Comparing reporting of abortions in three nationally representative surveys: methodological and contextual influences

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ABSTRACT

Background Abortions are known to be underreported in surveys. Previous research has found a number of ways in which survey methodology may affect respondents' willingness to disclose abortions. The social and political climate surrounding abortion may also create stigma affecting abortion reporting, and this may vary between countries and over time.

Methods We estimate the extent of underreporting in three nationally representative population surveys by comparing survey rates with routine statistics, in order to explore the ways in which survey methodology and cultural context might influence reporting of abortion. Data are analysed from two National Surveys of Sexual Attitudes and Lifestyles, conducted in 2000 and 2010 (Natsal-2 and Natsal-3) in Britain, and the Fertility, Contraception and Sexual Dysfunction survey (FECOND) conducted in 2010 in France. The three surveys differ with regard to survey methodology and context.

Results There was no strong evidence of underreporting in Natsal-2, which collected data on abortion using a direct question. There was evidence of underreporting 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 underreporting 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.

Key messages

- A direct question may be more effective in eliciting reports of abortion than a pregnancy-history module in surveys.
- Underreporting of abortions has second-order effects on reporting of other pregnancy outcomes. Researchers must consider the implications of underreporting of abortions in analyses of all pregnancy outcomes.
- Reporting of abortions in surveys can be improved, and continued investment in empirical research examining and assessing different methodologies to improve reporting is essential.

INTRODUCTION

Abortions are known to be underreported in surveys.[1–3] It is estimated that only 39% of all abortions were reported in face-to-face interviews in the 2006–2010 US National Survey of Family Growth (NSFG).[3] In France, Moreau *et al*[2] estimate that 60% of abortions were reported in the 1997 Cohorte sur la Contraception (COCON) survey. In contrast, reporting in the British National Surveys of Sexual Attitudes and Lifestyles (Natsal) has historically been higher. An estimated 84% and 86% of abortions were reported in Natsal-1 (1990) and Natsal-2 (2000), respectively.[4 5]

The aim of this analysis is to better understand differential reporting of abortion in three population surveys, two conducted in Britain and one in France, by examining methodological and country-level factors that may be implicated.

Survey methodology

Methodological aspects of survey administration are thought to influence reporting of sensitive behaviours such as abortion. When information on abortion is collected as part of a self-administered

interview, reporting is higher.[1 6] A question asked later in the survey, when the interviewer has built up rapport with the respondent, may elicit more accurate reporting.[7] Varying question wording may affect reporting; in a pilot survey, a direct question on abortion elicited more reported abortions than a pregnancy-history module, and clarifying the question wording around induced abortion reduced classification error.[2] Reporting of abortion is higher in telephone than face-to-face interviews,[8–10] perhaps due to the greater psychological and social 'distance' from the interviewer. Longer interviews elicit fewer reports of abortion than shorter ones.[8] Finally, interviewer characteristics influence reporting; in the US, white, black and Hispanic women were less likely to report an abortion to an interviewer of a different race (London and Williams, 1990 cited in Smith *et al*[10]).

Participation and reporting biases

Underreporting may result from imperfect sampling; most population surveys underrepresent respondents from marginalised and disadvantaged groups, among whom abortion may be more common.[2] Furthermore, participation in surveys has declined over time,[11] intensifying this problem. To address this, surveys may employ repeated efforts to contact respondents, which, while improving the participation rate, might also result in a greater proportion of 'reluctant' respondents, who are more likely to not respond or respond inaccurately, leading to poorer data quality.[12] Both imperfect sampling and declining participation could affect reporting of abortion in surveys.

For some people, abortion is sensitive or stigmatised and this may influence willingness to report.[13 14] Survey respondents may misreport their abortion history to provide more socially desirable responses.[15] In the US, the stigma of abortion has been shown to vary with ethnicity.[16] In Romania's 1993 Reproductive Health Survey, which took place when abortion was common and political support for abortion was strong, approximately 80% of abortions were reported.[17] The high reporting may reflect its commonality and acceptance during that time. Little research has considered how the stigma surrounding abortion may differ cross-nationally or over time. However, reporting of abortion may be an indicator of differential experience of stigma.

Implications

Underreporting of abortions has consequences for research. If abortions are more likely to be reported by certain subgroups,[1] this will induce bias in analyses of characteristics associated with abortion. Furthermore, underreporting of abortions has second-order effects on reporting of all pregnancies. Without full reporting of abortions, estimates of conception rates and unplanned pregnancies, which are essential for research into determinants of fertility in populations, are compromised, as are estimates of associations of other characteristics with these outcomes. A better understanding of the factors that elicit or inhibit reporting of abortions in surveys is vital to understanding why some people misreport their abortion history, and thus to develop survey methodologies that lead to improved reporting.

Both Britain and France conduct nationally representative probability surveys on sexual and reproductive behaviour. In Britain, the Natsal surveys have been conducted at 10-yearly intervals since 1990. In France, surveys of sexual and reproductive behaviours have been conducted at regular intervals since the late 1970s.[18] The surveys in both countries collect data on experience of abortion, with sufficient information to date at least the first and last abortion reported. Both countries also collect reliable national level data on all abortions that take place in facilities, providing an external standard against which to compare the rates reported in surveys.

In 2010, the third British Natsal study (Natsal-3) changed the way it collected data on abortion, from a direct question to a pregnancy-history module. We hypothesised that this may have had an impact on the extent of reporting. The French Fertility, Contraception and Sexual Dysfunction Survey (FECOND) was conducted during the same period as Natsal-3, also using a pregnancy-history module to collect data on abortion. We hypothesised that differences in reporting between Natsal-3 in Britain and FECOND in France might reflect differential stigma around abortion in the two countries. Differential abortion stigma in the two countries has not been directly studied, but differences in legislative frameworks, healthcare provision and social norms may lead to variation in stigma. In Britain, abortion is available up to 24 weeks' gestation if two doctors agree that "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 pregnant woman or any existing children of her family". In France, abortion is available on request up to 14 weeks' amenorrhea. In Britain, contraception and abortion are provided free of charge through the National Health Service, whereas in France some contraceptive methods are partially reimbursed through a patient's health insurance, and until 2013 this was the case for abortion too (100% of the cost is now reimbursed).

METHODS

We analysed data from three nationally representative probability surveys aiming to examine sexual and reproductive behaviour and attitudes: the second and third Natsal surveys (Natsal-2, 15 162 men and women aged 16–44 years, and Natsal-3, 12 110 men and women aged 16–74 years) in Britain, conducted in 2000 and 2010, respectively, and the Fertility, Contraception and Sexual Dysfunction Survey (FECOND,

8645 women aged 14–49 years) in France, conducted in 2010. Natsal-2 and Natsal-3 used a multistage, clustered and stratified probability sampling strategy. Both surveys used computer-assisted personal interviews (CAPI) with an computer-assisted self-administered interview (CASI) or paper self-administered questionnaire for more sensitive questions. 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, following a two-stage, random probability sampling process. The response rate was 63.9% in Natsal-2, 57.7% in Natsal-3 and 50.2% in FECOND. We limited the sample to women aged 17–45 years to calculate abortion rates among 16–44-year-olds, giving a sample size of 6781 in Natsal-2, 5608 in Natsal-3 and 4173 in FECOND. Further details on sampling, response rates and post-stratification weightings are presented in Appendix 1, and the methodologies of all the surveys are published elsewhere.[19 20]

Question wording and mode in the three surveys

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

> '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?' [NB. There was a problem with the wording of this question; it should have read 'What age were you when you had the FIRST termination?' In the raw dataset the age for this question was later than age at last abortion for three cases, so these ages were swapped for these three cases. This error should not affect our analyses as we are only interested in the last abortion.] and 'What age were you when you had the last one?'

Natsal-3 collected information about abortion through a pregnancy history in the CASI section of a face-to-face questionnaire. Women were asked:

> '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 through a telephone-administered questionnaire. Women who had ever had sex were asked:

> 'Have you ever been pregnant, whether the pregnancy ended in a miscarriage, birth, termination or abortion, extrauterine 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?'

Table 1 Survey characteristics of Natsal-2, Natsal-3 and FECOND

Survey characteristic	Natsal-2	Natsal-3	FECOND
Study design	Nationally representative probability survey		
Women aged 17–45 years (n)	6781	5608	4173
Survey mode	Face-to-face interview, CASI for sensitive questions		Telephone interview
Survey mode for abortion questions	CASI		Telephone interview
Data collection for abortions	Direct question	Pregnancy history	
Country	Britain		France

CASI, computer-assisted self-administered interview; FECOND, French Fertility, Contraception and Sexual Dysfunction Survey; Natsal, National Survey of Sexual Attitudes and Lifestyles.

Natsal-2 and Natsal-3 were conducted on the comparable populations at two different points in time, allowing us to compare reporting under two methodologies. However, aspects other than those associated with methodology may have changed in the 10 years between the two surveys, including the extent of stigma surrounding abortion and inclination to participate in surveys. Abortion data in Natsal-3 and FECOND, both conducted at the same point in time,were collected through a pregnancy history, allowing a comparison between two country contexts with similar methodology. The wording of the pregnancy-history module varied slightly between Natsal-3 and FECOND, and an additional difference is that in Natsal-3, data on abortion were collected through a self-completion module of a face-to-face interview, while FECOND was administered by telephone.

A summary of the study designs and data collection in the three surveys is shown in table 1.

Analysis

By law, all abortions must be recorded in Britain and France. Recording is considered complete for all years since abortion was legalised in Britain, and from 2002 onwards in France,[21] although in both countries recording captures only abortions that take place through a facility. We compared abortion rates estimated from each survey with those calculated from routinely-collected data in the year preceding the survey, in Britain and France.

To calculate the extent of underreporting of abortions in the three surveys, we replicated the methods

of Copas *et al*[4] in their methodological paper examining reporting of sexual behaviours and outcomes. We estimated the abortion rate for each age group and all women by calculating the proportion of women in each age group plus 1 year who reported an abortion at a year younger than their current age. For example, the estimated abortion rate among 16–19-year-olds is the proportion of women aged 17–20 years in the survey reporting an abortion aged 1 year younger than their current age, multiplied by 1000 to obtain a rate per 1000 women. It should be noted that these figures are approximations; as we do not have exact dates of events in all three surveys and rely on reported ages, it is not possible to know exactly whether an abortion took place within the last year. Women with missing data on pregnancy outcome or age at last abortion were excluded from the denominator, as we could not determine whether they had an abortion during the relevant time period. As the age range in Natsal-2 was restricted to 16–44-year-olds, we doubled the weights applied to 44-year-olds in this survey, 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.[22] Due to the limited information collected in routine statistics, we could not assess reporting by other characteristics, for example, income, education, or social class.[1]

RESULTS

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

All results are shown in table 2. In Natsal-2, the abortion rate obtained from the survey was 13.5 per 1000 women (95% CI 10.5 to 17.3), which approximates to 86% of the rate obtained from routinely-collected data of 15.8 per 1000 women (henceforth referred to as the routinely-recorded rate). The confidence interval (CI) of the survey-estimated rate overlapped the routinely-recorded rate. In Natsal-3, the survey-estimated abortion rate was 12.0 per 1000 women (95% CI 9.6 to 14.9), which is 72% of the routinely-recorded rate or 16.6 per 1000 women. The CI for this rate did not include the routinely-recorded rate. In FECOND, the survey-estimated abortion rate was 11.8 per 1000 (95% CI 8.6 to 16.0), which is 66% of the routinely-recorded rate of 17.9 per 1000 women. The CI for the survey-estimated rate did not include the routinely-recorded rate.

Table 2 Abortion rates by age group in Natsal-2, Natsal-3 and FECOND, compared with national statistics.

	Routine data	Survey data		Reporting completeness
Survey	Rate	N*	Rate (95% CI)	% (95% CI)
Natsal-2	15.8	88	13.5 (10.5 to 17.3)	86 (67 to 110)
Natsal-3	16.6	96	12.0 (9.6 to 14.9)	72 (58 to 90)
FECOND	17.9	50	11.8 (8.6 to 16.0)	66 (48 to 89)

Survey data from Natsal-2 are compared with routine data from 1999; data from Natsal-3 are compared with routine data from 2009, data from FECOND are compared with routine data from 2009.
*Number in survey reporting an abortion aged 1 year younger than their current age.
FECOND, French Fertility, Contraception and Sexual Dysfunction Survey; Natsal, National Survey of Sexual Attitudes and Lifestyles.

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

In Natsal-2, 86% (95% CI 67% to 110%) of abortions were reported, and the CI of the survey-estimated rate overlapped the routinely-recorded rate. In Natsal-3, 72% (95% CI 58% to 90%) of abortions were reported. Estimated completeness of reporting declined between Natsal-2 and Natsal-3, however the CIs of reporting completeness in Natsal-2 and Natsal-3 overlap.

Difference in abortion reporting between Natsal-3 and FECOND

In Natsal-3, 72% of abortions were reported (95% CI 58% to 90%), compared with 66% in FECOND (95% CI 49% to 89%). There was no significant difference in the proportion reported between the surveys, and in absolute terms the difference between Natsal-3 and FECOND in reporting completeness was small.

Variation in abortion reporting by age group

The sample sizes within age groups are small and CIs around survey-estimated abortion rates by age group are wide (results not shown). This makes it difficult to assess whether reporting differs by age group using these data.

DISCUSSION

In all three surveys, abortion rates estimated from survey data were lower than rates obtained from routinely-collected data. In Natsal-3 and FECOND, there was strong evidence of underreporting, demonstrated by the exclusion of the national rate from the CI around the estimated survey rate. In Natsal-2, there was no statistical evidence that the survey-estimated abortion rate was different to the national rate, and the survey rate was closer to the national rate (although CIs were wide; a larger sample may have detected a difference). The findings suggest that reporting may have declined between the two Natsal surveys, although confidence intervals around reporting completeness were wide and overlapping. Some of the decline may be attributable to the change between the two surveys from a direct question on abortion to a pregnancy history module, although other factors, including a decline in survey participation, are also likely at play. These findings lend more weight to previous findings from a smaller sample in France, which also considered differences in abortion reporting with a direct

question compared to a pregnancy history module and found higher reporting with a direct question[2] .

Strengths and limitations

A key strength of this study is that we could make two important comparisons: one stemming chiefly from a difference in survey methodology, the other relating principally to differences in country context. We could also compare the survey-estimated abortion rates with reliable and complete national-level routinely-collected data in Britain and France. In comparing reporting resulting from a direct question rather than a pregnancy history (Natsal-2 vs Natsal-3), we build on previous research by Moreau *et al*,[2] benefitting not only from a considerably larger sample and thus greater power to assess differences in reporting, but also from more accurate national statistics against which to compare the survey data. [NB. These data were known to be incomplete in France until recent years but are now considered complete.[21]] It should be noted that the national statistics that we compare against only count abortions that take place through facilities. Abortions that take place without any contact with a facility are not included in these figures. French women who travel abroad to obtain an abortion are not included in the French national statistics. We may therefore be underestimating the extent of underreporting of abortions, if the complete data are an undercount of the total number of abortions that take place in each country.

The similarities and differences between the three surveys enabled us to conduct a natural experiment, although with important limitations. Particularly between Natsal-3 and FECOND, several differences need to be noted besides country context, including a slight difference in question wording, and the difference in interview mode. As abortion was a rare event in the surveys, confidence intervals are wide. A larger sample may have detected differences in reporting completeness between Natsal-3 and FECOND, or between Natsal-2 and routine data; that is, it is possible that other differences may have been missed because the analysis was underpowered. We could not examine underreporting by subgroups because of a lack of comparable information in the surveys and routine statistics, and because where this was available, for age, the sample size was too small for reliable conclusions to be drawn.

Survey methodology, survey participation and reporting bias

Part of the mechanism for the observed increased reporting with a direct question may be that a pregnancy history is burdensome to complete, so some respondents may omit pregnancies that are less salient or that they do not wish to talk about to shorten it.[6] Some people may not 'count' certain pregnancies, such as those ending in abortion, in their reproductive biographies. Here, underreporting stems less from deliberate omission, but from question comprehension and recall.

Participation bias may also be implicated in the differences in reporting between Natsal-2 and Natsal-3. Participation declined from 65.4% to 57.7% between the two surveys. The decline in participation likely resulted in poorer representation of some subgroups, among whom abortion rates may be higher. [NB. After final weighting, Natsal-2 slightly overrepresented cohabiting respondents and respondents in professional and managerial/technical social classes. Natsal-3 slightly overrepresented respondents who are married or cohabiting and underrepresented single people, and slightly underrepresented Asian respondents, although it is not possible to say to what extent these changes were a result of changes in participation.] This would affect the survey-estimated abortion rates, but through poorer representativeness rather than underreporting per se. However, the poorer representation of subgroups would further induce bias if those groups also differed in their willingness to disclose their abortion (in the US, reporting varies by race and income[1]). If lower participation was boosted by call-backs, which would increase the response rate and representativeness but also the proportion of 'reluctant' respondents, lower reporting might be partly due to this poorer data quality.[12] Reporting of abortions has also declined over time in the US NSFG.[23] The stigma of abortion may also have changed over time.

Previous research has found higher abortion reporting in self-administered survey modes,[1 6] highlighting that stigma is an important factor in respondents' willingness to disclose in surveys. It is perhaps surprising then to find no difference in reporting between FECOND and Natsal-3, despite the more private setting (using CASI) in Natsal-3. Studies have also found higher abortion reporting in telephone than face-to-face interviews;[8 10] perhaps as FECOND was conducted by phone, respondents did feel a sense of anonymity. It should be reiterated that the comparison between Natsal-3 and FECOND is less clear, and other differences between surveys – the slight variation in question wording as well as the difference in survey mode – may be working in different ways, perhaps confounding differences between them, for example, if the more inclusive language around abortion in FECOND increased reporting, at the same time as the decreased privacy of a telephone interview decreased it.

Differences in reporting of abortion between Natsal-3 and FECOND might have indicated cross-national differences in societal or public health attitudes to abortion. Little comparative research has examined cross-national variation in abortion stigma or attitudes to abortion. Future research could consider ways to assess this, for example, comparing reporting of or attitudes to abortion in standardised multi-country surveys.

Implications

This study highlights the interaction of survey methodology, participation and stigma in preventing people from discussing and disclosing their abortions, although it is unable to disentangle these phenomena. We hypothesise that a direct question may be more effective in eliciting reports of abortion than a pregnancy history. However, many surveys collect data on abortion through a pregnancy history. Pregnancy histories are more informative overall, but we suggest they do not optimise accurate abortion reporting. Furthermore, data quality in birth histories becomes poorer with each successive birth asked about.[24] This effect is likely stronger for abortions. Supplementing the pregnancy history with additional abortion-specific direct questions may yield higher overall reports of abortion. Although these can collect less detailed information than a pregnancy history, data on whether the respondent has ever had an abortion, how many, and at what age(s), enables estimation of lifetime prevalence, yearly incidence, age patterns, and associations with sociodemographic characteristics and behaviours. There may be value in collecting a smaller amount of data, that is more complete, rather than more detailed information that is subject to substantial underreporting.

Our findings will be useful in eliciting more accurate reporting of abortions in surveys, and are encouraging, as they indicate that reporting of abortion in surveys *can* be improved. Surveys are one of the few ways to examine individual-level characteristics associated with abortion in a representative population, and we call for continued investments in empirical research examining and assessing different methodologies to improve reporting. This will be key to improving research not just into abortion but also conceptions and unplanned pregnancies, so is an essential component of demographic research. Where abortions are underreported, there are second-order effects on reporting of other pregnancy outcomes. This may result in inaccurate estimates of prevalence, and biased estimates of associations. In the meantime, therefore, it is imperative that researchers consider the implications of underreporting of abortions in analyses of all pregnancy outcomes.

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Contributors RHS analysed the data and drafted successive versions of the article. ES advised with data analysis. All authors interpreted the data, edited drafts and approved the final version of the article.

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Patient consent for publication Not required.

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