation procedures are reimbursed, whilst the patch, vaginal ring, spermicides, cap, and male and female condoms are not. In Britain, contraception can be prescribed by a range of providers and practitioners, including nurses. In France, however, contraceptive provision until 2009 was limited to GPs and gynaecologists. Since 2009 midwives (who, unlike in Britain, do not work almost exclusively from hospitals) have also been authorised to provide contraception. Bajos et al. (2004) found that 20% of women received contraceptive services from a GP, and 69% from a gynaecologist.

Some aspects of contraceptive provision exclusively affect young people. Durand et al. (2002) argue that programmes for access to contraception for young people are not well known and

not well adapted to young people's needs. Until 2001, under-18s in France could not be prescribed contraception without parental consent. Today, as contraception is reimbursed through the health insurance system, and under-18s are covered through their parents' health insurance, anonymity with regard to contraceptive use can still be difficult (Bajos & Durand 2001). Under-18s can access contraception free of charge and without the requirement for parental consent at Family Planning and Education Centres (Le Guen & Bajos 2014). These are unevenly distributed across the country. There is a long history of family planning provision for young people in Britain; Brook Advisory Centres, which provide sexual health services for under-25s, were first established in the 1960s, and today young people's clinics in Britain are widespread and an important source of contraception and advice for young people (Wellings 2001). Finally, Ventola suggests that French practitioners may be more paternalistic in their approach to prescribing contraception, whilst in Britain women have more autonomy over their choice of method (Ventola 2016). This may have consequences for method choice and use among young women.

Sex education

Differences in sex education between the two countries might also contribute to differences in contraceptive use and sexual behaviour. In France, sex education was made mandatory in schools in 2001 (International Planned Parenthood Federation 2006). Minimum standards for provision, issued by the Ministry for Public Education, defined in 2003, state that sexuality education must 'integrate biological knowledge and psychological, emotional, social, cultural and ethical dimensions of sexuality' (International Planned Parenthood Federation 2006). Quality of provision varies between rural and urban areas, and depending on the political priorities of school directors and regional authorities (International Planned Parenthood Federation 2006; Haut Conseil à l'Egalité 2016). A recent report by the French High Council for Equality urged sex education to be revisited, with a focus on better understanding and

recognition of young people's sexuality, and particularly on promoting equality between men and women (Haut Conseil à l'Egalité 2016).

In Britain, the Education Act 1996 required that sex education should inform pupils about STIs and HIV, and encourage pupils to have due regard to moral considerations and family life (Education Act, 1996). It is therefore compulsory to teach pupils the biological aspects of puberty, reproduction and the spread of viruses and infection, and these subjects are taught as part of the national curriculum for science. Other aspects of sex education are not mandatory, however the majority of schools choose to teach them as part of Personal, Social, Health and Economic education (PSHE) (House of Commons Education Committee 2015). There is no prescribed content for sex education, and the quality of sex education varies among schools; a 2013 report by the schools inspection body (Ofsted) found that sex and relationships education required improvement in over a third of schools (The Office for Standards in Education Children's Services and Skills 2013).

Sex education addresses the technical and educational aspects of sexual behaviour and contraceptive use but does not necessarily provide the motivation to delay childbearing and therefore change behaviours. Evidence from interventions is mixed (DiCenso et al. 2002; Kirby 2002b) Harden et al. (2006) suggest that 'although sex education is an important part of young people's preparation for adulthood, the evidence is that it is not, on its own, an effective strategy of encouraging teenagers to defer parenthood' (p 3).

Social allocations for young parents

In both countries, certain social allocations are made available to young mothers. In Britain[1], child benefit is paid for every child, with the amount paid dependent on the number of children. This payment is not means-tested, and is taxed only if the household income exceeds £50,000. Mothers who already receive certain benefits can also claim a Sure Start Maternity Grant. This

[1] All information on social allocations in Britain obtained from www.gov.co.uk

is a one-off payment of £500 at the birth of the first child to help towards the costs of having a child. Support for childcare is paid to full-time higher education students with children aged under-15, or under-17 if they have special educational needs. The amount paid is means-tested, and can cover up to 85% of childcare costs. For those aged under 20 at the start of their education or training course, Care to Learn can also help pay for childcare costs. Young mothers may also be eligible for income support, which is paid to those who cannot work full time and do not have enough income to live on. A lone parent aged under-18 received up to £56.80 per week in 2013, and a lone parent aged 18 or over up to £71.70 per week. Finally, people on low incomes are eligible for housing benefit, which can cover all or some of rental costs, depending on an individual's income and circumstances.

In France[2], mothers whose income falls below a certain threshold are eligible for a 'prime de naissance', a means-tested lump sum paid at the end of pregnancy and designed to cover the initial costs of childbearing, and a means-tested monthly payment designed to cover basic costs of education and care paid until the child is three years old. All individuals who are raising their child alone receive a non means-tested monthly payment, and all families with two or more children aged under 20 receive a non means-tested monthly payment, with the amount dependent on the number of children. Further allocations are available for those with particularly limited resources, with the amount paid depending on each individual situation and the *département* in which the individual lives. A means-tested payment is available at the start of the school year to help with the costs of the new school term. Childcare costs can be supplemented by a means-tested allocation paid to individuals in work (including part time) to cover a proportion of the costs of childcare. Income support is also available for young mothers

[2] All information on social allocations in France obtained from the Ministry of Social Affairs and Health (Ministère des Affaires sociales et de la Santé), www.social-sante.gouv.fr, and the Family Allowance Fund (Caisse d'Allocations Familiales), www.caf.fr

with limited the resources: the Revenu de Solidarité Active, which guarantees a minimum level of resources, is paid to individuals aged older than 25 who are without paid work - however there is no age condition if an individual is pregnant or has a child aged up to 3 years old. Means-tested housing allocations are also available to cover a portion of housing costs.

4 METHODS

This PhD research makes use of both two nationally-representative probability surveys and routine data on conceptions and abortions. Data from the surveys are used to examine the association between socioeconomic characteristics and sexual behaviours, and reproductive health outcomes at an individual level. The routine data are used to examine rates and trends in conception and abortion and the association between disadvantage and conception and abortion rates at an area level. This Chapter outlines the data sources and how they were used, and describes the challenges posed by the comparative element of the study and how these were resolved.

4.1 DATA FROM SURVEYS

The individual level analyses in this PhD draw on data from two nationally-representative probability surveys: the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3) in Britain (total sample size 15,162) and the Fertility, Contraception and Sexual Dysfunction Survey (FECOND) in France (total sample size 8,645). These surveys have the benefit of being conducted at the same point in time (fieldwork for both began in 2010), and covered similar topics, facilitating comparability between the two. Both surveys follow on from previous sexual behaviour surveys – Natsal-3 follows two earlier Natsal surveys conducted in 1990 and 2000, and the FECOND survey follows five previous national surveys on contraceptive use, sexual behaviour and reproductive outcomes in France, beginning in 1978. Both surveys therefore used methods that had been tested previously.

4.1.1 Study designs

Full details of the Natsal-3 and FECOND study designs are published elsewhere (Erens et al. 2014; Legleye et al. 2013).

4.1.1.1 Sampling

Natsal-3 used a multistage, clustered and stratified probability sampling strategy; within each primary sampling unit (postcode sectors), addresses were selected at random. Sampled addresses were sent a letter with information about the survey, and subsequently were visited by an interviewer. English-speaking women and men aged 16-74 and living in private households (that is to say, not residential institutions) in Britain were eligible for the survey. At each address where contact was made and where any residents were within the eligible age range, one individual was randomly selected using a Kish grid. Prior to selection, primary sampling units were stratified by region, population density, the proportion of the population aged under-60, and the proportion of households with a head in a non-manual occupation, using data from the 2001 census. This was in order to maximise precision of the sample and to ensure that different strata were correctly represented. The sampling frame of Natsal-3 was the Postcode Address File, which is a list of all addresses in the country. As the Postcode Address File excludes the homeless and those living in institutions, Natsal-3 aimed to be representative of English speaking individuals aged 16-74 years living in private residential households. The target sample size consisted of a 'core' sample of 10,000 adults aged 16-74, and a further 'boost' sample of younger adults aged 16-34. This was in order to provide sufficient statistical power to examine behaviours among those considered to be at highest risk of a range of sexual health outcomes. The final sample size in Natsal-3 was 15,162.

In FECOND, two samples were independently selected to include a random sample of individuals who had a telephone landline, and a random sample of mobile phone users who did not have a landline, following a two stage random-probability sampling process. In the first stage, an initial probability sample of households or mobile phones was selected using random digit dialling, to generate landline and mobile phone numbers. Mobile phone numbers comprised 16% of the sample, which is the proportion of the eligible population with a mobile phone but no landline. To avoid double counting, and ensure that the mobile phone sample included only individuals

not contactable by landline, respondents of mobile phones were asked at the beginning of the survey whether they were contactable by landline or not, and those that responded affirmatively were eliminated. In the selection of numbers, no geographic stratification was done because this information was not available in random digit dialling. The numbers generated were checked against the databases of the French Telecommunications and Post Regulator and the telephone directory to eliminate unavailable and professional numbers, and all remaining numbers were called automatically to eliminate out of service and disconnected numbers. French-speaking women and men aged 15-49 and living in private households in Metropolitan France, or owning a mobile phone but no landline and living in Metropolitan France, were eligible for the survey. For landlines for which postal addresses could be found, an advance letter was sent before the call. One eligible individual per household contacted was then randomly selected for participation in the study using a Kish grid, with women being given a higher probability of selection in order to over-represent them in the final sample. For the mobile phone sample, one eligible individual per mobile phone number contacted was randomly selected using a Kish grid, but women were not given a higher probability of selection. The final sample size was 8,645.

4.1.1.2 Response and weighting

The response rate in the Natsal-3 survey was 57.7%, after taking into account non-eligible subjects. The Natsal-3 data were weighted to adjust for the unequal probabilities of selection in terms of age and the number of eligible adults in the household. After application of these weights, the Natsal-3 sample was broadly representative of the British population in the 2011 census. Men and London residents were slightly under-represented, so a non-response post-stratification weight was applied to correct for differences in sex, age, and Government Office Region between the achieved sample and the 2011 census.

The response rate in the FECOND survey was 54.1% for the landline sample and 37.6% for the mobile phone sample, after taking into account non-eligible subjects. The total response rate

was 50.2%. The FECOND data were weighted to adjust for the unequal probabilities of selection in the sample in terms of age, sex and land-line or mobile phone interview. After application of these weights, some groups were under-represented in comparison to the French census collected continuously from 2005-2009, particularly individuals born outside of France, and those with no qualifications. Post-stratification weights were applied to correct for differences in sex, age, marital/cohabitation status, level of education, professional situation, place of birth, and dependent children between the achieved sample and the census.

4.1.1.3 Data collection

The Nastal-3 survey comprised both a computer-assisted person interview (CAPI) (referred to hereon as a face-to-face interview), and a computer-assisted self-interview (CASI). In Natsal-3, the more sensitive questions asked in the face-to-face interview used show cards, where the participant responded to the question by saying the letter of the answer that applies rather than saying the response itself. This both preserves confidentiality, as it means the full response is not disclosed to others who may overhear the interview, and lessens the sensitivity of responses. For some questions asked in the face-to-face interview, the interviewer had the option to defer these questions to the more private CASI if they felt that the respondent might be inhibited from answering them, for example if they may potentially be overheard. The most sensitive sections of the questionnaire were asked in the CASI, which was completed by the respondent directly on a laptop computer.

The FECOND questionnaire was administered by phone, and all responses were articulated verbally, not using letter codes. Respondents who initially did not wish to answer a sensitive question were further probed; interviewers explained that they understood that they questions were of a personal nature, reminded the respondents of the scientific purpose of the study and reassured them that all responses were anonymous and confidential. At the end of the interview, respondents were asked whether they were alone during the time that the interview was administered (not including infants), and if not, who was present (specifically a partner,

child aged over 10, child aged under 10, a friend or other family member, or other). After the interview was completed, interviewers were asked whether they thought that the respondent was able to respond freely to the questionnaire.

Neither survey aimed to use interviewers of the same gender as respondents, as in both surveys, the gender of the respondent was not known before they were selected for the survey.

4.1.2 Variables

Both surveys collected detailed information on respondents' past and present sexual behaviour and contraceptive use, reproductive events and socioeconomic characteristics. Not all of the information collected was directly comparable; not all questions were asked in both surveys, for some questions the subgroup to which the questions were asked was different in the two surveys, and sometimes the question wording in the two surveys was different and comparison between responses was not possible. A full list of the relevant information collected in both surveys, alongside an assessment of their comparability between the two surveys for the purposes of this research, is presented in APPENDIX A. This section describes the key variables used in this research: how and among whom the information was collected, how the variable was coded or constructed for the analyses, and any important differences in data collection between Natsal-3 and FECOND.

4.1.2.1 Sexual behaviour and contraceptive use

The key sexual behaviour and contraceptive use variables relevant to the questions addressed in this thesis were age at first sex with any partner or an opposite sex partner, age of partner at first heterosexual intercourse, contraceptive use at first sex, and current contraceptive use.

Age at first sex with any partner and/or an opposite sex partner

Both surveys asked respondents about both same and opposite sex experience. Women and men were asked in the Natal questionnaire: 'How old were you when you first had sexual intercourse with someone of the opposite sex or hasn't this happened?' and 'Have you ever had

sex with a *(man/woman)* involving *(genital area/penis/vaginal)* contact?', 'How old were you when this happened?' In Natsal-3, all questions on first heterosexual intercourse (age, age of partner, contraception used) were asked in the face-to-face interview, using show-cards. If the interviewer deemed that the setting lacked privacy, these questions were asked in the CASI. All Natsal-3 questions on first sex with a same-sex partner were asked in the CASI. All women and men were asked in the FECOND questionnaire: 'Have you ever had sex with a man?' and 'Have you ever had sex with a woman?' and 'How old were you when this happened?' Respondents aged 15-29 were later asked to clarify at what age they 'first had sexual intercourse with penetration with a man/woman'. The age at first sex variable used in this research is based on responses to the first question, specifying only sexual intercourse. This is because the second question was asked only of younger respondents, so a variable created based on this question would not be applicable to older cohorts, and would not be comparable between cohorts. It was also considered that the less specific wording of 'sex' (*rapports sexuels* in the questionnaire) was more comparable than 'sex with penetration' with regard to the Natsal-3 wording of 'sexual intercourse'. (In Natsal-3, terms are defined in the CASI, and sexual intercourse is described as vaginal, oral and anal sexual intercourse. Respondents are asked to confirm whether they have ever had heterosexual intercourse, but not what age they were the first time this happened. This occurs *after* respondents are asked about the timing and circumstances of the first time they had sex, including the age of their first sexual partner).

The focus of this PhD is on factors leading to conception and abortion, consequences of heterosexual intercourse only. However, it was considered important in the analysis of the timing and circumstances of sexual debut, as this would be a standalone paper as well as part of this PhD research, to include both same and opposite sex first intercourse. In that specific analysis I was interested in the timing and circumstances of first sex and how this differs between Britain and France, and not with any consequences of intercourse that are specific to heterosexual experience. In later analyses, when I consider first sex as a stage in the pathway to abortion, the analysis is limited to first heterosexual intercourse.

When considering age at entry into sexuality, a binary variable was coded describing whether the individual reported first sex before 16 or not. Sixteen was chosen as the cut-off because it is the age below which less than a quarter of individuals in both countries reported having had sex, therefore representing a 'minority' behaviour to an extent; and in order to be consistent with much of the previous literature on first sex. Sixteen is also the legal age of consent in Britain, but in France the law prohibits sex between an adult aged 18 or over and a person under the age of 15. Respondents who reported first sex before age 13 (1.69%, n=185 in Natsal-3; 0.63%, n=53 in FECOND among 16-49 year-old sample) were excluded from the analysis because they were filtered differently through subsequent questions in the two surveys, and there was no way in which this could be reconciled. In Natsal-3, respondents who reported first sex before age 13 were asked how old they were the first time they had sex since turning 13. In FECOND, no additional questions were asked of respondents who reported first sex before age 13. In addition, young people who have first intercourse before age 13 are likely to represent a group with an atypical set of circumstances.

Partner age at first heterosexual sex

In Natsal-3, respondents were asked 'How old was that partner at that time' with regard to the first time they had 'sexual intercourse with someone of the opposite sex', aged 13 or over. In FECOND, respondents were asked 'How old was your partner at the time?' with regard to the first time they had sexual intercourse with penetration with an opposite sex partner, that was not coerced. In order to be comparable, this variable was recoded in both surveys to exclude those who reported first sex before age 13. The variable was coded into five categories: more than two years younger, up to two years older or younger, two to five years older, more than five years older, and don't know. 174 (1.78%) respondents in Britain and 78 (1.11%) in France who had ever had sex and whose first sex had not occurred before age 13 reported that their first sex was with a same sex partner. These respondents were excluded from the analysis of

partner characteristics and I was unable to conduct separate analyses for these subgroups because of the small numbers.

Contraceptive use at first sex

In Natsal-3, respondents were asked 'Did you or your partner use any form of contraception or take any precautions at that time?' during the questionnaire module on first sexual experiences. Respondents could choose from a list of responses. In FECOND, respondents were asked 'Did you or your partner take any steps to prevent pregnancy?' in the questionnaire module on first sexual experiences and then 'Which method(s) did you use?'. Respondents were not given a list of responses. Contraceptive use at first sex was recoded as a binary variable describing whether or not the respondent had used a reliable method of contraception the first time they had sex. Reliable methods include all medical methods of contraception and condoms, and exclude withdrawal, periodic abstinence, and no method.

Current contraceptive use

In Natsal-3, questions on current contraceptive use were asked of all men and women who reported heterosexual sex since age 13. In FECOND, questions on ever use of contraception were asked of all men and women reporting ever having had heterosexual sex, but questions on current contraceptive use were asked only of men and women reporting ever having had heterosexual sex and not sterile (or partner not sterile), not pregnant or trying to get pregnant (or partner not pregnant or trying), and for men, reporting heterosexual sex in the last 12 months and reporting a partner at the time of the survey. In Natsal-3, women were asked first: 'Which [contraceptive methods] have you used at all with a partner in the last year?', and could choose multiple responses from a list, and then: 'What is your usual method these days?', to which they could choose up to three responses from a list. All questions on current contraceptive use were asked in the face-to-face interview. In FECOND, women were asked first: 'Currently, do you or your partner use a method for avoiding pregnancy, including a natural method, and if so which one?', to which multiple free responses were possible, and then: 'Of these methods,

which would you consider your main method?', to which one response was possible. For this analysis the answer to the second contraceptive question in FECOND was used, and in Britain the second contraceptive question was recoded using a hierarchy of effectiveness, such that where a respondent provided multiple responses to this question, the most effective method was recorded (for example, if a woman reported pill and condom use, this was coded as pill).

4.1.2.2 Reproductive events

The key reproductive events of interest in this research are conception before age 20 and abortion before age 20.

Conception before age 20 and abortion before age 20

In Natsal-3, information on reproductive events was collected through a pregnancy history module in the CASI (self-administered) section of the questionnaire. In FECOND, this information was collected through a pregnancy history module over the phone. In FECOND, the pregnancy history module was posed to both men and women, but in Natsal-3 it was posed only to women. In Natsal-3, women were asked 'Have you ever been pregnant?', and those that responded affirmatively were asked 'How many times have you been pregnant?'. For each pregnancy, women were then asked 'Thinking about the *[nth]* pregnancy, what was the outcome of that pregnancy?', and could type in a response code of one of five outcomes: miscarriage, termination or abortion, stillbirth, live birth (one child), and live birth (more than one child). If the outcome of the pregnancy was a live birth, women were asked 'In what month and year was [the child] born?', and typed in the month and year. If the outcome was an abortion, women were asked 'How old were you when this happened?', and typed in their age in years. In FECOND, women were asked 'Have you ever been pregnant, whether the outcome of the pregnancy was a miscarriage, an abortion, an extra-uterine pregnancy or other?', and those that responded yes were asked 'How many times in total have you been pregnant, whatever the outcome of the pregnancy?'. For each pregnancy, the questions are phrased as follows: 'We will now talk about your *[nth]* pregnancy: How did this pregnancy end?'. Respondents chose from a

list that was read out to them by the interviewers and could choose one response from the following: a birth, an abortion, a miscarriage, an extra-uterine pregnancy, a termination for medical reasons (a therapeutic abortion), a still birth. They articulated their response verbally. They were then asked 'On what date did this *[nth]* pregnancy end?', which was coded as a year if the respondent did not remember the exact date.

Data from the pregnancy history module on pregnancy outcomes, and the woman's age at that event, or the date of event combined with the woman's date of birth were used to generate comparable variables on reported age at first conception, age at last conception, age at first abortion, and age at last abortion. Binary variables were coded for respondents aged 20 and above describing whether or not a woman reported a conception before age 20 and an abortion before age 20. As miscarriages and stillbirths may be unreliably reported, and in order to be consistent with other Natsal publications and with statistics produced by the Office for National Statistics, conceptions were limited to those ending in a live birth or abortion in both Natsal-3 and FECOND.

For many women, abortion is a sensitive or stigmatised event, and abortions are known to be under-reported in surveys (Jones & Kost 2007). In France, Moreau et al. (Moreau et al. 2004) estimated that the annual frequency of abortions reported in the 1997 COCON survey was 60% of the true population rate, derived from national statistics provided by the French National Institute for Demographic Studies (INED) and adjusted for under-registering of abortions in these statistics. However, the British Natsal surveys have historically had good abortion reporting; the reported abortion rates among 16-44 year-olds were 84% and 87% of the population rates in Natsal-1 (1990) and Natsal-2 (2000) respectively, and the confidence intervals of the estimates included the population rates (Copas et al. 2002; Wadsworth et al. 1993). Under-reporting of abortions affects not only estimates of abortion but also estimates of conception, both in terms of frequency and in terms of the characteristics of women who

experience them if under-reporting is not random. Under-reporting of abortions in both surveys is discussed in detail in Chapter 5.

4.1.2.3 Socioeconomic characteristics

Both surveys gathered detailed information on the socioeconomic characteristics of respondents and their parents. This allows more accurate measurement of the social characteristics of young people, whose own socioeconomic characteristics can be very difficult to measure, by using their parents' characteristics. An overview of the social and economic characteristics collected in both surveys is presented in Table 4.1. The indicators that can be used for a comparison are limited to those for which the same or similar information was collected in both surveys.

Table 4.1: Available indicators of socioeconomic characteristics in Natsal-3 and FECOND, their suitability for analysis of young people's sexual and reproductive health, and their comparability across surveys

	Natsal-3	FECOND	Suitability as a measure of socioeconomic characteristics
Professional situation (economic activity): current economic activity of respondent, e.g. full time education, training, paid employment, retired.	✓ractivhi2	✓a35_r	May not be suitable for older respondents as current economic activity may not accurately reflect their socioeconomic characteristics when they were younger. This indicator distinguishes between young people who are currently working and those who are in full-time education and can therefore be used as a measure of current participation in education among young people. However, as a measure of participation in education it is applicable only to young people aged under 22, the age at which most students have completed tertiary education, as otherwise it may misclassify young people who have completed a high level of education and are currently working.
Socio-professional category: occupational classification	✓ rsoc2010_9, rsoc2010_7, rsoc2010_4, rnssecgp_6, rnssecgp_4	✓ pcs34_r, pcs8_r	Not suitable for younger respondents because a large proportion are students in full time education and therefore classified as inactive. May not be suitable for older respondents as current socio-professional category may not accurately reflect their socioeconomic characteristic when they were younger
Household NSSEC code: National Statistics Socioeconomic Classification, based on employment characteristics	✓ hnssecgp_6, hnssecgp_4	×	May be suitable for young people as uses standard British measure of socioeconomic status and uses information from household so better represents young people than an individual measure Suitability is limited by missing data among young people, who may not be able to provide sufficient employment information about their household head. Household socioeconomic characteristics are not collected in FECOND, so this indicator is not comparable between the two surveys.
Household income	✓ income	✓ a74_r	Not suitable for young people because many are in full time education and therefore classified as inactive. Income of young people who are independent may not accurately reflect their actual socioeconomic characteristics. Young people living with their parents may not know the household's income.
Highest qualification achieved	✓educ3	✓ a33_r	Suitable for both younger and older respondents as once completed, highest level of education is unlikely to change over time. A potential limitation is that younger respondents (aged under-25) may not have completed their educational trajectory, and that there may be reverse causality between pregnancy and educational attainment (i.e. dropping out of school in the event of pregnancy).
Left school at 16 with/without obtaining any qualifications	✓educ	×	Suitable for all respondents aged over 16 There may be reverse causality between pregnancy and educational attainment (i.e. dropping out of school in the event of pregnancy). This data is not available in FECOND so is not comparable between surveys.
Parent's education: highest qualification of parent	×	✓ a19_r, a16_r	Suitable for all respondents as an indicator of social origin Highest qualification of parent is unlikely to vary over time Non-response is relatively high, and non-responders are more similar to those with parents with a lower level of education on other characteristics.

Parent's social class: based on parent employment characteristics when respondent was aged 15	✓parsc3, parsc_kw	×	Suitable for all respondents as an indicator of social origin Parent's social class when the respondent was aged 15 does not vary over time Non-response is relatively high, and non-responders are more similar to those with parents with a lower level of education on other characteristics.
Index of Multiple Deprivation quintile: Measure of area-level deprivation, based on postcode.	✓adj_imd_quintile	×	May not be suitable for older respondents if their current situation does not reflect their situation when they were younger. Young people living independently may be misclassified on this indicator because, for example, students often live in more deprived areas although they come from relatively advantaged backgrounds.

I constructed two indicators of young people's socioeconomic status from the information available in both surveys: respondent's own level of education, and parent socioeconomic group.

Level of education

At the time of data collection, schooling was compulsory until age 16 in both Britain and France. (New legislation raising the age of participation to 18 was introduced in Britain in 2013). In Britain, compulsory education culminates in the sitting of the General Certificate of Secondary Education (GSCE) exams. Students then choose whether to pursue post-secondary education, which describes all courses – either academic or vocational – taken after compulsory education but before higher education (university degree or equivalent). Some choose to stay in education and complete their A-levels, which involves two further years of study and is the most common route to university. Others choose to pursue vocational qualifications, which may be at any level from basic skills training to higher vocational qualifications. It is less common for students who take vocational qualifications to go on to do a university degree. In France, students attend a collège until age 15, at the end of which they take an exam called the 'diplome national du brevet'; this is not compulsory but all students are automatically enrolled. Students decide at this point whether to attend a 'lycée général et technologique', where they prepare for the baccalaureate exam, taken at age 18 and comparable to A-levels in Britain, or a 'lycée

professionel', where they can prepare for the 'Certificat d'Aptitude Professionel' (CAP), or the 'Brevet d'Etudes Professionel' (BEP), taken at age 16/17, or simply take a year of classes until they have reached school leaving age. Similarly to in Britain, students who attend the lycée géneral often go on to study at university, whereas those who attend the lycée professionel less commonly do so.

Most analyses conducted by the Natsal team use the variable 'left school at 16 with/without any qualifications' to measure individual-level education. This is a useful variable because it is applicable to all over-16s, including those who have not completed their educational trajectory. However, the differences in schooling systems, and particularly qualifications (which are taken at different ages) between Britain and France mean that an equivalent variable cannot be constructed in the French dataset. Instead, I use 'any post-16 education' to measure level of education. This is a binary variable constructed from two variables: highest qualification achieved and current economic activity. Respondents are assigned to the higher category if their highest qualification is more than the CAP, BEP (in France), or GCSE (Britain) or equivalent, or if they are aged 17-20 and are currently in education, to take into account that some young people may not have completed their educational trajectories. Because respondents currently aged 16 may still be undertaking the final year of their compulsory education, we do not know whether they will undertake any post-16 education or not, so this variable cannot be used as an indicator of educational level among under 17s.

Vocational and academic qualifications tend to lead to different career trajectories, and may therefore be an indicator of socioeconomic characteristics. However, it is likely that breaking the educational variable down into a more refined indicator, by separating vocational and academic post-16 education, does not adequately capture the differences between France and Britain in terms of the educational systems, opportunities available for undertaking vocational and academic training, and the value attached to each. In addition, the sample size and

distribution of this indicator means that a fairly small proportion report vocational training as their highest qualification, which is restrictive in analyses where the outcome is rare.

The variable 'any post-16 education' has the advantage of being applicable to the youngest age groups (anyone aged 17 or over) as it is constructed using both the highest qualification achieved and whether the respondent is currently in education. However, due to the differences in the education systems in Britain and France described above, it is possible that this variable might not be capturing the same features in the two countries. For this reason, I also ran sensitivity analyses using another indicator of level of education, educational level.

Educational level is an ordered categorical variable, also derived from highest qualification achieved and current economic activity. Respondents are assigned to the lowest category, 'no post-16 education', if they have not completed any post-compulsory education. They are assigned to the second category, 'post-16 education, no tertiary education' if their highest qualification is the Bac and they are not currently in full-time education. They are assigned to the highest category, 'completed any higher education', if their highest qualification is more than the Bac (in France), or A-level (Britain) or equivalent, or if their highest qualification is the Bac (in France) or A-level (in Britain) or equivalent and they are aged 20-25 and are currently in full-time education, to enable this measure to include young people aged between 20 and 25 who may not have completed their higher education. Again, because respondents currently aged under 20 may be planning to participate in higher education but have not yet begun, this variable cannot be used as an indicator of educational attainment among under 20s. An advantage of this variable is that it can be used to consider the relative importance of participating in higher education versus staying in education beyond age 16.

A limitation of measuring the level of education among young people is that we do not know their future educational trajectory. We can only make judgements on their level of education based on their present circumstances, which may change. This is true of both variables used in

this analysis. For example, those who are currently completing post-16 studies may not actually complete them.

Parent socioeconomic group

The French and British surveys collect different information with regard to parent socioeconomic group. The British survey collects information on parent social class, derived from information on occupation and social class when the respondent was aged 14. In France, the survey collects information on parent's education (highest qualification achieved). Because these variables are not directly comparable, we constructed a tiered indicator of three levels – higher, middle and lower – on the grounds that parental educational level is strongly associated with parental socioeconomic position (Krieger et al. 1997). Our data are consistent with this: 79% of participants aged 30-49 with a degree-level qualification in Natsal-3, and 74% in FECOND, were in managerial and professional positions. In the British survey, parents who had never had a job or who were partly skilled or unskilled were assigned to the lower socioeconomic group, those in technical and skilled positions to the middle group, and those in professional and managerial occupations to the higher group. In the French survey, parents who had no qualifications were assigned to the lower group, those with baccalaureate or less to the middle group, and those with a degree-level qualification to the higher group. As information on parents' characteristics was collected differently in the two surveys, this variable measures relative, not absolute disadvantage. In creating this variable, we found relatively high non-response in both Britain and France to the question on parent characteristics; 8% in Natsal-3 and 9% in FECOND were unable to answer this question. Further examination of item non-responders showed that on education, they more closely resembled respondents from lower socioeconomic backgrounds. In order not to lose a large number of respondents from the analysis, and not to bias the results towards respondents from higher socioeconomic groups, we created a fourth 'missing' category in this variable. A fourth category was created instead of collapsing the non-response category into the lower group because it is not known whether the

non-responders differ from the lower socioeconomic group with regard to other, unmeasured characteristics.

4.1.2.4 Other variables adjusted for in multivariate analyses

In multivariate analyses, models were run adjusting for socio-demographic characteristics known to be associated with sexual behaviour and reproductive health among under 20s. The variables available in both surveys were family structure at age 14 (in Britain) or 15 (in France), and importance of religion.

Family structure at age 14/15

In Natsal-3, all respondents were asked if they lived more or less continuously with both natural parents until age 14. In FECOND, respondents aged under-30 were asked who they lived with at age 15, and given the options of with both parents, alternating between parents, with their father, with their mother, with another family member, at boarding school, with a foster family, and other. Family structure at age 14/15 was recoded in both surveys to a binary variable: lived with both parents at age 14/15 or not.

Importance of religion

In Natsal-3, all respondents were asked how important religion and religious beliefs are to them now, and given four options: very important, fairly important, not very important, and not very important at all. In FECOND, respondents were asked if religion is important in their lives today, and given five options: very important, important, not very important, not important at all, and no religion. Importance of religion was recoded in both surveys to a binary variable: very/fairly important, or not/not at all important. For those who reported no religion, this variable was coded as not/not at all important.

4.2 ROUTINE AND CENSUS DATA

Analyses of routine data include only England and Wales, and France. Scotland was excluded from these analyses because data on abortions in Scotland are collected separately, and the cost

of obtaining them from National Services Scotland was prohibitively high. The routine data are used to examine rates and trends, in England and Wales and in France, in conception rates, abortion rates and the abortion ratio, and to examine the association between area-level disadvantage and conception rates and the abortion ratio.

4.2.1 Recording of conceptions and abortions data in England and Wales and France

In both countries (England/Wales and France), abortions are notifiable, which means that they must legally be recorded. Different systems are used in England and Wales and in France to collect this information.

England and Wales

In England and Wales, registered medical practitioners are legally required to notify the Chief Medical Officer (CMO) of every abortion performed using an abortion notification form (HSA4). The Department of Health receives these notifications and carries out statistical processing and analysis. Checks are made to investigate inconsistencies, missing data and possible duplicates, and each quarter a count of abortions by clinic and Primary Care Trust is made, and investigations carried out where clinics have a 10% or more drop in the number of forms submitted (Department of Health 2013). Recording of abortions in England and Wales is believed to be complete (Mary Grinsted, Department of Health, personal communication). All births are registered.

France

All abortions must legally be recorded in France. As in Britain, notifications forms are used to record each abortion. Notifications forms are distributed, collected and processed by the Ministry of Health. The health and welfare directorates (DDASS) in each *département* distribute the notification forms to the hospitals. The regional health and welfare directorates (DRASS) collect the forms, and the research, study, evaluation and statistics directorate (DREES) processes the data (Rossier & Pirus 2007a). These data are considered heavily incomplete or in

some cases are not available at all between 1998 and 2004, as publication of the notifications was suspended due to problems with the optical scanning technology used to read the forms (Rossier & Pirus 2007a). Two other sources of data also contain information on abortions: the annual statistics of healthcare facilities (SAE) and the medical statistics database (PMSI).

The SAE statistics are based on annual hospital surveys, and are completed once a year by hospital management, usually on the basis of hospital admissions records. The hospital statistics *do not* include medical abortions carried out in doctors' practices, health centres or family planning centres (Annick Vilain, DREES personal communication). Information on woman's age at abortion is not collected; the age distribution of abortions in these statistics is estimated using the age structure obtained from the PMSI (Rossier & Pirus 2007a). The aim of the PMSI is to provide an inventory of all medical acts in all hospitals and their costs. The PMSI database contains information recorded on each patient at the end of their stay by the doctor or *département* secretary. Data on elective abortions include place of residence, age, length of hospital stay, technique and anaesthetic. It is estimated that the PMSI covers 96% of medical, surgical and obstetrical activity – this high level dates back from 1998, when private hospitals joined the PMSI (Buisson et al. 2003). Before this, coverage was lower.

Unlike in Britain, where reporting is believed to be complete, in France abortions are known to be under-recorded. Each data source suffers from under-reporting in different ways. The causes of under-reporting in the notification forms are believed to be of two types: First, some abortions were not being recorded for various reasons that would not lead to systematic bias (disorganisation, lack of stock of notification forms, etc). Second, some induced abortions were not recorded by certain practitioners in the private sector, who recorded them instead as spontaneous abortions in order to bill them at a higher rate or to perform more abortions than allowed under the legal quota (this quota of one abortion per three other surgical procedures was dropped in 2001). This systematic under-recording affected all information sources. For

recent years, the collected notifications covered an estimated 79% of terminations in 1997, 67% in 2002, and 81% in 2005 (Rossier et al, 2009).

The DREES considers that the list of hospitals supplying annual statistics (SAE) is complete. However, around 2% of hospitals do not answer the survey and others (a larger proportion) do not complete all parts of the questionnaire. The DREES and DRASS issue reminders to the hospitals that do not return the questionnaire but not to those who partially complete it. In two years, 1995 and 2000, major changes occurred to the questionnaire or the way it was administered, and statistics for these years are considered to be less exhaustive than for others. The SAE statistics *are* believed to be exhaustive from 2002 onwards, but only of abortions performed in hospitals.

The PMSI are less exhaustive than the SAE, but they are more precise. DREES does not systematically compare the number of abortions reported for each hospital in the two sources, but it calculates an overall correction, by hospital size, between the two sources on the basis of geographic area (Rossier & Pirus 2007a).

All births must be registered in France.

4.2.1.1 Implications of under-recording of abortions for the PhD research

This PhD research will use routine data on abortions in two ways. Firstly, in order to examine rates and trends in conceptions, abortions and the abortion ratio, which requires national-level data on conception and abortion rates by age group dating from 1980. The abortion data for this part of the analysis was provided by INED and calculated from the abortion notifications. These rates have been re-estimated by Mireille Le Guen and Laurent Toulemon to correct for the under-recording of abortions, based on the calculations of Clementine Rossier, Claudine Pirus, Laurent Toulemon and France Prioux (Rossier & Pirus 2007a; Rossier et al. 2009) and are considered accurate. Their methods are described in more detail below. Secondly, the routine data will be used to examine the association between area-level disadvantage and conception and abortion, which requires area-level data by age group. Abortion data for this part of the

analysis were obtained from two sources: the abortion notifications were obtained from INED, and the SAE statistics were obtained from the DRESS. Neither had already been corrected for under-recording of abortions. For this part of the analysis, the strength of the association is more important than the absolute numbers. Under-reporting of abortions will bias the association between area-level disadvantage and conception rates, abortion rates and abortion ratio only if the extent to which abortions are under-recorded varies systematically according to area- (*département*-) level disadvantage. If under-reporting is greater in more disadvantaged areas, this will lead to an underestimation of the association, and if under-reporting is greater in less disadvantaged areas this will lead to an overestimation of the association. No previous research has re-estimated abortion rates to correct for under-recording of abortions at a *département* level. The approaches considered for this research are discussed below.

4.2.1.2 Methods of accounting for under-recording to re-estimate national level figures and rates

Rossier and Pirus (2007) examined under-recording of abortions in France in depth, and came up with two main strategies to re-estimate the total number of abortions at the *national* level. For the years 1976-1996, they adjusted for underreporting of abortions in some hospitals by selecting *département*s with the highest ratio of abortions recorded in notifications to births, calculating the average and applying it to the whole of France. However, we know that among young people in Britain the abortion ratio varies according to socioeconomic situation, and so in France may vary by *département*, so this method is not appropriate for an analysis examining differences between *département*s. For 1998 and 2002, in order to adjust for reporting of some induced abortions as spontaneous abortions, Rossier and Pirus selected *département*s where more than 90% of abortions are performed in the public sector (and so assume that mis-reporting induced abortions as spontaneous abortions in order to charge higher fees is negligible in these *département*s). They then calculated the average ratio of spontaneous abortions to births and applied this ratio to the total number of births in all *département*s. However, given

that they also found that the ratio of spontaneous abortions to births varied from 9% to 34% in different *département*s, this method may induce more error into a by *département* analysis. From 2002 onwards, the hospital statistics are assumed to be exhaustive but do not include individual level information on age – rates by age are estimated by applying the age distribution of the PMSI.

4.2.1.3 Methods of accounting for under-recording in départemental-level analyses

In order to examine the potential bias in the association between area-level disadvantage and conception and abortion due to under-recording of abortions in France, several scenarios were modelled. First, the analyses were run using the data from the notifications at face value. Second, the analyses were run using data from the notifications, with abortions all corrected by the same factor. Finally, the analyses were run using the abortions data from the SAE at face value. These analyses were all run on under-18s only, because this was the only age grouping possible in the SAE data. The strength of the association between area-level disadvantage and conception rates was weakest in the scenario using SAE data, and strongest in the scenario using the notifications data at face value.

Abortion data from the SAE were obtained from the DREES and were available for the years 2005-2009. Comparing the numbers of abortions in the SAE data and the notifications for all years in which data were available for each shows that overall the SAE records more abortions, but that the difference in recording varies by *département*. In some *départements*, more abortions were recorded in the notifications than in the SAE, and vice versa. Whether more abortions were reported in the SAE or the notifications in each *département* was not always consistent by year. In these data the notifications record the woman's *département* of residence, whilst the SAE records the *département* of the hospital where the abortion took place.

In all scenarios, the strength of the association between disadvantage and conception and abortion was lower in France than in England and Wales. As the interest of this research is on

the difference in the strength of the association between England and Wales and France, the scenario which gave the most conservative interpretation, i.e. that for which the difference between Britain and France was the narrowest, using notifications data at face value, was chosen.

To further examine the possibility of bias introduced by the poor quality of the abortions data, the same analyses were run but considering the association between area-level disadvantage and birth rates. Reporting of births takes place through registries in both countries and is known to be complete. The results of these analyses showed that the strength of the association between area-level disadvantage and birth rates was also weaker in France than in Britain, lending further support to the validity of the results on conceptions and abortions.

4.2.2 Choosing a measure of area level deprivation

One component of this PhD research is to examine the association between area-level disadvantage and conception and abortion rates in England and Wales and France. The measure of area-level disadvantage needs to be comparable both between the two countries and over time. Several possibilities were considered.

4.2.2.1 Country specific composite measures for Britain and France

In both Britain and France, composite measures of area level deprivation have been developed, the Index of Multiple Deprivation (IMD) in Britain and the FDep in France.

The Index of Multiple Deprivation was developed in 2000 and is the official measure of relative deprivation for small areas in Britain. The IMD measures a broad concept of deprivation. The measure is made up of 38 indicators spread across seven domains: Income; Employment; Health and Disability; Education, Skills and Training; Barriers to Housing and Other Services; Crime; and Living Environment. These are combined into an overall weighted Index of Multiple Deprivation, which can be used to rank areas in England according to the deprivation experienced by the people living there (McLennan et al. 2011). It takes into account the multi-dimensional aspect

of deprivation and the fact that these separate dimensions can compound and reinforce each other in the experience of deprivation. The IMD is available for the years 2000, 2004, 2007, 2010 and 2015.

The FDep was developed in France by Rey et al. (2009). It was constructed at a commune level (a smaller area level unit than *département*) using data from the census and additional data on household income, and is also available at *département* level. The FDep was created using principal component analysis and is an index made up of four variables, each representing a fundamental dimension of socioeconomic situation, of similar meaning throughout the country and correlated in a similar fashion by age group and degree of urbanicity: the percentage of manual labourers/blue collar workers in the active population, the percentage of high school graduates among the over 15s, the unemployment rate, and the median household income. The FDep is available for the years 1990, 1999 and 2009.

There are two main limitations to the use of these composite indices in this research. Firstly, neither index is available for the earliest years of interest in this analysis and so are not comparable over the whole time period under study. Secondly, these indices are not thought to be comparable to each other. This is largely because of urban and rural differences in deprivation in Britain and France; whilst in Britain rural areas tend to be wealthier, this is the opposite in France.

European Deprivation Index

Pornet et al. (2012) have proposed a European Deprivation Index, the methodology of which is different to those most often used in constructing deprivation indices. The authors suggest that there is no 'gold standard' for measuring deprivation in terms of choice of variables included in the index, but rather that these vary depending on country. The basis of this approach is that the experience of being deprived in a community is widely shared in any culture or community. Rather than solely using census data, the construction of this indicator first derives an individual-level deprivation indicator using data from the European Union Statistics on Income and Living

Conditions (EU-SILC) survey, and then selects ecological variables from censuses that are most closely related to the individual deprivation indicator (Pornet et al. 2012). They argue that as the same theoretical concept is explored, this ecological index should be well suited for different contexts while offering the possibility to compare different countries, even if the variables may vary from one country to the other. In France, the EDI is constructed at the level of the Iris, the smallest administrative area unit, and includes the following variables: housing overcrowding, lack of central or electric heating, non-homeownership, unemployment, non-French nationality, no car, manual labourer or farmer, low level of education and single parent family.

The methodology used for the European deprivation index is reproducible for the 26 European countries covered by the EU-SILC survey. As the survey is repeated every year, the index can be updated too. To date, this index has only been constructed for France, and is not available for previous years so does not allow us to compare over time. However, its harmonised methodology means that it has the potential to be very useful in future comparisons using European data.

Townsend Index

The Townsend Index is a measure of material deprivation within a population. It is a composite measure made up of four variables: unemployment (percentage unemployed among those aged 16 and over), non-car ownership (percentage of all households not owning a car), non-home ownership (percentage of all households not owning their home) and household overcrowding (defined as fewer rooms, excluding kitchen and bathroom, than persons). It can be calculated for any area for which the data are available, but is most commonly calculated using census data.

The Townsend index has the advantage that it can be constructed for both countries using census data so is available for all the years for which conception and abortion data were obtained. However, it suffers from the same problem as the IMD and FDep when doing cross national comparisons, which is that the urban/rural differentials in deprivation level mean that,

as it was derived using British census data, it is a less accurate representation of deprivation in France (Rey et al. 2009).

4.2.2.2 Proportion with degree level education

In both the French and British census, information is collected on highest qualification attained. The proportion of the male population with a degree or equivalent post-18 qualification is a measure that is comparable both between the two countries and over time, and is available at small area level.

The composite indices described above all suffer from limitations with regard to their comparability between England and Wales and France and the fact that they are not available for the earliest years of the period under study. For this reason, the proportion with a degree level qualification is the most appropriate measure of area level disadvantage for comparison between countries and over time. In order to account for the fact that this measure might vary over time or between areas, not because of actual changes in educational attainment in the population but because of variation in the population age structure, the measure will be limited to the proportion aged 30-44 with a degree or equivalent. The measure is limited to men as men's participation in education has been more consistent over the last decades than women's, among whom participation in education and the labour force has increased substantially.

In England and Wales, a map of quintiles of area-level disadvantage as measured using the proportion with no degree level qualification at Local Authority level broadly corresponds to the equivalent map of disadvantage measured using the Index of Multiple Deprivation. In France, both the FDep and disadvantage measured using the proportion with no degree qualification show the South-East of France as being relatively less disadvantaged. Some northern departments have a lower level of disadvantage when measured using the proportion with no degree-level qualification than when measured using the FDep, and some central departments have a higher level of disadvantage as measured using the proportion with degree-level qualification.

4.2.3 Sources of data

4.2.3.1 Conceptions and abortions

England and Wales

Data on number of conceptions, conception rates, and the number and proportion of conceptions leading to abortion among residents of England and Wales from 1977-2011 were provided by the Office for National Statistics. These data were used to derive the birth rate and abortion rate. Data were provided by single year of age for under 20s and by five-year age group thereafter. Data were also broken down by area of residence for the years 1992-2011, at Local Authority (LA) level for 1992-2000, and Primary Care Trust (PCT) level for 2001-2010.

France

In France, national level data on conception rates, birth rates, abortion rates and the abortion ratio by age group for the years 1976-2009 were provided by Mireille Le Guen of the National Institute for Health and Medical Research (INSERM) and INED, and by Laurent Toulemon of INED. These figures have been re-estimated by them to take into account under-recording of abortions in France, and are considered complete. Further information on under-recording of abortions and methods for accounting for this is provided in Section 4.2.1.2 (above). As these data were not disaggregated by area, further data were obtained from INED and the National Institute of Statistics and Economic Studies (INSEE). Data on births were provided by INSEE and comprised individual-level data with a format of one record per birth, from 1981-2009. Each record contained information on the year of the birth, age of woman at the birth and her area of residence. Area of residence was available at *département* level for all years. Data on abortions based on notifications were obtained from INED. For the years 1980-1996 and 2006-2009, individual-level data was obtained with a format of one record per abortion. Each record contained information on the year of abortion, age of woman at the time of abortion, and her area of residence. Area of residence was available at *département* level for all years. Due to problems with data collection in France, these data were not available for the years 1998-2004

(Rossier & Pirus 2007a). Abortions are known to be under-recorded in the notifications data. However, this under-recording would introduce bias in area-level analyses of the association between area level disadvantage and conception and abortion rates only if the extent to which abortions are under-recorded varied systematically according to *département* level disadvantage, and the results of the analyses of several different scenarios suggest that it is reasonable to use the data from the notifications (see Section 4.2.1.3).

Numbers of conceptions by age and *département* were calculated by summing the number of abortions and the number of conceptions. In France, mid-year population estimates by age group and *département* were available from INSEE. Data on number of conceptions, number of abortions, number of births and the mid-year population were used to calculate conception rates, birth rates, abortion rates and the abortion ratio by age group and *département* for the years 1980-2009.

4.2.3.2 Area level disadvantage

The proportion of males aged 30-44 without a degree qualification or equivalent was chosen as an indicator of disadvantage comparable over time and between the two countries. In both countries, this was available from census data.

England and Wales

In England and Wales, these data were downloaded from the Casweb and Nomis websites. The age groupings of these data changed between the 1991 and 2001 censuses, as did the definitions of level of education as posed in the census form. These changes are summarised in Table 4.2. The data were available at enumeration district level in 1991, at lower layer super output area (LLSOA) in 2001 and at middle layer super output area (MLSOA) in 2011. These data were then aggregated up to the relevant geography for which the conceptions and abortions data were available using lookup tables between the geography of the conceptions and abortions data and the geography of the census output areas. In some cases, these lookup tables were not available, and geographic information systems (GIS) software was used to analyse the boundaries of the

conceptions and abortion geographical unit and the boundaries of the census output areas and create the relevant lookup table between the two geographies. There was some error in the mapping between health boundaries and census geography boundaries, for example, where a census enumeration district was split over the boundary of two Local Authorities. However, these overlaps were rare, and the small size of the enumeration districts compared to the health authorities means that the error is minimal and can be considered negligible.

France

In France, the census data were downloaded from the INSEE website and was available for 30-44 year old males at *département* level for all years (Table 4.2).

Table 4.2: Changes between census years in definition of qualifications used in indicator of disadvantage, age group for which the data was available, area level at which the data was available, census sample from which data were collected, and source of data, by country and year

Country	**England and Wales**				**France**			
Census year	1981	1991	2001	2011	1982	1990	1999	2008
Qualifications	Any qualifications obtained after the age of 18 such as: degrees, diplomas, HNC, HND, nursing qualifications, teaching qualifications, graduate or corporate membership, other professional, educational or vocational qualifications		Level 4 and above: Degree (for example BA, BSc), Higher Degree (for example MA, PhD, PGCE), NVQ Level 4-5, HNC, HND, RSA Higher Diploma, BTEC Higher level, Foundation degree (NI), Professional qualifications (for example teaching, nursing, accountancy)		University diploma (1st cycle, BTS, DUT, 2nd cycle or 3rd cycle)			
Age group	30-44		35-49		30-44			
Area level	Enumeration district (ED)		Lower layer super output area (LLSOA)	Middle layer super output area (MLSOA)	*Département*			
Sample	10% sample		All	All	All			
Source	Casweb	Nomis	Nomis	Nomis	INSEE			

Ethical approval

Ethical approval for this analysis was obtained from the London School of Hygiene and Tropical Medicine Research Ethics Committee (ref: 6473) and the National Research Ethics Committee (NRES) (ref: 13/LO/1275). Permission to use abortion data obtained from the Department of Health for this research was obtained from the Chief Medical Officer Professor Dame Sally Davies.

5 COMPARING REPORTING OF ABORTIONS IN THREE NATIONALLY REPRESENTATIVE SURVEYS: METHODOLOGICAL AND SOCIAL-CONTEXTUAL INFLUENCES

5.1 INTRODUCTION

The following research paper presents the results of analyses estimating the extent of under-reporting of abortions in surveys in Britain and France. The analyses use data from the Natsal-2 and Natsal-3 surveys in Britain and the FECOND survey in France, alongside routine data on abortions in both countries. This paper examines the extent of underreporting of abortions in Britain and France in the 2010 surveys and assesses whether the extent of this under-reporting differs between the countries. It also compares the extent of under-reporting in Natsal-2, in which reporting of abortions has previously been found to be good (Copas et al. 2002) and Natsal-3, where the method used to collect data on abortion changed, in order to examine the effect of survey methodology on reporting of abortions.

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I am the first author on this paper. I was responsible for constructing the variables for analyses, conducting the analysis and writing the article. My co-authors supported this work in an advisory capacity and in helping to edit the writing.

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5.2 ARTICLE

Abstract

Background

Abortions are known to be under-reported in surveys. Previous research has found a number of ways in which survey methodology may increase or decrease women's willingness to disclose abortions. The social and political climate surrounding abortion may also affect the stigma women feel about reporting an abortion, and this may vary between countries.

Methods

This paper estimates the extent of under-reporting in three nationally-representative population surveys by comparing the survey rates with routine statistics, in order to explore the ways in which survey methodology and country context might influence reporting of abortion. Two National Surveys of Sexual Attitudes and Lifestyles, conducted in 2000 and 2010 (Natsal-2 and Natsal-3) from Britain are used, as well as the Fertility, Contraception and Sexual Dysfunction survey (FECOND) in France, conducted in 2010. The three surveys differ with regard to survey methodology and country context.

Results

There was no evidence of under-reporting in Natsal-2, which collected data on abortion using a direct question. There was evidence of under-reporting in Natsal-3 and FECOND, both of which collected data on abortion through a pregnancy history module. There was no evidence of a difference in the extent of under-reporting between Natsal-3 and FECOND, which differed with regard to survey methodology (self-administered module in Natsal-3, telephone interview in FECOND) and country context.

Conclusion

A direct question may be more effective in eliciting reports of abortion than a pregnancy history module.

Introduction

Abortions are known to be under-reported in surveys (Jones & Kost 2007; Moreau et al. 2004). It is estimated that 47% of all abortions were reported in face-to-face interviews in the 2002 US National Survey of Family Growth (NSFG), comparing the survey reports to data collected by the Guttmacher Institute from abortion patients and providers (Jones & Kost 2007), and preliminary analyses of the 2011-2013 round of the survey estimated this figure at just 38% for abortions occurring in the period 2006-2010 (National Center for Health Statistics 2011). In France, Moreau et al. (Moreau et al. 2004) estimate that the annual frequency of abortions reported in the 1997 COCON survey was 60% of the true population rate. However, the British National Surveys of Sexual Attitudes and Lifestyles have historically had good abortion reporting; the reported abortion rates among 16-44 year-olds were 84% and 87% of the population rates in Natsal-1 (1990) and Natsal-2 (2000) respectively and the confidence intervals of the estimates included the population rates (Copas et al. 2002; Wadsworth et al. 1993). The aim of this analysis is to better understand the differential reporting of abortion in British and French population surveys, by examining both methodological and country-level factors that may be implicated.

Survey methodology

Methodological aspects of the survey administration are thought to influence reporting of sensitive behaviours such as abortion. In particular, when information on abortion is collected as part of a self-administered interview, a greater number of women report abortions and a greater number of abortions are reported by each woman (Jones & Kost 2007; Lindberg & Scott 2016). Other aspects of the questionnaire design may also influence reporting of abortions, for example question wording, question type and question ordering. Women may be less likely to report an abortion when it is asked as part of a pregnancy history because this is burdensome to complete (Lindberg & Scott 2016). It is widely accepted that sensitive items should not come at the start of an interview (Groves et al. 2013), and a question that is asked at the end of a survey, when the interviewer has built up rapport with the respondent, may elicit more accurate

reporting of sensitive behaviours. Moreau et al. (Moreau et al. 2004) found that varying the formulation of the question regarding abortion elicited different responses. A direct question on experience of abortion elicited more reported abortions than a pregnancy history module, and clarifying the question wording around induced abortion and including follow-up questions reduced classification error. The most common classification error was to use the term 'induced abortion' to describe another obstetric event, for example therapeutic abortion or spontaneous miscarriage. This would lead to an overestimate of abortions.

Further methodological influences that may influence reporting of abortions include the survey context, characteristics of the interviewer and duration of the questionnaire. In a study comparing women's reporting of abortion in a survey with their medical records, Jagganathan (2001) found that in-person interviews were less successful in eliciting reports of abortion than telephone interviews. Nebot et al. (1994) found in a study in Baltimore (USA) comparing two cross-sectional surveys, one conducted over the phone and one face-to-face, that the reported abortion rate was higher in the survey conducted over the phone. In a study examining factors shaping young women's willingness to report abortions, respondents expressed a greater willingness to report an abortion in a telephone interview than a face-to-face interview (L. Smith et al. 1999), perhaps due to the greater psychological 'distance' from the interviewer. Longer interviews have been found to elicit fewer reports of abortion than shorter ones (Jagannathan R. 2001). Finally, some previous research in the US has found that white, Black and Hispanic women were less likely to report an abortion if the interviewer was of a different race (London and Williams 1990, cited in Smith et al., 1999).

Survey participation

Under-reporting may also result from imperfect sampling; most population surveys under-represent respondents from the most marginalised and disadvantaged sections of the population, where recourse to abortion may be more frequent (Moreau et al. 2004). Whilst all three of the surveys used in this analyses utilised post-stratification weights to take into account

the under-representation of some groups, this does not eliminate bias completely as it assumes that the women who were not captured or refused interview would respond in the same way as women with the same profile who did respond. In addition, participation in surveys has declined over time (R Tourangeau & Plewes 2013). When participation declines, the problem of under-representation of some groups is intensified. In order to limit this problem, surveys employ repeated efforts to contact respondents, which, while improving the participation rate, also results in the sample containing a greater proportion of 'reluctant' respondents, who are more likely to not respond or not respond accurately, leading to poorer data quality (Fricker & Tourangeau 2010). Both imperfect sampling and declining participation rates could plausibly affect reporting of abortion in surveys.

Stigma

For some women, abortion is a sensitive or stigmatised behaviour (Cockrill et al. 2013; Kumar et al. 2009). In the past in many countries abortion was subject to legal, religious and social censure, and this remains the case to a lesser but still important extent today. Women may not report some or any of their abortions in order to provide more socially desirable responses (Roger Tourangeau & Yan 2007). In the US, the stigma of abortion has been shown to be experienced differently by different ethnic groups (Shellenberg & Tsui 2012). Romania's 1993 Reproductive Health Survey elicited approximately 80% of abortions that were recorded in national registers (IMCC & CDC, 1995). Abortion had long been used as a means of fertility regulation in Romania, even during periods when it was not legal, due to a lack of readily available contraception (B. R. Johnson et al. 1996). The Reproductive Health Survey took place during a period when abortion was legal, abortion rates were high and political support for abortion was strong (IMCC & CDC, 1995). The lower under-reporting of abortion in this survey may reflect its commonality and acceptance during that time. Little research has considered how the stigma surrounding abortion may differ cross-nationally. However, reporting of abortion

may be an important indicator of how stigma might be experienced differently in different countries.

Implications

Survey researchers continue to persevere with the collection of abortion data in surveys because it is one of the few ways in which to examine the individual-level characteristics associated with abortion in a representative population. However, under-reporting of abortions has important consequences for research. If abortions are more likely to be reported by certain subgroups of the population (Jones & Kost 2007), this may induce bias in analyses of characteristics associated with abortion. The US NSFG user guidelines in 2014 go so far as to state that abortion reports from the NSFG: 'should not be used for substantive research' (National Center for Health Statistics 2014). In addition, under-reporting of abortions has knock-on effects on reporting of all pregnancies. Without full reporting of abortions, the estimates of conception rates and unplanned pregnancies, which are essential for demographic and epidemiological studies of the determinants of fertility in populations, are compromised, as are estimates of the association of other characteristics with these outcomes (Lindberg & Scott 2016).

Methods

This paper draws on data from three nationally-representative probability surveys: the second and third National Survey of Sexual Attitudes and Lifestyles (Natsal-2, 15,162 men and women aged 16-44 and Natsal-3, 12,110 men and women aged 16-74) in Britain, conducted in 2000 and 2010 respectively, and the Fertility, Contraception and Sexual Dysfunction Survey (FECOND, 8,645 women aged 14-49) in France, conducted in 2010. In this analysis we limited the sample to women aged 17-45 in order to calculate abortion rates among 16-44 year-olds, giving a sample size of 6,781 and 5,608 in Natsal-2 and Natsal-3 respectively, and 4,173 in FECOND.

Data collection for Natsal-2 took place from 1999-2001 and used a multistage, clustered and stratified probability sampling strategy; within each primary sampling unit (postcode sectors),

addresses were randomly selected. Natsal-2 used computer-assisted personal interviews (CAPI) with a computer-assisted self-administered interview (ACASI) or paper self-administered questionnaire for more sensitive questions. The response rate in Natsal-2 was 63.9%. As not all respondents in the general population sample selected for inclusion in the survey had an equal chance of selection, weights were applied to correct for this. After application of these weights, a non-response post-stratification weight was used to correct for the under-representation of men aged 25-29, and of London residents.

Fieldwork for Natsal-3 and FECOND began in 2010; Natsal-3 was conducted through computer-assisted personal interviews (CAPI) with a computer-assisted self-administered interview (CASI) for the more sensitive questions. As in Natsal-2, Natsal-3 used a multistage, clustered and stratified probability sampling strategy. The response rate in the Natsal-3 survey was 57.7%, after taking into account non-eligible subjects. The Natsal-3 data were weighted to adjust for the unequal probabilities of selection in terms of age and the number of eligible adults in the household. After application of these weights, the Natsal-3 sample was broadly representative of the British population in the 2011 census. Men and London residents were slightly underrepresented, so a non-response post-stratification weight was applied to correct for differences in sex, age, and Government Office Region between the achieved sample and the 2011 census.

In FECOND, two samples were independently selected to include a random sample of individuals who had a telephone landline and a random sample of mobile phone users who did not have a landline, following a two stage random probability sampling process. An initial probability sample of households or mobile phones was selected using random digit dialling, and one eligible individual per household or mobile phone was randomly selected for participation in the study. Further details of both study designs are published elsewhere (Erens et al. 2014; Legleye et al. 2013). The response rate in the FECOND survey was 54.1% for the landline sample and 37.6% for the mobile phone sample, after taking into account non-eligible subjects. The total

response rate was 50.2%. The FECOND data were weighted to adjust for the unequal probabilities of selection in the sample in terms of age, sex and landline or mobile phone interview. After application of these weights, some groups were under-represented in comparison to the French census collected continuously from 2005-2009, particularly individuals born outside of France, and those with no qualifications. Post-stratification weights were applied to correct for differences in sex, age, marital/cohabitation status, level of education, professional situation, place of birth and dependent children between the achieved sample and the census. Full details of the study designs in each of the questionnaires are published elsewhere (Erens et al. 2014; Legleye et al. 2013; Erens et al. 2001)

Question wording in the three surveys.

Natsal-2 asked a single, direct question about experience of abortion ever, and subsequently asked follow-up questions on number of abortions and age at the first and, if relevant, last abortion. This question was asked in a computer-assisted self-interview section of the face-to-face questionnaire.

> To all women: 'Have you ever had a termination of pregnancy (abortion)?' If *yes*, then: 'How many terminations of pregnancy (abortions) have you had?' If *one abortion*, then: 'What age were you then?' If *more than one abortion,* then: 'What age were you when you had the termination?' and 'What age were you when you had the last one?'

Natsal-3 collected information about abortion as part of a pregnancy history. Respondents were asked if they had ever been pregnant, if so how many times, and what the outcome of each pregnancy was. For every pregnancy outcome that was reported as abortion, they were asked what age they were at the time. This information was collected in the computer-assisted self-interview section of the questionnaire.

> To all women: 'Have you ever been pregnant?' If *yes*, then: 'How many times have you been pregnant?' For each pregnancy in turn 'What was the outcome of that pregnancy?'

If outcome was '*I had a termination or abortion*', then: 'How old were you when this happened?'

FECOND also collected information about abortion as part of a pregnancy history. Respondents were asked if they had ever been pregnant, how many times in total, the outcome of each pregnancy and they age at which the pregnancy ended. This information was collected as part of the telephone-administered questionnaire.

To all women who have ever had sex: 'Have you ever been pregnant, whether the pregnancy ended in a miscarriage, birth, termination or abortion, extra-uterine pregnancy or anything else?' If *yes,* then: '[Besides your current pregnancy], how many times have you been pregnant, no matter how the pregnancy ended?' For each pregnancy in turn: 'How did this pregnancy end?' If *with a termination/abortion*', then: 'When [on what date – month/year or year only] did this pregnancy end?'

The three surveys enable us to compare one country at two time points, and two countries at the same time point. All three surveys covered similar topics and collected detailed information on abortion. The Natsal-2 and Natsal-3 surveys were conducted on the same population at two different points in time, allowing us to compare the extent of under-reporting under two different methodologies. However, other aspects than just the questionnaire methodology may have changed in the ten years between the two surveys, including women's experience of abortion stigma and survey participation. The information on abortion in the Natsal-3 and FECOND surveys, both conducted at the same point in time, was collected through a pregnancy history module, allowing a direct comparison between two country contexts with similar survey methodology. A notable difference between the two surveys is that in Natsal-3 data on abortion was collected through a self-completion module of a face-to-face interview, while the FECOND survey was administered by telephone.

Analysis

By law, all abortions must be recorded in Britain and France. This recording is considered to be complete for all years since abortion was legalized in Britain, and from 2002 onwards in France (Rossier & Pirus 2007a). We compared the abortion rates estimated from the survey data to routine data from Britain and France. We compared the rates estimated from the survey conducted in 2000 to 1999 routine data, and rates from the surveys conducted in 2010 to 2009 routine data.

In order to calculate the extent of under-reporting of abortions in the three surveys, we replicated the methods used by Copas et al. (2002) in their methodological paper examining reporting of sexual behaviours and outcomes. We estimated the abortion rates in each age group by calculating the proportion of women in each age group plus one year who reported an abortion at a year younger than their current age. For example, the estimated abortion rate among 16-19s in 1999 is the proportion of women aged 17-20 in the survey reporting an abortion aged one year younger than their current age. The proportion is multiplied by 1,000 to obtain a rate per 1,000 women. In all three surveys, women who are missing data on any pregnancy outcome or on age at last abortion were excluded from the denominator, as it was not possible to know whether they had an abortion during the relevant time period or not. Natsal-2 only interviewed 16-44 year-olds; in order to estimate abortions occurring to women when they were aged 44, we applied double the weights to 44 year-olds, effectively generating a group of 45 year-olds, under the assumption that abortion rates among 43-year-olds and 44-year-olds in the survey are similar (confirmed by data supplied by the Office for National Statistics). We estimated abortion rates by age group to assess whether there was any pattern in reporting completeness by age. Due to the limited information collected in routine statistics, we were not able to assess reporting by any other characteristics that have been found to be important in other countries (Jones & Kost 2007), for example income, level of education, or social class.

Results

Reporting of abortions in Natsal-2, Natsal-3 and FECOND

All results are shown in Table 5.1, presented at the end of this paper. In Natsal-2, there was no evidence that abortions were under-reported in the survey compared to national statistics. The abortion rate obtained from the survey was 13.5 per 100 women (95%CI 10.5-17.3), and the confidence interval of the rate obtained from the survey overlapped the true population rate of 16.2 per 1,000. In Natsal-3, the abortion rate obtained from the survey was 12.0 per 1,000 women (95%CI 9.6-14.9), and the confidence interval for this rate did not include the true population rate, suggesting that abortions are under-reported in Natsal-3. Our data suggest that abortions are also under-reported in France. The abortion rate among 16-44 year-olds obtained from the survey was 11.8 per 1,000 (95%CI 8.6-16.0), which is 66% of the true population rate of 17.9 per 1,000. As in the Natsal-3 data, the confidence interval for the survey rate does not include the true rate.

Differences in reporting of abortions between Natsal-2 and Natsal-3

In Natsal-2, 83% (95%CI 65%-107%) of abortions among 16-44 year-olds were reported, and the confidence interval of the rate obtained from the survey overlapped the true population rate. In Natsal-3, 71% (95%CI 56%-88%) of abortions among 16-44 year-olds were reported. Although the confidence intervals of reporting completeness in Natsal-2 and Natsal-3 overlap, the confidence interval for the survey rate in Natsal-3 excluded the true population rate, suggesting that reporting of abortions declined between the two surveys.

Difference in abortion reporting between Natsal-3 and FECOND

We found no evidence of a difference in reporting of abortions between Natsal-3 and FECOND. In Natsal-3, 71% of abortions were reported (95%CI 56%-88%), compared to 66% of abortions in FECOND (95%CI 49%-89%). There was no significant difference in the proportion reported between the two surveys.

Variation in abortion reporting by age

The confidence intervals around all the abortion rates by age group are very wide, and almost all overlap the rate obtained from national statistics. The confidence intervals for the abortion rate among all ages is narrower in Nastal-3 and FECOND and does not overlap the true rate, suggesting that the overlap in the rates by age is due to the uncertainty induced by the much smaller sample size. This makes it difficult to assess whether there is any differential under-reporting by age group using these data.

Discussion

Summary of results

In the Natsal-2 survey, conducted in 2000 and asking a direct question about abortion in the self-administered section of the questionnaire, there was no evidence that abortions were under-reported compared to national statistics. In the Natsal-3 survey, conducted in 2010 and collecting information on abortion as part of a pregnancy history module in the self-administered section of the questionnaire, and the FECOND survey, also collecting information on abortion in a pregnancy history module but in a telephone-administered questionnaire, fewer abortions were reported in the surveys compared to rates obtained from national statistics.

Strengths and weaknesses

A key strength of this study is that we are able to make two important comparisons: one where the main difference is country context, and one where the main difference is survey methodology. We are also able to compare the abortion rates obtained from the surveys with national-level routinely-collected data in Britain and France that in both countries is considered reliable and complete. We were unable to examine whether under-reporting varies by sub-group because of a lack of comparable information available in both the surveys and the routine statistics, and because where this was available, in the case of age, the small sample size meant that the level of uncertainty in the survey results was such that no meaningful conclusions could

be drawn. We are only able to examine the reporting of abortions; it would be useful to be able to triangulate results on reporting of abortions with reporting of other sensitive or under-reported behaviours, such as crime or illicit drug use, however there was no way of doing this with our data.

Survey methodology, survey participation and stigma

These analyses allow us to discuss the influences of survey methodology and participation, and abortion stigma, on reporting of abortions in surveys. The difference in reporting between Natsal-2 and Natsal-3, which were conducted on the same population but with very different approaches to collecting information on abortion, suggest that the methodology used in Natsal-2 may be more effective at eliciting self-reported abortions. The key difference in the way in which information on abortions was collected between Natsal-2 and Natsal-3 was that that Natsal-2 used a direct question, whereas in Natsal-3 the information was collected as part of a pregnancy history module. Some previous research has found that a direct question elicits more abortions from more women than a pregnancy history module (Moreau et al. 2004). Part of the mechanism for this may be that a pregnancy history module is more burdensome to complete, and so some women may omit pregnancies that are less salient or that they do not wish to talk about in order to shorten the process (Lindberg & Scott 2016). It is also possible that some women choose not to 'count' certain pregnancies, such as those that end in abortion. In this instance under-reporting stems not so much from deliberate omission, but from question comprehension and recall.

The differences in reporting between Natsal-2 and Natsal-3 may not be entirely due to reluctance to report abortions. The participation rate declined between the two surveys, from 65.4% in Natsal-2 to 57.7% in Natsal-3. It is likely that the decline in participation also resulted in an increased under-representation of some sub-groups, amongst whom abortion rates may be higher (Moreau et al. 2004). This would have a direct effect on the abortion rates obtained from the survey, but as a result of poorer representativeness rather than under-reporting per

se. However, if the lower participation was boosted by call-backs, which would increase the response rate and representativeness but may lead to a greater proportion of more 'reluctant' respondents, then the relatively worse reporting of abortion might be partly due to this poorer data quality (Fricker & Tourangeau 2010). Reporting of abortions has also declined in the US National Survey of Family Growth (National Center for Health Statistics 2011).

It is perhaps surprising that there was no difference in reporting between the two country surveys, despite the more private setting in which the questions in Natsal-2 were asked. Previous research comparing reporting of abortions among the same women in face-to-face compared to self-administered survey sections has found that self-administered survey modes lead to greater reporting of abortions (Jones & Kost 2007; Lindberg & Scott 2016), suggesting that stigma is an important factor in women's reluctance to disclose abortions in surveys. However, other studies have conducted experiments to test the effects of using de-stigmatising language to try to normalise abortion and reduce its sensitivity in a survey setting, and have nevertheless obtained significant under-reporting of abortions (Moreau et al. 2004). Previous studies have found that women were more willing to report an abortion in a telephone than a face-to-face interview context (Smith et al. 1999, Jagganathan 2001). It is possible that as the FECOND survey was conducted entirely over the phone, women did feel a certain level of anonymity.

Significant differences in reporting of abortion between Natsal-3 and FECOND, which both employ a pregnancy history module to collect data on abortions, might also have been indicative of cross-national differences in societal or public health attitudes to abortion. Future research could consider other means of assessing cross-national differences in abortion stigma and attitudes to abortion.

Implications

As long as abortion remains a socially-censured behaviour, it is unlikely that all women will report their abortions in surveys. However, this study highlights the interaction of survey methodology, survey participation and stigma in preventing women from discussing and

disclosing their abortions. The findings of this research suggest that a direct question may be more effective at eliciting reports of abortion than a pregnancy history module. Declining participation in social surveys may also pose significant problems for survey-based estimates of abortion rates, which are already under-reported. Under-reporting of abortions in surveys has implications for research on all pregnancy outcomes. Where abortions are under-reported, there is a knock-on effect on reporting of other pregnancy outcomes. This may result in inaccurate estimates of prevalence, and biased estimates of associations. In addition, if women misreport their pregnancy history, it is plausible that they may also alter other aspects of their contraceptive and reproductive history to fit (Lindberg & Scott 2016). Future empirical research examining and assessing different methodologies to improve abortion reporting in surveys is key to improving research on not just abortion but also conceptions and unplanned pregnancies.

Table 5.1: Abortion rates by age group in the Natsal-2, Natsal-3 and FECOND, compared to national statistics.

	Routine data, Britain, 1999	Natsal-2 (2000)	Reporting completeness	Routine data, Britain, 2009	Natsal-3 (2010)	Reporting completeness	Routine data, France, 2009	FECOND (2010)	Reporting completeness
Age group	**Rate**	**Rate (95%CI)**	**%**	**Rate**	**Rate (95%CI)**	**%**	**Rate**	**Rate (95%CI)**	**%**
16-19	26.5	31.6 (18.2-54.5)	119 (69-206)	25.8	21.2 (13.1-34.0)	82 (51-132)	18.9	9.8 (3.3-28.7)	52 (17-152)
20-24	28.8	15.5 (9.3-25.7)	54 (32-89)	28.8	20.1 (13.6-29-6)	70 (47-103)	26.9	26.5 (15.1-26.4)	99 (56-98)
25-29	20.0	18.6 (11.3-30.5)	93 (56-152)	21.6	21.8 (15.3-30.1)	101 (71-140)	23.5	12.8 (6.2-26.6)	55 (26-113)
30-34	13.5	8.2 (4.7-14.2)	61 (35-105)	15.2	6.8 (3.5-13.4)	45 (23-88)	18.9	10.5 (4.9-22.6)	56 (26-120)
35-39	8.8	8.1 (4.2-15.7)	92 (48-179)	9.2	2.1 (0.5-8.8)	23 (5-95)	13.7	11.6 (6.3-21.4)	85 (46-156)
40-44	3.2	5.5 (1.8-16.5)	170 (56-509)	3.6	2.5 (0.6-10.5)	70 (17-293)	5.8	2.9 (0.9-9.4)	50 (15-161)
16-44	15.8	13.5 (10.5-17.3)	86 (67-110)	16.6	12.0 (9.6-14.9)	72 (58-90)	17.9	11.8 (8.6-16.0)	66 (48-89)

5.3 CONCLUSION

The findings of this analysis suggest that survey methodology may have an important effect on reporting of abortions. The differences in reporting completeness between Natsal-2 and Natsal-3 suggest that a direct question may be more effective in eliciting reports of abortion. Other factors, such as changes over time in attitudes to abortion or in survey participation rates may also be implicated. There was no evidence for a difference in reporting completeness between Natsal-3 and FECOND. As there were differences between the two surveys in not only country context but also the mode of data collection, it is more difficult to disentangle the contributions of each of these factors to reporting. That the extent of under-reporting of abortions appears to be similar in Britain and France means that the extent of bias in the conceptions and abortions data in the surveys is unlikely to differ between the two countries, although it was not possible to draw any conclusions on the extent of under-reporting by age group.

6 CONCEPTION BEFORE AGE 18 IN FRANCE

Many studies have sought to better understand the characteristics of women who become pregnant aged under 20 in Britain (Kiernan 1997; Wellings et al. 2001; Bonell et al. 2005; Kneale 2009), largely in response to the high teenage pregnancy and birth rates in Britain compared to other European countries. In the most recent comprehensive analyses of conceptions to young women in Britain, Wellings et al. (2016) used data from the third National Sexual Attitudes and Lifestyles survey (Natsal-3) to examine the characteristics associated with conception before 18 among 18-24 year-olds. They found that 11% of women aged 18-24 reported a conception before age 18. Women living in a more deprived area (as defined by the Index of Multiple Deprivation), with a lower level of education, reporting first sex before age 16, who did not use a reliable method of contraception at first sex, and who did not live with both their natural parents at age 14 were more likely to report a conception before age 18. There was weak evidence that women who considered that the timing of their first sex was too early were more likely to report a conception before age 18. The main reason reported for first sex, main source of education was not school, relative willingness of respondent and partner at first sex, reporting needing more information at first sex, and communication with parents at first sex were not associated with reporting of a conception before age 18. This model did not include parental socioeconomic group as a dependent variable, but a previous analysis by the same research group, using data from Natsal-2, found that parent socioeconomic group was not independently associated with motherhood or abortion before age 18.

Fewer studies have examined this in detail in France. Before embarking on a detailed comparative analysis of sexual and reproductive health outcomes among young people in Britain and France, I will use this Chapter to briefly examine the characteristics associated with motherhood and abortion among young people in France, replicating the analyses of Wellings et al. (2016) as far as is possible using the data available in the 2010 FECOND survey.

The key independent variable relevant to this analysis is reporting of a conception before age 18, among age 18-24 year-olds. The FECOND survey collected data on respondent level of education, parent's socioeconomic group (derived from parent's qualifications), ease of communication with parents about sex or contraception, whether the respondent received any information about sexual relationships, contraception or STIs at school, respondent's views on timing of first sex, family structure at age 15, and age at first sex. This analysis uses completion of any post-16 education as an indicator of educational level in order to be comparable with Wellings et al. (2016), who group their educational variable into whether a respondent has gained or is studying for any further (post-GSCE) qualifications or not. Information on parent socioeconomic group is collected differently in Natsal-3 and FECOND. The FECOND survey collects information on parent's level of education, whilst Nastal-3 derives parent social class from information on parent's occupation and occupational responsibilities. In order to be broadly comparable, parent's socioeconomic group was recoded into a tiered variable. The variable used by Wellings et al. (2016) as an indicator of sex education was the main source of informational about sexual matters reported by the respondent, grouped into school, parent or other. These data are not available in FECOND, and the sex education indicator in this analysis refers to whether the respondent received any information in school on sexual relationships, STIs or contraception. FECOND asks respondents about ease of communication about sexuality or contraception with their mother or father at age 15, whereas Natsal-3 asks about communication about sexual matters at age 14 with the adults that the respondent lived with at the time. The comparability of survey data collected in Natsal-3 and FECOND are discussed in more detail in Section 4.1.2, and a summary of all relevant data available and its comparability across surveys is presented in APPENDIX A. The FECOND survey did not collect information on area-level deprivation, main reason for first sex, relative willingness of respondent and partner at first sex, and whether the respondent felt that they needed more information at first sex, variables that were included in Wellings et al's (2016) analyses. These variables are therefore not included in this analysis.

Bivariate analyses were used to examine the proportion reporting a conception before 18 according to respondent characteristics, and multivariate logistic regression was used to identify the characteristics that were independently associated with reporting a conception before age 18. All statistical analyses used the survey commands of Stata 14 to take into account the weighted nature of the data.

Among women aged 18-24 in France, 7% reported a conception before age 18. As in Britain, women with some post-16 education were less likely to report a conception before age 18 than women with no post-16 education (OR 0.15, 95%CI 0.06-0.40). There was some weak evidence that women whose first sex took place before age 16 were also more likely to report a conception before age 18 (OR 2.18, 95%CI 0.92-5.17) than women whose first sex occurred aged 16 or over. In contrast to Britain, use of a reliable method of contraception at first sex, family structure at age 15 were not associated with reporting of a conception before age 18.

Table 6.1: Prevalence and odds of reporting a conception before age 18 among women aged 18-24

	n, N	% (95% CI)	aOR (95%CI)	P-value
Parent's socioeconomic group				
Lower	152, 141	4.31 (1.92- 9.39)	1.00 (.- .)	.
Middle	441, 451	4.36 (2.34- 7.97)	0.96 (0.29- 3.24)	0.954
Higher	241, 260	4.08 (1.66- 9.70)	1.92 (0.52- 7.13)	0.332
Not answered/refused	118, 94	9.28 (4.98-16.63)	1.26 (0.39- 4.12)	0.701
Post-16 education or studying				
None	207, 162	14.13 (8.96-21.59)	1.00 (.- .)	.
Some	745, 784	2.32 (1.29- 4.15)	0.15 (0.06- 0.40)	<0.001
Easy to talk to parents about sex or contraception				
No	429, 424	5.59 (3.14- 9.75)	1.00 (.- .)	.
Yes with one/both	520, 520	4.34 (2.78- 6.70)	0.55 (0.22- 1.36)	0.196
Lived with both natural parents at age 14/15				
No	284, 249	8.78 (5.21-14.41)	1.00 (.- .)	.
Yes	666, 696	3.24 (1.95- 5.32)	0.61 (0.26- 1.45)	0.262
No contraception at first sex				
Any other method	716, 743	6.01 (4.10- 8.72)	1.00 (.- .)	.
None or traditional	45, 39	3.05 (0.42-18.81)	0.23 (0.02- 2.61)	0.234
Opinion on timing of first het sex				
Not the right time	121, 106	8.34 (3.23-19.86)	1.00 (.- .)	.
About the right time	633, 669	5.05 (3.33- 7.57)	0.69 (0.23- 2.05)	0.506
Received sex education at school				
No	256, 244	4.11 (1.86- 8.82)	1.00 (.- .)	.
Yes	696, 702	5.18 (3.42- 7.76)	1.45 (0.47- 4.49)	0.518
Had first het sex before age 16 if aged 13+				
No	803, 793	3.96 (2.49- 6.27)	1.00 (.- .)	.
Yes	138, 142	10.64 (6.02-18.10)	2.18 (0.92- 5.17)	0.076

The FECOND surveys suffer from under-reporting of abortions, which has a knock-on effect on reporting of conceptions (see Chapter 5). It is not possible to know whether abortions are under-reported at random in these data, but research in the US has found that certain groups are more likely to decline to disclose their abortion(s) than others (Jones & Kost 2007). Women with higher incomes were less likely to under-report abortions, but women with a higher level of education were more likely to. If abortions are not reported at random, these results may be biased towards women who do report abortions. It is not obvious from previous research what the effect of this on the results would be. If, as in the US, women with a higher level of education are less likely to report an abortion than women with a lower level of education, the association found in this analysis may overestimate the association between conception before 18 and level of education. Equally, however, if women from a higher socioeconomic background are more likely to report an abortion, the association between parent socioeconomic group and conception before 18 may be underestimated in this analysis. The under-reporting of abortions would only undermine the comparative element of this analyses if the extent of under-reporting or the factors associated with under-reporting differed between Britain and France. There was no evidence that the extent of under-reporting of abortions varied between Britain and France (Chapter 5), however it is not possible to know whether the factors associated with under-reporting of abortion are the same in both countries.

7 HOW DO DIFFERENCES IN SEXUAL ACTIVITY AND CONTRACEPTIVE USE CONTRIBUTE TO DIFFERENCES IN CONCEPTION AND ABORTION RATES AMONG UNDER 20S IN BRITAIN AND FRANCE?

7.1 INTRODUCTION

This paper describes differences between Britain and France at each stage in the pathway to abortion, and considers how these differences might contribute to variation in conception and abortion rates between the two countries. The data used are from both surveys in the two countries, and routine statistics on conceptions and abortions. The findings are interpreted with reference to the wider social context in the two countries, exploring the ways in which the differences between the two countries might be revealers of the ways in which behaviours are shaped by social contextual factors.

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I am the first author on this paper. I was responsible for constructing the variables for analyses, conducting the analysis and writing the article. My co-authors supported this work in an advisory capacity and in helping to edit the writing.

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7.2 ARTICLE

Abstract

Young women in Britain are more likely to become pregnant than young women in France. Among those who conceive, young women in Britain are less likely to have an abortion. The two countries are geographically close and share economic and socio-demographic similarities, yet are dissimilar in ways that affect young people's lives.

This paper describes the rates and trends in conception rates, abortion ratio and abortion rates among under 20s in Britain and France, and examines differences in sexual activity and contraceptive use that might underlie some of the variation. We draw on routine data on conceptions and abortions collected by French and British authorities, as well as several probability surveys of sexual behaviour in Britain and France conducted from 1983-2010.

A greater proportion of young women in Britain are sexually active than young women in France. Differences in contraception are smaller; among 18-19 year-olds, use of a reliable method of contraception is higher in France than in Britain, but among 16-17 year-olds it is lower. Differences in sexual activity are an important driver of the differences in conception and abortion rates. Even if contraceptive use were the same in both countries, conception rates would be higher in Britain because of the greater proportion who are sexually active and therefore at risk of pregnancy. It is possible that if the pattern of contraceptive use among 16-17 year-olds was the same in Britain and France, the between country difference between the conception and abortion rates in this age group would be even greater.

Introduction

Young women in Britain are more likely to become pregnant than young women in France. The conception rate among under 20s was 47 per 1,000 in Britain in 2011, compared to 25 per 1,000 in France (Sedgh et al. 2015). Among those who do become pregnant, young women in Britain are less likely to have an abortion (Sedgh et al. 2015). Little is known about why conception and abortion rates should be different in the two countries, and how these differences have changed over time.

Abortion is the end point of a process. It requires first that women are sexually active, that they do not use contraception or experience a contraceptive failure, that they become pregnant, that they choose to terminate the pregnancy and finally that they are able to access abortion services (Bajos, Guillaume, et al. 2003; Rossier, Michelot, Bajos, et al. 2007). Differences between Britain and France in these 'proximate' determinants of abortion may underlie some of the variation in conception and abortion rates, yet little is known about how they might differ. A better understanding of how each of these elements contributes to the variation in conception and abortion rates will help guide preventive efforts and provide insight into what may be the most effective focus of intervention to enhance young people's sexual health in both countries.

This paper first examines trends in sexual behaviour and contraceptive use among young people, and second describes and compares the current rates and trends over time in reproductive health outcomes – namely conception rates, the abortion ratio and abortion rates – in Britain and France, focusing on under 20s. The objective of this paper is to examine the relative contribution of sexual behaviour and contraceptive use to variation in the conception rate and abortion rate between the two countries. Although previous studies have examined rates and trends in the two countries separately (Wellings & Kane 1999; Kafé & Brouard 2000), no recent study, to our knowledge, has made use of a direct comparison in order to better understand the situation in both countries. Analysing historical trends provides an opportunity to analyse the conditions under which changes in sexual behaviour may occur (Bajos et al. 2010), and therefore

can provide an insight into the role of contextual factors that a static analysis cannot. Cross-national comparative studies, too, enable us to examine the role of the socio-cultural setting that could not be considered in a single country analysis, and help us to identify, analyse and discuss similarities and differences across societies. We interpret the results with reference to the social and demographic context in order to better understand the present differences and changes that have taken place over the past 30 years in conception and abortion rates in Britain and France.

Methods

We use individual-level data from two nationally representative probability surveys, the 2010 National Survey of Sexual Attitudes and Lifestyles (Natsal-3) in Britain (total sample size 15,162) and the 2010 Fertility, Contraception and Sexual Dysfunction Survey (FECOND) in France (total sample size 8,645). These surveys, which contain detailed, comparable information on sexual behaviour and contraceptive use, were used to examine trends over time in onset of sexual activity by comparing age at first sex among different cohorts (ranging from those aged 16-19 at time of interview to those aged 45-49), and to examine sexual activity and contraceptive use among 16-17 and 18-19 year-olds in 2010. Some questions on contraceptive use were asked differently in the French and British surveys. On current contraceptive use, in Britain women are asked first: 'Which [contraceptive methods] have you used at all with a partner in the last year?', to which multiple responses are possible, and then: 'What is your usual method these days?', to which three responses are possible. In France, women are asked first: 'Currently, do you or your partner use a method for avoiding pregnancy, including a natural method, and if so which one?', to which multiple responses are possible, and then: 'Of these methods, which would you consider your main method?', to which one response was possible. For this analysis we used the answer to the second contraceptive question in France, and coded the second contraceptive question in Britain in a hierarchy of effectiveness such that where a respondent provided

multiple responses to this question, the most effective method was used (for example, if a woman reported pill and condom use, this was coded as pill).

We also make use of three consecutive Natsal surveys (Natsal-1 in 1990, Natsal-2 in 2000 and Natsal-3 in 2010), and the General Household Survey for 1983 in Britain, as well as several sexual and reproductive health surveys in France dating back to 1983 (surveys were carried out in 1983, 1988, 1994, 2000 and 2010), to describe trends in contraceptive use over time. For this analysis we limit the sample to women aged 18-19, as under 18s were not included in some of the earlier surveys. As earlier surveys provide less information than later ones on the population requiring contraception (i.e. sexually active *and* seeking to avoid pregnancy), we describe contraceptive use trends among *all* women aged 18-19, including those who have never had sex.

To examine trends over time in rates of conceptions and abortions, we used routinely collected administrative data from the Office for National Statistics (ONS) in England and Wales and the National Institute of Statistics and Economic Studies (Insee) in France. We obtained data on the numbers of births and abortions that occurred each year between 1980 and 2011 in France and England and Wales, alongside mid-year population estimates for the same period. We calculated annual conception rates (the total number of births and abortions per 1,000 women, not including miscarriages) and abortion rates by age group. We also calculated the annual abortion ratio, that is the percentage of conceptions that end in abortion. Finally, in order to calculate conception rates among sexually-active women, we applied the conception rates obtained from national statistics in both countries to the proportion of the population that was sexually experienced, obtained from the survey data.

The survey data used in this analysis includes Scotland, whereas the routine data on conceptions and abortions is limited to England and Wales because this data was not available broken down by age group (15-17 and 18-19) in Scotland. The conception and abortion rates among under 20s in 2011 was slightly lower in Scotland than in England and Wales, at 44/1,000 and 19/1,000 respectively. The smaller population size in Scotland means that the overall effect on conception

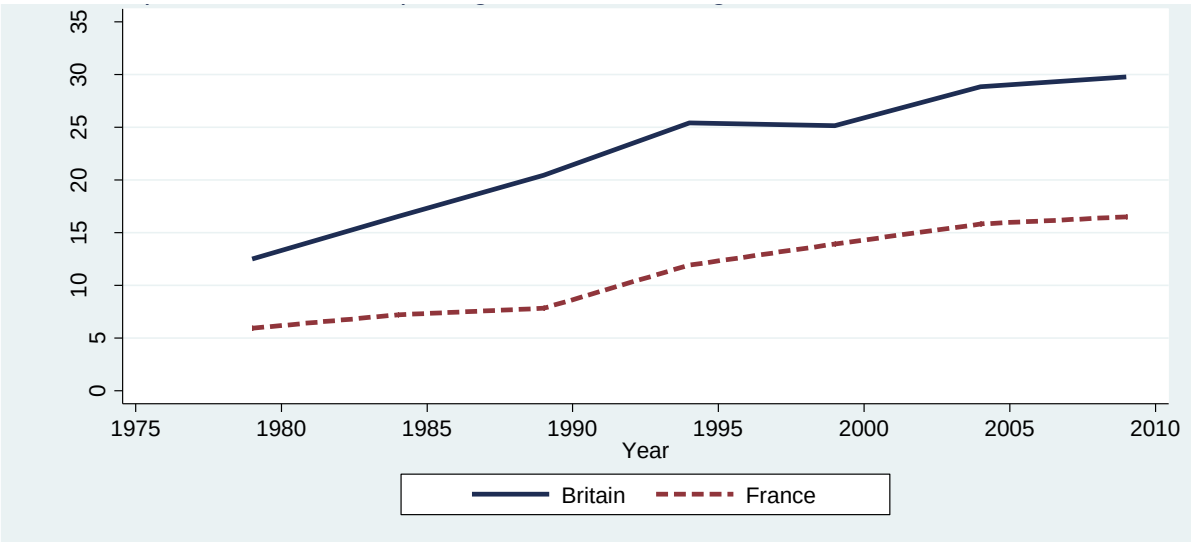
and abortion rates of excluding Scotland is negligible; the conception rates and abortion rates including Scotland are the same as those excluding it. It is therefore reasonable to compare the British survey data with routine data from England and Wales in this analysis.

Results

Sexual activity

In both Britain and France, the proportion of women reporting first heterosexual intercourse before age 16 has increased (Figure 7.1). In Britain, however, the proportion is higher than in France and the increase has been more marked. Among those aged 16 in the period 2007-2010, 29.8% of young women in Britain reported first sex before age 16 compared to 16.5% of young women in France. The proportions in both countries reporting first sex before age 18 are more similar, yet still higher in Britain. Among those aged 18 in the period 2007-2010, 67.4% of women in Britain reported sexual debut before age 18, compared with 58.1% in France (results not shown). In both age groups, among those who had ever had sex, the proportion who reported sex in the last four weeks, was similar (results not shown).

Figure 7.1: Proportion of women reporting first sex before 16, by year in which they turned 16, Britain and France 1975-2010



Contraceptive use

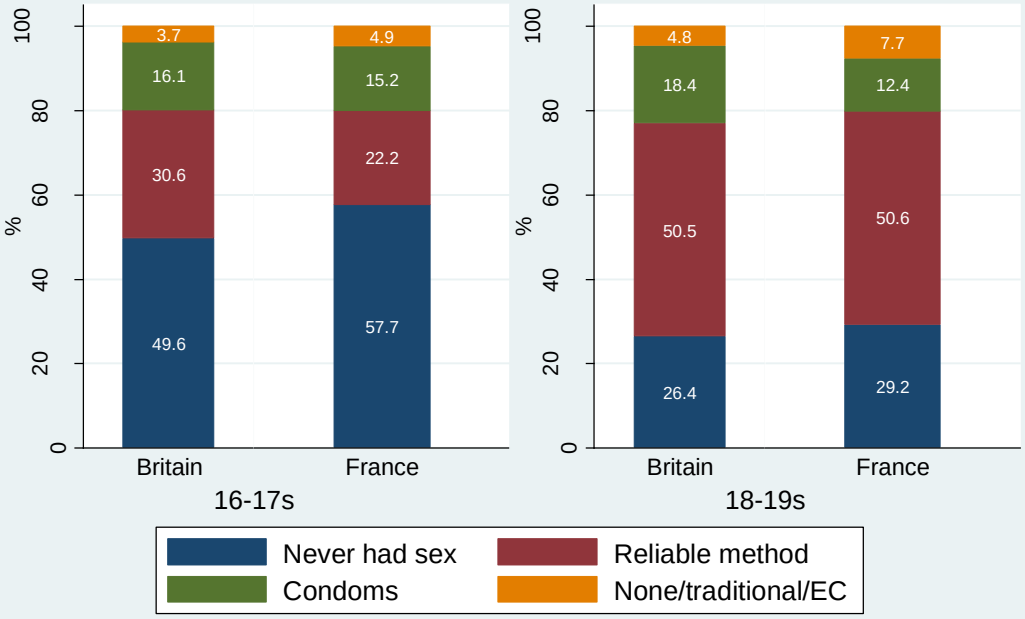
Use of a medical contraceptive method among women aged 18-19 years old has increased in both countries over time (Figure 7.2). Such methods include the pill, patch, implant, injection, and IUD, and exclude condoms, other barrier methods, and traditional methods of contraception. Trends in contraceptive use do not show marked differences between Britain and France from the early 1990s onwards. However in France, the increase since the early 1980s has been larger as use at this time was lower (24%). In Britain there has been a smaller increase, from 43% in 1983 to 49% in 2010.

Figure 7.2: Proportion using medical method of contraception among 18-19 year old women, Britain and France

Figure 7.3 shows the distribution of risk of conception among young women in Britain and France assigned to categories based on their contraceptive use and sexual activity. The top two sections of the bar (representing women who are sexually active and using no contraceptive method or condoms only) show those at greatest risk of conception. Among 16-17 year-olds, a similar proportion of women in Britain and France were using condoms or no method. More 16-17 year-olds in Britain were using a medical method of contraception than in France (31% in Britain, 22% in France). However, the proportion of 16-17 year old women reporting never having had sex and therefore at zero risk of conception was lower in Britain (50% in Britain, 58% in France), shown in the bottom section of the graph. Among 18-19 year-olds, a slightly higher proportion of women in Britain report using no contraception or condoms only than in France. However, within this group the proportion reporting no contraception was higher in France (8%

in France compared to 5% in Britain). The proportion using a medical method of contraception is similar in both countries, but the proportion in Britain who have never had sex is smaller, at 26% compared to 29%. The proportion of 18-19 year-olds usually using a medical method is slightly higher in the data used in Figure 7.3 than Figure 7.2 because the denominator in Figure 7.3 excludes those who are pregnant or trying to become pregnant.

Figure 7.3: Sexual activity and contraceptive use among 16-17 and 18-19 year-olds, Britain and France, 2010. (Sample: women aged 16-17 and 18-19 who have ever had sex and are not pregnant or trying).



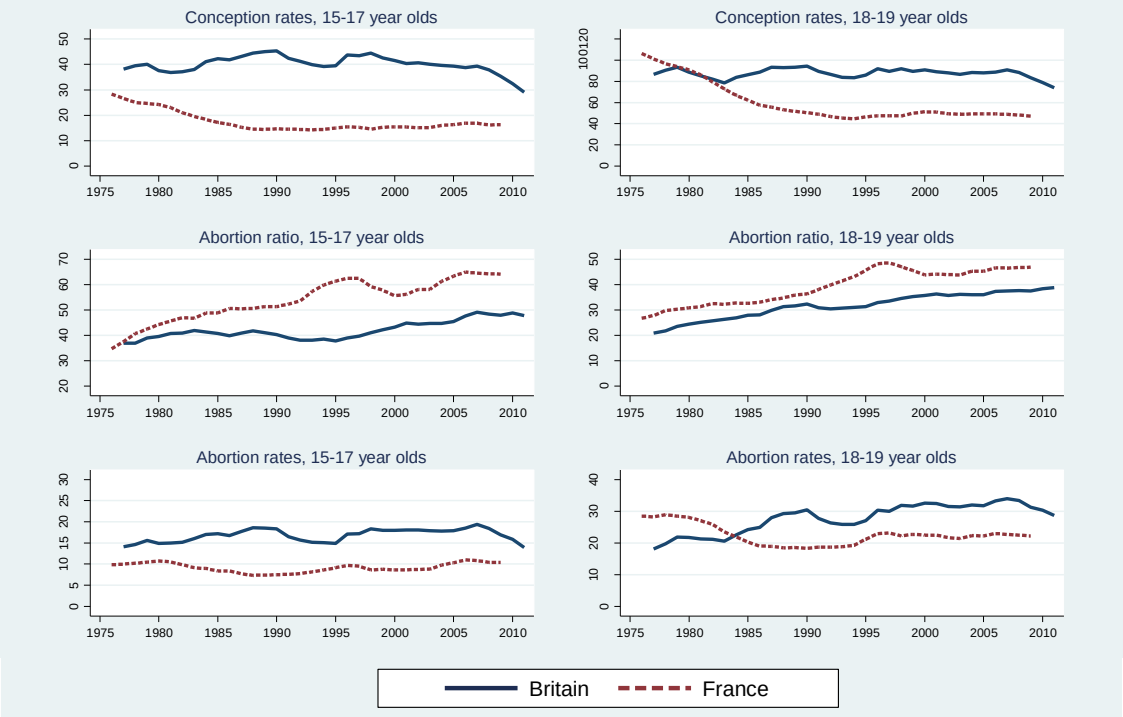
Sample: 16-17 and 18-19 year old women - 2010
Reliable methods are all hormonal methods, IUDs

Looking more closely at young women who reported sex in the past year, contraceptive method mix was different in Britain and France (results in APPENDIX B). Among 16-17 year-olds, more women in France than in Britain relied on the condom only or used no reliable method of contraception. In Britain, 40% of sexually active 16-17 year-olds were using only condoms or no method, compared to 47% in France. Among 18-19 year-olds, this pattern was reversed, although the differences between the countries were smaller. A greater proportion of women in Britain were relying on condoms or using no contraception than in France (34% in Britain compared to 30% in France). Interestingly, in both age groups a greater proportion of women using a medical method in Britain reported using long-term reversible contraception (nearly one fifth of 16-17 and 18-19 year-olds in Britain, and less than one percent in France).

Conception and abortion rates

In England and Wales, conception rates (obtained in both countries from national statistics on births and abortions) among 15-17 year-olds in 2010 were more than twice as high as in France (35 per 1,000 vs. 16 per 1,000), and were substantially higher among 18-19 year-olds (83 per 1,000 compared to 47 per 1,000) (Figure 7.4). Among those who became pregnant, a higher proportion of young people in France had had an abortion in both age groups. Although a lower proportion of young people chose to have an abortion in the event of pregnancy in England and Wales, the abortion rate was still higher because of the higher conception rate (17 per 1,000 compared to 20 per 1,000 among 15-17s; 31 per 1,000 compared to 22 per 1,000 among 18-19s).

Figure 7.4: Conception rates, abortion rates, birth rates and the abortion ratio among 15-17 and 18-19 year olds, England and Wales and France 1976-2011

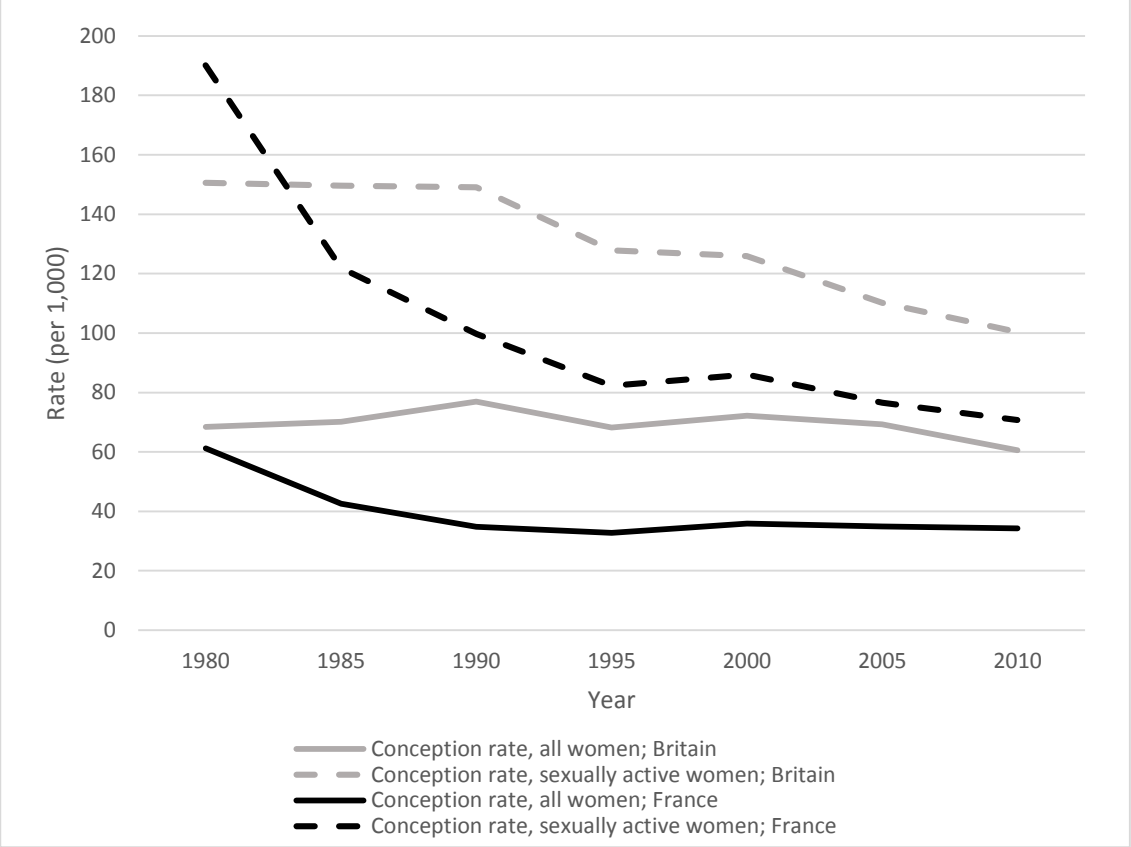


Among both 15-17 and 18-19 year-olds, conception rates declined steadily until the late 1980s and then remained stable in France. In England and Wales, rates fluctuated throughout the 1980s and 1990s, showing no consistent decline until the late 1990s (Figure 7.4). The difference between the conception rates in England and Wales and France therefore widened between the

1980s and 1990s, and began to narrow only in the late 1990s. Among 15-17 year-olds (left panel) the abortion ratio in France increased steadily from the beginning of the period under study. In England and Wales, the increase is less steep. This increase in the abortion ratio effectively 'cancels out' the decline in conception rates, and in France the abortion rates remain stable. In England and Wales, abortion rates initially increased as the conception rate increased by more than the abortion ratio, but the abortion rate subsequently stabilised and began to decline in the mid-2000s. Among 18-19 year-olds (right panel), the abortion ratio increased steadily in both countries, but was higher in France throughout the thirty-year period, and increased more rapidly in France. Note the different scales for the two age groups. The abortion rate among 18-19 year-olds has increased over time in England and Wales, as a greater proportion of a stable number of conceptions were terminated by abortion. The rate began to decline in the mid-2000s, corresponding to the steep decrease in conception rates. In France, the abortion rate declined in the 1980s, corresponding to a steep decline in conception rates, then stabilized before rising again, corresponding to the stable conception rate at this time combined with a continuing increase in the abortion ratio. Figure 7.5 shows that conception rates among sexually

active 18-year-olds have declined in both countries, and that this decline has been steeper than the decline among all 18 year-olds.

Figure 7.5: Conception rates among all women and sexually active women, 1980-2011



Discussion

In both Britain and France, the proportion of young women who are sexually active has increased over the last thirty years, but has been consistently higher in Britain. The use of medical methods of contraception has increased in both countries since the 1980s. The prevalence of medical contraceptive method use is currently similar in both countries, but there are considerable differences between Britain and France in current method mix, with both greater LARC use and greater reliance on condoms in Britain. Overall, more young women are at risk of pregnancy in Britain because a greater proportion are sexually active, even though it seems that, particularly among 16-17 year-olds, young women who are sexually active may use contraception more effectively than their French counterparts. In France, whilst conception rates have decreased, the propensity to terminate a pregnancy has increased. Consequently,

abortion rates among young people have stayed relatively stable over the last 30 years. In Britain, conception rates fluctuated throughout the 80s and 90s, showing no sustained decline until the 2000s. However, the proportion of women who choose an abortion in the event of pregnancy has increased, and as a result, so has the abortion rate.

Differences in conception and abortion rates can firstly be considered in the context of differences in sexual activity and contraceptive use. Our analyses suggest that differences between Britain and France in young people's sexual activity are the main drivers of the differences in conception rates. Throughout the period under study, more young women in Britain are sexually active, which means that a higher proportion of young women in Britain than France are at risk of an unintended pregnancy, even if they were to use contraception with the same effectiveness as young people in France. Furthermore, these differences are greatest in the youngest age group, which corresponds to the larger difference in conception rates.

From the early 1990s prevalence of medical contraceptive use was similar in Britain and France. In 2010, a greater proportion of 18-19 year-olds in Britain reported ever having had sex but not currently using a reliable method than in France, and a greater proportion of those who were sexually active and trying to prevent a pregnancy reported no usual method of contraception. However, among 16-17 year-olds, examining method choice only among those currently sexually active showed that young women in this age group in France appeared to be using less effective methods than their British counterparts. It could be that if contraceptive use among this age group in Britain and France were equivalent, but the proportion of sexually active women remained the same, the difference between the conception rates in the two countries would be even greater. Interestingly, LARC methods were more common in Britain, which may reflect issues of contraceptive access and provision. The pill is very much the dominant method in France (Bajos et al. 2012); LARC remains uncommon among young women in France, especially under 20s (Moreau, Bohet, et al. 2013). In Britain recent campaigns have focused on LARC uptake among young people, largely in response to high pregnancy rates. Examining

sexual activity and contraceptive use shows that in both age groups, the proportion of young women at risk of pregnancy is higher in Britain, but that this is driven largely by their greater sexual activity rather than their poorer contraceptive use.

During the last 40 years dramatic changes have taken place in Europe. Characterised as the 'second demographic transition', these changes have included declines in fertility rates, increase in age at first birth, decrease in marriage rates and increase in age at first marriage, increases in extra-marital births, and increased divorce rates (Bajos et al. 2003). These changes reflect changing social norms: changing attitudes to family and sexuality; increased educational participation among women and increased female participation in the work force; and the diffusion of modern contraception. Although the age at first birth has increased, the average age at first sex has decreased over this period (Bajos et al. 2010; Mercer et al. 2013). A consequence is that the interval between first sex and first birth has lengthened, resulting in an increased period during which young people, who are also particularly fecund, are at risk of unintended pregnancy and abortion. It is therefore not unexpected, when we situate the results in this demographic context, that abortion rates should have increased over this period (Rossier & Pirus 2007b). Although the proportion of young women who are sexually active has increased in the past thirty years, this has not resulted in an increase in conception rates in either country. Conception rates among those sexually active have declined, showing that the increase in sexual activity among under 20 year-olds was accompanied by improvements in pregnancy prevention.

Our results suggest that the differences in conception and abortion rates among under 20s between Britain and France may in large part driven by the greater proportion that is sexually active in Britain. However, we must also consider these differences with reference to the social context in which they occur, to better understand why more young people begin their sexual lives earlier in Britain. In this instance, a comparative study is illuminating because it allows us to hypothesise about the role of social contextual factors. Early school leaving is more common in Britain, and the proportion leaving school early has declined less over time in Britain than in

France (Ní Bhrolcháin & Beaujouan 2012). As a result, more young women in Britain than in France are not in education, and, in addition, the disparity between the two countries grew during the period analysed. Early school leaving and educational attainment are known to be associated with earlier sexual initiation and earlier childbearing (Wellings 2001; Kiernan & Hobcraft 1997). Whilst staying in education does not necessarily in itself prevent early childbearing, it has been suggested that young people who stay in education prioritise their academic studies (Bozon & Kontula 1998) and also likely have stronger aspirations for future careers that they prioritise over relationships and childbearing.

In Britain and France, and across much of Europe and other industrialised countries, the period of youth is lengthening (Galland 2001) as young people spend more time in education and the difficulties in entering the labour market mean that it is more difficult to reach economic independence. However, the transition to adulthood is experienced differently in Britain and France. Cécile van de Velde (2008), in her study of the transition to adulthood in four European countries, suggests that whilst in Britain the focus is on independence, and a rapid transition to this state, in France the period of youth is considered much more as a period of investment in the future; the focus is on education and the diploma achieved is very strongly linked to the future social status. In France, becoming pregnant at a young age is in complete contradiction with the prescribed social order and the focus on educational success (Le Van 2006), whilst in Britain it is more compatible with the typical model of transition to adulthood where it can be considered as an alternative way of acquiring an adult social status for young women for whom traditional routes (education and employment) may appear less evident. Future research should investigate this further by examining differences in pregnancy intentions among young people between the two countries.

In both countries, the transition to adulthood happens at a more rapid pace among those from more disadvantaged backgrounds (Bidart & Lavenu 2006; Thomson et al. 2004). Entry into parenthood is a commonly used indicator of one 'threshold' of the transition to adulthood, and

sexual debut a less common one. However, both are important markers of this transition, and are shaped by social-contextual factors. These results can therefore also be interpreted in light of the differences in social inequality in the two countries. In both countries, sexual debut is earlier and condom use at first sex lower among more disadvantaged young people (Wellings 2001; Bozon 2012a; Bajos et al. 2012). In Britain, conception rates among under-18s are higher in more deprived areas (Wilkinson et al. 2006; Conrad 2012). Social inequalities are more pronounced in Britain than in France, both in terms of the proportion of the population with an income below 60% of the median (UNICEF, 2013), and in terms of the income ratio of the richest to poorest (OECD 2011a). There is therefore a greater proportion, and greater number, of young people living in more disadvantaged situations in Britain than in France. It is therefore possible that the higher conception and abortion rates in Britain are also partly a result of the greater proportion of the population that is disadvantaged relative to France. Future research in this area should examine whether conceptions and abortions among young people are more socially stratified in Britain compared to France.

Whilst education and opportunities provide the motivation to delay pregnancy, they do not provide the means. The more common use of less effective methods of contraception among 16-17 year-olds in France compared to Britain may reflect poorer access to contraception in France. In France, some but not all contraceptive methods are partially reimbursed through the health insurance system. Until 2001, under-18 year-olds could not be prescribed contraception by a GP or gynaecologist without parental authorisation, and today under-18s are covered on their parents' health insurance (Bajos & Durand 2001). Under-18s can obtain contraception free of charge and anonymously only from family planning centres, which are unevenly distributed throughout the country (Bajos & Durand 2001). This is in contrast to Britain, where all contraception is free of charge and family planning services for young people were established in the 1960s (Wellings 2001).

It is possible that other individual level behavioural factors that we have not addressed here, for example effectiveness and consistency of use of contraception or type and length of partnership may be important in the different conception and abortion rates between the two countries. We have no data on effectiveness of use, even for LARC methods which may be removed. Contraceptive failure rates have been found to be different in the US and France, suggesting that differences in contraceptive practices between countries may exist (Moreau et al. 2007). This study benefits from repeated cross-sectional survey data going back over three decades and that are relatively comparable both over time and between countries, and allows us to identify clear trends and differences between the two countries in sexual activity and contraceptive use. Another strength of this study is that it uses routinely collected data on births and abortions, which does not suffer from under-reporting in the same way that self-reported data in surveys does. Abortions are notifiable in both Britain and France. In France, reporting was sub-optimal prior to the early 2000s, but country level rates have been re-estimated by the National Institute for Demographic Studies in France and are considered accurate, particularly with respect to trends over time (Rossier & Pirus 2007a; Rossier et al. 2009). The abortion ratio has increased over time in both countries. As well as reflecting an increase in the number of young women choosing to have an abortion in the event of pregnancy, the increase in the abortion ratio may also reflect improvements in access to abortion services. Data on access to abortion are not easily identifiable. In Britain, however, the increasing proportion or abortions to all women are funded by the NHS and take place before ten weeks gestation (Department of Health 2015) may indicate improvements in access to abortion.

There are large differences in conception and abortion rates between Britain and France, and these have persisted over time. Some of these differences can be attributed to differences in the proportion of under 20s that is sexually active, which has been greater in Britain throughout the thirty-year period studied, particularly among the youngest. Differences in contraceptive use appear to be a less important driver of the differences in conception and abortion rates. Differences in sexual behaviour and contraceptive use, and conception and abortion rates, may

be shaped by wider social contextual factors including country-level social inequality and differences in the timing and pace of the transition to adulthood. The use of less effective methods of contraception among 16-17 year-olds in France may be indicative of greater difficulties in accessing contraception.

7.3 CONCLUSION

The findings suggest that differences in the proportions of young women that are sexually active, which have persisted over time, are likely to be a key driver of the differences in conception and abortion rates between Britain and France. Considering the findings with reference to country-level differences in social contextual factors between the two countries suggests that differences in social inequality and the timing and pace of the transition to adulthood, as well as service-level factors such as ease of access to contraception among younger teenagers, might be important in understanding why we see such differences in behaviours between the two countries. This is explored further in Chapters 8 and 9, in which the analyses focus on the social and economic characteristics associated with each stage in the pathway to abortion using individual-level data, and again the findings are considered in relation to the wider social context in the two countries.

8 GENDER, DISADVANTAGE AND SEXUALITY: A FRENCH-BRITISH COMPARISON OF THE TIMING AND CIRCUMSTANCES OF FIRST SEX

8.1 INTRODUCTION

The research paper presented in Chapter 7 showed marked differences between Britain and France in the proportion of young women that are sexually active, and these are likely to be important in driving the differences in conception and abortion rates among under 20s between Britain and France. In order to better understand why we see such differences, this paper explores this further by examining in more detail the timing and circumstances of sexual debut in the two countries. Drawing on survey data in the two countries, I examine differences over time and between the two countries in the proportion of men and women reporting first sex before age 16, in the socio-economic characteristics associated with reporting first sex before age 16, and the age difference with the first sexual partner reported by men and women.

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I am the first author on this paper. I was responsible for constructing the variables for analyses, conducting the analysis and writing the article. My co-authors supported this work in an advisory capacity and in helping to edit the writing.

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8.2 ARTICLE

Abstract

Variation in sexual behaviour and sexual health across countries has been widely documented, and international comparisons are often the impetus for intervention. The focus in much existing research on sexual behaviour has been on individual determinants. Yet, differences in sexual health status across countries can tell us about the role of social contextual factors and how they might shape experiences of sexuality in different settings. This paper presents a comparative analysis of the social contexts of entry into sexuality in Britain and France. We use data from two nationally-representative probability surveys, both of which commenced fieldwork in 2010 and collected similar information on sexual behaviour and socioeconomic characteristics. Our analyses focus on first sexual intercourse, age of the respondent, and age of their first partner. Median age at first sex has declined in both countries over the past decades but remains one year higher in France compared with Britain. The proportion reporting first sex before 16 differed between the two countries; in Britain one third of men and women aged 16-19 in 2010 reported first sex before 16, in France one third of men and 15% of women. In both countries, men and women with a lower level of education were more likely to report first sex before 16. In France, women's first sexual partner was more often older than the respondent than in Britain. In both countries, socioeconomic characteristics are important in shaping entry into sexuality, but in France their effect is rendered more complex by the fact that this is a highly gendered event. In both countries, greater social resources were associated with a smaller age difference with the first partner. This comparative analysis highlights the role of social context in shaping entry into sexuality. Policies aiming to improve sexual health that focus on behaviour change may have limited impact.

Introduction

Variation in sexual behaviour and sexual health across countries has been widely documented, and international comparisons are often the impetus for intervention (Social Exclusion Unit 1999). In the past two decades a number of international comparisons of sexual behaviour and sexual health have been made, including a comparative study of sexual behaviour in European countries (Hubert et al. 1998), a global comparison of sexual behaviour in 59 countries (Wellings et al. 2006), and several studies of young people's sexual behaviour using European survey data (e.g. Madkour et al. 2014). A five-country comparison of young people found differences between Britain, France, the US, Canada and Sweden in condom use at last intercourse and in multiple partnerships (Darroch et al. 2001) and a study of 15 year-olds in 24 countries found wide variation in contraceptive use and method mix between countries (Godeau, Gabhainn, et al. 2008). Variation in sexual health outcomes is observed within populations as well as between them (see Wilkinson et al. 2006 on the variation in under-18 conceptions by area), and this marked variation within and between countries is likely to reflect the powerful role of social contextual factors, including gender relations, social norms and unequal access to resources, in shaping sexual behaviour and sexual health status (Collumbien et al. 2012; Sommer & Parker 2013).

Individual, community and societal health status is affected not just by individual characteristics and behaviours, but by the social, economic and political environment (Bonell et al. 2006; Sommer & Parker 2013) . These social structural factors shape and constrain health behaviours, and therefore health outcomes (Rhodes et al., 2005). Over the latter decades of the twentieth century, the importance of social structural factors in shaping health status became increasingly recognised, with some shift in the focus of public health interventions from behaviour change to structural change (Sommer & Parker 2013). However, despite the importance of contextual factors in explaining differences in sexual behaviour within and between populations there have

to date been few empirical attempts to explore the strength and origin of their influence (Madkour et al. 2014). Yet, differences in sexual health status across countries can reveal much about the role of social contextual factors and how they might influence experiences of sexuality in different settings, which has been less well documented in the literature to date (Parker & Aggleton 2007; Wellings et al. 2006).

Sexual health may be particularly strongly shaped by contextual factors, being affected by norms, socioeconomic disadvantage and future opportunities (Kotchick et al. 2001). Acceptance of early sex has been found to be higher in more deprived areas in Britain (Thomson 2000). Young people from disadvantaged may feel that they have less to lose from the outcomes of risky sexual behaviour (Thomson 2000), or they may prioritise their education over sexual relationships (Bozon 2012a). In countries where there is a stronger sexual double standard between men and women, there has been found to be greater divergence between men and women in reported sexual behaviours such as number of sexual partners (Bajos & Marquet 2000).

This paper presents a comparative analysis of entry into sexuality in Britain and France. We have chosen a comparative approach for this research because of the advantages of considering two country contexts in formulating hypotheses about the role of social contextual factors. Britain and France share many similarities, yet, as will be detailed below, are dissimilar in ways that affect young people's lives. Here we consider entry into sexuality in Britain and France. Circumstances and characteristics of first sex are markers of subsequent sexual trajectories; those reporting earlier onset of sexual activity have been found to report less contraceptive use and a greater number of sexual partners (Bozon 1993; Wellings et al. 2001). However, sexual debut does not occur in a vacuum, but is the culmination of a long socialisation process. The aim of this paper is to better understand the link between onset of sexual activity and the social context in which it occurs.

Britain and France are in many ways socioeconomically and demographically similar, however they also show important differences. Although GDP per capita is roughly the same in both countries (OECD 2010), Britain is a more socially unequal country than France; the proportion with an income below 60% of the median is 22% in Britain compared to 16% in France (OECD 2011a), and the Gini-index shows that income distribution is more unequal in Britain (OECD 2011a). The 'child poverty gap', that is to say the distance between the poverty line and the median incomes of those below the line, is greater in Britain (UNICEF 2013). Young people in Britain also have lower educational participation rates; less than 75% of 15-19 year-olds are currently in education in Britain, compared to 85% in France (UNICEF 2013). Whilst staying in education itself may not prevent earlier sexual initiation, it may mean that young people prioritise academic studies over romantic relationships (Bozon & Kontula 1998). In France, country-level evidence suggests that gender inequality is greater than in Britain; women's early working careers are more precarious than those of men, more experience a long term period of unemployment, and fewer are on permanent contracts (Hamel & Rault 2014). In the Global Gender Gap report of 2013, France ranks 43rd of 136 in gender equality compared to the United Kingdom's much higher ranking of 18 (World Economic Forum 2013). France ranks particularly low for wage equality for the same work between men and women. Differences between Britain and France in gender inequality may be reflected in differences in men's and women's experiences of first sex.

Social contextual differences also impact on the way in which young people experience the transition to adulthood in the two countries. Considering how this process takes place in Britain and France can help to better understand the social contextual factors shaping sexual debut. Van de Velde (2008) argues that whilst in Britain the focus is on independence, and a rapid transition to this state, in France the period of youth is considered much more as a period of investment in the future; the focus is on education and the diploma achieved is very strongly linked to future social status. This means that in Britain the transition is accelerated; young people leave home early, usually with their own resources, and rapid entry into the labour

market is encouraged (Van de Velde 2008; Galland 2001). Young people also become parents earlier in Britain; although the median age at first birth is similar in Britain and France (UNECE, 2010), Britain experiences an early childbearing 'hump' around the ages of 19-21 whereby the pace of first childbearing accelerates, before decelerating and peaking around age 30, whereas France does not (Rendall et al. 2005). This social context shapes the timing and circumstances of many life events, plausibly including age at first sex; a more rapid transition to adulthood may mean that other events are accelerated too, including sexual debut.

Given the differences between Britain and France in the social context, and particularly those which affect young people, we might expect to find that the models of sexual debut in the two countries are also different.

Methods

Study designs

This paper draws on data from two nationally representative probability surveys, the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3) in Britain (total sample size 15,162) and the Fertility, Contraception and Sexual Dysfunction Survey (FECOND) in France (total sample size 8,645). In this analysis we limited the sample size to men and women aged 16-49, resulting in a final sample size of 10,932 and 8,437 for Natsal-3 and FECOND respectively. Fieldwork for both surveys began in 2010; Natsal-3 was conducted through computer-assisted personal interviews (CAPI) with computer-assisted self-administered interview (CASI) sections for more sensitive questions, and FECOND was conducted over the phone, using both landline and mobile numbers. Natsal-3 used a multistage, clustered and stratified probability sampling strategy; within each primary sampling unit (postcode sectors), addresses were randomly selected. In FECOND, two samples were independently selected to include a random sample of individuals who had a landline and a random sample of mobile phone users who did not have a landline, following a two stage random probability sampling process. An initial probability sample of households or mobile phones was selected using random digit dialling, and one eligible

individual per household or mobile phone was randomly selected for participation in the study. Details of the methods of both surveys are described elsewhere (Erens et al. 2014; Legleye et al. 2013). These surveys have the benefit of being conducted at the same point in time, and covered similar topics, facilitating comparability between the two. Both surveys gathered detailed information on sexual behaviour, as well as information on the socioeconomic characteristics of respondents and their parents. Data on parent characteristics allow us to examine the characteristics of young people, whose own socioeconomic characteristics can be difficult to measure as they have not yet established an independent socioeconomic position. In addition, using data on parent socioeconomic characteristics rather than respondent socioeconomic characteristics among older age groups allows us to examine the respondent's socioeconomic group at the time of onset of sexual activity.

Variables

The key variable relevant to the questions addressed in this paper was experience of first sexual intercourse, that is, age at occurrence and age of partner at the time. Women and men were asked in the Natsal-3 questionnaire: 'How old were you when you first had sexual intercourse with someone of the opposite sex?', and 'Have you ever had sex with a *(man/woman)* involving *(genital area/penis/vaginal)* contact?' Women and men were asked in the FECOND questionnaire: 'Have you ever had sexual intercourse with a man?' Have you ever had sexual intercourse with a woman' (i.e. both surveys asked about both same and opposite sex experience). We selected comparable variables using information from the two surveys on age at first sex and partner age at first heterosexual sex. We also selected comparable variables for individual and parent socioeconomic characteristics. Respondent level of education, derived from information on the highest qualification achieved and current educational activity, was defined as having completed some post-16 education or training *versus* having completed none. The compulsory school leaving age is 16 in both countries. This variable was therefore applicable to all respondents aged 17 and over. Parental socioeconomic information was not collected in

the same way in both surveys; the French survey asked about parent's level of education, whereas the British survey asked about parent's occupation and social class when the respondent was aged 15. We therefore created a relative scale of higher, middle and lower, using the tertiles of the information collected in each survey, on the grounds that parental educational level is strongly associated with parental socioeconomic position. In creating this variable, we found relatively high non-response in both Britain and France to the question on parent characteristics (8% in FECOND and 9% in Natsal-3). Further examination of item non-responders showed that on other characteristics they more closely resembled respondents from lower socioeconomic backgrounds. In order not to lose a large number of respondents from the analysis, and not to bias the results towards respondents from higher socioeconomic groups, we created a fourth 'missing' category in this variable.

When considering age at entry into sexuality, we created a binary variable for whether the individual reported first sex before 16 or not. Sixteen was chosen as the cut-off because it is an age below which less than half of individuals in both countries have had sex, therefore representing a 'minority' behaviour to an extent; and in order to be consistent with much of the previous literature on first sex. Respondents who reported first sex before age 13 (1.69%, n=185 in Natsal; 0.63%, n=53 in FECOND) were excluded from the analysis because they were filtered through subsequent questions differently in the two surveys and there was no way in which this could be reconciled, and because young people who have first intercourse before age 13 are likely to represent a group with an atypical set of circumstances.

Analysis

After examining the median age at first sexual intercourse and the proportion of men and women in each age cohort reporting sex before 16 in both countries, we used bi-variate analysis to examine the relationships between reporting first sex before 16 and socioeconomic characteristics (level of education and parent's relative socioeconomic group). We then conducted logistic regression models to study these associations, controlling for reliogiosity

(reporting of importance of religion at the time of interview) and family structure at age 14/15 (whether the respondent lived with both, only one, or neither parent at this age), as well as the socioeconomic variables in the model, for men and women aged 17-49. Finally, we examined partner characteristics at first sex, and the bivariate associations between partner characteristics and socioeconomic characteristics. The analysis of partner characteristics was limited to respondents aged under 30, because those aged 30 and over were not asked this question in the French survey. All analyses were conducted using Stata 13, using methods that accounted for the complex sampling design of the surveys.

Results

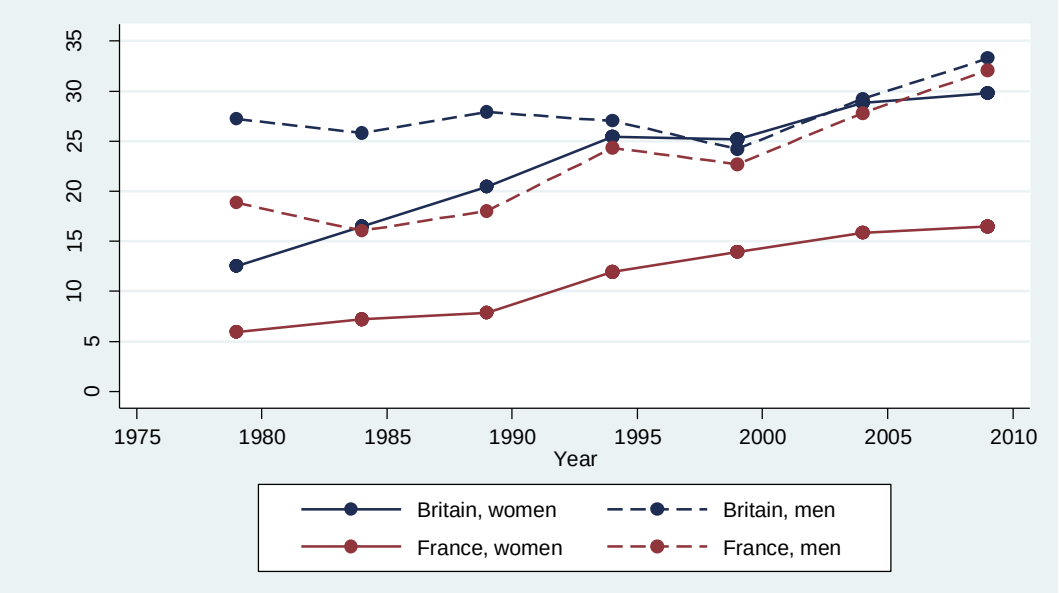
Trends in age at first sexual intercourse in Britain and France

We found differences between Britain and France in median age at first intercourse in the most recent cohort (those aged 16-19 in 2010) of men and women. The median age at first sex among this group was 16 for women and men in Britain, and 17 for men and women in France. We also found differences between the two countries in the proportion for whom this event occurred before age 16. Among men and women in Britain, around one third reported first sex before age 16. In France, around one third of men and 17% of women aged 16-19 reported first sex before 16.

In both countries, the median age at first intercourse in both countries decreased between 1980 and 2010. In Britain, the median age at first sex declined from 17 to 16 among both men and women, and in France it declined from 18 to 17 among women but did not change among men. Over the same period, the proportion of men and women reporting having had sex before 16 increased by year of occurrence in both France and Britain (Figure 8.1), but there were differences between the two countries. In Britain, the proportion of men reporting first sex before 16 increased from 27% in 1980 to 33% in 2010 in Britain, whilst in France it increased more markedly, from 19% to 32%, to reach roughly the same proportion in 2010. Among women, the proportion reporting first sex before 16 in the British survey increased from 13% to

30% in the last three decades, and although France too saw an increase, from 6% to 17% over the same period, the prevalence remained markedly lower than in Britain for all cohorts.

Figure 8.1: Proportion of men and women reporting first intercourse before age 16, 1980-2010, Britain and France by year in which respondent was aged 16



Throughout the thirty- year period there remained a large gender gap in France, with over twice as many men as women reporting first sex before 16 (Figure 8.1). In Britain, the gap between the number of men and women reporting first sex before 16 in the 1980s had all but closed by the mid-1990s, and the proportion reporting early sexual debut most recently was only slightly higher among men (33% compared to 30%).

Social correlates of first sex before 16

In Britain and France, among women and men, and across cohorts, the proportion reporting first sex before 16 was higher among those with a lower level of education compared to those with a higher level of education (Table 8.1). In Britain, there is a strong and consistent association between parental characteristics and first sex before 16 among men and women in all age groups, the proportion being higher among those with parents from lower socioeconomic groups. In France, by contrast, this was true for men aged under 35 but among women, across all age groups, the proportion reporting first sex before 16 did not vary by parental characteristics.

Table 8.1: Proportion reporting first intercourse before 16 by socioeconomic characteristics, by age group and sex, 16-49 year-olds, Britain and France

Britain

	Men						Women					
	16-24		25-34		35+		16-24		25-34		35+	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Post-16 education												
None	46.96	145 (210)	33.91	145 (180)	35.27	286 (174)	45.91	149 (311)	33.83	165 (349)	21.57	207 (178)
Some	23.73	178 (243)	20.5	175 (192)	21.18	266 (156)	22.99	167 (309)	19.85	163 (296)	12.01	142 (122)
p-value	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Parent's socioeconomic group												
Lower	34.78	70 (107)	28.88	69 (84)	27.82	119 (73)	33.21	71 (143)	30.06	78 (157)	20.06	89 (76)
Middle	32.25	177 (244)	25.1	163 (189)	26.98	298 (175)	29.83	171 (321)	25.47	162 (308)	15.64	174 (151)
Higher	20.51	60 (82)	15.75	49 (53)	18.56	65 (40)	23.27	58 (112)	14.41	42 (81)	11.08	43 (36)
Missing	36.56	45 (66)	36.86	31 (38)	34.4	54 (29)	30.7	35 (76)	28.27	36 (71)	11.39	15 (16)
p-value	<0.001		<0.001		0.048		0.023		<0.001		0.014	

France

	Men						Women					
	16-24		25-34		35+		16-24		25-34		35+	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Post-16 education												
None	38.67	96 (85)	33.04	119 (87)	20.2	171 (119)	21.87	46 (41)	20.41	89 (63)	8.81	104 (79)
Some	25.42	116 (140)	17.12	91 (104)	12.28	79 (86)	14.38	126 (136)	9.56	94 (102)	5.43	65 (82)
p-value	<0.001		<0.001		<0.001		0.042		<0.001		0.004	
Parent's socioeconomic group												
Lower	40.16	43 (35)	33.87	66 (53)	15.89	71 (52)	14.52	29 (30)	13.62	47 (41)	6.41	49 (38)
Middle	33.4	93 (93)	19.12	60 (57)	15.61	92 (77)	17.95	69 (62)	12.03	58 (55)	7.85	68 (73)
Higher	21.74	72 (87)	20.29	63 (62)	18.86	62 (56)	16.23	78 (84)	11.2	52 (49)	6.15	30 (31)
Missing	33.28	31 (33)	28.61	21 (19)	19.93	24 (20)	16.06	26 (24)	19.29	27 (20)	8.54	22 (19)
p-value	0.003		0.009		0.623		0.823		0.191		0.584	

Notes: n=weighted counts, N=unweighted counts. Denominator for post-16 education is respondents aged 17 and over.

In multivariate analyses education remained strongly associated with earlier sexual debut among all age groups of men and women in both Britain and France. Men and women with a higher level of education were less likely to report first sex before 16 compared to those with a lower level of education (Table 8.3, presented at the end of this paper). However, the association with parent relative socioeconomic group was less clear in multivariate analyses. In Britain, men and women aged 25-34 with parents in a higher socioeconomic group were less likely to report first sex before 16 compared to those with parents from a lower socioeconomic group (women: aOR 0.58, 95%CI 0.0.42-0.72; men: a0R 0.53, 95%CI 0.33-0.85). In France men aged 25-34 with parents from the middle socioeconomic group were less likely to report first sex before 16 compared to those with parents from a lower socioeconomic group, and there was weak evidence for an association between parental socioeconomic group and reporting of sex before 16 among those aged 17-24. Among men aged over 35, those with parents from a higher

socioeconomic group were more likely to report first sex before 16 (aOR 1.65, 95%CI 1.00-2.73). Further analyses (not shown) suggested that the key confounding variable was respondent level of education. There was no association between parent socioeconomic group and reporting of sex before 16 among women in France.

Partner characteristics at first sex

174 (1.78%) respondents in Britain and 78 (1.11%) in France who had ever had sex and whose first sex occurred aged 13 or older reported that their first sex was with a same sex partner. These respondents were excluded from the analysis of partner characteristics and we were unable to conduct separate analyses of data from these subgroups because of the small numbers. In Britain, both women's and men's first opposite sex partner was more often close to them in age (less than two years older or younger) than in France, where the first partner was more often older, especially among women (Table 8.4, presented at the end of this paper). In France, 53% (95%CI 46.7-59.8) of women aged 16-19 reported that their first opposite sex partner was close to them in age, compared to 68% (95%CI 46.7-59.6) in Britain. In both countries, the proportion of women reporting a first partner close to them in age increased with successive age cohorts, from 53% (95%CI 49.7-55.7) among respondents aged 25-29 at the time of the survey in Britain and from 46% (95%CI 41.7-50.4) among that age group in France. In both countries, a higher proportion of women reported an older first opposite sex partner than men but the proportion reporting them to be five or more years older decreased over time. Among women in Britain and France, having completed some post-16 education was associated with reporting that their sexual partner was close to them in age (Table 8.1). Among men in France, higher parental socioeconomic group was associated with reporting a first partner close in age.

Table 8.2: Proportion reporting a small age difference (<2 years) with their first sexual partner by socioeconomic characteristics and by sex, 16-29 year-olds, Britain

	Britain				France			
	Men		Women		Men		Women	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Post-16 education or studying								
None	80.82	397 (543)	54.83	294 (618)	72.41	278 (228)	38.19	147 (110)
Some	84.16	878 (1160)	60.25	616 (1084)	78.54	480 (608)	52.48	596 (629)
p-value	0.091		0.012		0.073		<0.001	
Parent's socioeconomic group								
Lower	80.59	203 (291)	54.18	162 (318)	65.3	110 (112)	44.02	122 (106)
Middle	83.82	630 (825)	58.94	458 (846)	77.51	270 (294)	46.69	224 (231)
Higher	83.18	318 (404)	61.7	200 (342)	79.9	312 (362)	53.51	318 (334)
Missing	81.95	117 (160)	56.64	82 (169)	75.07	66 (68)	46.66	82 (69)
p-value	0.666		0.098		0.02		0.102	

Notes: n=weighted counts, N=unweighted counts. Denominator for post-16 education is respondents aged 17 and over.

Further analyses of the social correlates of first sex before 16 showed that the results are fairly robust, but that the association between parental socioeconomic group and reporting of first sex among men in France was slightly sensitive to the age groupings, as were the associations between socioeconomic characteristics and reporting of a small age difference with the first partner (APPENDIX C). Using a different categorisation of the education variable did not change the interpretation of the results (APPENDIX C). Full models of all adjusted analyses are also presented in APPENDIX C.

Discussion

Median age at first sex has declined in both countries but remains one year higher at 17 among men and women in France compared with 16 among men and women in Britain. Similarly, the proportion reporting first intercourse aged under 16 also showed marked differences between the two countries, being 33% and 30% among men and women respectively in Britain, and 32% and 17% among men and women in France. The data also show differences between the two countries in variation in age at onset of sexual activity between men and women. In Britain, the gap between men and women has closed, with about a third reporting sex before 16 among both. In France, the proportion reporting first sex before 16 is twice as high among men compared with women. The proportion of young people reporting first sex before 16 was consistently higher in Britain, particularly among women where it has stayed at around twice

the level of France throughout the thirty-year period. Our data also show differences between the two countries in the strength of the association between age at first sex and socioeconomic characteristics. In both Britain and France, men and women of all age groups with a lower level of education were more likely to report first sex before 16. Level of education was more strongly associated with reporting of first sex before 16 than was parental socioeconomic group. Our data show that in both countries, there has been a convergence in men's and women's experiences of first sex in terms of the age difference with the first partner, which is narrowing over the generations. However in France, women's first sexual partner was more often older than the respondent compared with in Britain.

This study draws on data from two nationally-representative probability surveys gathering similar data from two countries, Britain and France, thereby facilitating comparison between the two. A strength of this study therefore is that we have been able to contrast common outcomes and their associations with socioeconomic characteristics using roughly comparable survey data sets in two countries. Such comparable data are difficult to obtain for sexual and reproductive health, and as such international comparisons have often been restricted to comparing aggregated data for entire countries and so have paid less attention to the variability within them (e.g. Singh et al. 2001). The rich individual-level data on socioeconomic characteristics enable us to analyse their role in detail, and information on parents' characteristics allows us to make judgments about the social characteristics of young people. A limitation of our analysis is that we have been obliged to use existing indicators within each dataset, which may not be directly comparable across surveys. For example, parental characteristics are measured using social class (derived from occupation and other variables) in Britain and educational level in France. This means that we cannot be sure whether differences seen between countries are real or whether they represent differences in measurement. If parent social class is a better measure of young people's socioeconomic position in Britain than parent level of education is in France, then the less consistent associations found between parent relative socioeconomic group in France compared to Britain may reflect this rather than

real differences in the effects of socioeconomic position. Young people's knowledge of their parents' characteristics may not be reliable; both surveys suffer from missing data in this respect. Parent's level of education might be more difficult for young people to report than their occupation. Although recall of personally significant events such as first sex is known to be good (Copas et al. 2002), the data may nevertheless suffer differentially in the two countries from social desirability bias (Copas et al. 2002; Wellings & Collumbien 2012). Despite these limitations, these data allow a comprehensive analysis of sexual initiation in Britain and France.

The period under study of 1980 to 2010, during which time age at first sex fell in both Britain and France, was characterised by considerable social change. Both countries saw a continuing relaxation of social mores and a weakening of the influence of religion, together with profound changes in the aspirations and personal autonomy of women (Bozon & Kontula 1998; Bajos et al. 2014; Mercer et al. 2013). This was reflected in the increased participation of women in education and the labour force and in changes in family stability and structure (increases in divorce and childbearing outside of marriage). It was also a period during which the meanings of sexuality were changing; sexuality was increasingly dissociated from reproduction thanks to the widespread availability of contraception and weakening of religious influence and the separation of sexual initiation from marriage (Bozon & Kontula 1998). The pace of change in sexual lifestyles has been faster among women than among men. In both countries there has been some convergence over time in men's and women's reported sexual behaviours, including age at first sex and number of partners (Mercer et al. 2013; Le Guen & Bajos 2014; Bajos et al. 2010).

The findings from this comparative study suggest that social contextual factors are important in shaping first sex. The differences in the timing and circumstances of entry into sexuality between the two countries reflect the double inequality present in both countries; the socioeconomic inequality that is greater in Britain, and the gender inequality that may be more pervasive in France. It appears that socioeconomic disadvantage is a strong driver of inequalities

in age at sexual debut among young people in Britain, operating to some extent through its effect on education. In Britain and France, the transition to adulthood is accelerated among those from poorer backgrounds (e.g. Bidart & Lavenu 2006 (France), Thomson et al. 2004 (United Kingdom)), as it is in other countries such as the US (Johnson & Mollborn 2009). This is reflected in our results in the earlier age at sexual debut among respondents from less advantaged backgrounds. This was particularly the case in Britain, where the greater socioeconomic inequality means that there is a greater proportion of the population living in relative poverty compared to France (OECD 2011a). The accelerated transition to adulthood among young people from poorer backgrounds, combined with a greater level of socioeconomic inequality, may help understand the apparent greater importance of social resources in shaping entry into sexuality in Britain compared to France.

In France, although social characteristics are important, as seen in the variation in reporting of first sex before 16 by parents' socioeconomic group among men, their effects are rendered more complex by the fact that entry into sexuality is a highly gendered event. The gendered nature of entry into sexuality in France is shown in the much smaller proportion of women reporting first sex before 16, regardless of parental social group. That there was no evidence of any variation in reporting of sex before 16 among women in France by parent relative socioeconomic group, yet there was among men, suggests that there may be a stronger differential social control on young women's sexuality based on sex in France than in Britain. Our data on partner age at first sex also indicate a less strongly gendered model of entry into sexuality in Britain. In France, women's first heterosexual partner is more often two or more years older, whereas in Britain, a majority of women report that their first partner was close to them in age. We can draw on other indicators that allow us to hypothesise about gender relations in Britain and France. There are differences between the two countries in men's and women's reported number of partners, masturbation and feelings of love at first sex, which can all be considered as indicators that tell us about attitudes to sex and sexuality. The gap between men and women is greater in France in all these indicators. The gap between the mean number

of partners reported by men and women who have ever had sex is consistently wider in France (Leridon 2012; Mercer et al. 2013). This greater gender difference in France is also seen in the proportion reporting ever having masturbated, which is higher among men in both countries (Bozon 2012b; Natsal data, results not shown), and in the proportion reporting being in love at first sex, which is higher among women in both countries but with a greater gender difference in France (Palmer 2014; FECOND data, results not shown). The situation in both countries, but most strongly in France, is demonstrative of a sexual double standard for men and women, where men are expected to be sexually active and women sexually chaste, and where for women entry into sexuality is expected to be an emotional experience, whereas for men the focus is on pleasure (Mitchell 2012; Bajos & Marquet 2000; Marston & King 2006). Previous research has found that in countries where gender inequality is greater, there is a stronger sexual double standard between men and women, and sexual behaviour patterns showed more divergence between the sexes (Bajos & Marquet 2000). The gender gap seen in young people's entry into sexuality might therefore reflect a greater inequality between men and women in France than in Britain.

In both countries, but more so in France where it is more common for there to be a larger age difference between partners, there was some evidence that greater social resources were associated with a smaller age difference with the heterosexual first partner, suggesting that such social resources enable individuals to distance themselves from the dominant social norms. Bajos and Marquet (2000) find a similar pattern when examining reporting of multiple partnerships in different European countries; education was strongly associated with reporting of multiple partners among women, with those with a higher level of education reporting more partners. This suggests that those with greater social resources may have greater sexual autonomy and be more able to participate in and report behaviours that stray from society's image of female sexuality.

We have considered in this paper the structuring roles of gender and socioeconomic status in shaping entry into sexuality, but other contextual factors may also be important, for example population density and religious attendance. A greater proportion of the population in Britain lives in cities; the proportion living in urban agglomerations of more than one million is 28% in Britain compared to 22% in France (World Bank 2010). Place of residence may be important because cities or more populous areas may offer a greater number of opportunities for engaging in sexual activity, greater anonymity, and a greater variety of sexual models and more opportunities to explore different behaviours (Sandfort, Bos, et al. 1998). Indeed, place of residence has been found to be associated with having taken part in a greater variety of sexual practices (Sandfort, Hubert, et al. 1998). Attachments to religious beliefs and institutions may also influence young people's sexual behaviour (Manlove et al. 2006). Data from the World Values Survey (Wave 5: 2005-2009) shows that the proportion reporting that religion is very or rather important in their lives is similar in Britain and France (33.6% and 35.5% respectively among people aged under 30) and that religious participation and frequency of prayer were both lower in France (Norris & Inglehart 2004). This analysis found that in both countries, respondents who reported that religion was important to them were less likely to report first sex before 16 (see APPENDIX C).

A central focus of sexual health promotion to date has been on changing individual risk behaviours (Collumbien et al. 2012). Our findings suggest that models of entry into sexuality are strongly shaped by the social context in which it takes place, and therefore the impact that such interventions can have is limited by these wider social and structural constraints. Behaviour is more than merely a personal choice, and social structures, institutions and norms impose limitations on individuals' ability to make choices and on what choices they can make.

This comparative analysis suggests that sexual behaviours and, by extension, sexual health status are strongly shaped by the social context. What happens in the sphere of sexuality should be considered with reference to the context in which it takes place. Sexual debut is not usually

considered a 'threshold' in the transition to adulthood, as are, for example, leaving home, finding work, entering the first cohabiting union and having a first child (Galland 2001; Van de Velde 2008). However, first sex represents an event that takes place within the transition to adulthood, and which is affected by its timing and pace. Our findings have shown that in Britain, where the transition to adulthood is more rapid, onset of sexual activity occurs earlier, suggesting that in contexts where the transition to adulthood is accelerated, so might be sexual debut. If, in addition, the transition to adulthood is accelerated among certain groups, sexual debut can be expected to occur earlier in these groups, and this is borne out in our results. Social factors also shape the circumstances of first sex; our results suggest that entry into sexuality may be a more strongly gendered event in France. This is in line with previous research that has shown that reporting of sexual behaviours, including age at first sex, is closely aligned with social standards that value male sexual activity and place restrictions on the sexuality of women, and that the differences between men and women's reports are smallest in countries that have achieved a higher level of gender equality (Bajos & Marquet 2000).

Table 8.3: Adjusted odds of reporting sex before 16 by socioeconomic characteristics, by age group and sex, 17-49 year-olds, Britain and France.

Britain

	Men						Women					
	17-24		25-34		35+		16-24		25-34		35+	
	OR and 95% CI	P-value	OR and 95% CI	P-value	OR and 95% CI	P-value	OR and 95% CI	P-value	OR and 95% CI	P-value	OR and 95% CI	P-value
Post-16 education												
None	1.00	.	1.00	.	1.00	.	1.00	.	1.00	.	1.00	.
Some	0.40 (0.30- 0.54)	<0.001	0.60 (0.45- 0.80)	0.001	0.56 (0.41- 0.78)	0.001	0.39 (0.31- 0.49)	<0.001	0.58 (0.46- 0.72)	<0.001	0.57 (0.42- 0.78)	<0.001
Parent's socioeconomic group												
Lower	1.00	.	1.00	.	1.00	.	1.00	.	1.00	.	1.00	.
Middle	1.10 (0.77- 1.58)	0.594	0.88 (0.62- 1.26)	0.493	1.00 (0.71- 1.41)	0.997	1.20 (0.89- 1.60)	0.225	0.95 (0.73- 1.23)	0.685	0.87 (0.61- 1.25)	0.459
Higher	0.74 (0.48- 1.14)	0.167	0.53 (0.33- 0.85)	0.009	0.75 (0.47- 1.22)	0.252	1.06 (0.73- 1.53)	0.774	0.51 (0.36- 0.73)	<0.001	0.69 (0.41- 1.16)	0.164
Missing	0.97 (0.59- 1.61)	0.916	1.42 (0.82- 2.45)	0.207	1.39 (0.72- 2.70)	0.321	0.98 (0.63- 1.51)	0.915	0.88 (0.60- 1.27)	0.483	0.55 (0.29- 1.03)	0.06
n (N)	1031 (1405)		1247 (1384)		2008 (1121)		1024 (1779)		1276 (2292)		2050 (1674)	

France

	Men						Women					
	17-24		25-34		35+		16-24		25-34		35+	
	OR and 95% CI	P-value	OR and 95% CI	P-value	OR and 95% CI	P-value	OR and 95% CI	P-value	OR and 95% CI	P-value	OR and 95% CI	P-value
Post-16 education												
None	1.00	.	1.00	.	1.00	.	1.00	.	1.00	.	1.00	.
Some	0.63 (0.42- 0.95)	0.028	0.44 (0.29- 0.67)	<0.001	0.49 (0.34- 0.71)	<0.001	0.61 (0.37- 1.01)	0.053	0.38 (0.25- 0.57)	<0.001	0.56 (0.38- 0.81)	0.002
Parent's socioeconomic group												
Lower	1.00	.	1.00	.	1.00	.	1.00	.	1.00	.	1.00	.
Middle	0.78 (0.43- 1.43)	0.427	0.52 (0.30- 0.88)	0.016	1.07 (0.68- 1.68)	0.785	1.12 (0.61- 2.05)	0.716	0.84 (0.51- 1.39)	0.5	1.38 (0.86- 2.22)	0.185
Higher	0.55 (0.30- 1.01)	0.056	0.67 (0.39- 1.15)	0.144	1.65 (1.00- 2.73)	0.049	1.04 (0.58- 1.86)	0.893	1.01 (0.59- 1.73)	0.98	1.27 (0.72- 2.26)	0.411
Missing	0.76 (0.36- 1.64)	0.488	0.68 (0.32- 1.44)	0.315	1.22 (0.64- 2.35)	0.543	0.74 (0.35- 1.57)	0.432	1.10 (0.55- 2.20)	0.779	1.15 (0.58- 2.27)	0.697
n (N)	705 (811)		889 (864)		1480 (1416)		1086 (1067)		1420 (1327)		2360 (2535)	

*Notes: n=weighted counts, N=unweighted counts. *Adjusted for all variables in model, religiosity and family structure at age 14. ** Adjusted for all variables in model and religiosity.*

Table 8.4: Age difference of first opposite sex partner by sex and age group among respondents aged 16-29, Britain and France.

Britain

	Men						Women					
	16-19		20-24		25-29		16-19		20-24		25-29	
Partner age	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**
>=2 years younger	10 (13)	2.8 (1.5-5.0)	23 (32)	3.8 (2.6-5.5)	51 (58)	8.3 (6.3-10.8)	1 (3)	0.4 (0.1-1.2)	5 (9)	0.9 (0.4-1.8)	11 (17)	1.7 (1.0-2.8)
<2 years older/younger	316 (486)	91.0 (88.1-93.3)	511 (629)	84.8 (81.8-87.4)	470 (609)	76.1 (72.5-79.4)	217 (423)	67.5 (63.3-71.5)	359 (608)	58.9 (55.4-62.3)	346 (690)	52.7 (49.7-55.7)
>=2 years older	20 (34)	5.7 (4.0-8.0)	61 (78)	10.2 (8.0-12.9)	67 (77)	10.8 (8.5-13.7)	93 (182)	29.0 (25.2-33.1)	205 (354)	33.5 (30.3-37.0)	230 (474)	35.0 (32.2-37.9)
>5 years older	2 (4)	0.5 (0.2-1.5)	7 (13)	1.2 (0.7-2.2)	29 (36)	4.7 (3.3-6.7)	10 (20)	3.1 (1.9-4.8)	41 (67)	6.7 (5.1-8.7)	70 (148)	10.6 (9.0-12.5)

France

	Men						Women					
	16-19		20-24		25-29		16-19		20-24		25-29	
Partner age	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**	**n (N)**	**% (95% CI)**
>=2 years younger	7 (6)	2.5 (1.1-5.8)	13 (23)	3.9 (2.5-5.9)	36 (40)	5.5 (4.3-7.1)	2 (1)	0.6 (0.1-4.0)	3 (3)	0.6 (0.2-2.1)	8 (9)	1.2 (0.6-2.4)
<2 years older/younger	204 (192)	77.6 (71.0-83.0)	268 (347)	81.8 (77.3-85.5)	286 (297)	76.2 (72.9-79.2)	202 (159)	53.3 (46.7-59.8)	241 (293)	49.2 (44.7-53.8)	302 (288)	46.0 (41.7-50.4)
>=2 years older	51 (48)	19.6 (14.4-26.0)	37 (52)	11.2 (8.3-14.8)	66 (59)	15.5 (12.9-18.5)	160 (131)	42.2 (35.8-48.7)	188 (214)	38.4 (33.9-43.0)	246 (230)	37.5 (33.4-41.8)
>5 years older	1 (1)	0.3 (0.0-2.4)	11 (11)	3.2 (1.6-6.5)	17 (16)	2.8 (1.9-4.3)	15 (15)	3.9 (2.3-6.6)	58 (63)	11.8 (9.1-15.2)	101 (84)	15.3 (12.1-19.2)

Notes: n=weighted counts, N=unweighted counts

8.3 CONCLUSION

The findings of this paper have shed some light on the ways in which sexual debut might be shaped by social and contextual factors. In particular, the results suggest that stronger gendered social norms may be operating in France, with a stronger differential social control over women's sexuality based on their sex, compared to in Britain. In both countries, social characteristics differentiated to an extent between those who began their sexual lives earlier and those who did not. Considering this finding in the context of differences in the transition to adulthood within and between Britain and France, it appears that where the transition to adulthood is accelerated then so is sexual debut.

9 UNDERSTANDING DIFFERENCES IN CONCEPTION AND ABORTION RATES AMONG UNDER 20S IN BRITAIN AND FRANCE: EXAMINING THE ROLE OF DISADVANTAGE

9.1 INTRODUCTION

Chapter 7 discussed population-level differences between Britain and France in sexual activity, contraceptive use and recourse to abortion among young women, and the way in which these differences were likely to contribute to the differences in conception and abortion rates between the two countries. The findings presented in Chapter 8, exploring the timing and circumstances of first sex in Britain and France, suggest that sexual debut is strongly shaped by the social context in which it occurs. An important finding was that sexual debut occurred earlier in more disadvantaged groups. This is important, given the differences between the two countries in levels of social inequality and the extent of disadvantage. We can consider this in the context of young parenthood. Parenthood can be a means of attaining an adult social status among those for whom the traditional route, through education and employment, seems less viable. Young people may be more motivated to avoid pregnancy if they have a reasonable expectation of their opportunities for inclusion in an economically advanced society (Arai 2008; Le Van 2006). In a context where the gap between the richest and the poorest is wide, these expectations may become less reasonable among the more disadvantaged. In a context of greater social inequality, socioeconomic characteristics may have a greater effect on pregnancy prevention behaviours and reproductive health outcomes than in a more equal context. Even if the effect of socioeconomic characteristics were the same in both countries, greater inequality may lead to greater prevalence of these pregnancy prevention and reproductive health outcomes because of the relatively larger proportion of the population that is disadvantaged. The following Chapter considers this further by examining the association of socioeconomic characteristics with indicators of each stage in the pathway to abortion – first heterosexual

intercourse, contraceptive use at first sex, conception and recourse to abortion – among men and women in Britain and France.

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I am the first author on this paper. I was responsible for constructing the variables for analyses, conducting the analysis and writing the article. My co-authors supported this work in an advisory capacity and in helping to edit the writing.

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9.2 ARTICLE

Abstract

Socioeconomic characteristics are associated with sexual activity, contraceptive-use, pregnancy and abortion, especially among under 20s, and may be implicated in cross-national differences in conception and abortion rates. Less is known about whether the direction or magnitude of the association differs for each outcome, between men and women, or cross-nationally. Data were analysed from the third British National Survey of Sexual Attitudes and Lifestyles (Natsal-3, n=5,959) undertaken 2010-2012, and the 2010 French Fertility, Contraception and Sexual Dysfunction survey (FECOND, n=3,027). We estimated the prevalence of sexual activity before age 16, contraceptive use at first sex, conception before age 20, and recourse to abortion in the event of conception among men and women aged 17-29 in Britain and France, and used logistic regression to examine associations between socioeconomic characteristics – educational level and parental socioeconomic group – and each outcome. Fewer women in France reported sex before 16, and gender differences were notable in France but not Britain. At each outcome Britain and France differed with regard to prevalence, but associations with socioeconomic characteristics were similar. Respondents with less education, and, less consistently, with parents from lower socioeconomic-group, were more likely to report sex before 16 (Britain, women: aOR 0.4, men: aOR 0.5, France, women and men: aOR 0.5), no contraception at first sex, and pregnancy before 20. Differences in age at sexual debut between Britain and France are an important driver of cross-national differences in conception and abortion rates. Population-level differences between the two countries may be partly driven by country-level differences in the extent of social disadvantage.

Introduction

Teenagers in Britain are more likely to become pregnant than those in France. The conception rate among women aged 15-19 was 47/1,000 in England and Wales in 2011, compared to 25/1,000 in France (Sedgh et al. 2015). Among those who do become pregnant, young women in Britain are less likely to have an abortion than those in France; 42% of conceptions to 15-19 year-olds in 2011 were terminated with abortion in England and Wales compared to 61% in France (Sedgh et al. 2015). Abortions are notifiable in both Britain and France, and these data are considered reliable (Department of Health 2013; Rossier et al. 2009). Certain socioeconomic factors are known to be associated with early pregnancy and abortion. Studies in Britain show that individuals from deprived households, and those living in deprived areas, are more likely to become pregnant before 20 (Conrad 2012; Kneale et al. 2013). Early school leaving age and lower educational attainment are associated with pregnancy before 20 in Britain (Wellings et al. 2001). In France, qualitative and quantitative research has shown that young women from less affluent backgrounds are more likely to become pregnant and less likely to terminate the pregnancy with abortion (Le Van 2006; Sihvo et al. 2003; Lee et al. 2004a).

Whilst we know that under 20 conception and abortion is associated with certain socioeconomic characteristics, this reading of the data can mask important nuances. Abortion is the result of a multi-stage pathway, which starts with first sexual intercourse and contraceptive use or non-use on this and later occasions, continues with the occurrence of an unintended pregnancy, and ends with a woman's decision to end the pregnancy and access abortion services (Bajos, Guillaume, et al. 2003; Rossier, Michelot, Bajos, et al. 2007). Differences in teenage pregnancy rates may therefore be partly due to the proportion that is sexually active, as well as in the steps that sexually active teenagers take to prevent pregnancy (including method use or non-use, method choice and the effectiveness with which they are used). The abortion rate is further determined by the fact that those who do become pregnant differ in their likelihood of having an abortion (Darroch et al. 2001).

Socioeconomic characteristics have been found to be associated with each of these stages in the pathway to abortion. Wellings et al. (2001) found that British women with lower educational attainment were more likely to report earlier sexual debut, and that this was more strongly associated with early sex than was parents' social class. In France, age at first sex was earlier among men and women with a lower educational-level, but variations according to parents' socioeconomic status were smaller (Bozon 2012a). Analysis of a school based survey in France found that among 15-year-old girls, reporting having had sex was associated with neither educational-level nor parent socioeconomic status in multivariate analyses (Godeau, Vignes, et al. 2008). In France, among women of all ages, those with low socioeconomic security, living in rural areas or with low education more frequently report non-use of contraception (Bajos et al. 2012; Rossier, Michelot, Bajos, et al. 2007). Less research has examined socioeconomic differentials in young people's contraceptive use in France, but condom use at first sex has been found to be lower among women with a lower educational level (Moreau & Bajos 2005). In Britain, young people from more affluent backgrounds are more likely to use contraception and emergency contraception, and more likely to have an abortion if they become pregnant (Singh et al. 2001; Wellings et al. 2001; Wight et al. 2006; Lee et al. 2004a).

Little is known about whether the strength or direction of the association with socioeconomic characteristics varies at each stage in the pathway (sexual activity, contraceptive use, conception and abortion). The association with socioeconomic characteristics at different stages in the pathway to abortion may differ cross-nationally. A five-country comparative study of socioeconomic disadvantage and young people's sexual behaviour (considering the United States, Britain, France, Sweden and Canada, using national level aggregated survey data) found that contraceptive use at first intercourse differed according to socioeconomic indicators in Britain and the US, but not in France (Singh et al. 2001). This suggests that the effects of socioeconomic characteristics may not be the same in different country contexts. Furthermore, associations with socioeconomic characteristics at each stage of the pathway may differ by gender. Some studies have found that the association between parental characteristics and

sexual and contraceptive behaviours differed between men and women. In Britain, Wellings et al. found that parent social class was associated with age at first sex among men but not women (Wellings et al. 2001). In France, condom use at first sex has been found to be associated with educational level among women but not men (Moreau & Bajos 2005). Gender differences in associations between socioeconomic characteristics and reported sexual and reproductive health outcomes may also vary cross-nationally, and may reflect differences in the social pressures and expectations placed upon men and women (Bajos & Marquet 2000). Considering these differences between men and women cross-nationally may shed light on the ways in which country-level differences in gender social structures might shape behaviours and thus risk of conception and abortion (Marston & King 2006; Bajos & Marquet 2000). A cross-national comparison using contemporary individual-level data is the optimal means of examining the ways in which these contextual factors shape sexual behaviours and reproductive health outcomes.

In this analysis, Britain and France were chosen for comparison because whilst they are similar in many ways – they are geographically close and share economic and socio-demographic similarities – they have very different rates of conception and abortion among under 20s and differ in some important ways that affect young people's lives. Britain is a country more marked by social inequality than France. The proportion of the population that is disadvantaged is greater in Britain than in France: 21% of the British population has an income less than 60% of the median compared to 16% in France (OECD 2011a). There is also a wider gap between the incomes of the richest 20% and the poorest 20% in Britain compared to France (OECD 2011a). Where income inequality is greater, so are social differences and so social stratification becomes more evident (Wilkinson & Pickett 2009). We can consider this in the context of young parenthood: young people may be more motivated to avoid pregnancy if they have a reasonable expectation of their opportunities for inclusion in an economically advanced society (Arai 2008; Le Van 2006). In a context where the gap between the richest and the poorest is wide, these expectations may become less reasonable among the more disadvantaged. In a context of

greater social inequality, socioeconomic characteristics may have a greater effect on pregnancy prevention behaviours and reproductive health outcomes than in a more equal context. Even if the effect of socioeconomic characteristics were the same in both countries, greater inequality may lead to greater prevalence of these pregnancy prevention and reproductive health outcomes because of the relatively larger proportion of the population that is disadvantaged. Socioeconomic disadvantage may influence sexual and reproductive health in several ways. As well as affecting young people's expectations for their future and motivations to avoid pregnancy, it has been proposed that young people from more disadvantaged backgrounds may be less able to access sexual health knowledge and services (Social Exclusion Unit 1999). In England, more disadvantaged girls and boys (indicated by housing tenure) have been found to have less knowledge about contraception and STIs (Bonell et al. 2003). Qualitative research in England has found that more advantaged young women were more knowledgeable about contraception and health services and better able to access them and use contraception as they wanted (Jewell et al. 2000).

This paper presents a comparative analysis of two specific socioeconomic characteristics – individual educational level and parental socioeconomic group – associated with each stage of the pathway to abortion in Britain and France. We examine indicators of sexual debut, contraceptive use, pregnancy, and recourse to abortion. To our knowledge, this is the first paper to consider the associations with socioeconomic characteristics at each successive stage in the pathway to abortion, and to examine whether these associations differ between men and women and cross-nationally. The aim of this paper is to better understand the role of these two measures of socioeconomic status at each stage of the pathway to abortion among young men and women in Britain and France, and to establish whether, and if so, how, these pathways differ between the two countries, thus contributing to some of the variation in the conception and abortion rates between the countries. We interpret the results with reference to known differences in the extent of country-level inequality.

Methods

This paper draws on data from two nationally representative probability surveys, Britain's third National Survey of Sexual Attitudes and Lifestyles (Natsal-3; n= 15,162) and France's Fertility, Contraception and Sexual Dysfunction Survey (FECOND; n=8,645). We focus on men and women aged 17-29 to present an accurate reflection of the contemporary situation, resulting initially in samples of 5,929 and 3,027 for Natsal-3 and FECOND respectively. Fieldwork for both surveys began in 2010. Natsal-3 used computer-assisted personal interviews (CAPI) with a computer-assisted self-administered interview (CASI) for sensitive questions. FECOND was a telephone survey, using landlines and mobiles. Natsal-3 used a multi-stage, clustered and stratified probability sampling strategy; within each primary sampling unit (postcode sectors), addresses were randomly selected. In FECOND, two samples were independently selected to include a random sample of individuals who had a landline and a random sample of mobile phone users who did not have a landline, following a two stage random probability sampling process. An initial probability sample of households or mobile phones was selected using random digit dialling, and one eligible individual per household or mobile phone was randomly selected for participation. Details of both methodologies are published elsewhere (Erens et al. 2014; Legleye et al. 2013).

The response rate in the Natsal-3 survey was 57.7%, after taking into account non-eligible subjects. The Natsal-3 data were weighted to adjust for the unequal probabilities of selection in terms of age and number of eligible adults in the household. After weighting, the sample was broadly representative of the British population in the 2011 census. Men and London residents were slightly underrepresented, so a non-response post-stratification weight was applied to correct for differences in sex, age, and Government Office Region between the achieved sample and the 2011 census.

The response rate in the FECOND survey was 54.1% for the landline sample and 37.6% for the mobile phone sample, after taking into account non-eligible subjects. The total response rate

was 50.2%. The FECOND data were weighted to adjust for the unequal probabilities of selection in the sample in terms of age, sex and landline or mobile interview. After weighting, some groups were under-represented in comparison to the French census collected continuously from 2005-2009, particularly individuals born outside France, and with no qualifications. Post-stratification weights corrected for differences in sex, age, marital/cohabitation status, educational-level, professional situation, place of birth and dependent children between the achieved sample and the census.

These surveys have the benefit of being conducted at the same point in time, and covered similar topics, facilitating comparability between the countries. Both gathered detailed information on sexual behaviour, as well as information on the socioeconomic characteristics of respondents, including their educational-level at the time of interview and socioeconomic characteristics of their parents.

The key outcome variables relevant to the questions addressed in this paper were age at first heterosexual intercourse (dichotomised to before/after age 16), contraceptive use at first sex, and among women only, reporting of a conception before 20 and reporting of an abortion before 20, among those who had conceived. Use of a reliable method of contraception at first intercourse was selected as an indicator of contraceptive use in preference to current method of contraception because we are interested in behaviours relating to conceptions before 20, and current contraceptive use among older respondents may not be an accurate representation of their contraceptive use at younger ages. Reliable methods include all medical methods of contraception and condoms, and exclude withdrawal, periodic abstinence and no method.

Abortions are known to be under-reported in surveys (Jones & Kost 2007). This affects the accuracy of both the conception and the abortion figures, analyses of which must be interpreted with caution. To assess abortion under-reporting in Natsal-3 and FECOND, we compared the estimated birth and abortion rates to under 20s as reported in the surveys to national statistics. There was no evidence that the extent of under-reporting of abortions varied between the

surveys. Miscarriages are not included in these analyses. Men's reports of conceptions and abortions occurring to their partners were collected only in the French survey.

The key independent variables in these analyses were respondent educational level (an indicator of the respondent's individual social resources), and their parent's socioeconomic group (an indicator of the respondent's social origin). Respondent's educational progression, derived from information on the highest qualification achieved and current educational activity, was defined as having completed some post-compulsory education or training *versus* having completed none (the minimum school leaving age in Britain and France at the time of data collection was 16). We henceforth refer to this as respondent educational level. Sixteen year-olds were excluded from all analyses as they may not have completed compulsory education at the time of interview. Data on parental socioeconomic characteristics were collected differently in the two surveys; FECOND asked about parent's educational-level, whereas Natsal-3 derived parent's social class from questions about parent's occupation and responsibility when the respondent was 14. We created a scale of relative socioeconomic group with three levels, on the grounds that educational level is strongly associated with socioeconomic position (Krieger et al. 1997). Our data are consistent with this: 79% of participants aged 30-49 with a degree-level qualification in Natsal-3, and 74% in FECOND, were in managerial and professional positions. In the British survey, we assigned parents who had never had a job or who were partly skilled or unskilled to the lower socioeconomic group, those in technical and skilled positions to the middle group, and those in professional and managerial occupations to the higher group. In the French survey, we assigned parents who had no qualifications to the lower group, those with baccalaureate or less to the middle group, and those with a degree-level qualification to the higher group. As information on parent's characteristics was collected differently in the two surveys, this variable measures relative, not absolute disadvantage. Non-response to the question on parent characteristics was relatively high – roughly 10% – in both surveys. Examination of item non-responders showed that on other characteristics they more closely resembled respondents from lower socioeconomic backgrounds. In order to not lose a large

number of respondents from the analysis, and not bias the results towards respondents from higher socioeconomic groups, we created a fourth 'not answered' category in this variable. For all other variables in this analysis missing data was less than 2% (Mercer et al. 2013).

Analysis

We first described the two survey samples of men and women aged 17-29 years in terms of educational level, parental socioeconomic group, and outcomes on the pathway to abortion, and described the differences between Britain and France and between men and women. Each analysis was restricted to respondents who had had the chance to experience the outcome of interest. Analyses of contraceptive use at first sex were run on respondents who reported ever having had sex, and analyses of conception before aged 20 were run on respondents sexually experienced by age 20. Finally, analyses of conception before 20 and recourse to abortion among women who reported a conception before 20 were restricted to women aged older than 20 years and three months at interview. This was in order to include women who were pregnant at interview and was based on the assumption that women are likely to be aware of their pregnancy by three months gestation. We estimated abortion rates and birth rates as reported in the survey data using the proportion of women who reported a birth or abortion in the last year, based on their age at interview and the date or their age at the event. We used bi-variate analysis to examine the relationships between reporting each of these outcomes and educational level and parent socioeconomic group among men and women. Finally, we used multivariable logistic regression to examine these associations, adjusting for family structure at age 14/15 (whether the respondent lived with both natural parents at this age) as this was identified as a potential confounder. For all outcomes except reporting of sex before 16 we adjusted for age at first sex. In order to assess whether the strength or direction of association between socioeconomic characteristics and outcomes differed between men and women and between Britain and France, we tested for interactions of socioeconomic variables (parent

socioeconomic group and educational-level) with sex and with country. All analyses were run on complete cases.

Results

All tables are presented at the end of this section. Slightly over two thirds of women and men in Britain had completed any post-compulsory education (Table 9.1). In France, 66% of men and 75% of women had any post-compulsory education. In both countries, less than 20% of men and women had parents in the lower socioeconomic group, slightly less than half in the middle group, and approximately one quarter in the higher group.

We found important and statistically significant differences between Britain and France in the proportions of men and women reporting outcomes at each stage in the pathway to abortion (Table 9.1). There was no difference between the two countries in the proportion of men reporting first sex before 16. However, 27% of women in Britain reported first sex before 16 compared to 15% in France. A smaller proportion of respondents in France reported using no contraception at first sex than in Britain. In both countries, these proportions were similar between men and women. A greater proportion of sexually experienced women in Britain compared to France are estimated to have conceived before 20 (26% and 15% respectively). Finally, our data show that the proportion of women reporting an abortion in the event of a conception before 20 was higher in Britain (32%) than France (18%). The birth rates and abortion rates as reported in the surveys are both higher in Britain than in France (Table 9.1), although the confidence intervals around these estimates are wide and overlap. In both surveys, the abortion rates are lower than those obtained from national statistics. In Britain, the abortion rate derived from the survey was 14.7 per 1,000 compared to the population rate for England and Wales of 23.1 per 1,000. In France, the abortion rate obtained from the survey was 10.3 per 1,000 compared to the population rate of 17.8 per 1,000.

First heterosexual sex before 16: In Britain, men and women with parents from a higher relative socioeconomic group were less likely to report sex before 16 than those whose parents were in

a lower relative socioeconomic group (Table 9.2). In France this was the case only for men. The associations between parent relative socioeconomic group and reporting of sex before 16 were statistically significant in multivariate analyses only for men in Britain. In both countries, women and men with a higher educational level were less likely to report first sex before 16 in crude and multivariate analyses (Britain, men: aOR 0.5, women: aOR 0.5; France, men: aOR 0.5, women: aOR 0.5).

Contraception at first sex: In Britain and France, women with parents from a middle or higher relative socioeconomic group, and men with parents from a higher socioeconomic group were less likely to report using no reliable contraception at first sex (Table 9.3). In multivariate analyses, the association between parent relative socioeconomic group and reporting of no contraceptive-use at first sex was statistically significant among women in Britain and France, and men in France. In both countries, men and women with a higher educational level were less likely to report using no reliable method of contraception at first sex in crude and multivariate analyses (Britain, men: aOR 0.4, women: aOR 0.6; France, men: aOR 0.4, women: aOR 0.4).

Conception before 20: In both countries, women with parents from a middle and higher relative socioeconomic group were less likely to report a conception before 20; in multivariate analyses this association remained statistically significant only in Britain (Table 9.4). Women with a higher educational-level were less likely to report a pregnancy before 20 in Britain and France in crude and multivariate analyses (Britain: aOR 0.3; France: aOR 0.1).

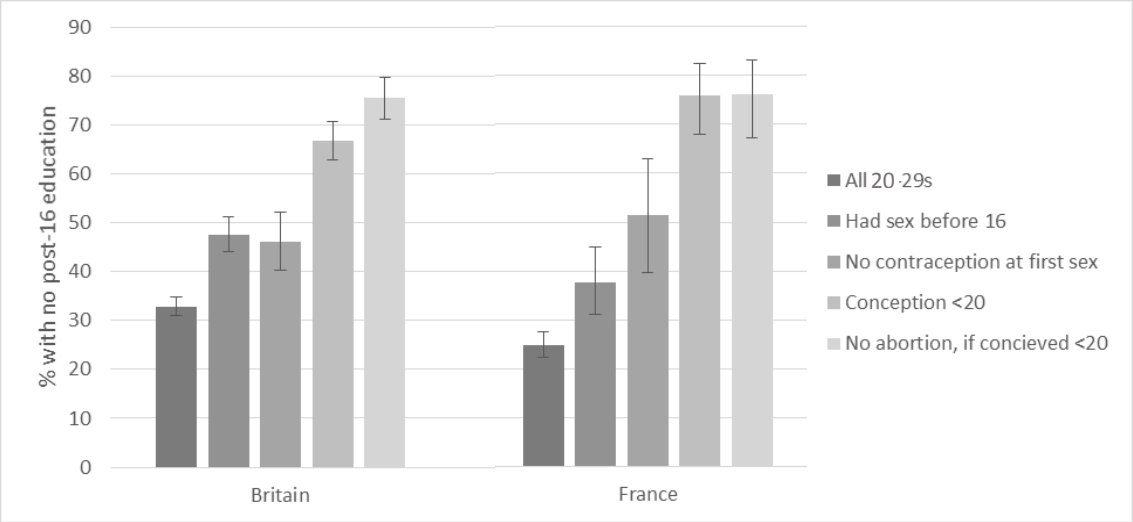
Abortion before 20, if conceived: In Britain, women with parents from a higher relative socioeconomic group were more likely to report an abortion in the event of a conception aged under 20 than those with parents from a lower socioeconomic group. In multivariate analyses this association was not statistically significant (Table 9.5). In Britain, women with a higher educational-level were more likely to report an abortion in the event of pregnancy aged under 20 in crude and multivariate analyses (Britain: aOR 3.1).

In Britain and France, testing for interactions found no evidence of differences between men and women in the strength or direction of the association between socioeconomic characteristics and sex before 16 or contraceptive use at first sex. The associations between the two measures of socioeconomic characteristics and each outcome on the pathway to abortion were similar in Britain and France. Testing for interactions found no evidence of between-country differences in the strength or direction of the association between parent relative socioeconomic group and any of the outcomes, or in the association between respondent educational-level and sex before 16 or contraceptive use at first sex. The association between respondent educational level and conception before 20 among women was stronger in France than in Britain (interaction term 0.49, $p<0.01$), and the association between respondent educational level and abortion in the event of conception was statistically significant in Britain but not France (interaction term 0.28, $p=0.02$).

Further analyses were conducted to test the robustness of the findings to changes in the indicator of education, and the results were broadly similar (APPENDIX D). There was a similar association between level of education measured as a tiered variable, with the categories: no post-16 education, post-16 education but no tertiary, and some tertiary education, in analyses restricted to respondents aged 20 and over.

With each sequential stage in the pathway to abortion, the composition of the sample reporting that outcome changes, reflecting the associations described above between socioeconomic characteristics and sexual health behaviours and outcomes. shows the percentage with no post-compulsory education among all women aged 20-29, women reporting first sex before 16, women not using a reliable method of contraception at first sex, women reporting conception before 20 (among those who were sexually experienced), and women not reporting an abortion (among those who conceived). The graph illustrates how at each successive outcome, the composition of the sample reporting that outcome becomes increasingly disadvantaged (in this case increasingly less educated) compared to the whole population and the preceding stage.

Figure 9.1: Distribution of level of education among women reporting successive sexual health outcomes, 20-29s, Britain and France.



**For condom at first sex, denominator is women who have ever had sex; for conceptions before 20, denominator is women who were sexually experienced by age 20; for no abortion if conceived before 20, denominator is women who reported a conception before age 20.*

Discussion

The results of this study reveal both notable differences and remarkable similarities between Britain and France in terms of sexual behaviour, contraceptive use and reproductive events reported by men and women aged under 20. We found important differences in age at sexual debut between the two countries, but at each further stage of the process leading to abortion, whilst Britain and France differed in the proportion reporting each outcome, they were similar with regard to the nature of the association with socioeconomic characteristics. In both countries there was a cumulative pattern of socioeconomic characteristics (most consistently education) in the pathway to abortion. Respondents with a lower educational level (and, less consistently, with parents from a lower socioeconomic group) were more likely to report first sex before 16, to not use reliable contraception at first sex, and among women, to report a pregnancy before 20 and to take it to term if they did. Among women, the association between respondent educational level and conception before 20 was stronger in France, while the association between respondent educational level and abortion before 20 (in the event of conception) was strong in Britain but not statistically significant in France.

Given that we found no evidence for between-country differences in the associations between socioeconomic characteristics and sexual activity and contraceptive use, the 'antecedents' of conception and abortion, it is possible that these between-country differences in the associations between educational level and conception and abortion outcomes might be due to differential misclassification that results from under-reporting of abortion (Jones & Kost 2007; Moreau et al. 2004) in both surveys, combined with small numbers reporting these outcomes. With a larger sample the association between educational level and recourse to abortion in France may have reached statistical significance. However, although our data showed no evidence for between-country differences in the association between socioeconomic characteristics and contraceptive use at first sex, such differences may exist in later contraceptive use among young people. Contraception is provided free of charge only in family planning clinics in France (Bajos & Durand 2001; Le Guen & Bajos 2014). This may have consequences for method choice and method satisfaction if young women from more disadvantaged backgrounds are less able to obtain any method or the method that suits them best. The stronger association between educational level and conception before 20 in France may reflect a stronger association between educational level and current contraceptive use.

Our research complements the ecological analyses of Darroch et al. (Darroch et al. 2001) and Singh et al. (Singh et al. 2001), which show socioeconomic gradients in sexual behaviour and reproductive health outcomes in five developed countries (Sweden, Britain, Canada, France and the US), but goes further because we made use of individual level data from two large, nationally representative surveys, with detailed and comparable information on two key measures of socioeconomic status and sexual and contraceptive behaviour. As data on parental characteristics were collected differently in the two surveys, these measures may capture different elements of socioeconomic position in Britain and France. However, by constructing a tiered variable, we were able use this data to examine the associations with parent relative socioeconomic group.

Contraceptive use at first sex as an indicator of contraceptive use at a young age is a crude indicator that does not capture all the nuances of contraceptive use, for example method choice or consistency of use, both of which may change over time (Hall et al. 2013). That said, contraceptive use at first sex is an indicator of contraceptive use for all sexually experienced respondents, not just those currently sexually active, and previous research has shown that contraceptive use at first sex is a strong predictor of current contraceptive use among young people (Shafii et al. 2007).

Although previous Natsal surveys have reported good consistency between reported abortion rates and national statistics (Copas et al. 2002), abortions are under-reported in Natsal-3. This is also true of FECOND and previous French sexual behaviour surveys (Moreau et al. 2004). Of greater concern for this study is that abortions are not under-reported at random in surveys. In the US National Survey of Family Growth, reporting of abortions was lower among women with low incomes, those aged 25-29 at the time of abortion, and those with some college education (Jones & Kost 2007). Under-reporting of abortions in surveys also affects the completeness of conceptions data. We must therefore be cautious in interpreting the associations found between socioeconomic characteristics and reporting of conceptions and abortions, which may be biased towards those who do report abortions. If reporting is biased towards women in higher socioeconomic groups, our study may underestimate the associations between socioeconomic status and reporting of conceptions and abortions. Another limitation of the data is that the numbers reporting abortion in the surveys are low, particularly in France where abortion rates are lower and the study sample size smaller, making interpretation of results more difficult due to lack of statistical power. We can compare our findings to studies using routinely collected data (Wilkinson et al. 2006; Humby 2013) to triangulate our results against more certain measures. Abortions and conceptions are under-reported in our data compared to national statistics, but the differences between Britain and France in estimated abortion rates compared to those obtained from national statistics are similar. In addition, detailed data on sexual behaviour and contraception, factors that are 'upstream' from conception and abortion,

enable us to make inferences directly on what this means for conception and abortions, and to inform the interpretations of our findings on conception and abortion. The associations observed in this study may also have been biased by differential reporting of sexual debut and contraceptive-use among people of different socioeconomic status. This would only undermine the between-country comparisons if this bias differed between Natsal-3 and FECOND. Finally, as this is a cross-sectional study, we can neither assume causality nor rule out reverse causality.

In both countries, parent's socioeconomic group was less consistently associated with each outcome on the pathway to abortion than respondent characteristics, measured here using educational level. In addition, the association between educational level and sexual and reproductive health outcomes changed little after controlling for parent's socioeconomic group. This may reflect the declining social control of families in contemporary European societies, a result of which is that the regulation of young people's sexuality is increasingly governed more by peers than by parents (Bozon 2013). Whilst previously a few important institutions, such as the state, the church, the school, and the family imposed controls over sexuality and sexual practices, contemporary society is characterised by a multitude of sources of influence including peers, the media, and school. It is therefore not surprising to find a less marked association with social origin (as indicated by parent relative socioeconomic group) than individual social resources (measured here using respondent educational level) in these analyses. Leaving school at 16 reflects a different expected trajectory, different peers and a different social milieu compared to staying in education, which translates into differences in behaviours.

In both countries, sexual behaviours and reproductive health outcomes were strongly associated with socioeconomic characteristics, particularly educational level. Britain and France both have comprehensive health and social welfare systems. Taxes and benefits allocated through the social welfare system reduce income inequality by a quarter in the UK, which is in line with the OECD average, but less than France (OECD 2015). However, Britain is a society that is more marked by socioeconomic inequalities than France (OECD 2011a). We did not find strong

evidence for our first hypothesis that in a context of greater socioeconomic inequality the association between relative socioeconomic status and sexual health outcomes would be stronger. However, our results suggest that the population-level differences in sexual health outcomes may be partly driven by country-level differences in inequality and degree of socioeconomic disadvantage. There are striking differences in population-level conception and abortion rates among under 20s obtained from national statistics between Britain and France, yet the associations between socioeconomic characteristics and the sexual and reproductive health outcomes studied in this paper are very similar in the two countries. The greater levels of social inequality in Britain compared to France mean that a greater proportion of young people in Britain are disadvantaged (OECD 2011a; UNICEF Office of Research 2013). More disadvantaged groups were more likely to experience each outcome on the pathway to abortion: more likely to begin their sexual lives early, to not use contraception and to become pregnant before 20. In Britain, women were less likely to terminate such a conception with abortion, and in France the likelihood of recourse to abortion was greater among women with a higher educational-level but the association was not statistically significant. The differences in conception and abortion rates between the two countries may be due in part to differences in the proportion of individuals that are more 'at risk' of experiencing these outcomes.

Other social contextual factors may also be important, particularly those that affect young people specifically or that relate to their motivations to avoid pregnancy. Young parenthood can be an alternative means of attaining an adult social status among those for whom traditional routes, through education and employment, seem less evident (Le Van 2006). Van de Velde (2008) argues that the transition to adulthood is experienced differently in Britain and France, with the focus in Britain being on a rapid transition to independence, whilst in France youth is considered as a time of investment, with a focus on education. In France, therefore, becoming a parent early goes very much against the social order, whilst in Britain it can be much more compatible with a transition to adulthood that encourages early independence. Motivations to avoid or delay parenthood translate into sexual behaviours and contraceptive use; young people

for whom education is important may prioritise this over romantic relationships and sexual initiation (Bozon & Kontula 1998), and may be more strongly committed, using contraception consistently and effectively. Socioeconomic differences in contraceptive use may be linked to knowledge; a British study found that socioeconomic disadvantage was associated with less knowledge about contraception (Bonell et al. 2003). Young people's motivations to learn and inform themselves about contraceptive methods may be influenced by their motivations to avoid pregnancy. In both countries, there were no gender differences in the proportion reporting no contraceptive use at first sex. However, in France but not in Britain, fewer women reported first sex before 16 than men. In France, it appears that although social disadvantage is important in shaping the timing of first sex, shown in the greater proportion of respondents with a lower educational-level reporting first sex before 16, it is also perhaps a more strongly gendered event than in Britain. Previous research has shown larger age gaps between partners at first sex in France than in Britain (Chapter 8), also reflective of stronger gendered social norms. These specific gender differences that are present in France but not in Britain highlight the important role of country context; the more gendered nature of first sex in France may reflect a more gender-unequal social structure in France (Bajos & Marquet, 2000; see also Chapter 8 in this thesis).

Young people's knowledge, attitudes and decisions regarding sex, contraception and abortion may also be affected by their or their parents' attachments to religious beliefs and institutions. Historically, France is a predominantly Catholic country, a religion that is more restrictive in its approach to contraception and abortion than the Church of England (Schenker 2000). However, young women who become pregnant in France are more likely to have an abortion (Sedgh et al. 2015). Young people in the US who report that religion is important to them have been found to be more likely to report later first sex and less likely to use contraception (Manlove et al. 2006; Kirby 2002a). However, the differences between Britain and France with regard to religious participation are minimal. Data from the World Values Survey (Wave 5: 2005-2009)

shows that religiosity, participation and frequency of prayer among under-30s is similar in both countries (Norris & Inglehart 2004).

Between-country differences in health care systems may affect young people's contraceptive-use. In Britain, contraception is provided free of charge to women of all ages and without parental consent for minors, from general practitioners, family planning clinics and youth oriented clinics (Wellings 2001). Until 2001 in France, under-18s could not be prescribed contraception without parental consent, and now are covered through their parents' health insurance (Bajos & Durand 2001). Young people can obtain contraception anonymously, and for free, only through family planning clinics (CPEFs), which are unevenly distributed across the country (Bajos & Durand 2001). In both countries, contraceptive use has been found to vary by socioeconomic characteristics (Moreau & Bajos 2005; Wellings et al. 2001). That young people in France are more likely to use contraception at first sex despite greater access to contraception in Britain suggests that the social contextual factors that affect young people's motivations to avoid pregnancy and parenthood, discussed above, are important in shaping sexual behaviours and reproductive health outcomes.

Differences in sex education between the two countries might also contribute to differences in contraceptive use and sexual behaviour. In France, sex education was made mandatory in schools in 2001 (International Planned Parenthood Federation 2006). In Britain, it is compulsory to teach pupils the biological aspects of sex as part of the national curriculum for science. Other aspects of sex education are not mandatory but the majority of schools choose to teach it (House of Commons Education Committee 2015; Tanton et al. 2015). In both countries, quality of provision is thought to be variable (International Planned Parenthood Federation 2006; Office for Standards in Education Children's Services and Skills (Ofsted) 2013). Although knowledge received in universal school-based sex education should not vary by socioeconomic status within countries, there is some evidence in Britain that sexual health knowledge was lower among more disadvantaged young men and women (Bonell et al. 2003).

Conception and abortion rates observed in national statistics are markedly higher in Britain than in France, yet in both countries there is a strong and similar association between socioeconomic characteristics and outcomes at each stage in the pathway to abortion. Britain is a society marked by higher levels of disadvantage than France (UNICEF Office of Research 2013; OECD 2011a) so population-level differences in conception and abortion rates may be partly attributable to a greater proportion of the population that is disadvantaged and more 'at risk'. Differences in broader social contextual factors may also influence young people's behaviours and decision making; differences in the way in which the transition to adulthood is experienced in the two countries mean that motivations to avoid or delay pregnancy may be weaker in Britain, and gender differences in timing of first sex in France but not Britain suggest that more strongly gendered social norms in France might also shape sexual behaviours. Future research should explore the mechanisms through which social disadvantage affects sexual behaviour and contraceptive use, paying particular attention to motivations to avoid pregnancy. In addition, research examining the association between disadvantage and conception and abortion rates at area level, and how this differs cross-nationally, will increase our understanding of the contextual factors implicated in cross-national differences in teenage pregnancy rates.

Table 9.1: Characteristics of the sample in terms of socioeconomic characteristics and reporting of each outcome in the pathway to abortion, 17-29 year-olds, Britain and France.

	Britain				France			
	Men		Women		Men		Women	
	n, N	% (95%CI)	n, N	% (95%CI)	n, N	% (95%CI)	n, N	% (95%CI)
Total N aged 17-29	2392		3327		1287		1740	
Post-16 education or studying	1770, 2355	68.6 (66.4- 70.8)	1763, 3271	67.2 (65.3- 69.0)	1170, 1286	61.5 (58.0- 64.8)	1812, 1738	75.1 (72.5- 77.6)
Parent's socioeconomic group								
Lower	1763, 2320	17.1 (15.5- 18.8)	1751, 3217	18.9 (17.4- 20.4)	1171, 1287	17.3 (14.7- 20.3)	1815, 1740	18.6 (16.4- 20.9)
Middle	1763, 2320	49.1 (46.7- 51.5)	1751, 3217	49.8 (47.8- 51.8)	1171, 1287	47.3 (44.1- 50.6)	1815, 1740	44.8 (42.1- 47.5)
Higher	1763, 2320	24.6 (22.5- 26.8)	1751, 3217	21.3 (19.7- 23.0)	1171, 1287	24.5 (22.0- 27.2)	1815, 1740	24.6 (22.4- 26.9)
Missing	1763, 2320	9.2 (8.0- 10.7)	1751, 3217	10.0 (9.0- 11.2)	1171, 1287	10.9 (9.0- 13.1)	1815, 1740	12.1 (10.4- 14.1)
Religion is very or fairly important	1812, 2390	24.7 (22.6- 27.0)	1796, 3322	29.8 (27.9- 31.6)	1167, 1283	19.9 (17.2- 22.9)	1809, 1734	26.3 (23.8- 28.9)
Lived with both natural parents until age 14/1	1814, 2392	73.5 (71.6- 75.4)	1796, 3326	68.5 (66.8- 70.2)	1171, 1287	72.8 (69.7- 75.8)	1812, 1738	71.4 (68.9- 73.9)
Had first het sex before age 16	1757, 2308	26.6 (24.6- 28.7)	1763, 3254	27.2 (25.5- 29.0)	1149, 1266	27.0 (24.2- 30.1)	1793, 1718	14.6 (12.8- 16.6)
No contraception at first sex	1482, 1938	12.7 (11.1- 14.6)	1520, 2854	12.0 (10.8- 13.3)	979, 1077	6.9 (4.9- 9.7)	1493, 1467	8.7 (6.9- 10.9)
Conception before age 20	.	.	1162, 2200	25.6 (23.7- 27.5)	.	.	1079, 1123	15.5 (13.0- 18.3)
Had an abortion before age 20, if conceived	.	.	298, 667	32.2 (28.3- 36.5)	.	.	169, 136	18.4 (12.4- 26.6)
Birth rate, 16-19s (per 1000)	.	.	42.1 (30.7-57.3)		.	.	12.3 (4.4-33.6)	
Abortion rate, 16-19s (per 1000)	.	.	14.7 (11.63-17.77)		.	.	10.9 (8.53-13.27)	

Notes: n=unweighted denominator, N=weighted denominator. For contraceptive use at first sex, denominator is respondents who have ever had sex; for reporting of a conception before 20, denominator is women aged 20 and over who were sexually experienced by age 20; for reporting of an abortion before 20, denominator is women aged 20 and over, reporting a conception before age 20

Table 9.2: Prevalence and odds of reporting first sex before 16 by parent socioeconomic group and individual level of education, 17-29 year-olds, Britain and France.

Britain

	Men						Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group												
Lower	289, 408	29.33 (24.79-34.33)	1	.	1	.	324, 618	30.50 (26.67-34.62)	1	.	1	.
Middle	843, 1092	27.68 (24.86-30.70)	0.92 (0.70- 1.21)	0.558	1.10 (0.82- 1.47)	0.523	858, 1568	26.84 (24.58-29.23)	0.84 (0.67- 1.04)	0.101	1.13 (0.90- 1.42)	0.287
Higher	428, 529	17.43 (14.23-21.17)	0.51 (0.37- 0.70)	<0.001	0.71 (0.50- 1.00)	0.047	369, 634	20.58 (17.44-24.12)	0.59 (0.45- 0.77)	<0.001	0.91 (0.69- 1.22)	0.546
Not answered	155, 217	36.54 (29.77-43.89)	1.39 (0.96- 2.01)	0.084	1.15 (0.77- 1.72)	0.504	169, 335	30.26 (25.20-35.86)	0.99 (0.72- 1.35)	0.943	0.96 (0.69- 1.33)	0.797
Post-16 education or studying												
None	522, 714	40.87 (36.89-44.98)	1	.	1	.	558, 1168	40.62 (37.51-43.82)	1	.	1	.
Some	1192, 1557	21.06 (18.85-23.46)	0.39 (0.31- 0.48)	<0.001	0.45 (0.36- 0.57)	<0.001	1170, 2030	21.31 (19.43-23.32)	0.40 (0.33- 0.47)	<0.001	0.46 (0.39- 0.56)	<0.001

France

	Men						Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group												
Lower	196, 178	32.80 (25.08-41.59)	1	.	1	.	335, 291	15.01 (10.96-20.21)	1	.	1	.
Middle	552, 622	26.53 (22.46-31.03)	0.74 (0.48- 1.14)	0.176	0.84 (0.53- 1.34)	0.467	801, 799	14.65 (12.08-17.65)	0.97 (0.64- 1.49)	0.895	0.94 (0.60- 1.45)	0.766
Higher	284, 352	22.49 (17.68-28.16)	0.59 (0.37- 0.96)	0.035	0.84 (0.50- 1.43)	0.525	442, 452	12.92 (9.83-16.80)	0.84 (0.52- 1.35)	0.472	1.00 (0.60- 1.66)	1
Not answered	117, 114	30.71 (22.28-40.67)	0.91 (0.51- 1.62)	0.743	0.77 (0.42- 1.41)	0.394	214, 176	17.23 (11.96-24.19)	1.18 (0.67- 2.06)	0.564	0.76 (0.41- 1.38)	0.365
Post-16 education or studying												
None	441, 348	36.16 (30.53-42.18)	1	.	1	.	438, 323	22.50 (17.98-27.78)	1	.	1	.
Some	708, 917	21.35 (18.38-24.66)	0.48 (0.35- 0.66)	<0.001	0.51 (0.36- 0.72)	<0.001	1352, 1393	12.07 (10.29-14.11)	0.47 (0.34- 0.66)	<0.001	0.46 (0.32- 0.67)	<0.001

Notes: n=unweighted denominator, N=weighted denominator. cOR=crude odds ratio; aOR=adjusted odds ratio. aOR adjusted for all variables in model and family structure at age 14/15.

Table 9.3: Prevalence and odds of reporting no contraceptive use at first sex by parent socioeconomic group and individual level of education, 17-29 year-olds, Britain and France.

Britain

	Men						Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group												
Lower	234, 332	15.92 (11.92-20.94)	1	.	1	.	279, 544	16.16 (13.09-19.79)	1	.	1	.
Middle	717, 927	12.37 (10.09-15.08)	0.75 (0.50- 1.11)	0.146	0.77 (0.51- 1.16)	0.215	747, 1396	8.93 (7.47-10.65)	0.51 (0.37- 0.70)	<0.001	0.52 (0.38- 0.73)	<0.001
Higher	366, 446	9.42 (6.78-12.95)	0.55 (0.34- 0.89)	0.014	0.74 (0.45- 1.22)	0.237	315, 538	10.09 (7.49-13.48)	0.58 (0.39- 0.88)	0.01	0.63 (0.41- 0.96)	0.032
Not answered	129, 181	14.02 (9.13-20.94)	0.86 (0.47- 1.56)	0.623	0.77 (0.41- 1.43)	0.405	138, 285	20.34 (15.70-25.93)	1.32 (0.89- 1.96)	0.161	1.05 (0.69- 1.62)	0.809
Post-16 education or studying												
None	471, 644	19.87 (16.40-23.86)	1	.	1	.	518, 1093	15.21 (13.07-17.63)	1	.	1	.
Some	980, 1265	8.76 (7.13-10.71)	0.39 (0.28- 0.53)	<0.001	0.44 (0.31- 0.62)	<0.001	974, 1713	9.44 (7.95-11.17)	0.58 (0.45- 0.75)	<0.001	0.62 (0.47- 0.81)	0.001

France

	Men						Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group												
Lower	164, 151	13.93 (6.71-26.69)	1	.	1	.	277, 244	17.84 (11.95-25.79)	1	.	1	.
Middle	478, 530	6.42 (4.00-10.16)	0.42 (0.16- 1.10)	0.077	0.57 (0.24- 1.33)	0.19	673, 693	4.72 (3.11- 7.10)	0.23 (0.12- 0.43)	<0.001	0.32 (0.17- 0.59)	<0.001
Higher	246, 305	1.36 (0.60- 3.06)	0.09 (0.03- 0.27)	<0.001	0.17 (0.06- 0.50)	0.001	368, 385	6.44 (3.85-10.58)	0.32 (0.15- 0.65)	0.002	0.52 (0.26- 1.03)	0.062
Not answered	92, 91	11.63 (6.01-21.29)	0.81 (0.27- 2.40)	0.708	0.80 (0.29- 2.25)	0.677	175, 145	14.43 (9.24-21.83)	0.78 (0.39- 1.55)	0.472	0.65 (0.31- 1.35)	0.246
Post-16 education or studying												
None	386, 312	12.35 (7.83-18.93)	1	.	1	.	394, 289	16.96 (12.19-23.10)	1	.	1	.
Some	593, 765	3.35 (2.21- 5.04)	0.25 (0.13- 0.48)	<0.001	0.40 (0.20- 0.82)	0.012	1097, 1176	5.77 (4.28- 7.73)	0.30 (0.18- 0.49)	<0.001	0.38 (0.22- 0.66)	0.001

Notes: n=unweighted denominator, N=weighted denominator. Denominator restricted to respondents who had ever had sex. aOR adjusted for all variables in model, family structure at age 14/15 and age at first sex. cOR=crude odds ratio; aOR=adjusted odds ratio. aOR adjusted for all variables in model and family structure at age 14/15.

Table 9.4: Prevalence and odds of reporting a conception before age 20 by parent socioeconomic group and individual level of education, 20-29 year-olds, Britain and France.

	Britain					
	Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group						
Lower	228, 442	34.42 (29.83-39.31)	1	.	1	.
Middle	563, 1057	21.79 (19.30-24.51)	0.53 (0.41- 0.69)	<0.001	0.72 (0.54- 0.97)	0.029
Higher	232, 399	13.96 (11.07-17.45)	0.31 (0.22- 0.43)	<0.001	0.56 (0.39- 0.82)	0.003
Not answered	107, 231	40.76 (34.12-47.75)	1.31 (0.93- 1.86)	0.127	1.10 (0.73- 1.67)	0.646
Post-16 education or studying						
None	442, 943	44.28 (40.88-47.74)	1	.	1	.
Some	700, 1220	13.84 (11.94-15.99)	0.20 (0.16- 0.25)	<0.001	0.27 (0.21- 0.34)	<0.001

	France					
	Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group						
Lower	196, 188	21.67 (15.24-29.85)	1	.	1	.
Middle	485, 530	13.01 (9.84-17.03)	0.54 (0.32- 0.92)	0.024	0.66 (0.37- 1.20)	0.173
Higher	269, 297	6.65 (3.66-11.78)	0.26 (0.12- 0.55)	<0.001	0.61 (0.27- 1.35)	0.223
Not answered	129, 108	33.61 (24.28-44.42)	1.83 (0.98- 3.43)	0.059	1.08 (0.52- 2.25)	0.838
Post-16 education or studying						
None	330, 249	38.03 (31.51-45.01)	1	.	1	.
Some	746, 872	5.33 (3.89- 7.27)	0.09 (0.06- 0.14)	<0.001	0.14 (0.08- 0.23)	<0.001

Notes: n=unweighted denominator, N=weighted denominator. Denominator restricted to women aged 20 and over, sexually experienced by age 20. cOR=crude odds ratio; aOR=adjusted odds ratio. aOR adjusted for all variables in model, family structure at age 14/15 and age at first sex.

Table 9.5: Prevalence and odds of reporting an abortion before age 20, among women who conceived before age 20, by parent socioeconomic group and individual level of education, 20-29 year-olds, Britain and France.

	Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group						
Lower	80, 176	31.85 (24.61-40.09)	1	.	1	.
Middle	122, 269	33.44 (27.27-40.24)	1.08 (0.69- 1.68)	0.75	0.91 (0.56- 1.50)	0.718
Higher	33, 69	51.10 (38.23-63.84)	2.24 (1.21- 4.15)	0.011	1.57 (0.82- 3.01)	0.171
Not answered	44, 104	16.88 (9.67-27.83)	0.43 (0.21- 0.91)	0.027	0.37 (0.18- 0.79)	0.01
Post-16 education or studying						
None	196, 457	23.44 (19.51-27.89)	1	.	1	.
Some	98, 198	50.68 (42.67-58.65)	3.36 (2.26- 4.99)	<0.001	3.14 (2.04- 4.82)	<0.001

	France					
	Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group						
Lower	43, 33	16.90 (7.21-34.71)	1	.	1	.
Middle	63, 53	15.79 (8.05-28.65)	0.92 (0.27- 3.14)	0.897	0.86 (0.24- 3.03)	0.813
Higher	18, 16	17.81 (4.83-48.06)	1.07 (0.19- 6.08)	0.943	1.12 (0.14- 8.75)	0.911
Not answered	45, 34	23.91 (11.48-43.21)	1.55 (0.42- 5.71)	0.514	1.47 (0.37- 5.78)	0.582
Post-16 education or studying						
None	127, 88	17.63 (10.74-27.58)	1	.	1	.
Some	40, 47	18.20 (8.84-33.79)	1.04 (0.38- 2.86)	0.94	1.23 (0.36- 4.23)	0.738

Notes: n=unweighted denominator, N=weighted denominator. Denominator restricted to women aged 20 and over, reporting a conception before age 20. cOR=crude odds ratio; aOR=adjusted odds ratio. aOR adjusted for all variables in model, family structure at age 14/15 and age at first sex.

9.3 CONCLUSION

Parenthood can be an alternative route to an adult social status among those for whom traditional routes, for example education and employment, seem less obvious. In Britain, where a greater proportion of the population is disadvantaged, more young people are living in situations conducive to young parenthood, and it is possible that this 'compositional effect' may contribute to the differences in sexual activity, contraception and recourse to abortion between Britain and France.

10 THE ASSOCIATION BETWEEN AREA-LEVEL DISADVANTAGE AND YOUNG PEOPLE'S CONCEPTION AND ABORTION RATES IN ENGLAND AND WALES AND FRANCE

10.1 INTRODUCTION

The papers presented in Chapters 8 and 9 in this thesis examined the association between disadvantage and sexual and contraceptive behaviours and reproductive outcomes at an individual level, using data from nationally representative surveys. These analyses found that the association between disadvantage and each stage in the pathway to abortion was similar in Britain and France. We might expect to find that this is mirrored in analyses at an area level. However, area-level disadvantage may consist of more than the agglomeration of disadvantaged individuals or families, and may have effects that are not accounted for by the levels of individual or family deprivation in these areas. The following paper uses routine data from England and Wales and France to consider the association between disadvantage and conception rates and the abortion ratio at an area level.

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I am the first author on this paper. I was responsible for constructing the variables for analyses, conducting the analysis and writing the article. My co-authors supported this work in an advisory capacity and in helping to edit the writing.

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CANDIDATE'S SIGNATURE **Date**: 15/08/2016

PRINCIPAL SUPERVISOR: EMMA SLAYMAKER

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10.2 ARTICLE

Abstract

Conception and abortion rates among under 20s are higher in England and Wales than in France. There is substantial geographical variation in conception and abortion rates in England and Wales. Conception rates among under 20s are highest, and the proportion of conceptions that end in abortion (the abortion ratio) are lowest, in more disadvantaged areas. Little is known about the association between area-level disadvantage and conception and abortion rates in France. Previous research has found that the association between individual-level disadvantage and sexual activity and contraceptive use – the 'antecedents' of conception and abortion – among under 20s is similar in the two countries. This paper uses routinely collected data on births and abortions and census data on qualifications, at area level, to examine differences in the correlation between area-level disadvantage and conception rates and the abortion ratio in England and Wales and France between 1980 and 2010. We found that in both countries, conception rates are higher, and the abortion ratio lower, in more disadvantaged areas. The correlation between area-level disadvantage, measured by the proportion of males aged 30-44 without university degree-level qualifications or equivalent, and both conception rates and the abortion ratio among under 20s was significantly stronger in England and Wales than in France throughout the time period studied. The fact that at area level the association between disadvantage and conception and abortion rates is stronger in England and Wales, suggests that other contextual factors mean that young people living in disadvantaged areas in England and Wales are more likely to become pregnant, and less likely to terminate that pregnancy with abortion, than their counterparts in France.

Introduction

Abortions are notifiable in Britain and France, meaning that data on abortion rates that is considered reliable is available. Conception and abortion rates among young people in England and Wales are high relative to other rich countries (Sedgh et al. 2015). A significant body of research has examined conceptions and abortions among young people in Britain, yet fewer studies have capitalised on the potential of cross-national research to increase our understanding of the British situation (Bajos et al. 1995; Singh et al. 2001; Darroch et al. 2001). Britain and France were chosen for comparison because whilst they are similar in many ways, they have very different rates of conception and abortion among under 20s and also differ in other important ways that affect young people's lives. In France, conception and abortion rates among under 20s are lower. The conception rate among women aged 15-19 was 25 per 1,000 in France, compared to 47 per 1,000 in England and Wales in 2011 (Sedgh et al. 2015). Among those who do become pregnant, young women in Britain are less likely to have an abortion than those in France; 42% of conceptions to 15-19 year-olds in 2011 were terminated with abortion in England and Wales compared to 61% in France (Sedgh et al. 2015). The differences in the abortion ratio (the proportion of conceptions that end in abortion) and conception rates are such that the abortion rate among under 20s is higher in Britain than in France. There is substantial geographical variation in conception and abortion rates in Britain. Area-level analyses have shown that pregnancy rates among under 20s are greatest in the most deprived local authority areas, and that in these same areas, the proportion of conceptions that end in abortion is lowest (Wilkinson et al. 2006; Conrad 2012; Diamond et al. 1999; McLeod 2001).

Young people with a lower level of education and from more disadvantaged backgrounds are more likely to have a conception or abortion before age 20 (Wellings et al. 2001; Kneale et al. 2013; Le Van 2006; Darroch et al. 2001). A comparative analysis of Britain and France using two nationally representative population surveys found that the associations between socioeconomic characteristics and sexual behaviour and contraceptive use, the 'antecedents' of

conception and abortion, were remarkably similar in the two countries; young women with a lower level of education were more likely to report first sex before 16 and less likely to use contraception at first sex (Chapter 9).

Although individual socioeconomic characteristics are strongly associated with conceptions in both countries, and the median income is similar (OECD 2015), the distribution of disadvantage is different. Britain is a more unequal country than France. The Gini coefficient, a measure of country-level income inequality, ranges from 0.25 to 0.35 in European Union countries. In Britain, at 0.35, it is the highest in the European Union (i.e. the most unequal). In France, the Gini coefficient is 0.31, closer to the European Union average (OECD 2011a). The percentage of the British population with an income less than 60% of the median is 21%, compared to 16% in France (OECD 2011a). It is possible that differences in the distribution of disadvantage, which mean that fewer young people live in disadvantaged situations in France compared to Britain, may contribute to the differences between the two countries in under 20 conception and abortion rates. If fewer young people are living in disadvantaged situations in France compared to Britain, then fewer grow up in the socioeconomic conditions that are conducive to pregnancy at younger ages. This paper compares the correlation of area-level disadvantage with conception rates and the abortion ratio among under 20s in Britain and France.

Methods

Data on births and abortions were drawn from routinely collected information from birth registers and abortion notifications and summed to calculate the total number of conceptions. Mid-year population estimates at the same geographical level were obtained in order to calculate the annual rate of conceptions in each area for women aged 15-19.

Sources of data

In England and Wales, data on conception and abortion rates were obtained from the Office for National Statistics at Local Authority (LA) level for 1992-2000 and at Primary Care Trust (PCT)

level for 2001-2011. Conceptions data were not available for the years prior to 1992. In France, abortions data were obtained from the National Institute for Demographic Studies (INED), at *département* level for 1980-2009, and data on births for the same years were obtained from the National Institute of Statistics and Economic Studies (INSEE). Due to problems with data collection, no abortions data were available at area level for the years 1998-2004. Mid-year population estimates by age group, year and *département* were obtained from INED, and these data were used to calculate conception rates and the abortion ratio.

We use the proportion of the male population aged 30-44 or 35-49 attaining a university degree or equivalent qualification as a measure of disadvantage. This is available from the census for both England and Wales and France. In England and Wales, these data were obtained from the censuses conducted in 1991, 2001 and 2011. In the 1991 census a university degree or equivalent is defined as any qualifications obtained over the aged of 18 (i.e. degrees, diplomas, HNC, HND, nursing qualifications, teaching qualifications, graduate or corporate membership, other professional, educational or vocational qualifications) and was available for the 30-44 year old age band. In the 2001 and 2011 censuses, a degree or equivalent is defined as qualifications at Level 4 or above, i.e. a degree, higher degree, NVQ Level 4-5, HNC, HND, RSA Higher Diploma, BTEC Higher level, foundation degree or professional qualifications, and was available for the 35-49 year old age band. In France, the data were obtained from the censuses conducted in 1980, 1990, 1999 and 2008. In all census years, degree or equivalent was defined as a university diploma (1st cycle, BTS, DUT, 2nd cycle or 3rd cycle) and was available for the 30-44 year old age band. We limited this area-level indicator of disadvantage to males in a restricted age group to ensure that changes over time and between areas in the indicator reflect true changes in disadvantage and not changes in the population age structure or in the expansion of women's participation in higher education. For clarity, we henceforth refer to the age band as 30-44 year-olds rather than distinguishing between the years for which data were available for 30-44 year-olds and the years for which data were available for 35-49 year-olds.

In England and Wales, a map of quintiles of area-level disadvantage as measured using the proportion with no university degree level qualification or equivalent corresponds to the equivalent map of disadvantage measured using the Index of Multiple Deprivation. In France, both the FDep and disadvantage measured using the proportion with no university degree level qualification or equivalent show the South-East of France as being relatively less disadvantaged. Some northern *département*s have a lower level of disadvantage when measured using the proportion with no degree level or equivalent qualification than when measured using the FDep, and some central *département*s have a higher level of disadvantage as measured using the proportion with university degree level qualification.

Analysis

For each area level, we calculated the conception rate and abortion ratio for women aged 15-19. We then examined the correlation between area-level disadvantage, measured here using the proportion of the male population aged 30-44 without a university degree or equivalent qualification, and the conception rate and the abortion ratio, for the most recent data available and over time. We compare these results between England and Wales and France. Finally, we calculated a Standardised Conception Rate Ratio for conception rates. We calculated stratum specific conception rates by stratum of disadvantage and applied the disadvantage-specific conception rates in Britain to the French distribution of disadvantage in order to calculate the number of conceptions expected in France if it had same the disadvantage-specific conception rates as Britain. The Standardised Conception Rate Ratio is the ratio of the observed number of conceptions in France to the expected number. Indirect rather than direct standardisation was chosen because the under-recording of abortions in France meant that some of the difference in stratum-specific conception rates between Britain and France would be due to under-recording rather than true differences, and it was not possible to know whether the extent of under-recording varied with level of disadvantage. However, it was possible using national-level figures on conception rates in France, adjusted for under-recording of abortions, to use indirect

standardisation to compare the observed number (from national statistics) with the calculated expected number, without the requirement for stratum specific conception rates.

Quality of abortions data

In both England and Wales and France, it is a legal requirement to record all abortions. Reporting of abortions in England and Wales is considered complete. Reporting of abortions in the French notifications data is known to be incomplete. The data in the French notifications are, however, considered to be representative of women having abortions with regard to socioeconomic characteristics (Rossier & Pirus 2007a).

The under-reporting of abortions in France would only lead to bias in our results if the under-reporting varied systematically according to *département* level disadvantage. It is not possible to assess using the notifications data whether the under-reporting varies in this way. In order to take into account the under-reporting of abortions in routinely collected data in France, we ran our analyses using three different scenarios of data. We first ran the analysis using the data from the bulletins at face value. Second, we ran the analysis using the data from the bulletins, using a correction factor which was calculated by dividing the total number of abortions in each year re-estimated by Toulemon and Le Guen (unpublished data) by the total number of abortions in each year recorded in the bulletins. The correction factor ranged from 1.17 to 1.46 depending on the year, and does not take into account any variation in under-reporting by *département*. Finally, we ran the analyses using data obtained from the annual statistics of healthcare facilities (SAE). The SAE also contain information on abortion, but not on the age of the woman; figures by age group are estimated by applying the known age distribution (from the notifications data). All three scenarios gave similar correlation coefficients and trends in the correlation over time; the strength of the association between disadvantage and conception and abortion was lower in France than in Britain. As the interest of this research is on the difference in the strength of the association between England and Wales and France, the scenario which gave the most

conservative interpretation, i.e. that for which the difference between Britain and France was the narrowest, was chosen. This was the scenario using data from the notifications at face value.

Data from birth registries in France are thought to be complete. We examined the correlation between birth rates and level of disadvantage at area level. We found that within England and Wales and France, the strength of the correlation was very similar for birth rates and conception rates. Between the two countries, the strength of the correlation between area level disadvantage and birth rates was higher in England and Wales than in France. As this follows a similar pattern to the differences between countries in the correlation between area-level disadvantage and conception rates, this gives us more confidence in the validity of the abortions data for this analysis.

Results

Area-level disadvantage

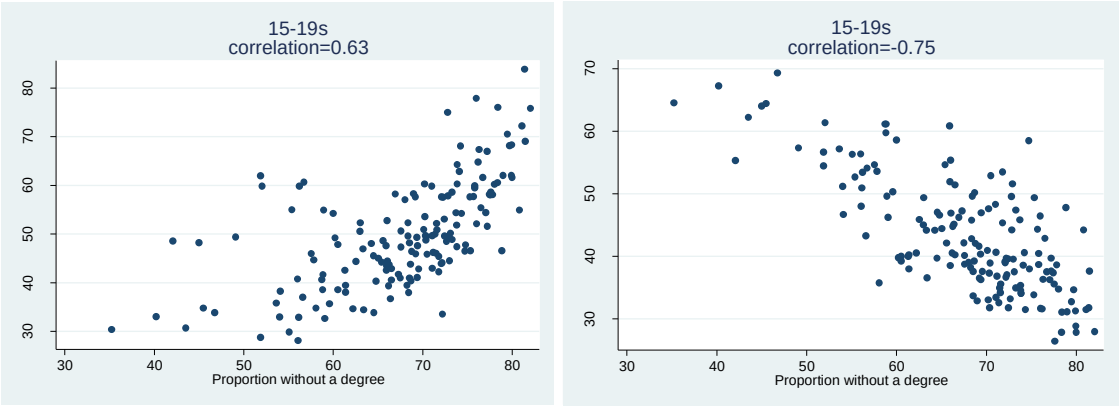
The proportion of men aged 30-44 without a university degree or equivalent qualification is higher in France but with a narrower distribution (Figure 10.1). In France the mean proportion without a university degree or equivalent qualification is 72%, compared to 68% in England and Wales, but in France the values for each area unit are more closely spread around the median than in England and Wales. In France the central 50% of values are slightly higher (more disadvantaged) than in England and Wales. In both countries, the proportion without a university degree level qualification or equivalent decreased over time.

Figure 10.1: Distribution of area level of disadvantage (proportion without a university degree or equivalent qualification) in England and Wales and France.

Correlation between area-level disadvantage and the conception rate and abortion ratio in England and Wales

In 2009, there was a strong positive correlation between area-level disadvantage and conception rates and the abortion ratio. Conception rates among 15-19s were higher in areas where the level of disadvantage was higher (Figure 10.2, left). The abortion ratio was lower in area where the level of disadvantage was higher (Figure 10.2, right).

Figure 10.2: Correlation between area-level deprivation and conception rates (left) and the abortion ratio (right) among 15-19s, England and Wales, 2009



The strong positive correlation between the level of deprivation and conception rates among young women has been sustained since the early 1990s (Figure 10.3, left). There has also been little change in the strength of the negative correlation between area level deprivation and the abortion ratio (Figure 10.3, right). Whilst there is some indication that the strength of the correlation with the conception rate may have increased, and the strength of the association with the abortion ratio decreased, since the early 2000s, the confidence intervals of these coefficients overlap. This correlation between area-level disadvantage and the conception rate and abortion ratio is clear when viewed on a map (Figure 10.6), the highest conception rates and lowest abortion ratios are seen in the most disadvantaged areas.

Figure 10.3: Change over time in correlation between area level disadvantage and conception rates (left) and abortion ratio (right) among 15-19s, England and Wales (excluding London), 1992-2011

London was excluded from Figure 10.3 because the pattern of change over time in the association between level of disadvantage and conception rates behaves different to the rest of the country. Both of these correlations in London are weaker than in the rest of the country (results not shown). If London is divided into inner and outer boroughs, the outer boroughs behave in a similar way to the rest of the country, showing a strong positive correlation between area level disadvantage and conception rates, and the inverse with the abortion ratio. The inner boroughs show a much more mixed pattern, with many outliers which distort the correlation. For example, some areas, such as Newham and Tower Hamlets, have a lower conception rate than would be expected for the level of disadvantage, and other boroughs, such as, Lambeth and Lewisham, have a higher conception rate than would be expected.

Association between area-level disadvantage and the conception rate and abortion ratio in France

In France, the direction of the correlation between area-level disadvantage and conception rates and the abortion ratio among under 20s is the same as in England and Wales, but the strength of the correlation is weaker (Figure 10.4). The correlation coefficient for the association between disadvantage and conception rates is 0.18 for 15-19s in 2009 compared to 0.63 in England and Wales. Similarly, the correlation coefficient for the association between disadvantage and the abortion ratio is 0.32, compared to 0.75 in England and Wales. Four *département*s in France, seen as outliers in Figure 10.4 (right), have a lower abortion ratio than would be expected for their level of disadvantage. These *département*s are all in the same region (Alsace Champagne-Ardenne Lorraine). It is possible that this reflects a data collection problem, whereby under-recording of abortions is particularly high in in these *département*s. These same *département*s also have lower conception rates than would be expected given their level of disadvantage, which also suggests that abortions may be under-recorded. It is also possible that the low conception rates reflect differences in sexual and reproductive health policies in that region. The areas with the highest abortion ratios, in the South-East of the country, are those which are less disadvantaged (Figure 10.6). The highest conception rates, however, were seen in the North of the country, which is characterised by high, but not the highest, levels of disadvantage.

Figure 10.4: Correlation between area level deprivation and conception rates (left) and the abortion ratio (right) among 15-19s, France, 2009

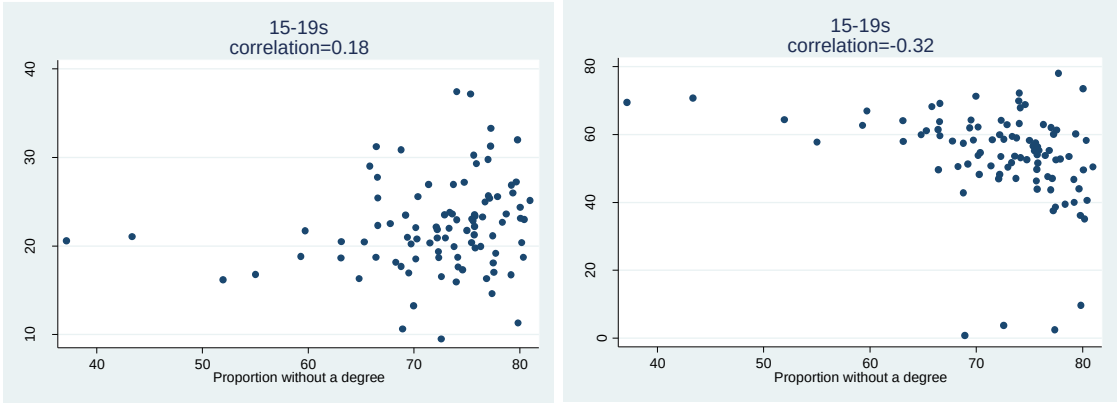
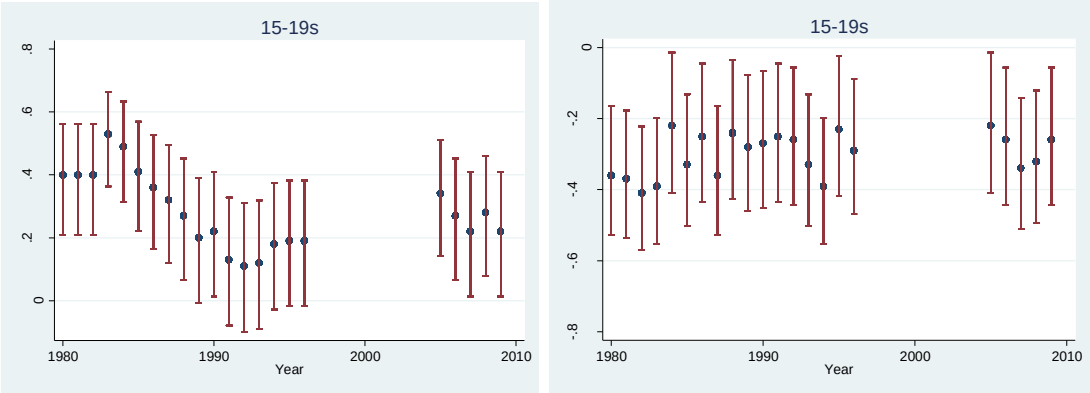
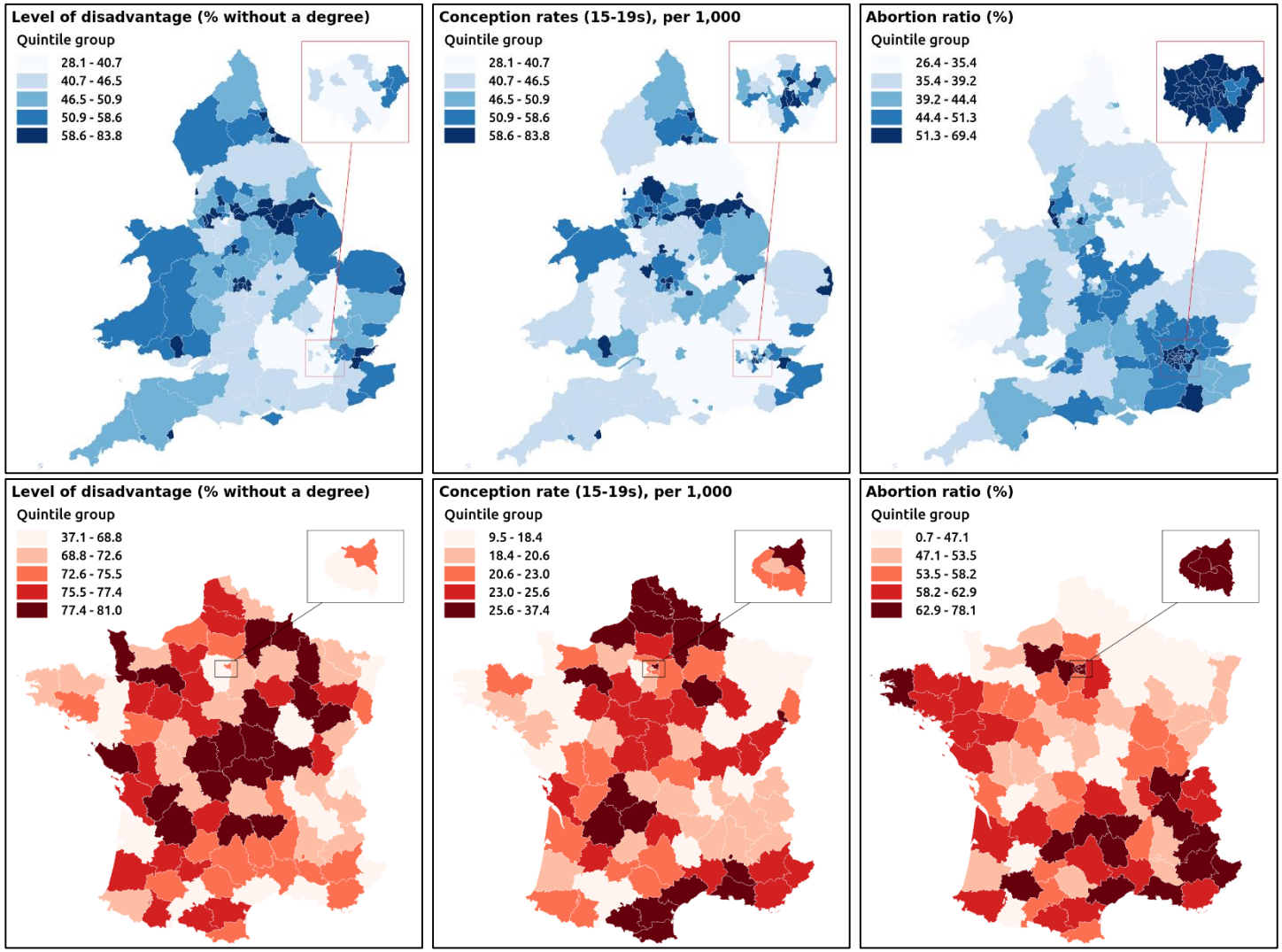


Figure 10.5: Change over time in correlation between area level disadvantage and conception rates (left) and the abortion ratio (right) among 15-19s, France (excluding Paris), 1980-2009.



In a similar way to England and Wales, the capital city is an outlier, and so has been excluded from the analysis of trends. The *département*s of Paris and neighbouring Hauts-de-Seine have higher conception rates than would be expected for their level of deprivation. The correlation is stronger when these two *département*s are excluded from the analysis, but still markedly lower than the correlation in England and Wales. The data for Paris and its suburbs are not available disaggregated to a lower level so we are unable to examine it in more detail.

Figure 10.6: Maps of disadvantage, conception rates and the abortion ratio, 2009, Britain (Local Authority level) and France (département level)



Standardisation

The Standardised Conception Rate Ratio is an estimate of the conception rate in France relative to what would be expected if it had the same disadvantage-specific conception rates as England and Wales. The Standardised Conception Rate Ratio is 51, suggesting that after adjusting for differences in the distribution of disadvantage, the conception rate in France was nearly 50% lower than would be expected (Table 10.1). In each stratum of disadvantage, the conception rate was lower in France than in England and Wales (results in APPENDIX E).

Table 10.1 Number of expected conceptions in France if France had the same disadvantage-specific conception rates as England and Wales, and corresponding Standardised Conception Rate Ratio (2009)

	England and Wales			France	
Strata of disadvantage	**Conception rate per 1,000**	**Population**	**Number of conceptions**	**Population**	**Expected conceptions**
1 - Least disadvantaged	45	127,725	5,691	192,990	8,599
2	45	188,865	8,578	99,829	4,534
3	49	221,148	10,821	78,559	3,844
4	50	212,303	10,669	270,736	13,605
5	53	204,685	10,831	227,040	12,014
6	56	177,509	9,994	189,417	10,664
7	57	207,654	11,890	172,035	9,851
8	62	156,218	9,712	253,077	15,734
9	69	121,287	8,371	292,208	20,168
10 - Most disadvantaged	74	126,176	9,381	126,688	9,419
Total	55	1,743,570	95,938	1,902,579	108,432
Total expected conceptions		95,938		108,432	
Total observed		95,938		55,689	
Standardised Conception Rate Ratio		1		51	

Discussion

This analysis has shown that in both England and Wales and France there is geographic variation in conception rates and the abortion ratio. Conception rates are higher, and the abortion ratio lower, in more disadvantaged areas. However, the strength of the correlation between conception rates and the abortion ratio is consistently higher in Britain. These differences remain when comparing data over time. Even if the French results underestimate the true correlation, the difference in the magnitude of the correlation in Britain and France is so wide

that it seems reasonable to suggest from these data that the magnitude of the correlation between area-level disadvantage and conception rates is smaller in France. There are important differences in both countries between the capital cities and the rest of the country. The Standardised Conception Rate Ratio showed that the conception rate in France is lower than would be expected if it had the same disadvantage-specific conception rates as England and Wales.

The conception rate among under 20s has been declining in Britain since the early 2000s, with the greatest drops seen in the latter years of the 2000s and through the first half of 2010 (Wellings et al. 2016, APPENDIX F). Recent analyses have shown that this decline has been greatest in the most deprived areas, measured using the Index of Multiple Deprivation, suggesting that the link between disadvantage and conception rates may have attenuated (Wellings et al. 2016). Although there was no evidence in this analysis that the correlation between disadvantage and conception rates in Britain weakened over the period of time studied, it is possible that this may have occurred in the years subsequent to this period.

The area level variation in conception and abortion rates among under 20s in Britain, and the association with disadvantage, is well established (e.g. McLeod 2001; Uren et al. 2007; Diamond et al. 1999). However, this comparative analysis suggests that both the area level variation and the association with disadvantage are also present in France, yet to a lesser degree. Previous research using individual-level data has shown that young people with a lower level of education and from more disadvantaged backgrounds are more likely to report a conception under 20 and less likely to have an abortion in the event of pregnancy (Wellings et al. 2001; Kneale et al. 2013; Le Van 2006; Darroch et al. 2001). A comparative analysis of Britain and France found that the association between socioeconomic characteristics and sexual behaviour and contraceptive use – the 'proximate determinants' of conception and abortion – was very similar in Britain and France (Chapter 9). The differences in inequality between the two countries mean that although the association between individual disadvantage and these proximate determinants of

conception and abortion is similar in the two countries, the greater proportion of young people living in disadvantaged situations in Britain results in a greater proportion being at risk of pregnancy. This translates into higher conception rates and abortion rates. Santelli and Schalet (2009) comment that 'since fewer young people experience intense and extended poverty in Western Europe than do young people in the United States, fewer Western European youth grow up under the socioeconomic conditions that are conducive to unintended pregnancy and child bearing', and this applies to a French-British comparison too.

However, were individual level disadvantage the sole driver of the differences between conception and abortion rates between the two countries, we would expect to find the correlation between area-level disadvantage and conception rates and the abortion ratio to be similar too. Our finding that the correlation between area-level disadvantage and conception rates and the abortion ratio is more pronounced in England and Wales suggests that other contextual factors mean that young people living in disadvantaged areas in England and Wales are more likely to become pregnant, and less likely to terminate that pregnancy with abortion, than their counterparts in France. This result is buttressed by the finding that when stratified by level of disadvantage, conception rates were still lower in France. It appears that young women's decisions with regard to pregnancy and parenthood are based on their local context and environment as well as individual-level characteristics.

There are a number of contextual factors that may contribute to young women's risk of pregnancy and decision making with regard to pregnancy and parenthood, beyond individual-level socioeconomic characteristics. Area-level disadvantage may consist of more than the agglomeration of disadvantaged individuals or families, and may have effects that are not accounted for by the levels of individual or family deprivation in these areas (Smith & Elander 2006). The greater prevalence of, and therefore visibility of, early pregnancy and parenthood in more disadvantaged areas of England and Wales may reinforce the association between disadvantage and conception rates and the abortion ratio if its greater social visibility leads to

social norms that are more accepting of early pregnancy and childbearing. Peers who are young parents may be seen as role models (Whitehead 2001), and the visibility of young parents in the neighbourhood and local community, and their acceptance within that community, may send a signal about local attitudes to early parenthood (Anderson 1991). Young women's perceptions of the place of motherhood in their lives is shaped by community and family views and experience, including the extent to which having children early is accepted and seen as normal (Lee et al. 2004b). However, it is difficult to disentangle whether norms follow visibility, or vice versa; it is also plausible that social norms that are accepting of young parenthood, in disadvantaged areas where early parenthood might be a rational alternative route to attaining a social status, lead to its greater prevalence and visibility, or that disadvantage and visibility of early pregnancy and parenthood each reinforces the other in a cycle.

Young people's reproductive behaviours may also be influenced, not only by the visibility of young parenthood, but also by its feasibility. In contexts where younger childbearing is more common, young people's parents themselves will be younger, and more able (and perhaps willing) to take on childcare duties for their grandchildren (Lee et al. 2004a). In addition, this form of intergenerational support will be more common in settings where both or one parent (particularly the mother) is not working.

In both Britain and France, the transition to adulthood takes place at a faster pace among more disadvantaged groups (Bidart & Lavenu 2006; Thomson 2009). However, the transition to adulthood is also experienced differently in Britain and France; Cecile van de Velde argues that in Britain, the focus is on a rapid transition to independence and the attainment of an adult social role, whilst in France, the period of youth is considered a period of investment in one's future (Van de Velde 2008). This means that becoming a parent early goes completely against the social order in France, yet is much more compatible with the model of attaining an adult social status in Britain. These cultural differences may mean that young women living in disadvantaged areas in France are less likely to view early parenthood as a means of attaining a

social status than their counterparts in Britain, and, connected to this, might experience cultural attitudes in their community that are less accepting of young parenthood and therefore be more motivated to delay pregnancy.

We do not have the data to consider in this analysis the contribution of contraceptive provision to area-level and cross-national variation in conception and abortion rates, however it is important to consider how it may play a role. The provision of family planning services and their accessibility for young people are likely to have an impact both on pregnancy rates and the abortion ratio. A lack of access to appropriate contraceptive and abortion services may result in more young people having unprotected sex, and may restrict young women's choices regarding the outcomes of pregnancy and lead to a lower abortion ratio (Lee et al. 2004a). Lee et al. (2004a) found that in Britain the area-level abortion ratio was associated, independently of deprivation level, with service provision; it was higher in areas where family planning clinics were more numerous and the availability of independent sector abortion provision was greater. They note that this may be because family planning clinics and abortion centres may have been sited in areas with higher abortion rates in order to meet demand. McLeod (2001), in her area-level analysis of the association between deprivation and teenage pregnancy in Scotland, found that some small-area variation in pregnancy rates existed over and above the effects of deprivation, which may indicate different levels of service provision. However, she concludes that eradicating this unexplained variation would make little difference in reducing numbers of unplanned pregnancies, compared with reducing the effects of deprivation (McLeod 2001). The stronger association between area-level disadvantage and the conception rate and abortion ratio in England and Wales therefore, may also be a result of poorer service provision in more deprived areas compared to a more equal distribution in France. Young people's clinics are more widespread in England and Wales than in France, where they are unevenly distributed at a national level (International Planned Parenthood Federation 2006), however it is possible that provision may be more equally distributed with regard to area-level disadvantage in France.

Differences between capital cities and the rest of the country in the association between area-level disadvantage and conception rates among under 20s in both Britain and France also highlight that whilst disadvantage is important, other cultural and contextual factors are also at play. In London, it is likely that the ethnic composition of the population contributes to conception rates – for example, two of the boroughs in which conception rates are low despite high levels of disadvantage have large South Asian populations, amongst which conception rates among under 20s are very low (Department for Children Schools and Families 2007). This is likely related to strong norms against sexual activity and particularly that evidenced by pregnancy in these communities (French et al. 2005) and a weaker link between parental education and aspirations for and among their children (Gutman & Akerman 2008).

Our results suggest that, beyond individual-level characteristics, contextual factors are also important in shaping conception and abortion rates among under 20s. Smith and Roberts (2009, p.678) argue that 'policy makers must understand the different meanings that young people from more deprived and more affluent areas place on life and success'. Representations and meanings of young parenthood differ between young people from more deprived areas and those that are more affluent, and these representations are also shaped by country-level contextual factors. This analysis has demonstrated that area-level variation in conception and abortion rates likely reflect more than a 'compositional effect', i.e. the aggregation of individual-level characteristics in that area. Young people's experiences are shaped not only by their personal characteristics but by the wider social context in which they live, make decisions and interact with others.

A strength of this study is that is does not rely on self-reported data on conceptions and abortions. By using routinely collected data, we benefit from more complete data which covers the whole country. Whilst in France, registration of abortions is not totally complete, we are able to use data on registrations of births, which are complete, to triangulate our findings on conceptions and the abortion ratio. In addition, even using the most conservative estimates of

the French data, there is a substantial difference in the magnitude of the correlation between area-level disadvantage and the conception rates and abortion ratios between Britain and France. By using the proportion of men aged 30-44 without a university degree level qualification or equivalent as our measure of disadvantage, we are able to compare both across countries and across time periods.

The distribution of disadvantage was clustered more closely around the mean in France than in Britain, and the extent of area-level disadvantage had declined over time more in France than in Britain. However, it is possible that this specific indicator of disadvantage does not accurately reflect differences in the extent of deprivation between the two countries. The mean proportion without a university degree level qualification or equivalent was slightly higher in France, and the departments are clustered more closely around this value with fewer *département*s having a smaller proportion without a degree. This is in contrast to country figures produced by the OECD which point to a greater proportion of the population being disadvantaged in the United Kingdom than in France (OECD 2011b).

Other measures of deprivation are available, such as the commonly used Index of Multiple Deprivation (IMD) and the Townsend Index in England and Wales, and the recently developed Fdep99 and European Deprivation Index (EDI) in France. However, we considered these indicators to be inappropriate for this analysis because of their limitations in comparing over time and across countries. Firstly, they are not directly comparable between England and Wales and France. Rey (2009) has shown that the Fdepp99 and the Townsend index are not comparable, mainly because of the differences in the socioeconomic characteristics of rural compared to urban areas between the two countries, and this limitation also applies to the IMD. Secondly, they are not comparable over time as they have not been developed for the earlier years of the period under study in this analysis. Finally, the proportion of the population with a university degree level qualification or equivalent or equivalent, as it is obtained from census data, has the advantage of being available at a detailed area level. The information can therefore

be aggregated up to the level at which the conceptions and abortion data is provided using lookup tables (tables showing the correspondence between different levels or units of geography) between the geography of the conceptions and abortions data and the geography of the census output areas. This was the case for England and Wales, and was particularly important in the case of historic Local Authority boundaries, for which relatively little digitised data were available. Where this was the case, geographic information systems (GIS) software was used to identify the boundaries of the conceptions and abortion geographical unit and the boundaries of the census output areas and create the relevant look up table between the two geographies. There was some error in the mapping between health boundaries and census geography boundaries, for example, where a census enumeration district was split over the boundary of two Local Authorities. However, these overlaps were rare, and the small size of the enumeration districts compared to the health authorities means that the error is minimal and can be considered negligible.

Disadvantage is a multi-dimensional concept and it is unlikely that our indicator of disadvantage – the proportion aged 30-44 without a university degree qualification or equivalent – captures all of the elements of disadvantage. For example, the IMD, which is a weighted composite indicator made up of several domains, gives less weighting to the educational domain than to the income domain (Department for Communities and Local Government 2011). In addition, although in both countries area-level disadvantage is correlated with conception rates and the abortion ratio, suggesting that it is capturing some aspects of disadvantage, it may not be capturing the same aspects in both countries. It is possible that qualifications are a more appropriate proxy indicator of area-level disadvantage in England and Wales than in France. If qualifications are less strongly correlated with other aspects of disadvantage in France than in Britain, the weaker correlation between area-level disadvantage and conception rates and the abortion ratio in this study may simply be a reflection of this. It is possible that using a different measure of disadvantage, which more accurately reflected differences in the distribution of deprivation in the two countries, the Standardised Conception Rate Ratio would be closer to

100. Future analyses could examine this further using data on more indicators of area-level characteristics, for example ethnic composition, and a more multi-dimensional measure to capture deprivation, or a wider range of indicators of disadvantage, including the proportion receiving unemployment support, the proportion unemployed, and overcrowding. Obtaining comparable measures of disadvantage for Britain and France is problematic due to data availability, possible differences in the meaning of each aspect of disadvantage between countries, and differences in urban-rural differentials in disadvantage between the two countries. However, two separate analyses, maximising the data available in each country, could be complementary in informing the interpretations of the findings. Another limitation of this data is the area level for which the data were available. Although the data show that average population sizes of English and Welsh Local Authorities and French *départements* are similar, the lower population density in France means that the French *départements* cover a larger area and are likely more heterogeneous. This may also contribute to the weaker correlation between area level disadvantage and conception rates and the abortion ratio in France relative to England and Wales.

The higher conception and abortion rates in England and Wales compared to France are likely to reflect not only the greater levels of socioeconomic inequality in the former, and therefore the greater proportion of the population that experiences the conditions conducive to teenage pregnancy and childbearing, but also differences in other aspects of the social context, such as the visibility and acceptability of young pregnancy and parenthood, the timing and pace of the transition to adulthood, and the opportunities that are available, and perceived to be available, to and by young people.

10.3 CONCLUSION

Although in individual analyses the association between socioeconomic characteristics and the 'proximate' determinants of abortion (sexual behaviour and contraception use) were similar, at an area level the correlation between disadvantage and conception rates and the abortion rate

was weaker in France. The findings of this paper suggest further that social and contextual factors play a role in shaping young people's reproductive behaviours.

11 DISCUSSION

This PhD set out to capitalise on the potential of cross-national research to increase our understanding of the high conception and abortion rates observed in Britain, by comparing it with France. The aim of the research was to explore how proximal and contextual factors shape conception and abortion rates among under 20s, with a particular focus on disadvantage. I hypothesised that some of the variation in conception and abortion rates between the two countries may be a consequence of some important social contextual differences. This Chapter consists of two broad sections: I first synthesise the findings of this thesis and discuss the limitations of the research, and second, I outline the implications for research and practice, as well as making recommendations for future research.

11.1 SUMMARY OF FINDINGS

In this PhD research I conceptualised abortion as marking the end point of a pathway, which allowed me to break down this analysis of abortion into its component parts. I began by describing differences in sexual behaviour and contraceptive use among under 20s in Britain and France, and, alongside this, differences between Britain and France in current rates and trends over time in conceptions, the proportion of conceptions that end in abortion, and abortions. I then examined, using individual-level data, the association between socioeconomic characteristics and indicators of each stage in the pathway to abortion – sexual activity, contraceptive use, conception and recourse to abortion – placing a particular focus on sexual debut. Finally, I built upon these results by examining the association between disadvantage and conception and abortion at an area level, to consider further the contribution of contextual factors to the variation in conception and abortion rates among under 20s observed between Britain and France.

Rates and trends in conception and abortion among under 20s

Conception rate and abortion rates among under 20s are higher in England and Wales than in France. The conception rate among 15-19 year-olds in 2009 was 55 per 1,000 in England and Wales and 29 per 1,000 in France. The abortion rate among 15-19 year-olds in 2009 was 23 per 1,000 in England and Wales and 15 per 1,000 in France. In France, abortion rates among under 20s have stayed relatively stable over the past 30 years; whilst conception rates have decreased, the propensity to terminate a pregnancy has increased. In England and Wales, conception rates fluctuated throughout the 80s and 90s, showing no sustained decline until the early 2000s. However, the proportion of women who choose an abortion in the event of pregnancy has increased, and as a result, so has the abortion rate. The gap between the two countries in the conception rates began to narrow in the early 2000s, when conception rates in England and Wales began to show a more sustained decline. Since the end of the period analysed in this research, the gap has narrowed further as conception rates in England and Wales have seen a further and steeper decline (Wellings et al. 2016, APPENDIX F). Importantly, this analysis of routine data showed that neither country has seen a sustained increase in conception rates, despite the steady increase in the proportion of young people that are sexually active. The increase in sexual activity has been accompanied by an increase in contraceptive use in both countries, and so conception rates have stayed stable or declined.

Differences in sexual activity

Using survey data to compare each stage in the pathway to abortion in Britain and France showed that differences in young women's sexual activity, particularly among the youngest age groups, are a key driver of differences in conception and abortion rates. A greater proportion of young women in Britain are sexually active before age 16, and this gap remains, although narrowed, at age 18.

Differences in contraceptive use

Analysis of the survey data showed that both men and women in France are more likely to use a method of contraception at first heterosexual intercourse than their British counterparts.

However, a closer examination of current use among 16-19 year-olds reveals that among those who are sexually active, young women in Britain are more likely to be using a more reliable method than women in France. This is particularly true for the youngest age group in our sample, 16-17 year-olds, who rely to a much greater degree on condoms in France than in Britain, where the pill and LARC are more common.

Differences in recourse to abortion

The third stage in the pathway to abortion that I was able to consider, using the routine data, was recourse to abortion. In France, the abortion ratio among under 20s has been higher than in Britain since the beginning of the period under study, and has also increased more rapidly than in Britain.

Associations between socioeconomic characteristics and sexual activity, contraceptive use, conception and recourse to abortion

Men and women with a lower level of education, and, less consistently, with parents from a lower socioeconomic group, were more likely to report first sex before 16 and to not use contraception at first sex. Among women, those with a lower level of education and, in Britain, with parents from a lower socioeconomic group were more likely to report a conception before age 20. In Britain, but not in France, women with parents from a lower relative socioeconomic group and with a lower level of education were less likely to report recourse to an abortion if they conceived before 20.

Correlation between area level disadvantage and conception rates and the abortion ratio

At an area level, in analyses using routinely collected data on births and abortions, which is more reliable than self-reported survey data, conception rates were higher and the abortion ratio was lower in more disadvantaged areas in both countries. The correlation between area-level disadvantage and both conception rates and the abortion ratio was more pronounced in Britain.

11.2 INTERPRETATION OF FINDINGS

The findings suggest that differences in the proportion of young women that are sexually active between Britain and France may be an important driver of the differences in conception and abortion rates. The greater proportion of young women that is sexually active in Britain means that a greater proportion of young women in Britain are at risk of conception than in France, even if they use contraception with the same efficacy. The contribution of contraceptive use to variation in conception and abortion rates is more difficult to interpret using these data. Both men and women in France are more likely to use a method of contraception at first heterosexual intercourse than their British counterparts. Contraceptive use at first sex is a predictor of use at subsequent occasions (Shafii et al. 2007), and so this suggests that the higher conception rate in Britain may also be partly driven by lower levels of contraceptive use. However, among those sexually active, the youngest women in Britain were more likely to be using a more reliable method than women in France. In France, 16-17 year-olds rely on condoms (a method with a higher failure rate relative to other methods) to a greater degree than in Britain, where the pill and LARC are more common. It is possible that the gap between Britain and France in conception (and, consequentially, abortion) rates is attenuated by these differences in contraceptive method mix between the two countries. The greater proportion of conceptions that end in abortion in France than in Britain attenuates the difference in abortion rates between the two countries, relative to the gap in conception rates.

In both countries, indicators of disadvantage – most consistently respondent level of education – were positively associated with reporting of first sex before age 16 and non-use of contraception at first sex among men and women, and with reporting of a conception before age 20 among women. In Britain, indicators of disadvantage were positively associated with reporting of an abortion before age 20, among women who had conceived, but in France this association was not statistically significant. These results are consistent with previous research undertaken in both countries – although more extensively in Britain – showing that disadvantage

is associated with sexual and contraceptive behaviour and reproductive health outcomes among young people (Bonell et al. 2006; Wellings et al. 2001; Bozon 2012a; Singh et al. 2001; Sihvo et al. 2003). However, the contribution of this direct comparison of two countries is to show that when it comes to the associations between socioeconomic characteristics and sexual activity, contraceptive use, conception before age 20 and abortion in the event of such a conception, Britain and France are in many ways remarkably similar. These results do not provide strong evidence to support the hypothesis that in a context of greater inequality, the influence of individual-level disadvantage on young people's sexual and reproductive health is stronger. However, they do suggest that the population level differences in sexual behaviour and contraceptive use, and, consequentially, conception rates and abortion rates, may be partly driven by country-level differences in the extent of disadvantage. That is to say, the greater proportion of the population that is disadvantaged in Britain means that more young people are living in the conditions more conducive to early pregnancy and childbearing.

The results are consistent with previous quantitative research (Bonell et al. 2006; Wellings et al. 2001; Bozon 2012a; Singh et al. 2001), but also resonate with findings from qualitative research showing that young parenthood can be a means of attaining an adult social status among those for whom more traditional routes, such as through education or employment, may seem less evident (Le Van 2006; Thomson 2009; Lee et al. 2004a). Young people's aspirations for the future have been shown to be associated with socioeconomic characteristics; those with strong educational and career ambitions are more likely to come from more advantaged backgrounds (Ashby & Schoon 2010; Sacker et al. 2002). Qualitative research has found that young women who perceived their lives as insecure were more likely to view motherhood as something that might change their lives in a positive way, while those who had aspirations and expectations for higher education and who were certain that their future life would involve further education and employment were more likely to have an abortion in the event of pregnancy (Lee et al. 2004a). Motivations to avoid pregnancy and parenthood might play a key role in shaping people's behaviours at each stage in the pathway to abortion; young people who

are more motivated to delay parenthood may be more likely to prioritise their education over romantic relationships; ensure that they inform themselves about, obtain, and use reliable contraception in order to prevent pregnancy once they are sexually active; and choose to have an abortion in the event of a pregnancy. The findings of this PhD research support the idea that motivations to avoid pregnancy arise in and are shaped by a specific social context, and that a better understanding of pregnancy among under 20s may be reached through a greater consideration of these nuances.

The findings also suggest that other social contextual factors, rather than just the compositional effect of inequality, play a role in shaping individual behaviours. The choices that a person can make and their ability to make those choices are limited by the social structures, institutions and norms that make up their social context. Examining similarities and differences between Britain and France in the socioeconomic characteristics associated with each stage in the pathway to abortion has shed light on the ways in which social contextual factors shape young people's behaviours. Differences in the proportion of young women that are sexually active are likely a key driver of the differences in conception and abortion rates among under 20s between Britain and France. Country-level differences found in the in-depth analysis of the timing and circumstances of first sex in the two countries suggest that sexual debut is strongly shaped by the social context in which is occurs. Whilst a similar proportion of men and women reported first sex before 16 in Britain, only half as many women compared to men reported this in France. Socioeconomic characteristics, as measured using indicators of parental relative socioeconomic group and respondent level of education, were strongly associated with variation in age at sexual debut in Britain, among both men and women. Respondents with a lower level of education, and, among 25-34 year-olds, with parents from a lower relative socioeconomic group, were more likely to report first sex before age 16. Socioeconomic characteristics were also associated with timing of sexual debut in France; men and women with a lower level of education were more likely to report first sex before 16, as were men, but not women, with parents from a lower socioeconomic group. That fewer women than men report first sex before 16 in France but not

in Britain, and that there was no association between parent socioeconomic group and timing of first sex among women in France, whereas this association was present among men in both countries and among women in Britain, indicates that there may be a stronger differential social control over young women's sexuality based on their in France, which is equally present across all social groups. In both countries, differences between men and women in the age of the first sexual partner suggest that first sex is a gendered event. In both Britain and France, women more often than men reported that their first partner was two or more years older than then. However, women in France more often than women in Britain reported that their first partner was two or more years older than them (50% and 41% respectively). This pattern of age mixing at first sex, reflecting traditional age differences at first cohabitation or marriage (in Britain and France men are on average two years older than women at first union (UNECE, 2010)), alongside a strong social control over young women's sexuality in France, suggests that sexual debut may be a more strongly gendered event in France than in Britain. Although this is also the case in Britain, where women more often than men report an older partner at first sex, it is perhaps less so. The finding that in Britain similar proportions of men and women report first sex before 16, that socioeconomic characteristics were associated with timing of sexual debut in the same way among men and women, and that young people's first sexual partner is more commonly close to them in age suggests that in Britain, young women are not subject to the same differential social control over their sexuality based on their sex to as great an extent as their counterparts in France.

At an area level, in analyses using routinely collected data on births and abortions, conception rates were higher and the abortion ratio lower in more disadvantaged areas in both countries. The routine data are less susceptible to reporting bias, and at an individual level differential underreporting of abortions by socioeconomic characteristics in the French survey may have masked an association between socioeconomic characteristics and recourse to abortion. Although in individual analyses the associations between indicators of disadvantage and sexual behaviour and contraceptive use – the 'antecedents' to conception and abortion – are very

similar in Britain and France, at area level the association between disadvantage and the conception rate and abortion ratio is stronger in Britain. This, again, suggests that patterns of pregnancy and parenthood among under 20s are determined not only by individual characteristics but also by wider social contextual factors. Certain aspects of the French context may 'mitigate' the effects of individual disadvantage, or some aspects of the British context may exacerbate them.

Average age at first birth is similar in the two countries (27.7 in Britain and 28.1 in France (UNECE, 2010), but this masks an early childbearing 'hump' and later onset of childbearing among more educated women in Britain (Rendall et al. 2005). In France, where the focus of the transition to adulthood is on investment in one's education, becoming a young parent may be more transgressive than it is in Britain, where the focus on a rapid transition to an independent, adult social status is more compatible with young parenthood. Furthermore, as in both countries the transition to adulthood is accelerated among more disadvantaged groups (Bidart & Lavenu 2006; Thomson et al. 2004), this is compounded by the greater social inequality and therefore the greater proportion that is disadvantaged in Britain. In addition, the more strongly gendered social norms in France may mean that there is a greater social control over both young women's sexuality and their capacity for motherhood through the eyes of society. This may contribute both to the timing and circumstances of young women's sexual debut, their desire or motivation to prevent a pregnancy to avoid such a transgression, and their decision with regard to abortion in the event of such a pregnancy.

11.3 STRENGTHS AND LIMITATIONS

Limitations of the survey data

The analyses in Chapters 5 - 9 used nationally representative survey data. The quality of the conclusions is dependent on the quality of these data. The response rate to Natsal-3 was 57.7% (Erens et al. 2013) and to FECOND was 50.2% (Legleye et al. 2013). This has the potential to limit the representativeness of the findings if individuals who respond differ from individuals who do

not, with regard to the characteristics of interest in this research. However, in each survey, post-stratification weights were applied to account for the differences observed between the survey sample and the general population, and the rates of response to Natsal-3 and FECOND are similar to other large scale social surveys undertaken at the same time (Craig & Mindell 2011; Park et al. 2012). The data would be biased only if the post-stratification weights did not correct for it.

Although recall of personally significant events such as first sex is known to be good (Copas et al. 2002), and in some of the analyses that are restricted to younger age groups the time between first sex and interview will be minimised, the data may nevertheless suffer differentially in the two countries from social desirability bias (Copas et al. 2002; Wellings & Collumbien 2012). If young women in France are more likely to misreport age at first sex towards a later age than young women in Britain, this may account for the differences in sexual activity among young women found between the two countries. It may also have led to bias in the associations found between socioeconomic characteristics and reporting of first sex before 16, if reporting varied differentially by socioeconomic characteristics in the two surveys. However, *reporting* of sexual behaviours can also be revealing of the context in which behaviours are taking place, and particularly of the ways in which gender norms create different expectations about socially acceptable or desirable behaviour for men and women (Bajos & Marquet 2000; O'Sullivan 2008).

The cross-sectional nature of the survey data means that reverse causality cannot be ruled out, and inferences of causality must be considered with caution. For example, that having a lower level of education was associated with reporting a conception before age 20 may mean that individuals with a lower level of education were more likely to become pregnant before 20, or that those who became pregnant before age 20 had a lower level of education because they dropped out of school subsequent to their pregnancy.

As this research relied on secondary data, analyses were limited by the data that were collected. It is possible that unobserved and/or unknown confounding may account for the associations

found in the analysis of survey data between socioeconomic characteristics and sexual behaviour, contraceptive use, conception and recourse to abortion. A key potential confounder that I was unable to consider in this analysis is ethnicity. Previous research has found ethnic differences in socioeconomic status and sexual and reproductive health outcomes among young people in Britain. People from Black and Ethnic Minority (BME) groups are at disproportionate risk of social exclusion in Britain (Office for National Statistics 2002). In the 1990s conception rates to 15-19 year-olds in England and Wales were higher among Caribbean than White women, and lower among Indian women (Berthoud 2001). In Britain, higher proportions of Black-Caribbean men and women, and lower proportions of Indian women, report first sex before 16 in comparison to the rest of the population (French et al. 2005). Higher proportions of Black-Caribbean men and women reported not using any form of contraception at first sex compared to the general population (French et al. 2005). The FECOND survey collects information on country of birth, which, although related, is not comparable. No information was available in the British survey on reproductive events as reported by male partners. A comparison of male partners' reports of reproductive events in the two countries might allow a richer understanding of relationship dynamics among women and couples who undergo pregnancy and abortion.

Under-reporting of abortions in the survey data

In both the British and the French surveys, abortions were under-reported when compared to estimates from routinely collected data. Under-reporting of abortions in surveys also affects the completeness of conceptions data. US research has found that abortions are less likely to be reported among women with a lower level of education and women with lower incomes (Jones & Kost 2007; Lindberg & Scott 2016). If reporting of abortions is biased towards women in higher socioeconomic groups, as in the US National Survey of Family Growth (Jones & Kost 2007), the findings from this research may underestimate the associations between socioeconomic status and reporting of conceptions and abortions. In order to minimise the risk of bias caused by under-reporting of abortions, analyses using conception or abortion as an outcome variable

were run where possible, using routinely collected data, and findings using survey data were triangulated with findings from routine data. For example, findings from the French survey data showed no association between socioeconomic characteristics and abortion in the event of a pregnancy occurring before age 20, whereas routine statistics showed that there was a strong association. This may be a result of the underreporting of abortions: if women from more disadvantaged backgrounds are less likely to report their abortions, then the survey sample of women obtaining abortions would be biased towards those from more privileged groups, therefore underestimating the association between socioeconomic characteristics and recourse to abortion. I was also able to triangulate the findings using data on conceptions and abortions collected in the survey against findings from data on sexual activity and contraceptive use. Both surveys collected detailed information on these factors 'upstream' to conception and abortion, and they are considered to be a less sensitive outcomes and so less likely to be underreported (Copas et al. 2002). Bias induced by the under-reporting of abortions would only undermine the *between-country* comparison if this bias differed between the French and British surveys. Although these analyses did not find any evidence of differential under-reporting of abortions in Britain and France, the sample of women reporting an abortion in the last year and relevant and comparable data collected in the both the surveys and routine data notifications were insufficient to allow an analysis of underreporting by socio-demographic groups.

Limitations of the routine data

Registration of abortions in France is known to be incomplete, for reasons discussed in depth by Rossier and colleagues (Rossier & Pirus 2007a). Although abortions in France are known to be under-registered (i.e. although they are notifiable, not all are), the rates as re-estimated by Rossier and colleagues, and used for this research to describe trends in conception and abortion rates (Rossier & Pirus 2007a; Rossier et al. 2009) are considered to be accurate. This re-estimation was done only at the national level, and estimating true numbers and rates at departmental level, which was necessary for area-level analyses of the association between

disadvantage and the conception rate and abortion ratio, was not possible using the available data as it risked inducing a further element of bias. However, for area-level analyses, the statistic of interest was not the conception rate or abortion ratio per se, but the correlation coefficient between the level of disadvantage in a *département* and its conception rate and abortion ratio. Thus incomplete registration of abortions would induce bias into the findings only if completeness of registration varied between *départements* and systematically with *département* level of disadvantage. Whilst it was not possible to test whether this was the case, several different 'scenarios' were run, using the data at face value, using the data with numbers of abortions in each *département* adjusted for underreporting by the same factor, and drawing on another source of routine data (the SAE). As the aim of the analysis was to establish whether the strength of the correlation between area level disadvantage and conception rates and the abortion ratio was different between England and Wales and France, the most conservative of these scenarios, i.e. the one that showed the smallest difference between the two countries, was chosen for the final analyses in order not to overstate the results. Finally, the same analysis was run to examine the association between area-level disadvantage and live births rates, as registration of live births is known to be complete. The fact that this analysis also found a large difference in the strength of the correlation between England and Wales and France lends more confidence to the findings of analyses of conception rates and the abortion ratio and suggests that completeness of abortion registration among under 20s varies little by *département*. This may be because younger women might be more likely to go to public hospitals to obtain an abortion, and registration of abortions in public hospitals is more complete because they have fewer incentives to not report, or misclassify, an abortion (Rossier & Pirus 2007a).

A lack of data on miscarriage has the potential to lead to inaccuracies in the difference between under 20 conception rates in England and Wales and France, if incidence of miscarriage in this age group differs between the two countries. Data on incidence of miscarriage from sources other than the surveys were not available in either country as there is no way to record this information: miscarriages are not notifiable and women don't necessarily seek care when they

have a miscarriage. Miscarriages are thought to be under-reported in population surveys (Lindberg & Scott 2016) and so it is not appropriate to use data from surveys to estimate incidence of miscarriage. It is not known whether incidence of miscarriage among under 20s differs between England and Wales and France. A model-based approach to miscarriage derived by Bongaarts and Potter (Bongaarts and Potter, 1983 cited in Sedgh, Singh, & Hussain, 2014), and supported by more recent findings in the US (Finer & Henshaw 2006), indicates that miscarriages are equal to approximately 20% of births plus 10% of induced abortions. Incidence of miscarriage may therefore be higher in England and Wales, where a greater proportion of pregnancies to under 20s are carried to term, meaning that each pregnancy is at risk of ending in miscarriage for a longer duration. The longer legal gestation limit for abortion in Britain may also mean that incidence of miscarriage is higher. However, the vast majority of abortions in Britain are performed at under 13 weeks (92% in 2014 (Department of Health 2015)). If incidence of miscarriage among under 20s is higher in England and Wales, the magnitude of the difference in conception rates calculated from routinely collected data on births and abortions, which excludes miscarriages, may underestimate the difference between the two countries but is unlikely to be creating a spurious difference.

For reasons of both patient confidentiality and data availability, in both England and Wales and France data on abortions were provided only at a relatively large area level. In France in particular, the data were available at *département* level, a large and heterogeneous area. A finer analysis could have been run if data were available at a lower area level, for example commune or IRIS level in France or Ward level in Britain. However, despite the heterogeneity of the areas available for analysis, the findings showed a clear difference in the strength of the correlation between area level disadvantage and conception rates and the abortion ratio between England and Wales and France. In addition, using Local Authority and Primary Care Trust as areal units of analysis in England and Wales is consistent with previous research on area-level variation in reproductive health outcomes among young people (Wilkinson et al. 2006; Conrad 2012) and is the level at which policy and government funds are often allocated.

It is possible that the indicator of disadvantage used in the area level analyses, the proportion of adults without a degree qualification or equivalent, does not accurately reflect differences in the extent of deprivation between the two countries. The mean proportion without a degree was slightly higher in France, and the *département*s are clustered more closely around this value with fewer *département*s having a smaller proportion without a degree. This is in contrast to country figures produced by the OECD which point to a greater proportion of the population being disadvantaged in the United Kingdom than in France (OECD 2011b). Furthermore, disadvantage is a multi-dimensional concept and it is unlikely that the indicator chosen for this analysis – the proportion aged 30-44 without a degree qualification or equivalent – captures all elements of disadvantage. Although in both countries area-level disadvantage is correlated with conception rates and the abortion ratio, suggesting that it is capturing some aspects of disadvantage, it may not be capturing the same aspects in both countries. In England and Wales, a map of quintiles of area level disadvantage as measured using the proportion with no degree level qualification broadly corresponds to the equivalent map of disadvantage measured using the Index of Multiple Deprivation. In France, both the FDep (see Rey, Jougla, Fouillet, & Hémon, 2009) and disadvantage measured using the proportion with no degree qualification show the South-East of France as being relatively less disadvantaged. Some northern *département*s have a lower level of disadvantage when measured using the proportion with no degree level qualification than when measured using the FDep, and some central *département*s have a higher level of disadvantage as measured using the proportion with degree-level qualification. It is possible that qualifications are a more appropriate proxy indicator of area-level disadvantage in England and Wales than in France. A different indicator might produce different results; if qualifications are less strongly correlated with other aspects of disadvantage in France than in Britain, the weaker correlation between area-level disadvantage and conception rates and the abortion ratio in this study may simply be a reflection of this.

Challenges of comparative research

Directly comparable data in the two surveys were not available for some exposures. Natsal-3 collected data on parent's occupation and occupational responsibilities, whereas FECOND collected data on parent's level of education. By constructing a tiered variable, on the grounds that level of education is strongly associated with occupation type (Krieger et al. 1997), I was able to use this data to examine the associations with parent relative socioeconomic position. In both countries, the survey data showed that level of education was strongly associated with occupation type and this association was statistically significant: 79% of participants aged 30-49 with a degree level qualification in Britain, and 74% in France, were in managerial and professional positions. Nevertheless, it is possible that these measures may capture different elements of socioeconomic position in Britain and France. If parent social class in Britain is a better measure of young people's socioeconomic position than parent level of education is in France, then the less consistent associations found between parent relative socioeconomic group in France compared to Britain may reflect this rather than real differences in the effects of socioeconomic position. Young people's knowledge of their parents' characteristics may not be reliable; both surveys suffer from missing data with respect to this variable although the extent of non-response is the same in both countries. Parental level of education (collected in the FECOND survey) may be more difficult for young people to report reliably than parental occupation (collected in the Nastal surveys). Despite these limitations, that both surveys collect information on parent characteristics is also a key strength of this research as it enables inferences to be made about the socioeconomic status of young people, who have not yet established an adult social position. Furthermore, very strong and consistent associations were found between respondent level of education, an indicator for which comparable data was collected in the British and French surveys and which is more easily comparable across countries. Therefore, it is unlikely that the differences in the way in which data on parent socioeconomic group were collected undermine the conclusions on the associations between socioeconomic characteristics and sexual and reproductive health outcomes of this research. Other cross-

national comparisons have used different methods to measure socioeconomic position among young people. The Health Behaviour in School Age Children (HBSC) survey, which collects data on health behaviours across more than 40 countries across Europe and North America, uses a Family Affluence Scale (Boyce et al. 2006). This measures socioeconomic position based on material markers, rather than social class. It minimises non-response by asking about things that respondents are likely to have accurate knowledge of, for example car ownership, number of bedrooms and family holidays (Boyce et al. 2006). The usefulness of this measure is limited, however, to research on the youngest age groups, who live with their parents. It would likely misclassify young people who had recently left home, but were materially relatively advantaged, for example university students, as more disadvantaged.

The question used to collect information on current contraceptive use was worded slightly different between the Natsal-3 and FECOND surveys. In Natsal-3, women were asked: 'Which [contraceptive methods] have you used at all with a partner in the last year?', and could choose multiple responses from a list, and then: 'What is your usual method these days?', to which they could choose up to three responses from a list. In FECOND, women were asked first: 'Currently, do you or your partner use a method for avoiding pregnancy, including a natural method, and if so which one?', to which multiple free responses were possible, and then: 'Of these methods, which would you consider your main method?', to which one response was possible. The different wording of this question may limit the comparability of the measures. By allowing multiple responses and showing a list of options, the question asked in Natsal-3 may give women more scope to over-report their current contraceptive use by listing more effective methods that they may use less regularly alongside their main method. This would lead to an overestimation of the differences between Britain and France in current use of reliable methods of contraception.

Besides differences in the data collected, a key methodological difference between the French and British surveys was the mode of administration. Natsal-3 was conducted using face-to-face

interviews with a computer-assisted self-administered questionnaire for the more sensitive questions. FECOND was conducted over the phone. These differences in survey mode are probably most important for sensitive questions. As discussed above, it is possible that differential reporting due to social-desirability bias may have affected both the proportions reporting sensitive outcomes and subsequently their associations with socioeconomic characteristics. For example, if the less private setting of FECOND resulted in greater differential reporting of abortion according to socioeconomic characteristics, this may have masked an association between recourse to abortion and level of education or parental socioeconomic group. That said, a telephone interview may suffer from less social-desirability bias than a face-to-face interview, insofar as it puts a greater physical and psychological distance between the interviewer and respondent, which may increase the respondent's feelings of anonymity (L. Smith et al. 1999).

The choice of indicator of disadvantage in the area level analyses was also limited by the comparative nature – between countries and over time – of the research. Composite indicators have the advantage of capturing multiple elements of disadvantage, but differences in rural/urban differentials in disadvantage between Britain and France mean that they are unsuitable for a cross-country comparison (Gregoire Rey[3], personal communication) and their relatively decent development precludes their use for comparison over the period of time studies in this analysis. The only indicator that was available in both countries for the time period under study, and that was conceptually broadly comparable, was the proportion of adults without a degree qualification. The limitations of this indicator are discussed in detail in Section 10.2.

11.4 IMPLICATIONS FOR RESEARCH

The gender differences found in the timing and circumstances of young people's first intercourse highlight the importance of including both men and women in research on teenage pregnancy

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as well as young people's sexual health. Decisions with regard to heterosexual intercourse and contraceptive are relational, and although conception and abortion are outcomes that are experienced by women, men are implicated in their occurrence. Yet, men are often excluded from analyses of young people's sexual and reproductive health (Swann et al. 2003), reflecting the normative view that protection and prevention are the responsibilities of young women (Bajos & Beltzer 2012). Besides the fact that understanding and improving men's sexual health and reducing social inequalities in men's sexual health outcomes is a worthy goal in itself, our understanding of young women's sexual and reproductive health will be enhanced by also considering differences in young men's sexual behaviour, contraceptive use and reproductive outcomes. Differences in sexual behaviours between men and women within and between countries can be revealers of the state of gender relations, and tell us about the ways in which sexual behaviours are socially constructed (Bajos & Marquet 2000).

The findings have also highlighted the need for an intersectional approach to sexual and reproductive health among young people, with greater consideration of how different elements – socioeconomic status, race, gender, age, religion, sexual orientation, disability, area of residence – at both the micro- and macro-level, interact to produce inequalities in outcomes. Intersectionality is a theoretical framework for understanding how multiple social identities intersect at the individual level to reflect interconnected systems of privilege and oppression (i.e., racism, sexism, heterosexism, classism) at the social structural level (Collins 2000; Crenshaw 1991; Bowleg 2012; Davis 2008). This analysis found that the associations between belonging to a particular socio-economic group and sexual health outcomes were not always the same among men and women, but gender and socioeconomic status are just two of many social identities that interact, on multiple levels, to shape experiences. Such an intersectional approach is perhaps more difficult in a cross-national comparative study, where data that are comparable between countries are limited.

It is also key, in order to better understand both within and between country variation in teenage conception and abortion rates and sexual and contraceptive behaviours, to recognise that young parenthood has different meanings in different social contexts, and that pregnancy and parenthood may be wanted outcomes. An approach that does not consider all teenage pregnancies as inherently unplanned allows a more nuanced conceptualisation of the reasons behind variation in sexual and reproductive health that goes beyond technocratic explanations of knowledge of and access to, for example, contraception and abortion services.

This research has also underlined the value of comparative studies in shedding light on the social contextual factors that shape sexual and reproductive behaviours. Greater harmonisation of data collection between national surveys, particularly of socioeconomic characteristics, might enable a finer analysis of the social factors shaping sexual behaviours, less constrained by the limitations of comparability of data between surveys.

Abortions in both the British and the French surveys were under-reported, as compared to the abortion rates calculated from routinely collected data. The US National Survey of Family Growth, in which under-reporting of abortion is higher – it is estimated that only 38% of abortions were reported in the 2006-2010 round of the survey – carries a warning that discourages researchers from using the abortion reports for substantive research, due to the bias that may be induced by the under-reporting and the fact that certain socio-demographic groups are less likely to report an abortion than others (Jones & Kost 2007). The extent of under reporting of abortions was not as great as in the US in either the Natsal-3 or FECOND surveys, with 71% and 66% of abortions being reported respectively. Nevertheless, if, as in the US, abortions are not under-reported at random, this could still introduce bias into the results and researchers must exercise caution in interpreting their findings on abortion. Furthermore, under-reporting of abortions affects estimates of all pregnancies, and so it is vital that researchers of all pregnancy outcomes using survey data in which abortions are not fully reported take this into account when drawing conclusions from these data. That the extent of

under-reporting in Natsal surveys was greater when information on abortion was collected as part of a pregnancy history rather than through a direct question suggests that methodological changes can improve reporting of abortions. Surveys on sexual behaviour and reproductive events may be able to capture more disclosures of abortions by asking a direct question.

11.5 IMPLICATIONS FOR PRACTICE

The findings of this PhD have highlighted the role of social contextual factors in shaping young people's sexual behaviour and reproductive decision making. Efforts to change behaviour at an individual or group level are unlikely to succeed on their own (WHO 2010). With regard to teenage pregnancy and abortion, it is important to recognise that not all young people wish to avoid pregnancy; some may feel ambivalent and some may wish to become parents (Le Van 2006; Arai 2008). Teenage pregnancy and parenthood has different meanings in varying social contexts; whilst among young people who place importance on their education and future careers, young parenthood can close doors, among those for whom these opportunities, real or perceived, are not available, parenthood can be, and often is, welcomed and considered by the young parents themselves as transformative (Lee et al. 2004b).

Increased support and opportunities for young adults, particularly among more disadvantaged groups, may translate into a decline in conception rates through their effects on young people's motivations to avoid pregnancy. The recent change in legislation in England to raise the compulsory participation age in education and training to 18 in 2015 may have some impact. This legislation requires that young people, after the compulsory school leaving age of 16, must either: stay in full time education; start an apprenticeship or traineeship; or work or volunteer for 20 hours or more per week whilst in part-time (at least one day per week) education or training (Department for Education 2011). However, the impact of this new legislation on young people, and, from the perspective of this research, on young people's motivations to avoid pregnancy, will depend on the way in which it is implemented. It may make little difference to young people's engagement in education, training and employment if it simply makes

participation in existing programmes compulsory, rather than expanding the range of pathways and opportunities that are available (Maguire 2013). Success may depend on their relevance and attractiveness to those young people who do not perceive that there are opportunities available to them, as well as providing high quality guidance and support to young people. Maguire argues that making young people remain in learning is not enough, and that this initiative must be accompanied by 'programmes of learning and support mechanisms, which are flexible, responsive and adaptable to a much more diverse group of post-16 learners' if participation and engagement are to be improved (Maguire 2013, p.74). She notes that recent declines in the proportion of 16-17s not in education, employment or training (NEET) were due in large part to policy interventions that provided guidance, such as the Connexions service, and tackled financial barriers to participation, such as the Educational Maintenance allowance. Both of these initiatives have recently been withdrawn. Action on the part of employers to support young workers and ensure that first jobs are considered as part of an educational progression into adult work (Bynner & Parsons 2002) may also help facilitate the transition into adulthood. However, young people begin thinking about their post-school plans some time before they leave school (Spielhofer et al. 2007), so if young people are not engaged in education, employment or training before age 16, raising the participation age to 18 is unlikely to make a difference without also tackling engagement earlier in the school journey.

As young people's aspirations are associated with disadvantage (Ashby & Schoon 2010; Sacker et al. 2002), policies that focus on addressing underlying social structures might also have an impact. These might include greater investment in early childhood interventions, aiming to tackle social disadvantage by providing educational and social support in the early years of life. A systematic synthesis of international research evidence and meta-analysis conducted in 2006 found that such interventions reduced teenage pregnancy rates, possibly through their effects on both attitudes to school and school attainment (Harden et al. 2006). Few evaluations of interventions to reduce teenage pregnancy have taken place in Britain or France, and most of these interventions included in the review took place in the US. Examples of such interventions

included a pre-school education and parent training programme aiming to enhance cognitive skills in early childhood (Campbell et al. 2002), and a skills development programme for children aged 6-12 and their parents that aimed to reduce health-risk behaviours in adolescence (Hawkins et al. 1999). Interventions at a later stage can also be effective; Harden et al's (2006) meta-analysis found evidence that interventions aiming to broaden young people's expectations and aspirations for the future resulted in reduced under 20 pregnancy rates. These interventions comprised high quality experiences of community work, raising awareness of opportunities available to young people in the future, work experience opportunities and careers advice. It is difficult to conclude with confidence from these complex interventions that they did trigger a 'chain of events' leading to fewer pregnancies among young women. In addition, these programmes that took place in the US may not necessarily translate to other country contexts. Nevertheless, the research evidence points to the role of aspirations and disadvantage in pregnancy rates among young people, and therefore the potential for policy that addresses both opportunities (or lack of) and tackles disadvantage and disengagement. The results of the interventions chimed with the views of young people living in the UK, particularly with regard to their aspirations and expectations for the future (Harden et al. 2006).

A recently updated review of interventions to prevent pregnancy among adolescents concluded that there was little evidence that promoting either contraceptive use alone or single education interventions would reduce unintended pregnancy (Oringanje et al. 2016). There was some evidence to suggest that multiple interventions, including educational aspects, skill building and contraceptive provision, may reduce unintended pregnancies in adolescents.

Technical or educational interventions focussing on individual behaviour change will not necessarily change people's motivations to avoid pregnancy. Indeed, the high teenage pregnancy rates in Britain could be considered paradoxical from a technical or educational perspective, given free-of-charge contraception and its accessibility to young people (Arai 2009). However, conception and recourse to abortion in the event of conception among under 20s are

indicators of young people's ability to ensure their own sexual health and of their motivations to avoid pregnancy. It is vital to create the conditions of choice for all young people that enable them to make safe, informed and autonomous decisions with regard to their sexual health, from the timing and circumstances of their first sexual experiences through to their access to their desired method of contraception and to abortion services should they not wish to continue with the pregnancy. All young people have a right to the knowledge, skills and services that they need to experience positive sexual relationships and good sexual health, to enable those who wish to prevent pregnancy and parenthood to do so.

At a practical level, this might mean ensuring comprehensive sexuality and relationships education, both school-based and through mass media campaigns, providing factual, accurate information and a safe space for discussion, and challenging norms and stereotypes that are harmful to young people's sexual health. In both countries, the quality and provision of SRE is uneven (International Planned Parenthood Federation, 2006; Ofsted, 2013) and in Britain its content is lacking in relational aspects (Ofsted, 2013), despite young people saying they want more focus on this (Macdowall et al. 2006). A recent report by the French High Council for Equality stresses the importance of promoting equality between men and women in sexuality education (Haut Conseil à l'Egalité 2016). An increased focus on school-based sex and relationships education on the relational aspects of sex may help disrupt gender stereotypes (Bajos & Bozon 2012). An increased focus on the relational aspects of sex may also enable young people to begin, and continue, their sexual lives in a way which is 'physically, emotionally and socially healthy' (Palmer et al. 2016): not under or exerting any partner or social pressure, protected against pregnancy and STIs, and at a time at which they consider themselves ready. Encouraging young people to delay first sex is unlikely to be effective and ignores the ways in which the timing and circumstances of sexual debut are strongly socially constructed. Furthermore, age at first sex does not in itself define the nature of the experience. Rather, Palmer argues that 'in shifting the focus from a problematisation of adolescent sexual intercourse to a more accepting approach concerned with transitioning into sexual activity in a

healthy and positive manner defined by circumstance rather than age, such efforts may be more compatible with the priorities of the young people targeted' (Palmer et al. 2016, p.11).

A focus on the positive circumstances of sex is also relevant to service provision and the clinical encounter. Encouraging greater openness and conversation about sex by practitioners with young people is important in de-stigmatising sexual health. Similarly, a continued focus on ensuring that all young people are able to access contraception is also key to enabling young people to ensure their own sexual health. Providing youth-friendly clinics that are non-judgemental, geographically accessible, and low- or no-cost, allows young people to access contraception, but equally important is ensuring that young people can make informed and autonomous decisions with regard to their choice of contraception. In this regard it is essential that practitioners are not only trained and knowledgeable in matters of contraception, but are also non-judgemental and recognise that the best contraception is the method with which the individual or couple is most satisfied. This has implications in settings where a large proportion of individuals obtain contraception from a general practitioner, who may not have as extensive a knowledge of each of the wide range of contraceptive methods available.

The proportion of conceptions among under 20s that end in abortion has been increasing steadily in Britain and France, concurrently with the increase in age at first birth in both countries (UNECE,2010). In Britain, an increasing proportion or abortions to all women are funded by the NHS and take place before ten weeks gestation (Department of Health 2015), which may indicate improvements in access to abortion. Ensuring access to abortion means providing services that are financially and geographically accessible, non-judgemental and that allow anonymity. Improving access to abortion and its visibility may also contribute to its de-stigmatisation, particularly in communities where young parenthood is accepted and abortion less so.

Creating these conditions of choice must occur both through more individual-level means outlined above, and also through developing public policies that effectively reduce the

'differential opportunity and privilege that lead to differential health status' (Wellings et al. 2006) on a wider, structural level. The Teenage Pregnancy Strategy in England, aiming to reduce the under-18 conception rate, is an example of such a multi-dimensional approach; it comprised a national media campaign, improvements to sex education and young people's sexual health services, and joint action to ensure national and local coordination across statutory and voluntary agencies, and strategy resources were disproportionately allocated to more deprived areas of the country, where conception rates were highest. The under-18 conception rate in England halved between the implementation of the strategy in 1999 and 2014, with the steepest decline occurring in the latter half of this period (Wellings et al. 2016, APPENDIX F). Evaluations of the strategy using observational data on changes in under-18 conception rates at national and area level and individual-level data on the association between area-level disadvantage and conception before 18 have shown that conception rates declined since the onset of the strategy and that this decline has been greatest in most deprived areas (which are also those that received more strategy resources), as measured by the Index of Multiple Deprivation (Wilkinson et al., 2006, Wellings et al. 2016). In addition, recent analyses of individual-level data suggest that the association between deprivation and under-18 conception has been partially attenuated (Wellings et al. 2016). These changes suggest that long-term, multi-component strategies are key to effecting change in the inequality in the distribution of conception and abortion aged under 20 among the population.

The findings of this research, which point to the key role of contextual factors in shaping young people's behaviours and decision-making, also highlight the need to enable young people to make active choices. An interim review of England's Teenage Pregnancy Strategy found that a key difference between areas with a similar level deprivation but differing rates of decline in under-18 conception rates was that in those areas where rates stayed static or increased, there was a long-standing culture of early pregnancy and low expectations of young women's aspirations, which stakeholders did not believe would change. In contrast, otherwise similar areas that had seen steeper declines in the under-18 conception rate were characterised by

active engagement of all the sectors involved in the strategy's implementation, and a strong 'senior champion' who was accountable for and led the local strategy (Department for Education and Skills 2006). The commitment of stakeholders at all levels, from policy-making to service provision and the clinical encounter, to enabling all young people to make active choices about their futures, may also be key in reducing the differentials in sexual health outcomes experienced by different social groups.

11.6 RECOMMENDATIONS FOR FUTURE RESEARCH

This PhD has identified several avenues for further research. In particular, whilst the findings have enabled me to hypothesise about the possible roles of social contextual factors in explaining variation between Britain and France in conception and abortion rates among under 20s, future research should examine this in more depth. Research into young people's sexual and reproductive health requires both qualitative and quantitative research approaches. More qualitative research in this area will be key in helping to unpack the mechanisms through which social contextual factors shape sexual behaviours, contraceptive use, pregnancy rates and recourse to abortion. Consistent with previous qualitative research on pregnancy and abortion decision-making among under 20s (Le Van 1998; Thomson 2009; Lee et al. 2004a), the findings of this research suggest that motivations to avoid pregnancy are an important mechanism linking disadvantage and conception among under 20s. Future qualitative research might explore in more depth how motivations to avoid pregnancy mediate the association between socioeconomic status and sexual behaviour and contraceptive use, as well as pregnancy and abortion decision making. Such studies could explore whether young people who are more strongly motivated to avoid pregnancy more likely to prioritise their education over their romantic and sexual relationships, and whether the strength of their motivation to avoid pregnancy affects how likely they are to inform themselves about, obtain and use reliable contraception. In the case of contraception, this will increase our understanding of why some

sexually active young people are not using contraception, to what extent this is related to pregnancy intentions, and how intentions are intertwined with knowledge and access.

Contraceptive provision for young people is quite different in Britain and France, with French teenagers, especially those aged under-18, facing arguably more barriers to obtaining their chosen contraceptive method than teenagers in Britain, due to issues surrounding anonymity, cost, provider attitudes, and geographical access (International Planned Parenthood Federation 2006; Ventola 2016). This PhD research found that among the youngest age group (16-17s), sexually-active young women in France were less likely to be using a reliable method of contraception than their British counterparts, and that among 18-19 year-olds the reverse was true. It was hypothesised that the lower use of more effective methods among under-18s in France compared to Britain may reflect greater difficulties in accessing contraception. In addition, use of LARC methods was markedly more common in Britain among women in both age groups. Further research could use qualitative methods to explore how these differences in provision of contraceptive services translate into differences in access, use and method choice, and whether this differs between social groups.

Future quantitative studies could also play a role in increasing our understanding of the possible causal pathways between distal factors and individual behaviours. A growing body of research is using longitudinal data and structural equation modelling methods to identify the pathways between childhood socioeconomic status and later educational achievement, employment aspirations and occupational outcomes (Fergusson et al. 2008; Schoon & Parsons 2002; Ashby & Schoon 2010). These analyses could be extended to examine other outcomes, including conception and recourse to abortion aged under 20. In Britain a possible data source might be the Avon Longitudinal Study of Parents and Children, a birth cohort study that has followed children born in 1992 and 1993 and their parents.

In area-level analyses of the association between disadvantage and conception rates and the abortion ratio, both Britain and France showed a different pattern in the capital city compared

to the rest of the country. In both countries, more disadvantaged areas tended to have higher conception rates and lower abortion ratios, but in both countries, the correlation in the capital cities is weaker than in the rest of the country. I was able to hypothesise about why this may be, and reasoned that other area level characteristics such as the ethnic makeup of the population may weaken the link between disadvantage and conception rates and abortion ratio. A more detailed analysis, particularly in London where more data are available at a smaller area level, would be valuable to examine why this further. This analysis could use data on more indicators of area-level characteristics, for example ethnic composition, and a more multi-dimensional measure to capture deprivation, such as the IMD, or a wider range of indicators of disadvantage, including the proportion receiving unemployment support, the proportion unemployed, and overcrowding. This may help unpack what it is about deprivation that impacts on area-level conception and abortion rates. By examining change over time, such an analysis could also take into account changes in the socio-historical context, for example Local Authority funding changes or policy initiatives such as the London Challenge, a secondary school improvement programme that ran in the capital from 2003-2011, and which saw a dramatic improvement in the performance of secondary schools in London (Kidson & Norris 2014). Such an analysis may be able to identify elements that are crucial to success in attenuating the correlation between disadvantage and conception and abortion rates.

Obtaining comparable data to run the same analysis in Paris would be more complicated, as data disaggregated to a lower area level are not is available for abortions and on some indicators, for example ethnicity, no data is collected. However, two separate analyses, maximising the data available in each country, could be complimentary in informing the interpretations of the findings.

11.7 CONCLUSIONS

The findings of this research suggest that differences in conception rates between Britain and France are driven proximately by differences in the proportion of young women that is sexually

active, and, to a lesser extent, differences in contraceptive use. However, this research suggests that these differences in behaviour are shaped by nation-specific compositional and contextual factors including the level of social inequality and the proportion of the population that is disadvantaged, the timing and pace of the transition to adulthood, prevailing norms relating to gender and young people's sexuality and capacity for parenthood, and the opportunities that are available to, and perceived to be accessible by, young people.

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APPENDIX A VARIABLES AVAILABLE IN NATSAL-3 AND FECOND

Table A.1 Variables available in Natsal-3 and FECOND and their comparability between surveys

Variable	Collected in Natsal-3 ✓/×, variable label in dataset	Collected in FECOND ✓/×, variable label in dataset	Comparability between surveys
Socio-demographic			
Sex	✓ rsex	✓ sexe	✓
Age	✓ dage	✓ rage	✓
Religion	✓ whirel, religion	×	×
Importance of religion	✓ religimp	✓ a78_r	✓
Frequency of attendance at religious service	✓ oftrelig	×	×
Lived with both parents at age 14/15[i]	✓ bothmapa2	✓ b1_r	✓ In FECOND this data is collected only for under-30s so it can only be used in analyses of that age group.
Ethnicity	✓ ethnic, ethnicgp	×	×
Country of birth	×	✓ a11_r	×
Nationality	×	✓ a13_r	×
Marital status	✓ marstat	✓ a9_r	✓
Partnership status	×	✓ partac	×
Education			
Highest qualification achieved	✓ educ3	✓ a33_r	✓
Age completed continuous full time education	✓ tedage		×
Socioeconomic group			
Hours worked per week	✓ hours	✓ a36_r	✓
Professional situation (economic activity)	✓ ractivhi2	✓ a35_r	✓
Socio-professional category	✓ rsoc2010_9, rsoc2010_7, rsoc2010_4, rnssecgp_6, rnssecgp_4	✓ pcs34_r, pcs8_r	✓ Categories in both surveys are based on economic activity and employment. Categories are different in each survey but could be grouped to be broadly comparable.
Subjective assessment of financial situation	×	✓ a73_r	×
Household income	✓ income	✓ a74_r	✓
Health cover	×	✓ a76_r	×

Index of Multiple Deprivation quintile	✓ adj_imd_quintile	×	×
Parent socioeconomic group			
Education of mother	×	✓ a19_r	✓ Information collected in each survey is different, but could be grouped to be broadly comparable
Education of father	×	✓ a16_r	
Parent's social class	✓ parsc3, parsc_kw	×	
Sexual activity			
Age at first sex[ii]	✓ derived from afsex, afsexall, frstsam, agegsam	✓ agerap1f, agerap1h	✓
Age at first heterosexual sex	✓ afsex, afsexall	✓ agerap_r	✓
Heterosexual sex in last 12 months	✓ vagsexyr	✓ rap12he_r	✓
Heterosexual sex in last 6 months	✓ Derived from lastvag	×	
Frequency of heterosexual sex in last 4 weeks	✓ sex4wks	✓ gh3_r, gf3_r	✓
Characteristics of first sex			
Partner age at first heterosexual sex[iii]	✓ age1part	✓	✓ In Natsal-3 but not FECOND this refers to partner age at first sex aged 13 or older. In both surveys the variable was recoded to exclude those who reported first sex before age 13. In FECOND this is asked of respondents aged under-30 only.
Opinion now on timing of first sex	✓ zrttime	✓ h1_r	✓ FECOND defined as sex with penetration, Natsal-3 as oral, anal or vaginal sex. In FECOND this is asked of respondents aged under-30 only
Partner more willing at first sex	✓ partmwill	×	×
Main reason for having sex	✓zmainrea2	×	×
Where met first partner	✓ zfstmet	×	×
Partner's first time	✓ Parts1st	✓ h4_r	✓
Type of relationship	✓ justmet	×	×
Where met first partner	✓ zfstmet	×	×
In love at first sex	✓ fstlove	✓ h5_r	✓ In Natsal-3 this was a possible response to the question on main reason for first sex, whilst in FECOND it was a stand-alone question. In FECOND this was asked of respondents aged under-30 only.

Contraception[iv]			
Contraceptive methods ever used	✓ conpill…implants	✓ pilulevie…vasectvie	✓
Contraceptive method(s) currently used		✓ pilac_f… vasectact_f/ pilac_h… vasectact_f	✓ These questions were asked of different sub-populations in the Natsal-3 and FECOND surveys, and the questions were worded slightly differently. By recoding a new variable with the most effective method reported, the information collected is broadly comparable.
Contraceptive method(s) used in last year	✓ ycompill…yimplant	×	
Main current contraceptive method	✓ usconfill…usimplant	✓ gf8_r/gh6bis_r	
Heterosexual sex with no contraception in last 4 weeks	×	✓ gf28_r/gh15_r	×
Heterosexual vaginal or anal sex with no condom in last year	✓ yrcond	×	×
Contraceptive method used at first sex	✓ fscondom…fscantre, fsprecnfgp	✓ metrap1preso	✓ In FECOND this is asked of respondents aged under-30 only
Condom used at last sex	✓ r1condl	✓ presderrs	✓
Partners			
Number of heterosexual partners in lifetime	✓ hetlife	✓ derived from i2_3, i3_r	✓
Number of heterosexual partners in last 5 years	✓ het5yrs	×	×
Number of heterosexual partners in last 12 months	✓ het1yr	✓ i4_r	✓
Conception[v]			
Ever been pregnant	✓ everpreg	✓ d1_r/d2_r	✓
Number of pregnancies	✓ nopreg	✓ nbgross_r	✓
Age at pregnancy	✓ derived from pregnancy history outcome and age/date and date of birth	✓ derived from pregnancy history outcome, date and date of birth	✓
Abortion[v]			
Ever had an abortion	✓ pregoab	✓ derived from nbivg	✓

Number of abortions in lifetime	✓ manyab2	✓ nbivg	✓
Age at abortion	✓ derived from pregnancy history outcome and age	✓ derived from pregnancy history outcome, date and date of birth	✓
Other			
Communication with parents about sex and contraception	✓ talkmapa	✓ b10_r	✓ In Natsal-3 this refers to sexual matters, in FECOND it refers to sexuality or contraception. In Natsal-3 this refers to the adult(s) that the respondent lived with at that time, in France the question is asked separately for mother and father. In France this was asked to under-30s only.
Sources of sex education	✓ sexedusch, lernmost	✓ b6_r, b7_0r, b7_1r, b8_0r, b8_1r,b9_0r, b9_1r	✓ Natsal-3 asks about all sources of information on sexual matters when growing up, and which was the main source. FECOND asked about the first source of information on contraception, and whether the respondent received info on contraception, STIs and sexual relationships at school (separate questions). In FECOND this is asked of respondents aged under-30 only.

[i] FECOND: age 15, Natsal-3: age 14.

[ii] In Natsal-3, the question referred to 'sexual intercourse'. In FECOND, the question referred to 'sex', with a later question on 'sex with penetration'.

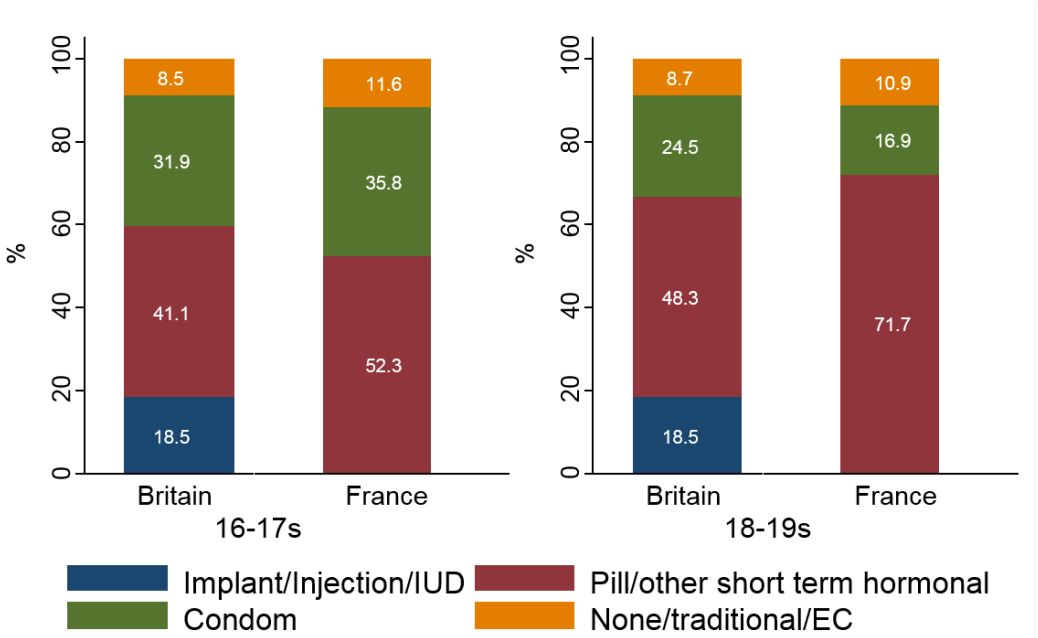
[iii] All questions about the circumstances of first sex in Natsal-3 refer to first sex aged 13+ not forced. All questions about first sex in FECOND refer to first sex that was not forced. In Natsal-3, questions about the circumstances of first sex were asked of all respondents. In FECOND, they were asked only of respondents aged under-30.

[iv] In both surveys, all questions on contraceptive use were asked of both men and women. In Natsal-3, questions on current contraceptive use were asked of all men and women who reported heterosexual sex since age 13. In FECOND, questions on ever use were asked of all men and women reporting ever having had heterosexual sex, but questions on current contraceptive use were asked only of men and women reporting ever having had heterosexual sex, not sterile (or partner not sterile), not pregnant or trying (or partner not pregnant or trying), and for men, reporting heterosexual sex in the last 12 months and reporting a partner at the time of the survey.

[v] In FECOND, the pregnancy history module, where these questions were asked, was administered to men and women. In Natsal-3 the pregnancy history module was administered only to women.

APPENDIX B SUPPLEMENTARY MATERIAL FOR CHAPTER 6

Figure B.1: Contraceptive method mix among 16-17 and 18-19 year-olds, Britain and France, 2010. (Sample: women aged 16-17 and 18-19 who have ever had sex and are not pregnant or trying).



Sample: 16-17 and 18-19 year old women who had sex in the last year and are not pregnant or trying - 2010

APPENDIX C SUPPLEMENTARY ANALYSES FOR CHAPTER 8

Table C.1: Full results of adjusted models of the odds of reporting first sex before 16 by age group and sex, Britain and France

Britain

	Men									Women								
	17-24			25-34			35+			16-24			25-34			35+		
	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value
Post-16 education																		
None	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.
Some	0.4	0.30,0.54	<0.001	0.6	0.45,0.80	<0.001	0.56	0.41,0.78	<0.001	0.39	0.31,0.49	<0.001	0.58	0.46,0.72	<0.001	0.57	0.42,0.78	<0.001
Parent's socioeconomic group																		
Lower	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.
Middle	1.1	0.77,1.58	0.59	0.88	0.62,1.26	0.49	1	0.71,1.41	1	1.2	0.89,1.60	0.23	0.95	0.73,1.23	0.69	0.87	0.61,1.25	0.46
Higher	0.74	0.48,1.14	0.17	0.53	0.33,0.85	0.01	0.75	0.47,1.22	0.25	1.06	0.73,1.53	0.77	0.51	0.36,0.73	0	0.69	0.41,1.16	0.16
Missing	0.97	0.59,1.61	0.92	1.42	0.82,2.45	0.21	1.39	0.72,2.70	0.32	0.98	0.63,1.51	0.91	0.88	0.60,1.27	0.48	0.55	0.29,1.03	0.06
Importance of religion																		
Not/not very	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.
Fairly/very	0.64	0.45,0.92	0.01	0.7	0.50,0.97	0.03	0.55	0.38,0.80	<0.001	0.43	0.32,0.58	<0.001	0.41	0.32,0.53	<0.001	0.44	0.31,0.62	<0.001
Family structure at age 14/15																		
Both natural parents	1	1.00,1.00	.	.	.	.	.	.	.	1	1.00,1.00	.	.	.	.	.	.	.
Not both natural parents	0.55	0.40,0.75	<0.001	.	.	.	.	.	.	0.63	0.50,0.80	<0.001	.	.	.	.	.	.
n (N)	1031 (1405)			1247 (1384)			2008 (1121)			1024 (1779)			1276 (2292)			2050 (1674)		

France

	Men									Women								
	17-24			25-34			35+			16-24			25-34			35+		
	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value
Post-16 education																		
None	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.
Some	0.62	0.41,0.93	0.02	0.43	0.28,0.66	<0.001	0.49	0.33,0.71	<0.001	0.57	0.34,0.95	0.03	0.38	0.25,0.57	<0.001	0.54	0.38,0.79	<0.001
Parent's socioeconomic group																		
Lower	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.	1	1.00,1.00	.
Middle	0.7	0.39,1.25	0.23	0.53	0.32,0.88	0.01	1.12	0.73,1.73	0.61	0.99	0.56,1.75	0.96	0.85	0.53,1.38	0.51	1.33	0.83,2.13	0.23
Higher	0.58	0.30,1.13	0.11	0.76	0.43,1.36	0.36	1.87	1.04,3.35	0.04	1.29	0.69,2.42	0.42	1.06	0.59,1.91	0.84	1.45	0.78,2.69	0.24
Missing	0.76	0.35,1.63	0.48	0.68	0.32,1.44	0.31	1.22	0.64,2.35	0.54	0.73	0.34,1.56	0.42	1.1	0.55,2.20	0.78	1.14	0.58,2.26	0.7
Importance of religion																		
Not/not very	1	1.00,1.00	.	.	.	.	.	.	.	1	1.00,1.00	.	.	.	.	.	.	.
Fairly/very	0.73	0.45,1.20	0.21	0.63	0.35,1.12	0.12	0.84	0.52,1.36	0.47	0.29	0.17,0.50	<0.001	0.36	0.21,0.63	<0.001	0.64	0.38,1.09	0.1
Family structure at age 14/15																		
Both natural parents	1	1.00,1.00	.	.	.	.	.	.	.	1	1.00,1.00	.	.	.	.	.	.	.
Not both natural parents	0.73	0.48,1.11	0.14	.	.	.	.	.	.	0.49	0.33,0.73	<0.001	.	.	.	.	.	.
n (N)	705 (811)			889 (864)			1480 (1416)			1086 (1067)			1420 (1327)			2360 (2535)		

The following section summarises an additional set of analyses that was undertaken to test the sensitivity of the results presented in Chapter 8. These sensitivity analyses explore the effect of changing the age groupings and the categories of the education variable. The coding of the two education variables used is explained in Section 4.1.2.3.

Proportion reporting first sex before age 16 by socioeconomic characteristics by five-year age groups

Further analyses of the social correlates of first sex before 16 showed that the association between parental socioeconomic group and reporting of first sex among men in France was slightly sensitive to the age groupings in the data. Whilst in all age groups the direction of the association was the same in larger or smaller age groupings, the statistical significance of the association changed. In the analyses presented in Chapter 8 (Table 8.1Table 9.2), the association between parent socioeconomic group and reporting of first sex before age 16 was statistically significant among both 16-24 year-olds and 25-34 year-olds, Table C2 shows that when analyses are run in five year age groups, the association is not significant among 25-29 year-olds. And, whilst in the analyses presented in Chapter 8 (Table 8.1), there is no evidence of an association between parental socioeconomic group and reporting of first sex before 16 among men in France aged 35+, Table C.2 shows that when the analyses are run in five-year age groups, there is an association among 40-44 year-olds and 45-49 year-olds, with more men with parents from higher socioeconomic groups reporting first sex before age 16.

Table C.2: Proportion reporting first intercourse before 16 by socioeconomic characteristics, by five age group and sex, 16-49 year-olds, Britain and France

BRITAIN

Men

	16-19		20-24		25-29		30-34		35-39		40-44		45-49	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Post-16 education														
None	53.38	46 (74)	44.45	99 (136)	33.82	72 (104)	33.99	73 (76)	38.36	84 (53)	32.42	104 (60)	36.16	97 (61)
Some	26.42	81 (125)	21.87	97 (118)	18.86	82 (105)	22.21	93 (87)	21.2	89 (61)	21.05	83 (47)	21.27	94 (48)
p-value	<0.001		<0.001		<0.001		0.007		0.002		0.026		0.006	
Parent's socioeconomic group														
Lower	33.81	34 (57)	35.73	36 (50)	26.73	28 (42)	30.58	41 (42)	31.6	37 (26)	26.19	40 (23)	26.56	41 (24)
Middle	37.41	85 (126)	28.63	92 (118)	23.65	81 (107)	26.72	82 (82)	28.09	92 (56)	26.11	101 (59)	26.92	105 (60)
Higher	20.75	25 (40)	20.34	35 (42)	13.94	23 (31)	17.73	26 (22)	15.94	20 (15)	18.95	21 (11)	21.05	24 (14)
Not answered	33.41	18 (30)	39.05	27 (36)	38.69	17 (23)	34.85	14 (15)	38.25	22 (15)	28.45	17 (8)	38.03	15 (6)
p-value	0.004		0.004		<0.001		0.106		0.071		0.752		0.617	

Women

	16-19		20-24		25-29		30-34		35-39		40-44		45-49	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Post-16 education														
None	59.46	42 (84)	42.11	106 (227)	34.73	82 (201)	33	84 (148)	27.71	76 (71)	20.69	68 (55)	17.69	63 (52)
Some	23.44	74 (145)	22.65	94 (164)	19.99	88 (179)	19.68	76 (117)	15.52	59 (54)	12.58	51 (41)	8.07	32 (27)
p-value	<0.001		<0.001		<0.001		<0.001		0.002		0.016		0.002	
Parent's socioeconomic group														
Lower	32.32	29 (59)	33.85	43 (84)	29.37	40 (89)	30.82	38 (68)	28.3	41 (39)	16.99	24 (18)	15.34	24 (19)
Middle	30.91	75 (144)	29.04	96 (177)	23.93	81 (178)	27.22	81 (130)	19.35	63 (58)	15.45	60 (52)	12.79	51 (41)
Higher	25.27	26 (51)	21.89	33 (61)	17.69	25 (52)	11.34	17 (29)	8.47	11 (10)	15.06	20 (14)	9.53	12 (12)
Not answered	28.3	15 (30)	32.85	20 (46)	29.31	18 (44)	27.24	17 (27)	15.19	7 (8)	13.55	7 (5)	4.54	2 (3)
p-value	0.490		0.045		0.013		<0.001		0.003		0.967		0.280	

FRANCE

Men

	16-19		20-24		25-29		30-34		35-39		40-44		45-49	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Post-16 education														
None	39.12	38 (27)	38.38	58 (58)	34.27	66 (54)	31.63	53 (33)	22.6	54 (39)	18.57	55 (43)	19.91	61 (37)
Some	31.56	73 (76)	19.11	43 (64)	14.78	37 (48)	19.2	54 (56)	11.73	30 (33)	12.12	25 (29)	13.26	24 (24)
p-value	0.027		<0.001		<0.001		0.019		0.005		0.077		0.127	
Parent's socioeconomic group														
Lower	53.11	27 (18)	28.35	16 (17)	28.33	28 (25)	39.43	38 (28)	16.23	23 (17)	8.87	13 (12)	21.9	35 (23)
Middle	33.47	69 (64)	26.27	50 (63)	22.29	45 (42)	16.1	36 (34)	19.97	47 (39)	16.9	43 (39)	10.88	25 (19)
Higher	23.19	27 (29)	19.39	18 (24)	20.82	21 (24)	21.49	21 (19)	10.39	8 (9)	24.91	17 (15)	25.07	15 (12)
Not answered/	24.23	14 (15)	47.66	17 (18)	21.69	9 (11)	37.84	12 (8)	13.64	6 (7)	20.73	8 (6)	27.65	9 (7)
p-value	0.011		0.021		0.692		0.002		0.365		0.06		0.046	

Women

	16-19		20-24		25-29		30-34		35-39		40-44		45-49	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Post-16 education														
None	20.52	12 (12)	22.37	35 (29)	23.34	53 (38)	17.23	36 (25)	10.73	34 (23)	6.65	29 (22)	9.61	41 (34)
Some	15.19	71 (62)	13.48	56 (74)	9.17	43 (47)	9.92	51 (55)	5.5	26 (35)	8.44	31 (35)	2.11	7 (12)
p-value	0.454		0.021		<0.001		0.023		0.021		0.407		<0.001	
Parent's socioeconomic group														
Lower	14	15 (14)	15.15	14 (16)	14.74	23 (20)	12.68	24 (21)	6.88	15 (11)	7.1	20 (14)	5.35	15 (13)
Middle	17.27	51 (44)	15.73	40 (44)	13.95	42 (40)	9.81	30 (30)	8.39	30 (32)	6.69	23 (26)	7.25	23 (24)
Higher	17.92	28 (24)	17.57	27 (34)	8.92	15 (14)	13.48	22 (20)	6.99	10 (11)	10.79	11 (10)	0.47	0 (1)
Not answered/	17.7	17 (15)	13.69	9 (9)	21.07	16 (11)	17.19	11 (9)	6.9	5 (4)	8.06	6 (7)	10.19	10 (8)
p-value	0.903		0.906		0.200		0.482		0.937		0.656		0.072	

Notes: n=weighted counts, N=unweighted counts. Denominator for post-16 education is respondents aged 17 and over.

Analyses of reporting first sex before 16 using different groupings of the educational level variable

Running the analyses using the 'educational level' variable rather than 'post-16 education' had little impact on the interpretation of the findings presented in Chapter 8. The main difference between the models using educational level, restricted to 20-29 year-olds, and the models using post-16 education, restricted to 17-29 year-olds, were in the analyses of the association between socioeconomic characteristics and age difference with the first sexual partner. In the models using level of education (20-29 year-olds) there was no evidence that individual level of education was associated with reporting that the first sexual partner was close in age among women in Britain, whereas in the models using post-16 education (17-29 year-olds), there was. Among men in France, there was stronger evidence of an association between educational level and reporting a small age difference with the first sexual partner than there was between post-16 education and reporting a small age difference with the first partner. There was no evidence of an association between parent socioeconomic group and reporting a small age difference with the first sexual partner among men in France in the models using level of education. Among women in France, there were also changes in the statistical significance of the association between parental socioeconomic group and level of education and reporting of a first partner that was close in age. Further analyses (not shown) showed that the changes resulted from the different age groupings, not the different education variable.

Table C.3: Proportion reporting first intercourse before 16 by socioeconomic characteristics, by age group and sex, 20-49 year-olds, Britain and France

	Britain											
	Men						Women					
	20-24		25-34		35+		20-24		25-34		35+	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Educational level												
No post-16 education	44.45	99 (136)	33.91	145 (180)	35.27	286 (174)	42.11	106 (227)	33.83	165 (349)	21.57	207 (178)
Post-16 education	29.14	51 (67)	29.16	95 (109)	26.75	164 (98)	27.89	46 (87)	28.2	77 (154)	13.46	73 (61)
Some tertiary education	17.11	46 (51)	15.15	80 (83)	15.84	102 (58)	19.18	48 (77)	15.67	86 (142)	10.79	69 (61)
p-value	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Parent's socioeconomic group												
Lower	34.78	70 (107)	28.88	69 (84)	27.82	119 (73)	33.21	71 (143)	30.06	78 (157)	20.06	89 (76)
Middle	32.25	177 (244)	25.1	163 (189)	26.98	298 (175)	29.83	171 (321)	25.47	162 (308)	15.64	174 (151)
Higher	20.51	60 (82)	15.75	49 (53)	18.56	65 (40)	23.27	58 (112)	14.41	42 (81)	11.08	43 (36)
Not answered	36.56	45 (66)	36.86	31 (38)	34.4	54 (29)	30.7	35 (76)	28.27	36 (71)	11.39	15 (16)
p-value	<0.001		<0.001		0.048		0.023		<0.001		0.013	

	France											
	Men						Women					
	20-24		25-34		35+		20-24		25-34		35+	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Educational level												
No post-16 education	38.38	58 (58)	33.04	119 (87)	20.2	171 (119)	22.37	35 (29)	20.41	89 (63)	8.81	104 (79)
Post-16 education	20.97	14 (23)	19.81	39 (43)	15.18	32 (31)	16.86	18 (21)	11.94	36 (33)	6.95	28 (31)
Some tertiary education	18.3	29 (41)	15.54	52 (61)	10.83	46 (55)	12.25	37 (53)	8.52	59 (69)	4.67	37 (51)
p-value	<0.001		<0.001		0.001		0.028		<0.001		0.004	
Parent's socioeconomic group												
Lower	40.16	43 (35)	33.87	66 (53)	15.89	71 (52)	14.52	29 (30)	13.62	47 (41)	6.41	49 (38)
Middle	30	120 (127)	19.03	81 (76)	15.98	115 (97)	16.56	91 (88)	11.86	73 (70)	7.45	76 (82)
Higher	21.48	45 (53)	21.14	42 (43)	19.68	39 (36)	17.75	56 (58)	11.18	37 (34)	6.56	21 (22)
Not answered/refused	33.28	31 (33)	28.61	21 (19)	19.93	24 (20)	16.06	26 (24)	19.29	27 (20)	8.54	22 (19)
p-value	0.02		0.008		0.632		0.868		0.197		0.751	

Notes: n=weighted counts, N=unweighted counts.

Table C.4: Adjusted odds of reporting sex before 16 by socioeconomic characteristics, by age group and sex, 17-49 year-olds, Britain and France

Britain

	Men						**Women**					
	20-24		**25-34**		**35+**		**16-24**		**25-34**		**35+**	
	OR and 95% CI	**P-value**	**OR and 95% CI**	**P-value**	**OR and 95% CI**	**P-value**	**OR and 95% CI**	**P-value**	**OR and 95% CI**	**P-value**	**OR and 95% CI**	**P-value**
Educational level												
No post-16 education	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.
Post-16 education	0.54 (0.35- 0.81)	0.004	0.87 (0.62- 1.22)	0.404	0.72 (0.50- 1.02)	0.067	0.56 (0.39- 0.81)	0.002	0.81 (0.62- 1.05)	0.11	0.63 (0.43- 0.92)	0.016
Some tertiary education	0.30 (0.19- 0.48)	<0.001	0.42 (0.29- 0.60)	<0.001	0.40 (0.27- 0.60)	<0.001	0.37 (0.26- 0.55)	<0.001	0.45 (0.34- 0.59)	<0.001	0.51 (0.35- 0.76)	0.001
Parent's socioeconomic group												
Lower	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.
Middle	0.89 (0.56- 1.42)	0.629	0.91 (0.64- 1.30)	0.594	1.02 (0.72- 1.44)	0.899	1.15 (0.79- 1.67)	0.479	0.97 (0.75- 1.26)	0.833	0.88 (0.62- 1.26)	0.49
Higher	0.73 (0.41- 1.30)	0.281	0.63 (0.39- 1.03)	0.063	0.90 (0.54- 1.49)	0.679	0.97 (0.60- 1.59)	0.907	0.57 (0.40- 0.83)	0.003	0.73 (0.43- 1.23)	0.231
Not answered	0.90 (0.46- 1.78)	0.766	1.45 (0.84- 2.52)	0.185	1.42 (0.74- 2.74)	0.292	0.90 (0.52- 1.56)	0.712	0.87 (0.60- 1.27)	0.47	0.55 (0.29- 1.04)	0.065
n (N)	648 (803)		1247 (1384)		2008 (1121)		647 (1070)		1276 (2292)		2050 (1674)	

France

	Men						**Women**					
	20-24		**25-34**		**35+**		**16-24**		**25-34**		**35+**	
	OR and 95% CI	**P-value**	**OR and 95% CI**	**P-value**	**OR and 95% CI**	**P-value**	**OR and 95% CI**	**P-value**	**OR and 95% CI**	**P-value**	**OR and 95% CI**	**P-value**
Educational level												
No post-16 education	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.
Post-16 education	0.41 (0.21- 0.81)	0.01	0.52 (0.32- 0.86)	0.01	0.66 (0.41- 1.08)	0.097	0.64 (0.30- 1.37)	0.246	0.49 (0.30- 0.81)	0.006	0.72 (0.45- 1.14)	0.161
Some tertiary education	0.40 (0.22- 0.73)	0.003	0.37 (0.23- 0.60)	<0.001	0.40 (0.25- 0.62)	<0.001	0.34 (0.18- 0.66)	0.001	0.31 (0.20- 0.49)	<0.001	0.44 (0.29- 0.68)	<0.001
Parent's socioeconomic group												
Lower	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.	1.00 (.- .)	.
Middle	0.96 (0.44- 2.09)	0.926	0.53 (0.32- 0.89)	0.016	1.12 (0.73- 1.73)	0.605	1.07 (0.50- 2.28)	0.859	0.87 (0.54- 1.41)	0.582	1.35 (0.84- 2.16)	0.21
Higher	0.86 (0.34- 2.14)	0.74	0.84 (0.46- 1.51)	0.56	2.04 (1.13- 3.70)	0.019	1.82 (0.79- 4.17)	0.157	1.19 (0.66- 2.15)	0.572	1.62 (0.86- 3.03)	0.136
Not answered/refused	2.08 (0.79- 5.48)	0.136	0.68 (0.32- 1.43)	0.307	1.22 (0.64- 2.35)	0.544	0.46 (0.16- 1.37)	0.162	1.10 (0.55- 2.19)	0.797	1.14 (0.57- 2.25)	0.709
n (N)	377 (494)		889 (864)		1480 (1416)		565 (651)		1420 (1327)		2360 (2535)	

*Notes: n=weighted counts, N=unweighted counts. *Adjusted for all variables in model, religiosity and family structure at age 14. ** Adjusted for all variables in model and religiosity.*

Table C.5: Proportion reporting a small age difference (<2 years) with their first sexual partner by socioeconomic characteristics and by sex, 20-29 year-olds, Britain

	Britain				France			
	Men		Women		Men		Women	
	%	n (N)	%	n (N)	%	n (N)	%	n (N)
Educational level								
No post-16 education	78.98	324 (432)	53.58	248 (523)	71.34	218 (189)	35.69	121 (91)
Post-16 education	83.73	257 (348)	57.45	174 (324)	79.66	121 (144)	46.3	102 (110)
Some tertiary education	80.49	380 (440)	57.46	272 (432)	78.29	215 (311)	54.57	319 (379)
p-value	0.657		0.504		0.045		0.002	
Parent's socioeconomic group								
Lower	77.74	144 (197)	53.81	129 (252)	64.16	83 (95)	37.47	82 (83)
Middle	81.5	485 (602)	56.16	347 (627)	78.45	279 (319)	46.85	238 (269)
Higher	79.84	244 (295)	58.62	155 (259)	77.88	140 (175)	57.07	165 (179)
Not answered	82.49	88 (115)	53.69	59 (127)	77.26	53 (55)	44.77	58 (50)
p-value	0.248		0.294		0.103		<0.001	

Notes: n=weighted counts, N=unweighted counts

APPENDIX D SUPPLEMENTARY ANALYSES FOR CHAPTER 9

Table D.1: Full results of adjusted models of the odds of reporting first sex before 16, no contraception at first sex, conception before aged 20 and recourse to abortion before age 20, 17-29s, Britain

	Britain																	
	First sex before 16						No contraception at first sex						Conception<20			Abortion<20, if conceived		
	Men			Women			Men			Women			Women			Women		
	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value
Post-16 education																		
None	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.
Some	0.45	0.36,0.57	<0.001	0.46	0.39,0.56	<0.001	0.44	0.31,0.62	<0.001	0.62	0.47,0.81	<0.001	0.27	0.21,0.34	<0.001	3.14	2.04,4.82	<0.001
Parent's socioeconomic group																		
Lower	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.
Middle	1.10	0.82,1.47	0.520	1.13	0.90,1.42	0.290	0.77	0.51,1.16	0.220	0.52	0.38,0.73	<0.001	0.72	0.54,0.97	0.030	0.91	0.56,1.50	0.720
Higher	0.71	0.50,1.00	0.050	0.91	0.69,1.22	0.550	0.74	0.45,1.22	0.240	0.63	0.41,0.96	0.030	0.56	0.39,0.82	<0.001	1.57	0.82,3.01	0.170
Missing	1.15	0.77,1.72	0.500	0.96	0.69,1.33	0.800	0.77	0.41,1.43	0.410	1.05	0.69,1.62	0.810	1.10	0.73,1.67	0.650	0.37	0.18,0.79	0.010
Family structure at age 14/15																		
Both natural parents	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.
Not both natural parents	0.61	0.48,0.77	<0.001	0.57	0.47,0.68	<0.001	0.87	0.61,1.25	0.450	0.94	0.71,1.25	0.680	0.60	0.47,0.76	<0.001	1.07	0.71,1.63	0.740
Importance of religion																		
Not/not very	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.
Fairly, very	0.58	0.44,0.76	<0.001	0.44	0.35,0.54	<0.001	1.85	1.29,2.65	<0.001	1.45	1.08,1.93	0.010	1.41	1.05,1.91	0.020	1.01	0.61,1.67	0.980
Age at first sex	.	.	.	.	.	.	0.96	0.86,1.06	0.400	1.01	0.94,1.09	0.710	0.67	0.62,0.73	<0.001	0.85	0.72,1.00	0.050
N	13991.00			14507.00			13043.00			13946.00			13831.00			7587.00		

Notes: n=unweighted denominator, N=weighted denominator. Denominator for no contraception at first sex restricted to respondents who have ever had sex. Denominator for conception<20 restricted to women aged 20 and over, sexually experienced by age 20. Denominator for abortion<20, if conceived restricted to women reporting a conception before age 20. aOR adjusted for all variables in model.

Table D.2: Full results of adjusted models of the odds of reporting first sex before 16, no contraception at first sex, conception before aged 20 and recourse to abortion before age 20, 17-29s, Britain

	France																	
	First sex before 16						No contraception at first sex						Conception<20			Abortion<20, if conceived		
	Men			Women			Men			Women			Women			Women		
	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value	aOR	95%CI	P-value
Post-16 education																		
None	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.
Some	0.51	0.36,0.72	<0.001	0.46	0.32,0.67	<0.001	0.40	0.20,0.82	0.010	0.38	0.22,0.66	<0.001	0.14	0.08,0.23	<0.001	1.23	0.36,4.23	0.740
Parent's socioeconomic group																		
Lower	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.
Middle	0.84	0.53,1.34	0.470	0.94	0.60,1.45	0.770	0.57	0.24,1.33	0.190	0.32	0.17,0.59	<0.001	0.66	0.37,1.20	0.170	0.86	0.24,3.03	0.810
Higher	0.84	0.50,1.43	0.520	1.00	0.60,1.66	1.000	0.17	0.06,0.50	<0.001	0.52	0.26,1.03	0.060	0.61	0.27,1.35	0.220	1.12	0.14,8.75	0.910
Missing																		
Family structure at age 14/	0.77	0.42,1.41	0.390	0.76	0.41,1.38	0.370	0.80	0.29,2.25	0.680	0.65	0.31,1.35	0.250	1.08	0.52,2.25	0.840	1.47	0.37,5.78	0.580
Both natural parents	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.
Not both natural parents	0.65	0.46,0.91	0.010	0.51	0.37,0.71	<0.001	0.88	0.41,1.88	0.740	1.03	0.59,1.78	0.930	0.65	0.41,1.04	0.070	0.63	0.21,1.88	0.410
Importance of religion																		
Not/not very	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.	1.00	1.00,1.00	.
Fairly, very	0.73	0.48,1.12	0.150	0.32	0.20,0.52	<0.001	2.64	1.29,5.40	0.010	2.64	1.56,4.48	<0.001	3.23	1.85,5.66	<0.001	0.86	0.27,2.77	0.800
Age at first sex	.	.	.	.	.	.	0.89	0.71,1.12	0.310	1.11	0.97,1.27	0.120	0.74	0.63,0.88	<0.001	0.76	0.56,1.03	0.080
N	3361.00			5248.00			3168.00			4982.00			5263.00			5268.00		

Notes: n=unweighted denominator, N=weighted denominator. Denominator for no contraception at first sex restricted to respondents who have ever had sex. Denominator for conception<20 restricted to women aged 20 and over, sexually experienced by age 20. Denominator for abortion<20, if conceived restricted to women reporting a conception before age 20. aOR adjusted for all variables in model.

Analyses of reporting first heterosexual sex before 16, contraceptive use at first sex, conception before 20 and recourse to abortion before 20 using different groupings in the educational level variable

The following section summarises an additional set of analyses that was undertaken to test the sensitivity of the results presented in Chapter 9. These sensitivity analyses explore the effect of changing the categories of the education variable. The coding of the two education variables used is explained in Section 4.1.2.3.

Running the models using the variable 'educational level' rather than 'completed any post-16 education' had little impact on the interpretation of the findings presented in Chapter 9. Because the variable 'educational level' excludes respondents aged under 20, this sensitivity is restricted to respondents aged 20 and over. As in the analyses using 'post-16 education', the analyses using 'educational level' showed remarkable similarities between Britain and France in the associations between socioeconomic characteristics and each stage in the pathway to abortion. The proportions reporting each outcome and the crude and adjusted odds ratios for the association between socioeconomic characteristics and each stage in the pathway to abortion were similar. Some changes in the statistical significance of results were observed. The association between parent socioeconomic group and reporting of first sex before 16 among women in Britain was highly statistically significant ($p<0.001$) when adjusted for educational level among 20-29s but not when adjusted for post-16 education among 17-29s. The crude association between parent socioeconomic group and first sex before 16 among men in France was statistically significant among 17-29s but not among 20-29s.

There was no difference in the results of interactions between country and socioeconomic characteristics on conception and abortion before 20 in models using the educational-level variable compared with models using the binary variable of whether a respondent had completed any post-16 education.

These sensitivity analyses suggest that these results are reasonably robust, particularly to changes in the grouping of categories of education, but that they may be sensitive to changes in age groupings.

Table D.3: Characteristics of the sample in terms of socioeconomic characteristics and reporting of each outcome in the pathway to abortion, 20-29 year-olds, Britain and France

	Britain				France			
	Men		Women		Men		Women	
	n (N)	% (95%CI)	n (N)	% (95%CI)	n (N)	% (95%CI)	n (N)	% (95%CI)
Total N aged 20-29	1748		2580		964		1321	
Educational level								
No post-16	463 (625)	33.9 (31.4- 36.5)	504 (1061)	36.9 (34.7- 39.0)	355 (291)	42.4 (38.5- 46.4)	394 (289)	30.6 (27.6- 33.7)
Post-16	335 (456)	24.5 (22.4- 26.8)	327 (607)	23.9 (22.0- 26.0)	166 (202)	19.8 (17.1- 22.9)	247 (259)	19.2 (17.0- 21.6)
Some tertiary	568 (633)	41.6 (38.7- 44.5)	536 (856)	39.2 (36.9- 41.6)	316 (470)	37.7 (34.4- 41.2)	648 (771)	50.3 (47.2- 53.3)
Parent's socioeconomic group								
Lower	219 (292)	16.0 (14.2- 17.9)	266 (505)	19.5 (17.8- 21.3)	160 (151)	19.1 (15.9- 22.7)	250 (233)	19.3 (16.9- 22.0)
Middle	686 (839)	50.2 (47.4- 52.9)	678 (1226)	49.7 (47.5- 52.0)	396 (467)	47.3 (43.5- 51.1)	570 (617)	44.2 (41.2- 47.2)
Higher	341 (401)	24.9 (22.5- 27.5)	294 (498)	21.5 (19.7- 23.5)	198 (260)	23.7 (20.8- 26.8)	323 (347)	25.0 (22.6- 27.7)
Not answered	122 (164)	8.9 (7.5- 10.6)	127 (264)	9.3 (8.2- 10.6)	83 (86)	10.0 (7.9- 12.4)	148 (124)	11.4 (9.5- 13.7)
Importance of religion								
Fairly/very important	374 (418)	26.6 (24.0- 29.3)	428 (716)	30.6 (28.4- 32.8)	162 (167)	19.4 (16.3- 23.1)	325 (299)	25.3 (22.6- 28.2)
Lived with both natural parents at age 14/15								
Yes	1051 (1244)	74.6 (72.3- 76.8)	970 (1689)	69.2 (67.3- 71.1)	612 (723)	73.1 (69.4- 76.5)	935 (978)	72.5 (69.8- 75.2)
Had first heterosexual sex before age 16								
Yes	341 (453)	25.1 (22.8- 27.5)	364 (762)	26.4 (24.6- 28.4)	200 (219)	24.4 (21.2- 27.8)	183 (185)	14.4 (12.4- 16.7)
Used no contraception at first sex								
Used no reliable method	166 (205)	13.9 (12.0- 16.1)	160 (321)	12.8 (11.4- 14.4)	57 (49)	7.6 (5.2- 11.1)	113 (86)	9.7 (7.6- 12.2)
Conception before age 20								
Yes	.	.	297 (664)	25.6 (23.7- 27.5)	.	.	167 (134)	15.5 (13.0- 18.3)
Recourse to abortion before age 20 (if conceived)								
Yes	.	.	96 (191)	32.2 (28.3- 36.5)	.	.	31 (26)	18.4 (12.4- 26.6)
Birth rate, 16-19s (per 1000)	.	.	42.1 (30.7-57.3)		.	.	12.3 (4.4-33.6)	
Abortion rate, 16-19s (per 1000)	.	.	14.7 (11.63-17.77)		.	.	10.9 (8.53-13.27)	

Notes: n=unweighted denominator, N=weighted denominator. For contraceptive use at first sex, denominator is respondents who have ever had sex; for reporting of a conception before 20, denominator is women aged 20 and over who were sexually experienced by age 20; for reporting of an abortion before 20, denominator is women aged 20 and over, reporting a conception before age 20.

Table D.4: Prevalence and odds of reporting first sex before 16 by parent socioeconomic group and individual level of education, 20-29 year-olds, Britain and France.

Britain

	Men						Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group												
Lower	209, 277	29.23 (23.91-35.18)	1.00	.	1.00	.	260, 492	31.08 (26.85-35.65)	1.00	.	1.00	.
Middle	669, 818	25.48 (22.40-28.83)	0.83 (0.60- 1.13)	0.240	0.66 (0.49- 0.89)	0.006	666, 1202	25.83 (23.28-28.55)	0.77 (0.60- 0.99)	0.040	0.65 (0.51- 0.83)	0.001
Higher	336, 392	16.40 (12.79-20.77)	0.47 (0.32- 0.71)	<0.001	0.29 (0.21- 0.41)	<0.001	292, 494	18.89 (15.50-22.83)	0.52 (0.38- 0.70)	<0.001	0.34 (0.26- 0.44)	<0.001
Not answered	115, 154	36.53 (28.64-45.22)	1.39 (0.89- 2.18)	0.147	0.63 (0.46- 0.85)	0.003	123, 256	30.03 (24.44-36.29)	0.95 (0.67- 1.35)	0.781	0.61 (0.49- 0.77)	<0.001
Educational level												
No post-16	435, 583	38.38 (34.12-42.83)	1.00	.	1.00	.	487, 1023	37.95 (34.68-41.34)	1.00	.	1.00	.
Post-16	332, 451	28.37 (24.07-33.11)	0.64 (0.48- 0.85)	0.002	0.66 (0.49- 0.89)	0.006	322, 593	27.95 (24.36-31.85)	0.63 (0.50- 0.80)	<0.001	0.65 (0.51- 0.83)	0.001
Some tertiary	553, 616	14.02 (11.24-17.36)	0.26 (0.19- 0.35)	<0.001	0.29 (0.21- 0.41)	<0.001	531, 849	16.10 (13.54-19.03)	0.31 (0.25- 0.40)	<0.001	0.34 (0.26- 0.44)	<0.001

France

	Men						Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group												
Lower	154, 148	26.77 (19.29-35.87)	1.00	.	1.00	.	248, 230	14.89 (10.30-21.05)	1.00	.	1.00	.
Middle	394, 464	23.74 (19.22-28.95)	0.85 (0.51- 1.41)	0.531	1.08 (0.62- 1.86)	0.791	560, 607	14.46 (11.61-17.87)	0.97 (0.59- 1.58)	0.892	1.11 (0.67- 1.84)	0.679
Higher	196, 257	20.13 (15.03-26.44)	0.69 (0.40- 1.20)	0.188	1.32 (0.69- 2.51)	0.397	321, 344	12.50 (9.19-16.77)	0.82 (0.47- 1.41)	0.465	1.31 (0.74- 2.33)	0.354
Not answered	78, 80	33.53 (23.26-45.64)	1.38 (0.71- 2.68)	0.342	1.15 (0.56- 2.34)	0.707	143, 120	17.61 (11.20-26.60)	1.22 (0.62- 2.40)	0.561	0.78 (0.38- 1.57)	0.480
Educational level												
No post-16	345, 284	35.33 (29.14-42.04)	1.00	.	1.00	.	381, 281	22.95 (18.03-28.74)	1.00	.	1.00	.
Post-16	163, 199	19.04 (13.91-25.51)	0.43 (0.27- 0.69)	<0.001	0.44 (0.27- 0.71)	0.001	245, 256	13.96 (10.02-19.12)	0.54 (0.34- 0.88)	0.014	0.57 (0.34- 0.94)	0.027
Some tertiary	313, 465	15.13 (11.79-19.20)	0.33 (0.22- 0.49)	<0.001	0.32 (0.20- 0.51)	<0.001	642, 762	9.56 (7.62-11.92)	0.35 (0.24- 0.52)	<0.001	0.34 (0.22- 0.51)	<0.001

Notes: n=unweighted denominator, N=weighted denominator. cOR=crude odds ratio; aOR=adjusted odds ratio. aOR adjusted for all variables in model and family structure at age 14/15.

Table D.5: Prevalence and odds of reporting no contraceptive use at first sex by parent socioeconomic group and individual level of education, 17-29 year-olds, Britain and France.

Britain

	Men						Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group												
Lower	177, 241	16.86 (12.18-22.85)	1.00	.	1.00	.	234, 451	16.56 (13.17-20.61)	1.00	.	1.00	.
Middle	588, 730	13.59 (10.99-16.70)	0.78 (0.50- 1.20)	0.257	0.51 (0.32- 0.80)	0.004	609, 1125	9.74 (8.03-11.77)	0.54 (0.39- 0.76)	<0.001	0.67 (0.47- 0.96)	0.028
Higher	300, 353	10.42 (7.34-14.58)	0.57 (0.34- 0.97)	0.038	0.36 (0.23- 0.57)	<0.001	262, 444	10.76 (7.81-14.64)	0.61 (0.39- 0.95)	0.028	0.61 (0.42- 0.88)	0.008
Not answered	102, 137	15.58 (9.75-23.97)	0.91 (0.48- 1.74)	0.777	0.99 (0.90- 1.10)	0.889	109, 233	21.79 (16.66-27.97)	1.40 (0.92- 2.13)	0.112	1.04 (0.97- 1.11)	0.326
Educational level												
No post-16	396, 530	21.33 (17.37-25.90)	1.00	.	1.00	.	452, 960	15.82 (13.49-18.47)	1.00	.	1.00	.
Post-16	304, 415	11.12 (8.10-15.08)	0.46 (0.30- 0.71)	<0.001	0.51 (0.32- 0.80)	0.004	301, 561	10.96 (8.56-13.93)	0.65 (0.47- 0.91)	0.011	0.67 (0.47- 0.96)	0.028
Some tertiary	466, 527	8.33 (6.06-11.34)	0.34 (0.22- 0.51)	<0.001	0.36 (0.23- 0.57)	<0.001	466, 758	9.41 (7.07-12.43)	0.55 (0.39- 0.79)	0.001	0.61 (0.42- 0.88)	0.008

France

	Men						Women					
	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value	n, N	%(95% CI)	cOR(95%CI)	P-value	aOR and 95% CI	P-value
Parent's socioeconomic group												
Lower	130, 129	14.07 (5.88-30.01)	1.00	.	1.00	.	224, 210	20.25 (13.37-29.46)	1.00	.	1.00	.
Middle	360, 418	6.94 (4.14-11.41)	0.46 (0.15- 1.38)	0.164	0.55 (0.19- 1.59)	0.267	514, 562	5.79 (3.76- 8.82)	0.24 (0.12- 0.47)	<0.001	0.33 (0.17- 0.63)	0.001
Higher	180, 232	1.57 (0.64- 3.83)	0.10 (0.03- 0.37)	0.001	0.18 (0.05- 0.66)	0.009	290, 317	5.66 (3.45- 9.14)	0.24 (0.12- 0.48)	<0.001	0.42 (0.20- 0.89)	0.023
Not answered	73, 74	14.54 (7.56-26.13)	1.04 (0.31- 3.48)	0.950	0.99 (0.31- 3.13)	0.989	133, 111	15.77 (9.67-24.67)	0.74 (0.35- 1.56)	0.425	0.57 (0.26- 1.28)	0.176
Educational level												
No post-16	313, 263	13.69 (8.48-21.35)	1.00	.	1.00	.	347, 255	17.74 (12.53-24.52)	1.00	.	1.00	.
Post-16	154, 184	4.05 (1.99- 8.08)	0.27 (0.11- 0.66)	0.004	0.34 (0.14- 0.84)	0.020	221, 233	8.01 (4.63-13.50)	0.40 (0.20- 0.82)	0.013	0.44 (0.21- 0.91)	0.028
Some tertiary	276, 406	2.77 (1.51- 5.04)	0.18 (0.08- 0.41)	<0.001	0.30 (0.13- 0.72)	0.007	590, 710	5.64 (3.90- 8.11)	0.28 (0.16- 0.49)	<0.001	0.32 (0.17- 0.62)	0.001

Notes: n=unweighted denominator, N=weighted denominator. Denominator restricted to respondents who had ever had sex. aOR adjusted for all variables in model, family structure at age 14/15 and age at first sex. cOR=crude odds ratio; aOR=adjusted odds ratio. aOR adjusted for all variables in model and family structure at age 14/15.

Table D.6: Prevalence and odds of reporting a conception before age 20 by parent socioeconomic group and individual level of education, 20-29 year-olds, Britain and France.

	Britain					
	n, N	**%(95% CI)**	**cOR(95%CI)**	**P-value**	**aOR and 95% CI**	**P-value**
Parent's socioeconomic group						
Lower	222, 428	36.83 (32.17-41.75)	1.00	.	1.00	.
Middle	536, 1000	21.36 (18.83-24.13)	0.53 (0.41- 0.69)	<0.001	0.41 (0.31- 0.55)	<0.001
Higher	226, 380	11.38 (8.65-14.82)	0.31 (0.22- 0.43)	<0.001	0.17 (0.12- 0.23)	<0.001
Not answered	106, 207	37.50 (30.52-45.04)	1.31 (0.93- 1.86)	0.127	0.68 (0.62- 0.74)	<0.001
Educational level						
No post-16	439, 887	41.36 (38.02-44.79)	1.00	.	1.00	.
Post-16	250, 484	23.14 (19.45-27.30)	0.35 (0.27- 0.45)	<0.001	0.41 (0.31- 0.55)	<0.001
Some tertiary	417, 676	8.89 (6.93-11.34)	0.12 (0.08- 0.16)	<0.001	0.17 (0.12- 0.23)	<0.001

	France					
	n, N	**%(95% CI)**	**cOR(95%CI)**	**P-value**	**aOR and 95% CI**	**P-value**
Parent's socioeconomic group						
Lower	196, 188	21.67 (15.24-29.85)	1.00	.	1.00	.
Middle	485, 530	13.01 (9.84-17.03)	0.54 (0.32- 0.92)	0.024	0.62 (0.35- 1.11)	0.105
Higher	269, 297	6.65 (3.66-11.78)	0.26 (0.12- 0.55)	<0.001	0.82 (0.34- 1.98)	0.658
Not answered	129, 108	33.61 (24.28-44.42)	1.83 (0.98- 3.43)	0.059	0.93 (0.45- 1.89)	0.833
Educational level						
No post-16	330, 249	38.03 (31.51-45.01)	1.00	.	1.00	.
Post-16	211, 224	11.54 (7.63-17.07)	0.21 (0.12- 0.36)	<0.001	0.24 (0.14- 0.42)	<0.001
Some tertiary	535, 648	2.89 (1.81- 4.58)	0.05 (0.03- 0.08)	<0.001	0.06 (0.03- 0.12)	<0.001

Notes: n=unweighted denominator, N=weighted denominator. Denominator restricted to women sexually experienced by age 20. cOR=crude odds ratio; aOR=adjusted odds ratio. aOR adjusted for all variables in model, family structure at age 14/15 and age at first sex.

Table D.7: Prevalence and odds of reporting an abortion before age 20, among women who conceived before age 20, by parent socioeconomic group and individual level of education, 20-29 year-olds, Britain and France.

	Britain				
	n, N	**%(95% CI)**	**cOR(95%CI)**	**P-value**	**aOR and 95% CI**	**P-value**
Parent's socioeconomic group						
Lower	80, 176	31.85 (24.61-40.09)	1.00	.	1.00	.
Middle	122, 269	33.44 (27.27-40.24)	1.08 (0.69- 1.68)	0.750	2.40 (1.48- 3.88)	<0.001
Higher	33, 69	51.10 (38.23-63.84)	2.24 (1.21- 4.15)	0.011	6.32 (3.21- 12.41)	<0.001
Not answered	44, 104	16.88 (9.67-27.83)	0.43 (0.21- 0.91)	0.027	0.87 (0.74- 1.02)	0.083
Educational level						
No post-16	196, 457	23.44 (19.51-27.89)	1.00	.	1.00	.
Post-16	63, 131	40.50 (31.00-50.78)	2.22 (1.39- 3.55)	0.001	2.40 (1.48- 3.88)	<0.001
Some tertiary	35, 67	68.88 (55.78-79.52)	7.23 (3.93- 13.28)	<0.001	6.32 (3.21- 12.41)	<0.001

	France				
	n, N	**%(95% CI)**	**cOR(95%CI)**	**P-value**	**aOR and 95% CI**	**P-value**
Parent's socioeconomic group						
Lower	43, 33	16.90 (7.21-34.71)	1.00	.	1.00	.
Middle	63, 53	15.79 (8.05-28.65)	0.92 (0.27- 3.14)	0.897	0.77 (0.23- 2.63)	0.677
Higher	18, 16	17.81 (4.83-48.06)	1.07 (0.19- 6.08)	0.943	0.98 (0.13- 7.17)	0.984
Not answered	45, 34	23.91 (11.48-43.21)	1.55 (0.42- 5.71)	0.514	1.23 (0.32- 4.72)	0.760
Educational level						
No post-16	127, 88	17.63 (10.74-27.58)	1.00	.	1.00	.
Post-16	24, 25	13.33 (3.65-38.42)	0.72 (0.16- 3.27)	0.669	0.81 (0.14- 4.65)	0.815
Some tertiary	16, 22	25.69 (11.23-48.59)	1.62 (0.51- 5.15)	0.417	2.00 (0.57- 7.05)	0.281

Notes: n=unweighted denominator, N=weighted denominator. Denominator restricted to women reporting a conception before age 20. cOR=crude odds ratio; aOR=adjusted odds ratio. aOR adjusted for all variables in model, family structure at age 14/15 and age at first sex.

APPENDIX E SUPPLEMENTARY MATERIAL FOR CHAPTER 10

Table E.1: Stratum specific conception rates among 15-19s in Britain and France (2009)

	Conception rate per 1,000	
Strata of disadvantage	**England and Wales**	**France**
1 - Least disadvantaged	45	19
2	45	20
3	49	20
4	50	24
5	53	23
6	56	20
7	57	19
8	62	26
9	69	25
10 - Most disadvantaged	74	24
Total	55	22

APPENDIX F CHANGES IN CONCEPTIONS IN WOMEN YOUNGER THAN 18 YEARS AND THE CIRCUMSTANCES OF YOUNG MOTHERS IN ENGLAND IN 2000-2012: AN OBSERVATIONAL STUDY

This article was published in The Lancet in 2016. The aim of this paper is to examine changes in conceptions to women aged under-18 and the circumstances of young mothers in England in the years since the implementation of the Teenage Pregnancy Strategy in order to comment on the impact of the strategy. My role in this paper was in preparing the survey data for the individual level analyses. I constructed the main outcome variable for the analysis (conception before age 18), which required defining the population eligible to experience the outcome, deciding on the boundaries of the outcome that were possible with the data available, and coding the variable from multiple others. For presentation in the thesis, the labels of the tables and figures in the paper have been modified. The reference list has not, and is presented at the end of the Chapter.

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My role was in the preparation of the data for analysis, namely the construction of the main outcome variable. All authors interpreted data, reviewed successive drafts, and approved the final version of the article.

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Abstract

Context

In 2000, a 10-year Teenage Pregnancy Strategy (TPS) was launched in England to reduce under-18 conceptions and social exclusion among young parents. We use routinely collected data and data from Britain's National Surveys of Sexual Attitudes and Lifestyles (Natsal), to examine progress towards these goals.

Analyses

Random effects meta-regression was used to analyse the change in conception rates from 1994-8 to 2009-13 by Top-Tier Local Authority, in relation to *per capita* TPS-related expenditure, socio-economic deprivation and region. Data from comparable probability sample surveys: Natsal-1 (1990-91), Natsal-2 (1999-2001) and Natsal-3 (2010-2012) were used to assess the prevalence of risk factors and their association with under-18 conception among women aged 18-24; and the prevalence of current participation in education, work and training among young mothers.

Results

Under-18 conception rates declined steadily from their peak in 1996-1998 and more rapidly from 2007 onwards. More deprived areas and those receiving greater TPS-related investment had higher rates in 1994-8 and experienced greater declines to 2009-13. The association between under-18 conception and lower socio-economic status weakened slightly between Natsal 2 and 3. The prevalence of participation in education, work or training among young women with a child conceived before age 18 was low, but the odds of them doing so doubled between Natsal 2 and 3 (p=0.027).

Conclusion

A sustained, multi-faceted policy intervention, involving health and education agencies, alongside other social and educational changes, has likely contributed to a substantial and accelerating decline in under-18 conceptions in England since the late 1990s.

Introduction

At the end of the 20th century, concern for high rates of teenage conception in the UK compared with other Western European countries, together with the strong association between early parenthood and deprivation, provided the impetus to public health efforts to prevent teenage pregnancy. In 1999, the UK government launched a 10 year, nation-wide Teenage Pregnancy Strategy (TPS) in England with the dual aims of achieving a 50% reduction in under-18 conception rates by 2010, and mitigating social exclusion among teenage parents by increasing their participation in education, employment or training.[1]A strong rationale for the Strategy was the desire to halt the cycle of deprivation resulting from the increment of disadvantage conferred by early pregnancy additional to that experienced before conception.[2][3][4][5]

The TPS gave rise to a multi-component programme comprising a national media campaign, improvements to sex education and young people's sexual health services, support for young parents to increase participation in education, training and employment, and joint action to ensure national and local co-ordination across statutory and voluntary agencies.[6] Financial resources were allocated according to teenage pregnancy rates at area level. Because of the concentration of high rates of teenage pregnancy in poorer areas of the country, financial resources were disproportionately invested in the more deprived areas of England. Scotland, Wales and Northern Ireland decided their initiatives independently.

Under-18 conception rates fell by 51% between 1998 and 2014 in England. Of interest is the extent to which the decline appears to be related to TPS and other interventions; whether it has been seen equally amongst the most and least disadvantaged and what factors remain associated with under-18 conception. We combine analyses of routinely available area-level data on conceptions, deprivation, and policy–related expenditure, and individual-level data from three decennial waves of the National Survey of Sexual Attitudes and Lifestyles to describe change in outcomes relating to key goals of the English Teenage Pregnancy Strategy - that is,

under 18-conception rates and the prevalence of participation in education, work and training among women with a child conceived before age 18.

Methods

The study entailed (i) analysis of routine data on births and abortions for Top-Tier Local Authorities (TTLAs) in England, 1992 to 2013, together with (ii) analysis of individual level data from three waves of the National Survey of Sexual Attitudes and Lifestyles, 1990-1 (Natsal-1), 1999-2001 (Natsal-2), and 2010-12 (Natsal-3).

Routinely collected data

We obtained data by calendar year on (i) the resident population and (ii) births and abortions by age of mother from the Office for National Statistics (ONS) for each of the top-tier local authorities (TTLA) in England.[4] Due to their small resident populations, two authorities (City of London and the Scilly Isles) were combined with more populous neighbouring authorities (Hackney and Cornwall, respectively), resulting in a total of 148 local authorities for analysis.

We also obtained data from the Department for Communities and Local Government at the TTLA-level for the 2004 Index of Multiple Deprivation (IMD), a score of socio-economic deprivation based on a weighted average of 38 separate indicators across seven distinct domains (Employment, Health and Disability, Education Skills and Training, Barriers to Housing and Other Services, Crime, and Living Environment).[7]

As an indicator of the extent of TPS-related local activity, we obtained from the Department for Children, Schools and Families the TPS annual Local Implementation Grant (LIG) award to each TTLA for the financial year(s) 1999/00 to 2010/11, the amount reflecting the challenge in terms of under-18 conception rates and the size of the population. From these data we calculated the

[4]Top-tier local authorities consist of London boroughs, metropolitan borough councils, and unitary authorities, and are a level of local government with responsibilities including education and social services.

total *per capita* investment by dividing it by the 2001 ONS estimate of resident women aged 13-17.

Natsal data

The National Surveys of Sexual Attitudes and Lifestyles ('Natsal') are probability sample surveys of British residents of whom 18,876 aged 16-59 were interviewed between May 1990 and November 1991 (Natsal-1), 11,161 aged 16-44 were interviewed between May 1999 and February 2001 (Natsal-2), and 15,162 aged 16-74 years between September 2010 and August 2012 (Natsal-3). Participants resident in London were oversampled in Natsal-2, and those aged 16-34 years were oversampled in Natsal-3. The unadjusted response rate in Natsal 1 was 64.7%, and the co-operation rate (of eligible addresses contacted) was 71.5%. The unadjusted response rate for Natsal-2 was 63.1% and the adjusted rate, taking account of over-sampling in London, was 65.4%. The response rate for Natsal-3 was 57.7% and the co-operation rate was 65.8%. In Natsal-l, paper questionnaires were self- completed and interviewer administered. In Natsals 2 and 3, participants were interviewed using a combination of computer-assisted personal, (CAPI) and computer-assisted self interviews (CASI). Experimental comparison of pencil-and-paper and computer-assisted interviewing revealed no important differences in responses.[8] For all three surveys, after correcting for unequal selection probabilities, a non-response post-stratification weight was applied to ensure comparability with Census data in terms of region. Further details of the methods and response calculations are described elsewhere.[9][10]

Variables used in the analyses presented in this paper were selected on the basis of pre-existing evidence of their association with early conception.[2[3][4][5] They include: age at first heterosexual intercourse and, at the time of first sex: use of a reliable method of contraception at first sex; consensuality in terms of being equally or more willing than the partner at the time; autonomy of decision making, that is, not influenced by peer pressure or use of drugs or alcohol; and retrospective views on the timing of first sex, that is, whether it occurred sooner or later than ideal, or at the right time. These four variables were used to create a combined variable

termed sexual competence, as an alternative to chronological age in assessing the timing of first sex, as described in previous reports.[11 We also included source of information about sexual matters at the start of sexual activity, adequacy of that information, and ease of communication with parents about sex. Demographic measures included age at interview, family structure (whether the participant lived with both parents to age 16 (Natsal 2)/14 (Natsal-3), educational attainment, and area-level deprivation using the Index of Multiple Deprivation (IMD).[12] Full post-code data for use in estimating IMD were not available for Natsal-1.

Natsals-1 and 2 asked about the number and timing of all abortions and live births experienced; Natsal-3 asked, in relation to all pregnancies experienced, the timing and outcome of each. We calculated under-18 conceptions among 18 to 24 year old women by summing births occurring before age 18 years nine months and abortions occurring before age 18, excluding miscarriages and still births, for consistency with Office of National Statistics procedures. We assessed change in the prevalence of current participation in any of education, work or training among young mothers.

Statistical analysis

Analyses using routinely collected data included:

i) tabulation and graphical representation of trends in under-18 conception rates by quartiles of *per capita* total Local Implementation Grant investment and quartiles of area-level deprivation (IMD);

ii) random effects meta regression analyses of the change in under-18 conception rates between 1994-1998 (the pre-intervention 'baseline') and 2009-2013 (the most recently available ONS data) based on aggregate TTLA level data. Because of variability in how each TTLA spent their grant a random effects meta-regression was used. Absolute and percentage changes between these time points were analysed as outcomes separately and data from each TTLA were weighted by the inverse of the variance of the outcome estimate.The explanatory factors

considered were *per capita* TPS investment, region and deprivation (2004 IMD scores). For the two continuous covariates (TPS investment and IMD score) the linearity of their relationship with the outcome variable was assessed by also including quadratic terms in the regression model.

Analyses using Natsal data included:

(i) Logistic regression to examine factors associated with under-18 conception, separately in 1999-2001 and 2010-2012, among women aged 18-24 years, with and without adjustment for the effect of all variables except age at first intercourse. Logistic regression of interaction terms was also used to assess whether associations between factors and under-18 conception had changed between 1999-2001 and 2010-2001.

(ii) Bi-variate tabulations and logistic regression to examine the prevalence in 1990-91, 1999-2001 and 2010-12 of participation in work, education or training among women aged 18-24 years, according to whether or not they had a child conceived before age 18. Logistic regression of interaction terms was used to assess whether the association between early motherhood and participation changed over time.

All analyses were done using Stata 12.1 (version 13; StataCorp LP, College Station, Texas) accounting for stratification, clustering, and weighting of the Natsal data.

Ethics statement

Ethical approval for Natsal-2 was obtained from University College Hospital, North Thames Multicentre, and all local research ethics committees in Britain, and for Natsal-3 from the Oxford Research Ethics Committee A.

Results

Trends in under-18 conception rates, area-related deprivation and Teenage Pregnancy Strategy-related expenditure

Routinely collected national data on under-18 conceptions show a steady decline from their peak in 1998, with an apparent acceleration in that decline from 2007 onwards (Figure F.1). The trend was initially driven by the decline in maternities, until 2007 when the plotlines for abortions and births converged.

Figure F.1: Under-18 conception, maternity, and abortion rates and events of possible relevance to trends: 1994 - 2013 (per 100 women aged 15-17)

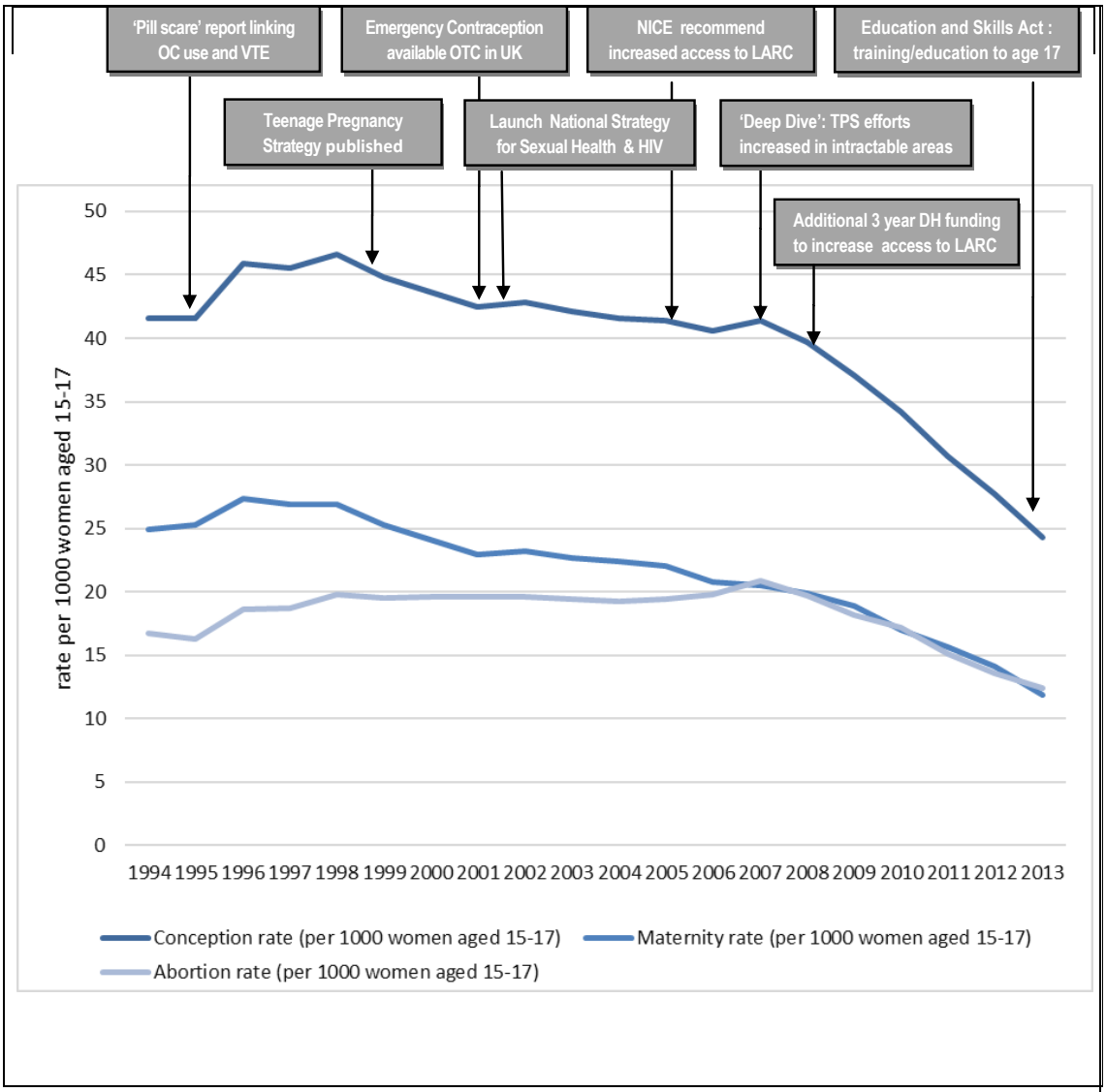

Figure F.2 shows annual rates of under-18 conception for the period 1994-2013 by quartile of area-related deprivation. A decline in under-18 conception is observed across all deprivation levels but is larger in the most deprived areas. Between 1998 and 2013, for example, the under-18 conception rate declined by 16 conceptions per 1000 women aged 15-17 in the least deprived areas, compared with 33 conceptions per 1000 women aged 15-17 living in the most deprived areas. This differential decline has resulted in a partial convergence in under-18 conception rates across the quartiles of deprivation.

Figure F.2: Trend in under-18 conceptions by quartile of Index of Multiple Deprivation quartile (1994-2013)

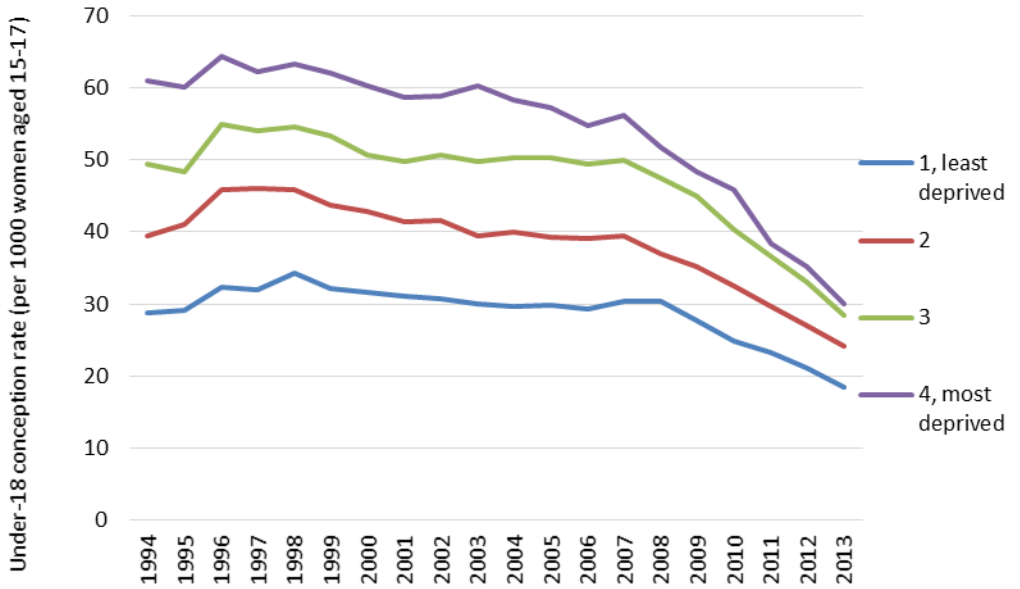

Figure F.3: Trend in under-18 conceptions by quartile of LIG for TPS (1994-2013)

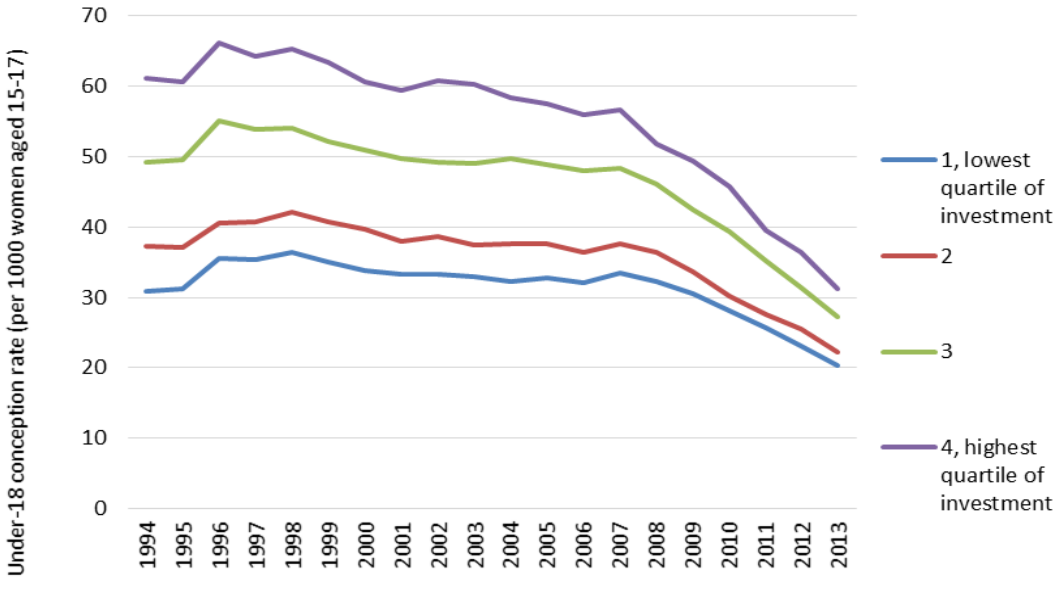

Figure F.3 shows the annual data for the same period by quartile of Strategy-related expenditure at local level, that is, per capita total Local Implementation Grant (LIG) investment. There is a pattern of partial gradual convergence in under-18 conception rates across LIG quartiles, with the greatest decline in areas receiving the highest LIG award. Between 1998 and 2013, areas receiving the highest level of LIG award experienced a decline of 34 conceptions per 1000 women aged 15-17, while in areas receiving the lowest level the decline was 16 conceptions per 1000 women aged 15-17.

Table F.1: Meta-regression analysis of the association between per capita total TPS funding and absolute and percentage change in the under-18 conception rate between 1994/98 and 2009/13.

	Absolute change in U18 conception rate per £100/girl LIG spend (95% confidence interval)	**p-value**	**Percentage change in U18 conception rate per £100/girl LIG spend (95% confidence interval)**	**p-value**
Unadjusted	-11.4 (-13.2, -9.6)	<0.0001	-8.6% (-11.9, -5.4)	<0.0001
Adjusted for:				
Region	-11.5 (-13.5, -9.5)	<0.0001	-8.3% (-11.4, -5.1)	<0.0001
Region, deprivation	-8.2 (-10.5, -5.8)	<0.0001	-6.2% (-10.2, -2.3)	0.002

Table F.1 presents the results of the regression analyses assessing the association between TPS spend and decline in under-18 conception rates, in both absolute and relative terms. In absolute terms, for every £100 per capita TPS spend, there was an estimated reduction in the conception rate of 11.4 per 1000 women aged 15-17 ($p<0.001$). After adjustment for socio-economic deprivation and region, this trend retained statistical significance, with a reduction of 8.2 conceptions (per 1000 women aged 15-17) per £100 per capita TPS spend ($p<0.001$). This trend was also reflected when modelling the percentage change in under-18 conception rates as the outcome; for every £100 per capita TPS spend, there was a 6.2% reduction in the under-18 conception rate, when adjusting for region and deprivation. Testing of quadratic terms indicated associations with per capita TPS spend (and IMD score) were approximately linear over the range of values considered for both absolute and percentage change, although the two models are not strictly compatible. The value of I-squared for both meta regression analyses was almost 100% because the outcome estimates from the TTLAs are all very precise as they are based on

rates from tens of thousands of person years, and hence the variability seen is interpreted as variability in the underlying change across TTLAs.

Factors associated with under-18 conception

Table F.2 (at the end of this paper) shows the prevalence and odds ratios of under-18 conception by selected characteristics of women aged 18-24 in 1999-2001 (Natsal-2) and 2010-2012 (Natsal-3). Comparisons between the two surveys must be cautiously made because of minor but possibly important differences in question formulation. However, with this proviso and within the limits of precision of the estimates for the 18-24 age-group, the results for the two survey waves are broadly similar with regard to the prevalence of behaviours likely to be proximally and causally associated with under-18 conception. The proportion with only minimum academic qualifications or none was, however, appreciably lower in 2010-12 (Natsal-3) compared with 1999-2001(Natsal-2), as was the proportion reporting their main source of sex education as other than school lessons. There was a more modest increase between the two time-points in the proportion reporting use of reliable contraception at first intercourse.

In terms of their relationship with under-18 conception: lower socio-economic status, lower educational attainment, earlier onset of sexual activity, receiving sex education from other than school sources and, more weakly, negative opinion about the timing of first intercourse, were associated with under-18 conception in both surveys. Interaction testing revealed little clear evidence of change in the association with under-18 conception between surveys for any of the factors considered. (all p-values were greater than 0.05 and are not shown). However, the association between living in an area in the highest quintile of deprivation and under-18 conception was somewhat weaker in Natsal-3 than in Natsal-2, (Natsal-2 1999-2001: Adjusted Odds Ratio (AOR): 5.18(1.91-14.05); Natsal-3 2010-2012: AOR: 2.89 (1.25-6.67). A similar finding was seen for educational level. Having minimum or no academic qualifications was strongly associated with under-18 conception in both surveys, but the adjusted odds ratio was somewhat lower in Natsal-3 than in Natsal-2 (Natsal-2 1999-2001:AOR: 5.61(2.97-10.62); Natsal-3 2010-

2012: AOR: 3.61 (2.29-5.67). The weaker association between use of reliable contraception at first intercourse and under-18 conception was further attenuated between Natsals 2 and 3.

Circumstances of women with a child conceived before age 18

Table F.3 (presented at the end of this paper) shows results from Natsals 1, 2 and 3 relating to the current participation of women aged 18 to 24 according to whether or not they had conceived a child before age 18 (were 'young mothers'). Estimates should be treated with caution because of the comparatively small survey sub-samples in the 18-24 age group. The results for all three surveys show the proportion of women in education, work, or training at the time of interview to be higher by a considerable order of magnitude among those who did not conceive a child before 18, compared with those who did. However, while the likelihood of participation among women who were not young mothers was unchanged across the three surveys, among the young mothers it remained constant between Natsal-1 and Natsal-2, but doubled between Natsals 2 and 3. Consequently the association between young motherhood and participation weakened substantially between Natsal-2 and Natsal-3.

Discussion

Summary

These data, from repeated national surveys and routinely collected statistics, document changes in England in the early 21st century, in the prevalence and correlates of under-18 conception, and in the circumstances of women who enter motherhood at an early age. A marked decline in under18 conceptions has occurred and has been greater in areas of greater deprivation and also in areas of higher TPS investment. The steep deprivation gradient previously associated with under-18 conception has been partially attenuated. Similarly, the association between conception before age 18 and lower educational level remains significant but has weakened over the period. Young people increasingly learn about sexual matters mainly from school lessons, and the association between conceiving before age 18 and receiving sex education from

other sources remains strong. The prevalence of participation in education, work and training among women with a child conceived before age 18, although low, increased between 1999-2001 and 2010-2012, a trend not seen among other, same-aged women.

Reductions in rates of teenage pregnancy, that is those occurring before age 20, have been seen in other high income countries[13] indicating a broader secular trend. Fewer comparative data exist specifically on under-18 pregnancies, and hardly any include abortion data, However, data on the under-18 birthrate in the European Union between 2004 and 2014 show a decline from 13.6 to 6.0 per 1,000 women aged 15-17 in the UK, compared with the average of 7.7 to 6.0 for all 28 countries.[14] Moreover, the weakening of the association between under-18 conception and deprivation in our study reverses the previous trend. In the 1980s and 1990s, teenage pregnancy rates increased among women living in the most deprived areas but remained unchanged or decreased among those in more affluent areas.[15[16] The increase in economic participation of teenage mothers seen in our data after 2000, is also a reversal of a previous trend. In 2005 we reported data from Natsals1 and 2 [17] which showed a widening gap at the end of the 20th century in the life chances and material prosperity of women who became mothers at an early age and those who did not. The recent improvement has occurred despite the less favourable economic climate in the post-2008 recession period, when the disparity between rich and poor increased.

The decline in teenage pregnancy rates has been differentially attributed to distal factors such as increased educational attainment and to more proximal factors such as improved use of contraception. Researchers finding a strong association between falling teenage pregnancy rates and increasing use of long-acting reversible contraception (LARC) in England since the late 1990s have underlined the contribution of increased access to reliable contraception to the decline.[18] Observers in the USA have reached similar conclusions[19] supported by intervention studies examining the impact of providing highly effective contraception free of charge.[20] In contrast, researchers using ecological analyses of routinely collected area-level

data in England to examine the relationship between educational attainment, contraceptive use and trends in under-18 conception concluded that the larger association with education indicates that this is the key driver.[21] Interpreting the associations between educational level, effective contraception and early pregnancy is difficult because of the likelihood of reverse causality. Low educational attainment is both cause and consequence of teenage pregnancy. The effect of use of highly reliable contraception in reducing early conception rates may be masked in research by the tendency for women who experience early pregnancy to subsequently use more reliable methods. Our findings suggest that contraceptive use and educational attainment each wield an independent influence on the likelihood under-18 conception. Because Natsal asks about contraception in the last year and ever, we are unable to measure use at the time of conception, and so reliable method use at first intercourse has been used as a proxy indicator in these analyses. However, unpublished Natsal data shows a two-fold increase in use of LARC methods by sexually active 16-17 year olds between Natsals 2 and 3.

It is plausible that both increases in educational attainment and in use of highly effective contraception have contributed to the falling teenage pregnancy rate. Educational aspirations provide the motivation, contraception the means, by which to avert early pregnancy. Both are clearly both policy related. Other studies have shown that multiple interventions (combining educational and behavioural interventions) lower the rate of teenage pregnancy[22] and highlight the importance of education in planning policies with this as their aim.[23] This was reflected in the decision by the English government to locate the Unit responsible for the TPS jointly in two government ministries, the Department of Education and the Department of Health and to make joint working between education and health agencies a key component of the Strategy.

Strengths and weaknesses

A strength of this study lies in the combination of individual level and area level data, and in our capacity to demonstrate independent associations between under-18 conception rates and

possibly influential variables. It should be noted however that slight changes in question wording between the surveys, may have influenced responses relating to experience of pregnancy in Natsals 2 and 3. In particular, we should note that abortions were slightly under-reported in Natsal 3 compared with the official UK figure in 2011.[24]

Compared with experimental approaches, observational studies have limitations in assessing the relative impact of policy-related intervention and secular trends on health outcomes. Specifically in this case, TPS funding was determined by the pre-intervention conception rate. This creates challenges in disentangling the effect of TPS funding from the effects of the pre-intervention rate on the subsequent conception rate, including the potential for regression to the mean. Our finding of an association between the decline in under-18 conception rates and TPS resourcing is certainly suggestive that government-linked efforts have contributed towards lowering under-18 conception rates but should not be seen as conclusive.

Individual level-data have also enabled us to show, where analyses of area-related data have not,[25] the progress that has been made in reducing the previously strong link between deprivation and early conception. The comparatively greater decline in the under-18 conception rate in the most deprived areas is worthy of note. Whilst it may legitimately be argued that the potential for decline was greater where baseline conception rates were higher, these were often areas in which complex and multiple social and health problems competed for public health efforts and resources.

Implications for policy and practice

Progress has been made towards halting the cycle of poverty and income inequality long associated with early pregnancy, and in improving the lot of young mothers. Despite this success, England's teenage pregnancy remains high by comparison with other high income countries [26] and there is more to be achieved. Some have suggested, since improvements in use of effective contraception appears to have contributed to the decrease in rates, that the policy emphasis should be placed where it has been successful in the past. Higher contraception

discontinuation rates among young people [27] favour their use of LARC and additional progress could be made by accelerating the rate at which they are used after onset of sexual activity. Despite the increase in use of these methods, they are used by barely one in six young women in their teens. The strong and sustained association between under-18 conception and earlier sexual activity suggests that sizeable additional gains might also be made by helping young women to become sexually active at a time that is right for them. [28] A third of all young women, and 60% of those for whom first sex occurs before age 16 subsequently consider that to have been too early for them. Bringing actual timing of occurrence in line with preference for timing could cut teenage pregnancy rates further, and an intensified policy focus aimed at achieving this may be warranted.

The data also underline the importance of continued efforts to prevent teenage pregnancy. The decrease in under-18 conception rates was more significant in the latter half of the decade and before then there was scope for detractors to dismiss it as a failure.[29] Our interim paper on the evaluation of the Teenage Pregnancy Strategy in 2006 showed modest falls in the first four years of the Strategy, albeit more marked in poorer areas of the country [30] in which government investment had been greatest. From 2007, however, pregnancy rates began to decrease more steeply and the downward trend continued after the Strategy was mainstreamed in 2010. The acceleration is partly explained by the likelihood that Strategy-related intervention took time to be implemented. It is also likely to reflect the renewed efforts mounted in 2006 to mobilise additional resources and to persuade senior stakeholders to prioritise the issue in areas in which multiple socio-economic problems were impeding progress, which is coincidental with a steeper decline in under-18 conception rates in these areas in the latter years of the Strategy. A further contributing factor is the synergy between Strategy-related initiatives and other therapeutic and policy-related intervention – the availability of emergency contraception without prescription, for example, the recommendation by the National Institute for Clinical Excellence that access to LARC should be increased, and the rise in educational attainment among young people. Taken as a whole, the evidence underlines the importance of long term,

sustained, multi-faceted prevention strategies to tackle the more intractable public health challenges.

Table F.2: Characteristics of women aged 18–24 years in England in Natsal-2 and Natsal-3 and factors associated with conception in women younger than 18 years (continued on next page)

	1999-2001							
					OR for <18 conception			
	Denominators (unweighted, weighted)	%	% <18 conception	95% C.I.	OR	AOR	95% C.I.	P-value
Total <18 conception prevalence	967, 993		13.0%	(10.8-15.6)				
Area level deprivation								0.008
[least deprived]	113, 115	11.5	3.3%	(1.3-8.5)	1	1	-	
2	115, 124	12.5	10.0%	(5.3-18.4)	3.23	3.4	(0.98-11.77)	
3	137, 156	15.7	8.1%	(4.7-13.7)	2.56	2.2	(0.78-6.22)	
4	229, 256	25.8	13.7%	(9.5-19.3)	4.58	3.48	(1.22-9.97)	
[most deprived]	373, 342	34.4	19.1%	(14.7-24.3)	6.82	5.18	(1.91-14.05)	
Quintiles of baseline teenage pregnancy rate								0.387
1, low	176, 203	20.5	11.0%	(7.1-16.6)	1	1	-	
2	190, 188	19.0	12.1%	(7.7-18.7)	1.12	0.79	(0.34-1.80)	
3	211, 211	21.3	15.3%	(10.6-21.5)	1.47	0.83	(0.38-1.80)	
4	216, 252	25.5	13.7%	(8.8-20.7)	1.29	1.04	(0.50-2.18)	
5 high	171, 136	13.8	11.3%	(6.9-18.1)	1.04	0.52	(0.23-1.18)	
Academic qualifications‡								<0.001
Studying for/gained further qualifications	435, 475	49.6	3.6%	(2.1-5.9)	1	1	-	
None, or those typically gained at 16◊	500, 483	50.4	22.9%	(19.1-27.1)	7.99	5.61	(2.97-10.62)	
Heterosexual intercourse before age 16								<0.001
No	693, 713	72.2	6.6%	(4.8-9.0)	1	1	-	
Yes	270, 274	27.8	29.3%	(24.0-35.3)	5.86	3.33	(2.04-5.45)	
Reliable contraception used at first sex^								0.0032
Yes	701, 724	82.3	11.8%	(9.4-14.7)	1	1	-	
No	163, 156	17.7	26.8%	(19.7-35.3)	2.73	2.09	(1.28-3.40)	
Opinion now about timing of first sex								0.079
About the right time/too late	508, 520	59.3	10.0%	(7.4-13.4)	1	1	-	
Too early	353, 357	40.7	21.0%	(16.9-25.9)	2.39	1.6	(0.95-2.70)	
Main reason for first sex*								0.1782
Autonomous reason	713, 723	84.7	14.5%	(11.8-17.5)	1	1	-	
Non-autonomous reason	128, 130	15.3	14.6%	(9.4-22.1)	1.01	0.58	(0.26-1.29)	
Partner more willing at first sex								0.356
No	650, 673	76.7	12.9%	(10.4-15.8)	1	1	-	
Yes	211, 204	23.3	20.0%	(14.7-26.7)	1.7	1.27	(0.76-2.13)	
Main source of sex education								0.2297
School lessons	253, 281	28.8	8.7%	(5.4-13.7)	1	1	-	
Parents	180, 193	19.8	12.6%	(8.4-18.5)	1.51	1.73	(0.75-3.99)	
Other	518, 502	51.4	15.9%	(12.7-19.7)	1.99	1.69	(0.92-3.10)	
Needed more information at first sex								0.1033
No	223, 232	24.2	7.0%	(4.1-11.8)	1	1	-	
Yes	711, 727	75.8	15.4%	(12.7-18.7)	2.43	1.79	(0.89-3.61)	
Communication with parents about sex								0.5468
Easy	328, 349	35.8	11.8%	(8.4-16.4)	1	1	-	
Difficult/Not discussed/Varied	616, 626	64.2	13.1%	(10.3-16.5)	1.12	1.22	(0.64-2.31)	
Lived with both natural parents to age~ 14[i]/16[ii]								0.2437
Yes	683, 714	71.9	10.5%	(8.2-13.4)	1	1	-	
No	284, 279	28.1	19.4%	(15.0-24.6)	2.04	1.31	(0.83-2.08)	

Table F1, continued.

	2010-2012							
					OR for <18 conception			
	Denominators (unweighted, weighted)	% with characteristic	% <18 conception	95% C.I.	OR	AOR	95% C.I.	P-value
Total <18 conception prevalence	1368, 817		10.6%	(9.1-12.4)				
Area level deprivation								0.005
[least deprived]	219, 131	16.0	5.6%	(3.1-9.9)	1	1	-	
2	227, 133	16.2	7.5%	(5.0-11.3)	1.37	1.18	(0.51-2.74)	
3	259, 164	20.1	6.9%	(4.4-10.7)	1.25	1.37	(0.55-3.39)	
4	307, 194	23.7	12.6%	(9.4-16.8)	2.43	2.15	(0.94-4.89)	
[most deprived]	356, 195	23.9	17.3%	(13.5-21.8)	3.51	2.89	(1.25-6.67)	
Quintiles of baseline teenage pregnancy rate								0.318
1, low	249, 154	18.9	8.3%	(5.5-12.4)	1	1	-	
2	252, 139	17.0	13.7%	(10.1-18.4)	1.75	1.16	(0.58-2.31)	
3	242, 134	16.5	10.2%	(6.9-15.0)	1.26	0.72	(0.33-1.60)	
4	304, 185	22.7	10.3%	(7.4-14.1)	1.26	0.66	(0.32-1.36)	
5 high	320, 204	25.0	10.9%	(7.8-15.0)	1.35	0.67	(0.31-1.43)	
Academic qualifications‡								<0.001
Studying for/gained further qualifications	825, 523	66.3	4.6%	(3.4-6.1)	1	1	-	
None, or those typically gained at 16◊	510, 266	33.7	23.0%	(19.4-27.0)	6.24	3.61	(2.29-5.67)	
Heterosexual intercourse before age 16								<0.001
No	884, 564	70.8	5.4%	(4.1-7.0)	1	1	-	
Yes	452, 233	29.2	24.1%	(20.2-28.6)	5.63	3.2	(2.03-5.04)	
Reliable contraception used at first sex^								0.191
Yes	990, 584	87.0	10.8%	(9.0-12.9)	1	1	-	
No	160, 87	13.0	21.8%	(16.2-28.8)	2.3	1.44	(0.83-2.48)	
Opinion now about timing of first sex								0.069
About the right time/too late	726, 439	65.4	9.1%	(7.2-11.4)	1	1	-	
Too early	426, 232	34.6	18.4%	(15.0-22.4)	2.26	1.56	(0.96-2.52)	
Main reason for first sex*								0.732
Autonomous reason	932, 551	83.2	11.4%	(9.5-13.6)	1	1	-	
Non-autonomous reason	205, 111	16.8	17.4%	(12.6-23.6)	1.64	1.09	(0.66-1.81)	
Partner more willing at first sex								0.118
No	970, 564	82.6	12.3%	(10.4-14.6)	1	1	-	
Yes	203, 118	17.4	13.6%	(9.5-19.0)	1.12	0.62	(0.33-1.13)	
Main source of sex education								0.048
School lessons	519, 314	38.5	7.9%	(6.0-10.3)	1	1	-	
Parents	205, 119	14.6	10.7%	(7.3-15.4)	1.4	1.01	(0.48-2.11)	
Other	639, 383	47.0	12.8%	(10.3-15.7)	1.71	1.71	(1.06-2.75)	
Needed more information at first sex								0.394
No	331, 207	27.9	8.3%	(5.9-11.6)	1	1	-	
Yes	930, 535	72.1	12.4%	(10.4-14.7)	1.56	1.25	(0.75-2.10)	
Communication with parents about sex								0.932
Easy	428, 256	32.0	10.1%	(7.6-13.4)	1	1	-	
Difficult/Not discussed/Varied	896, 543	68.0	9.9%	(8.1-12.1)	0.98	0.98	(0.58-1.65)	
Lived with both natural parents to age~ 14[i]/16[ii]								0.009
Yes	826, 527	64.6	6.7%	(5.2-8.6)	1	1	-	
No	541, 289	35.4	17.8%	(14.8-21.3)	3.02	1.72	(1.15-2.57)	

*Notes: Conception before age 18 =live births occurring before age 18 years 9 months and abortions occurring at age 17 and under. Miscarriages excluded due to common misreporting, in common with ONS. Still births excluded for comparability between Natsals 2 and 3. ǂ Participants aged ≥17 years. ◊English General Certificate of Secondary Education or equivalent. ^ Reliable contraception: contraceptive pill or condom. * Non-autonomous reason for first sex defined as following peers or being drunk in Natsal-2 and following peers, being drunk/stoned in Natsal-3. i Natsal-2. ii Natsal-3. AOR - odds ratio is adjusted for whether lived with both natural parents until age 14/16, ease of communication with parents about sex, index of multiple deprivation, educational attainment, main source of sex education, whether more information was needed at first sex, contraceptive method use at first sex, whether both partners were equally willing at first sex, autonomy of the reason for first sex and baseline <18 conception rate (area-level). Not adjusted for first sex before age 16.*

Table F.3: Current participation of women aged 18-24 in England by experience of early motherhood: 1990-1991, 1999-2001 & 2010-2012

	Experience of motherhood resulting from <18 conception		**No experience of motherhood resulting from <18 conception**		
Participating in education/work/training					
	Denominators¥	**% (95% CI)**	**Denominators¥**	**% (95% CI)**	**p-value§**
1990-1991	1135, 1393	79.0 (76.1-81.7)	180, 134	20.4 (14.1-28.5)	<0.0001
1999-2001	862, 910	82.0 (79.0-84.8)	106, 81	22.4 (14.4-33.1)	<0.0001
2010-2012	1203, 738	79.7 (77.0-82.2)	104, 43	36.5 (27.1-47.0)	<0.0001
Change in participation between Natsal surveys					
	OR (95% CI)		**OR (95% CI)**		**p-value‡**
1999-2001 vs 1990-1991	1.21 (0.93-1.58)		1.12 (0.56-2.25)		0.840
2010-2012vs 1999-2001	0.86 (0.67-1.11)		1.99 (0.99-4.00)		0.027

¥ unweighted, weighted numbers

§ p-value ($\chi^{2)}$

‡ p-value for interaction testing whether the association between time period and participation differs according to early motherhood status.

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