

Male experiences of unintended pregnancy: characteristics and prevalence

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STUDY QUESTION: What are the characteristics and circumstances of pregnancies men report as unintended in France?

SUMMARY ANSWER: Pregnancies reported as unintended were most prevalent among young men with insecure financial situations, less stable relationships and inconsistent use of contraception or false assumptions about their partner's use of contraception.

WHAT IS KNOWN ALREADY: Efforts to involve men in family planning have increased over the last decade; however, little is known about factors associated with men's pregnancy intentions and associated contraceptive behaviours.

STUDY DESIGN, SIZE, DURATION: The data presented in this study were drawn from the nationally representative *FECOND* study, a population-based survey conducted in France in 2010. The sample comprised 8675 individuals (3373 men), aged 15–49 years, who responded to a telephone interview about socio-demographics and topics related to sexual and reproductive health. The total refusal rate was 20%.

PARTICIPANTS/MATERIALS, SETTING, METHODS: This study included 2997 men, of whom 664 reported 893 recent pregnancies (in the 5 years preceding the survey). Multivariate Poisson's regression with population-averaged marginal effects was applied to assess the individual and contextual factors associated with men's intentions for recent pregnancies. The contraceptive circumstances leading to the unintended pregnancies were also assessed.

MAIN RESULTS AND THE ROLE OF CHANCE: Of all heterosexually active men, 5% reported they had experienced an unintended pregnancy with a partner in the last 5 years. A total of 20% of recent pregnancies reported by men were qualified to be unintended, of which 45% ended in induced abortion. Of pregnancies following a previous unintended pregnancy, 68% were themselves unintended. Among all heterosexually active men, recent experience of an unintended pregnancy was related to age, mother's education, age at first sex, parity, contraceptive method history, lifetime number of female partners and the relationship situation at the time of survey. Recent unintended pregnancies were also related to pregnancy order and to the financial and professional situation at the time of conception. The majority of unintended pregnancies occurred when men or their partners were using contraceptives; 58% of contraceptive users considered that the pregnancy was due to inconsistent use and 39% considered that it resulted from method failure. Half of the non-users who reported an unintended pregnancy thought that their partner was using a contraceptive method. The relative risk of non-use of a contraceptive method during the month of conception of a recent unintended pregnancy was higher among those without a high school degree (IRR = 2.9, CI 1.6, 5.2) and higher among men for whom the pregnancy interfered with education (IRR = 1.8, CI 1.0, 3.1) or work (IRR = 1.9, CI 1.1, 3.6).

LIMITATIONS, REASONS FOR CAUTION: From the perspective of men, the unintended pregnancy rates may be underestimated due to a combination of underreporting of abortion and post-rationalization of birth intentions. Our use of a dichotomous measure of unintended pregnancy is unlikely to fully capture the multidimensional construct of pregnancy intentions.

WIDER IMPLICATION OF THE FINDINGS: These results call for gender-inclusive family planning programmes, which fully engage men as active participants in their own rights.

STUDY FUNDING/COMPETING INTEREST(S): The *FECOND* study was supported by a grant from the French Ministry of Health, a grant from the French National Agency of Research (#ANR-08-BLAN-0286-01; PIs N.B., C.M.), and funding from National Institute of Health and Medical Research (INSERM) and the National Institute for Demographic Research (INED). None of the authors have competing interests.

Key words: pregnancy intention / men / gender / family planning / Europe

Introduction

The importance of understanding the circumstances and determinants of unintended pregnancies is well demonstrated among women. Similar to the USA and other Western country settings (Waller and Bitler, 2008; Finer and Zolna, 2013; Wellings *et al.*, 2013), unintended pregnancies in France are disproportionally represented among young, single women from disadvantaged socioeconomic backgrounds (Bajos *et al.*, 2013). Measures of unintended pregnancies are complex, but are generally designed to capture women's intentions at the time of conception (Santelli *et al.*, 2003). These encompass pregnancies that are unwanted (occurred when no or no more children were desired) and mistimed (occurred earlier than planned), reflecting a combination of attitudinal and behavioural constructs. However, decisions about whether or not to have sex, to use contraception and to terminate an unintended pregnancy, are rarely made by a woman in isolation (Guzzo and Furstenberg, 2007; Sassler *et al.*, 2009; Hayford and Guzzo, 2013). Despite efforts to involve men in family planning, few studies have examined male contraceptive behaviours and very little is known about the circumstances and characteristics of pregnancies that are considered by men to be unintended (Lindberg and Kost, 2014). Data from the National Survey of Family Growth (NSFG) indicated that one in three US males reported a recent unintended birth (defined as mistimed or unwanted) (Martinez *et al.*, 2006; Lindberg and Kost, 2014). The NSFG is one of a few national studies with published birth intentions, collected retrospectively from both males and females. A more common method is instead to estimate the male partner's intentions using women's reports. Such proxy measures that are based on perceived partner intentions fail to take into account those who are not in relationships or for other reasons are unaware of their partner's perspectives (Waller and Bitler, 2008; Lohan *et al.*, 2010). In addition, as explicated in the framework of couple's fertility intentions developed by Miller *et al.*, men's inner state desires and female partner's perceptions of men's desires are interrelated, yet distinct constructs (Miller *et al.*, 2004). Studies focused on teenage maternal and paternal views indicate that discrepancies in wantedness may influence prenatal care and maternal and child health outcomes (Carter *et al.*, 2013). However, understanding men's experiences regarding unintended pregnancies and the factors associated with these events is not only essential for gender-inclusive family planning, but is also an important dimension of men's sexual and reproductive health trajectories. As highlighted in a recent study by Lindberg and Kost (2014), there is need to focus research on men's intentions for pregnancy in their own rights. In this study, we used nationally representative data to explore the characteristics and circumstances of pregnancies that men consider as unintended in France. To our knowledge, no national study in Europe has focused specifically on the pregnancy intentions and practices of men.

Materials and Methods

Data were drawn from the FECOND study, a population-based survey of sexual and reproductive health, including questions on contraceptive practices and pregnancy intentions, conducted in France in 2010. Individuals were included following a two-stage random probability sampling method.

The initial sample of households was drawn from random digit dialling (including landline and cell phones) and one individual per phone number was randomly selected. The sample comprised 8675 individuals aged 15–49 years, including 3373 men. (Women were oversampled to study contraceptive failure rates.) The refusal rate was estimated at 20% among all respondents. The main reason for refusal was not having enough time to respond or never participating in surveys. The FECOND survey received the approval of the relevant French government oversight agency (CNIL). The current study was also approved by the Johns Hopkins School of Public Health Institutional Review board.

After giving verbal consent (parental consent was not required for minors in line with the age of consent to have sexual intercourse at 15 years in France), men responded to a telephone interview which collected information on a wide range of domains including socio-demographic characteristics and various topics related to sexual and reproductive health. In particular, they described all of the pregnancies they conceived with a partner regardless of outcome. Our study population included 2997 men who reported ever having heterosexual intercourse. Of these, 1535 men reported 3482 pregnancies, of which 893 pregnancies, reported by 664 men, were recent (defined as pregnancies occurring in the last 5 years).

Measure of unintended pregnancy

Our outcome variable was a retrospective account of pregnancy intentions summarized as a dichotomous indicator (unintended, intended). By unintended pregnancy, we mean pregnancies conceived by male respondents, that they considered unintended. In the original survey, respondents were randomly assigned one of two questions per pregnancy: half answered the question 'Had you *planned* this pregnancy', and the other half answered the question 'Had you *wanted* this pregnancy'. This was done to assess short- and long-term trends in unintended pregnancies in France; fertility surveys up to 1994 included a measure of pregnancy wantedness, while the 2000 survey included a measure of pregnancy planning. Our indicator combined the responses to these two questions. This decision was based on a preliminary analysis exploring the effect of the question wording 'planning' versus 'wanting' (Moreau *et al.*, 2014). Specifically, the prior analysis indicated a greater odds of unplanned when compared with unwanted pregnancies [odds ratio (OR) = 1.4, $P < 0.001$]. However, the factors associated with unplanned and unwanted pregnancies were similar and the effect of the wording was not statistically significant in our final models (Moreau *et al.*, 2014). Both questions about pregnancy planning or wantedness used the same five response options. We combined the items 'sooner' or 'at that time' as the intended category, and response items 'not at all', 'later' or 'I hadn't thought about it' as the unintended category. While the three-item responses comprising the unintended pregnancy category may represent different meanings of intentions and refer to different situations, we were not able to distinguish these subcategories due to small sample sizes. This was further made evident in subsequent recoding from unintended to intended pregnancies, where pregnancies were reclassified as 'intended' if the respondent was not using contraception at the time of conception because he 'wanted a child'. This added information led to a decrease in the proportion of unintended pregnancies from 29 to 21%.

Predictor variables

In order to explore characteristics of men who reported an unintended pregnancy, we used a set of socio-demographic and sexual health factors assessed at the time of survey. The socio-demographic variables included age, immigration status ('native' was defined as born in France to French parents;

'second generation' was defined as born in France to at least one immigrant parent; 'first generation' was defined as born in a foreign country), education level, professional situation and importance of religion. We also included their mother's education level as an indicator for socioeconomic background (Dubow et al., 2009), and because prior studies have reported an association between a mother's educational attainment and their offspring's sexual and reproductive health outcomes, especially at sexual debut (Rosenthal et al., 2001). Sexual and reproductive health characteristics were assessed through the variables: relationship status, age at first heterosexual intercourse, contraception use at first sex, number of different (contraceptive) methods ever used, number of births ever fathered, number of lifetime female partners and experience of a sexually transmitted infection in the last 5 years.

In addition, we explored the circumstances for each pregnancy through a set of time-varying variables. These included age at pregnancy, pregnancy order, pregnancy outcome, partner's perceived pregnancy intentions, the financial and relationship situation at the time of conception and whether pregnancy interfered with work or education, as these variables have been shown to be related to the reporting of unintended pregnancies among women (Sihvo et al., 2003).

Contraceptive circumstances associated with pregnancy intentions

For each pregnancy, men were asked if they (or their partner) were 'doing something to avoid a pregnancy' in the month of conception. In case any method was used, respondents described the specific method used including condoms and other barrier methods (spermicides, sponges, cervical cap, diaphragm), user-dependent hormonal methods (pill, patch, vaginal ring, injectables), long-acting reversible methods (intrauterine device or implant), sterilization or natural family planning (rhythm or withdrawal) and the reasons why they thought the pregnancy occurred. In this study, user-dependent hormonal contraception only consisted of the pill, as males did not report patch, vaginal rings or injectables. Likewise, no male respondents reported using permanent methods (vasectomy or tubal ligation) at the time of conception. Respondents were also asked if they thought the pregnancy occurred 'because the method didn't work' or because 'they didn't use their method consistently'. If they were not using a method and the pregnancy was unintended, men were asked about the reasons why they were not using contraception at the time of conception. Response items included: 'you did not expect to have sexual intercourse', 'you thought you were not at risk of pregnancy', 'you had no method on hand', 'you had never used contraception', 'you thought your partner was using contraception'.

Statistical analysis

We first summarized descriptive data and used Pearson's corrected χ^2 statistic to explore demographic, social, sexual and reproductive health characteristics associated with reporting a recent (in the last 5 years) pregnancy that was considered to be unintended. Associations were assessed both among all respondents, and among those who reported a recent pregnancy. We also examined the relationship between reporting a recent unintended pregnancy and current use of contraceptive methods among men who were in need of contraception at the time of the survey (defined as having a non-pregnant female partner, being sexually active in the last 3 months, non-sterile and not trying to conceive).

In the second part of the analysis, we investigated the contribution of time-varying characteristics related to pregnancy intentions beyond the relatively constant individual attributes of the respondents (immigration status, educational attainment, their mother's education level, religiosity and age at first sex). While educational attainment was only available at the time of the survey, and not at the time of pregnancy, we use educational attainment as a marker of men's social trajectory. Given that many participants were

students at the time of the survey, we also restricted the analysis to men who had completed their education to confirm the association between educational attainment and pregnancy outcomes. Because of the relative frequency of the outcome (19.6% of all recent pregnancies were reported as unintended), we used the Poisson regression models to estimate the relative risk of unintended pregnancy by individual attributes and by time-varying contextual factors present at the time of conception. After specifying the best fitted model for the mean (using goodness of fit and AIC criteria), we fitted a generalized estimated equation regression model (xtgee command in stata) to account for the correlation structure between pregnancies reported by the same individual. This generalized model characterizes the population average response (pregnancy intentions) for correlated data (in our sample, the mean number of recent pregnancies reported per respondent was 2.3). We selected an exchangeable correlation structure, which was found to best fit the data based on exploratory analyses of the working correlation and by using the qic criteria (similar to the AIC criteria in the context of correlated data with binary outcomes; Pan, 2001; Cui and Qian, 2007). Pregnancy outcome was not considered in the model since the resolution of a pregnancy is a consequence rather than a predictor of pregnancy intentions.

Finally, we examined the contraceptive circumstances surrounding each pregnancy and pursued the analysis using a generalized estimated equation Poisson regression model with exchangeable correlation to explore the social and demographic characteristics associated with the use of contraception at the time of conception of an unintended pregnancy ($n = 176$).

All analyses were weighted to account for the complex survey design and for sampling distortion due to non-response. Weights were created to account for the probability of being selected in the sample. Post-stratification techniques were applied to align the sample characteristics with the distribution of socio-demographic characteristics of the male population in France based on Census data.

Results

The description of the study population ($n = 2997$) according to whether or not they reported having conceived a recent unintended pregnancy with a partner is provided in Table I. We also present the same results among respondents who reported a recent pregnancy ($n = 664$). Of men who ever had heterosexual intercourse, 5% had experienced a recent unintended pregnancy. This proportion rose to 22% among those who reported a pregnancy in the same time period.

Among all heterosexually active men, the proportion with recent unintended pregnancy was highest between ages 20 and 34 years and lower among 15–19 year olds and those aged 35+. In contrast, for those with recent pregnancies, unintended pregnancy tended to be most common among the youngest age groups (15–19 and 20–24 years).

For all men and those with pregnancies in the last 5 years, the proportion with a recent unintended pregnancy was found to be highest among those in a non-cohabitating relationship at the time of the survey, those who reported 10 or more lifetime sexual partners and among those with a contraceptive history of five or more different methods. Men's own level of education seemed to have little effect, while their mother's higher educational attainment was significantly associated with the probability of a recent unintended pregnancy. Men in very difficult financial situations at the time of survey were more likely than those of better economic conditions to report a recent unintended pregnancy. This association was no longer significant when restricting the analysis to those who reported a recent pregnancy. Conversely, while a man's professional situation was not related to reporting an unintended pregnancy overall, unemployment was significantly related to having experienced

Table 1 Characteristics of male respondents according to whether they reported at least one recent unintended pregnancy (in the 5 years preceding the study).

Variable	n	All men who are heterosexually active, n = 2997		Men reporting pregnancy in last 5 years, n = 664		
		Recent unintended pregnancy (past 5 years)		Recent unintended pregnancy (past 5 years)		
		%	P > t ^a	n	%	P > t ^a
Total	151/2997	5.0		151/664	22.5	
Age			0.002			<0.001
15–19	11/279	3.9		11/12	91.7	
20–24	34/446	7.5		34/48	73.4	
25–29	29/431	7.3		29/184	30.1	
30–34	28/418	7.2		28/184	17.2	
35–39	17/483	3.7		17/181	9.7	
40–44	21/483	4.6		21/100	21.6	
45–49	11/457	1.7		11/35	26.0	
Education			0.976			0.264
<High school	59/1187	5.1		59/238	24.9	
High school	36/695	5.2		36/141	24.1	
Some college	31/596	4.6		31/139	20.8	
Graduate school	25/509	4.9		25/144	16.6	
Mothers education			0.043			0.001
No middle school diploma	24/745	3.2		24/188	12.8	
No high school degree	60/1124	5.4		60/259	23.6	
High school degree	28/420	7.0		28/100	30.0	
College or more	27/577	4.9		27/89	30.7	
Do not know	12/131	8.6		12/28	40.2	
Profession			0.138			<0.001
Works	115/2298	5.0		115/589	19.7	
Student	17/377	3.8		17/22	68.7	
Unemployed	19/276	7.5		19/50	42.5	
Other	0/42	0.0		0/3	0.0	
Income			0.044			0.233
No problem	39/1087	3.7		39/204	20.2	
Tight	70/1371	5.1		70/329	21.1	
Very difficult	41/532	6.9		41/128	28.5	
Medical insurance			0.796			0.600
Social security (SS)	20/246	5.8		20/44	28.6	
SS and private	123/2612	4.9		123/592	21.7	
Low income government	6/102	5.8		6/25	23.7	
Immigration			0.658			0.590
Born in France	124/2502	4.7		124/531	22.7	
Second-generation immigrant	14/282	6.0		14/64	26.8	
First-generation immigrant	12/210	5.9		12/68	18.2	
Importance of religion			0.252			0.012
Very important	25/542	4.0		25/150	14.5	
Not very important	33/822	4.3		33/171	20.1	
Not at all important	93/1633	5.7		93/343	27.7	

Continued

Table I Continued

Variable	n	All men who are heterosexually active, n = 2997		Men reporting pregnancy in last 5 years, n = 664	
		Recent unintended pregnancy (past 5 years)		Recent unintended pregnancy (past 5 years)	
		%	P > t ^a	n	%
Relationship			0.005		<0.001
No partner	26/733	3.1		26/48	45.9
Non-cohabitating partner	38/541	7.8		38/53	73.9
Cohabitating partner	87/1721	5.0		87/563	16.1
Age at first sex, mean (SD) ^b	16.3 (2.3) versus 17.1 (2.6)		<0.001	16.3 (2.3) versus 17.4 (3.0)	<0.001
Used contraception at first sex			0.013		0.294
Yes	64/1079	5.7		64/144	43.8
No	7/56	17.0		7/15	60.0
Nr of different methods ever used			<0.001		<0.001
Never used any method	0/34	0.0		0/7	0.0
1–4 methods	68/2172	3.3		68/461	15.0
≥5 methods	83/791	10.5		83/196	43.7
Nr of births given by partner(s)			0.005		<0.001
0 births	61/1631	3.5		61/85	65.8
1 birth	26/427	6.3		26/216	12.8
>1 births	64/939	6.7		64/363	18.4
Number of lifetime female partners			<0.001		<0.001
1	13/332	4.7		13/79	19.5
2–4	20/655	2.1		20/167	10.5
5–9	27/655	4.4		27/133	20.6
10 or more	82/1021	8.1		83/257	33.2
STI in last 5 years			0.166		0.157
Yes	138/2848	4.9		138/627	22.0
No	12/149	7.5		13/37	32.7

^aDisplaying unweighted n and weighted per cent (%). Pearson's corrected χ^2 test used to compare the proportion with unintended pregnancy by covariates (row per cent).

^bAge at first heterosexual sex using two-sample t-test to compare the mean age between men reporting unintended versus intended pregnancies.

a recent unintended pregnancy among those who reported a recent pregnancy. All associations remained significant in the multivariate analysis (data not shown).

Overall, one in five recent pregnancies (19.6%) were identified as unintended as shown in Table II. Based on the analysis of repeated recent pregnancies ($n = 229$), unintended pregnancies seemed to cluster; 68% of pregnancies that followed a previous unintended pregnancy were themselves unintended (data not shown). Results from the multivariate analysis among all recent pregnancies showed that the relative risk of a pregnancy being unintended was higher if reported by younger men rather than peers aged 25 and above (IRR = 2.3, 95% CI 1.5, 3.5), by men to whom religion was less important (IRR = 2.1, 95% CI 1.3, 3.5) or by men whose mother's were more educated (IRR for college or more compared with no diploma = 2.8, 95% CI 1.7, 4.6). Beyond the respondent's socio-demographic characteristics,

contextual factors at the time of conception were also related to men's pregnancy intentions. The relative risk of pregnancies being considered as unintended was 2-fold among men who, at the time, were in very difficult financial circumstances compared with peers who were not (IRR = 2.1, 95% CI 1.5, 3.0). So too, the risk of a pregnancy being reported as unintended was higher if the male reported that the pregnancy interfered with their education or work (IRR = 1.6, 95% CI 1.1, 2.2; IRR = 1.4, 95% CI 0.9, 2.3; respectively). Pregnancies occurring in non-stable relations were substantially more likely to be unintended (IRR = 2.6, 95% CI 1.5, 3.0). Furthermore, the female partner's perceived intentions were highly correlated to the male respondent's intentions (only 9.4% of unintended pregnancies were perceived as intended by the partner). The same factors related to pregnancy intention status were found when restricting the analysis to pregnancies ending in births (data not shown).

Table II Socio-demographic and contextual circumstances associated with an unintended pregnancy: pregnancy-based analysis among all pregnancies reported in the last 5 years.

	Total, n = 893 %	Intended, n = 717 %	Unintended, n = 176 %	P > t	Adjusted IRR ^a	95% CI	P > t
Total		80.4%	19.6%				
Mother's education ±							
No middle school diploma	33.9	37.0	20.3	0.003	Ref		
No high school degree	39.3	38.0	44.7		1.8	1.1, 2.8	0.011
High school degree	14.6	13.9	17.7		2.0	1.2, 3.3	0.006
College or more	12.2	11.0	17.3		2.8	1.7, 4.6	<0.0001
Immigration				0.237			
Native	74.7	72.3	75.3		Ref		
Second generation	10.3	14.7	9.3		1.3	0.8, 2.1	0.351
First generation	15.0	13.0	15.4		1.2	0.7, 2.2	0.494
Importance of religion							
Very important	23.6	24.8	18.8	0.0369	Ref		
Not important	76.4	75.2	81.2		2.1	1.3, 3.5	0.002
Age at pregnancy							
≥25 years	88.3	94.0	64.8	<0.0001	Ref		
<25 years	11.7	6.0	35.2		2.3	1.5, 3.5	<0.0001
Pregnancy order							
First	33.8	33.3	36.1	0.095	Ref		
Second	30.8	32.5	24.0		1.8	1.1, 2.7	0.010
Third	20.0	20.3	18.8		3.0	1.9, 4.6	<0.0001
Fourth or more	15.4	13.9	21.1		2.3	1.5, 3.5	<0.0001
Financial situation at the time of conception							
Not very difficult	86.3	91.9	63.3	<0.0001	Ref		
Very difficult	13.7	8.1	36.7		2.1	1.5, 3.0	<0.0001
Pregnancy interfered with education							
No	94.4	97.5	81.5	<0.0001	Ref		
Yes	5.6	2.5	18.5		1.6	1.1, 2.2	0.008
Pregnancy interfered with work							
No	93.9	96.9	81.7	<0.0001	Ref		
Yes	6.1	3.1	18.3		1.4	0.9, 2.3	0.102
Relationship situation at the time of conception							
Stable	89.6	95.5	65.4	<0.0001	Ref		
Other (instable/starting/ breaking)	10.4	4.5	34.6		2.6	1.9, 3.6	<0.0001
Partner pregnancy intentions							
Intended	73.5	88.8	9.4	<0.0001			
Unintended	26.5	11.2	90.6				
Pregnancy outcome							
Birth	745	83.5	38.1	<0.0001			
Elective abortion	10.4	1.8	45.8				
Miscarriage	12.4	13.0	9.9				
Ectopic	0.9	0.4	3.2				
Therapeutic abortion	1.1	0.7	2.7				
Stillbirth	0.7	0.8	0.2				

^aIncidence rate ratio calculated using the Poisson marginal population-averaged effects accounting for correlations between multiple pregnancies. The model was adjusted for mother's education, immigration, religiosity, age at pregnancy, financial and relationship situation at yrtime of pregnancy, pregnancy interfered with work or education. Partner pregnancy intentions were not included in the multivariate model because they are too closely related to the respondents' intentions. Pregnancy outcomes are a consequence of pregnancy intentions and were therefore not included as predictors either.

Of recent unintended pregnancies, 72% occurred in a month when the respondent or his partner was using contraception ($n = 128$), compared with 4% in cases where the pregnancy was intended. As can be seen in Fig. 1, 23% of men who experienced an unintended pregnancy were using condoms while 33% had partners who were using oral hormonal contraception methods in the month of conception, but 28% were not using any contraception in the month of conception (Fig. 1). Of contraceptive users who experienced an unintended pregnancy, 58% considered that the pregnancy was due to inconsistent or incorrect use of the method, while 39% reported that the pregnancy resulted from a method failure (data not shown). Altogether, half of the unintended pregnancies due to inconsistent use involved the pill, followed by condoms (Fig. 2). Pregnancies resulting from method failure were also mostly due to the use of the pill or condoms (Fig. 2). Most men who reported

that their partner was on the pill in the month of conception considered that the pregnancy was due to missed pills (58%). One-third of men using condoms at the time of conception confessed to having not used a condom that particular time, and almost half described a problem (slippage or breakage) with the condom (data not shown).

Regarding unintended pregnancies resulting from non-use of contraception ($n = 48$), the results showed that half of the men in that situation thought that their partner was using a method of contraception at the time of conception when they were not. This proportion varied substantially by relationship status in that it was higher when the relationship was instable or breaking at the time of conception ($P < 0.05$) (Fig. 3). Almost half of all men reporting unintended pregnancies resulting from complete non-use of contraception indicated they had not used contraception because no method was suitable for them, while about one-third had

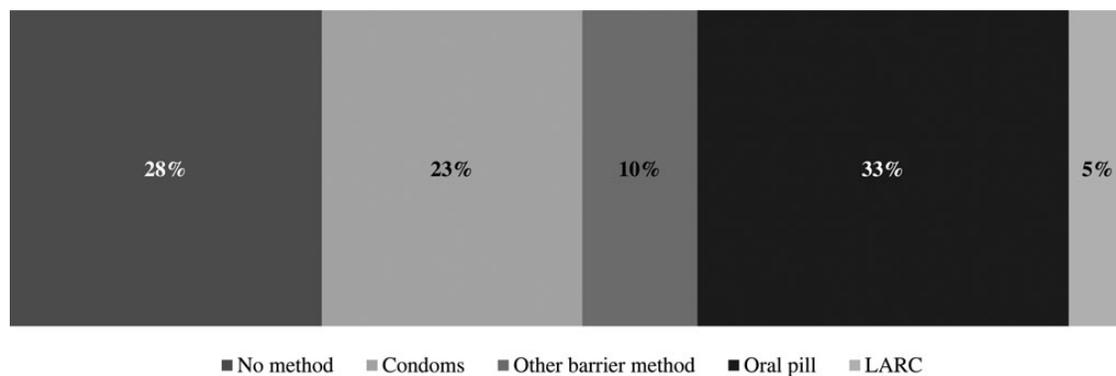


Figure 1 Contraceptive use reported at the time of of conception, by method.

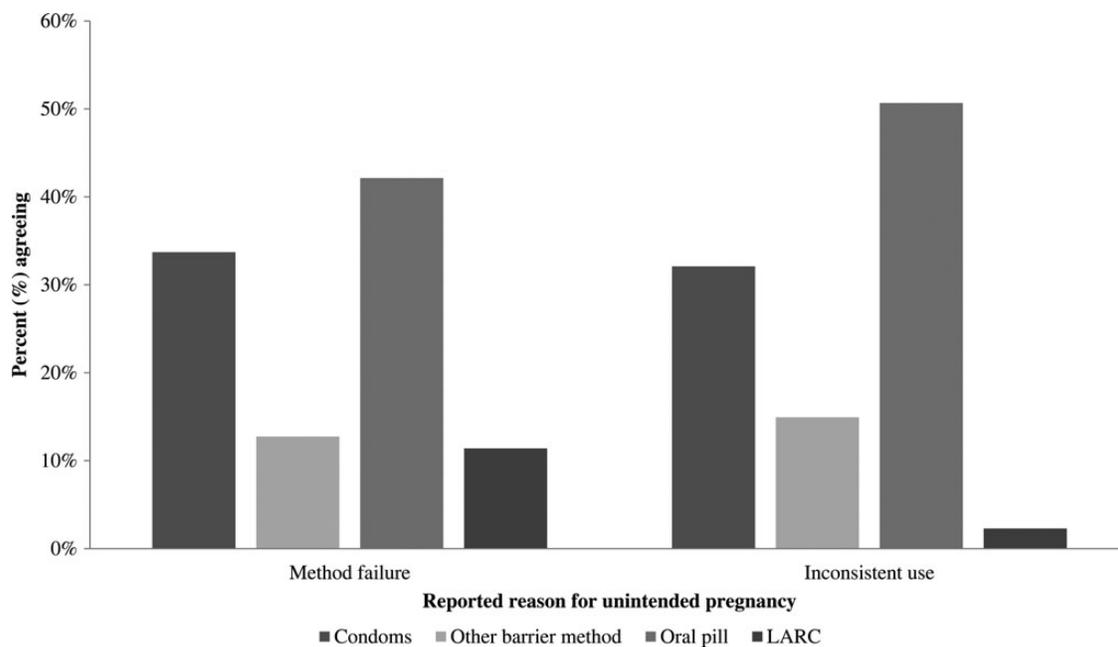


Figure 2 Reasons for pregnancies reported as unintended by men who indicated using contraception in the month of conception.

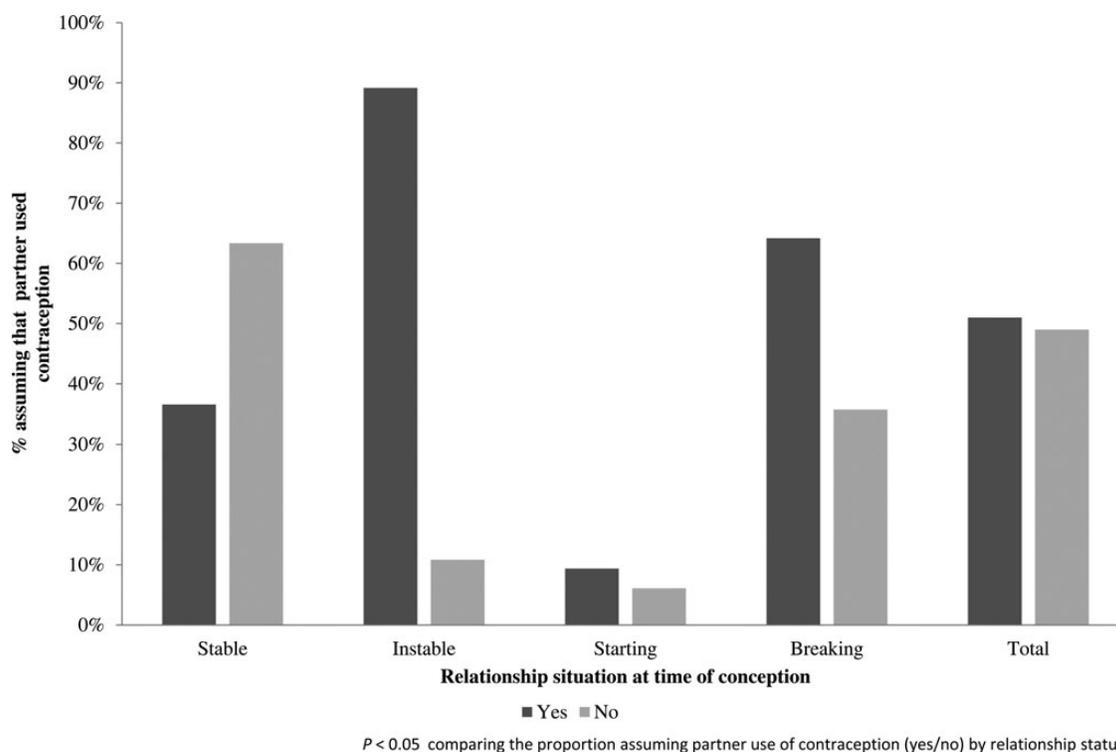


Figure 3 Proportion of men reporting unintended pregnancies who did not use contraception at the time of conception under the assumption that their partner was using contraception.

never used a method before, and one in four had not perceived any pregnancy risk (respondents could give more than one reason for not using contraception) (data not shown).

Further analysis showed that the time-varying social and relationship circumstances were strongly associated with non-use of contraception at the time of conception of an unintended pregnancy (Table III). The relative risk of not using contraceptives was higher among men for whom the pregnancy interfered with education (IRR = 1.8, 95% CI 1.0, 3.1) or work (IRR = 1.9, 95% CI 1.1, 3.6) compared with men for whom this was not the case. Conversely, the risk of non-use was lower if reported by men in very difficult rather than better financial situations at the time of conception (IRR = 0.5, 95% CI 0.3, 1.0). Although marginally significant, men in breaking relationships had a higher risk of not using contraceptives ($P = 0.065$) compared with peers in stable relations. Non-use was almost three times higher if reported by men without a high school degree compared with more highly educated peers (IRR = 2.9, 95% CI 1.6, 5.2) (Table III).

Discussion

This study highlights the common experiences of men who have reported recent unintended pregnancies, 45% of which resulted in an abortion according to their reports over the 5 years preceding the survey. Adding to the current literature, which has mostly focused on unintended births (Lindberg and Kost, 2014), our study provides new information on pregnancy intentions of men as we consider all pregnancy outcomes, an important addition since pregnancies ending in births

Table III Factors associated with non-use of a contraceptive method at the time of conception of an unintended pregnancy in the last 5 years ($n = 176$).

	Adjusted IRR ^a	95% CI	$P > t $
Financial situation			
No problem or tight	Ref		
Very difficult	0.5	0.3, 1.0	0.042
Pregnancy interfered with education			
No	Ref		
Yes	1.8	1.0, 3.1	0.038
Pregnancy interfered with work			
No	Ref		
Yes	1.9	1.1, 3.6	0.030
Relationship situation at the time of conception			
Stable	Ref		
Unstable	0.3	0.1, 1.1	0.082
Starting	1.2	0.5, 3.0	0.669
Breaking	1.8	1.0, 3.4	0.065
Education (highest diploma)			
High school degree or more	Ref		
No high school degree	2.9	1.6, 5.2	<0.001

^aAdjusting for age and educational attainment, and the financial, educational, work and relationship situation at the time of conception.

only contributed to 38% of all recent unintended pregnancies in our study. The use of self-reported data on abortion is always a limitation due to under-reporting (Jones and Forrest, 1992; Rossier, 2003; Bouyer et al., 2004) and may be further impaired in the case of men who are not always informed about these pregnancies. This later phenomenon may be limited as the percentage of unintended pregnancies ending in abortion (45%) in our survey was higher than the 32% reported by women in the 2000 national survey in France (Bajos et al., 2003). Post-rationalization of birth intentions, although not studied in men, is also a well-documented phenomenon in retrospective studies of pregnancy intentions (Bankole and Westoff, 1998; Speizer et al., 2013), and may have resulted in the misclassification of unintended births. However, the similarity in factors associated with unintended births and other unintended pregnancy outcomes partially elevates these concerns. Nonetheless, we acknowledge the possibility of an underestimation of unintended pregnancy rates reported by males due to the combination of abortion underreporting and post-rationalization of birth intentions. A further reason for why unintended pregnancies may be underestimated in this study is the decision to recode all pregnancies initially classified as unintended as intended if no contraception was used because the respondent 'wanted a child'. Such information is not routinely collected in national fertility surveys and therefore not included in measures of pregnancy intentions, although the multidimensional London measure of pregnancy intentions (Barrett and Wellings, 2002; Wellings et al., 2013) includes information on contraceptive use. While the reclassification may lower national estimates of unintended pregnancies rates, we consider the redefined measure captures a more homogeneous group of pregnancies more likely to be unintended, which was the focus of the present study. However, we acknowledge that the use of a dichotomous measure of pregnancy intentions, focused on a subgroup of pregnancies more likely to be unintended, does not reflect the complexity of fertility intentions made evident in recent research supporting the use of more nuanced measures that capture the multidimensional construct of pregnancy intentions (Zabin et al., 1993; Barrett and Wellings, 2002; Santelli et al., 2009; Wellings et al., 2013). This body of work, focused on women, draws attention to the complexity of intentions, sometimes ambivalent, or undetermined, or fluid, depending on relationship context (Zabin et al., 1993, 2000). Similar observations are reported by Edin and Nelson's in their qualitative study among low income fathers in the USA, revealing the complexities of men's pregnancy intentions and the hidden relational meanings of contraceptive behaviours for men (Edin, 2013). Further analysis of the dimensionalities of men's reproductive intentions is warranted to better understand how men negotiate pregnancy prevention strategies across their reproductive life span.

While such fluidity is not addressed in the current analysis, our results support the importance of contextual factors in determining fertility intentions. Thus, this study provides new information to comprehend the social and contextual factors that are associated with men's pregnancy intentions and their use of contraception at the time of conception. The respondents socio-demographic backgrounds had some connection to their experience regarding a recent unintended pregnancy, with a higher proportion of unintended pregnancies among men in difficult financial situations and among men with non-cohabitating partners. Unintended pregnancy was not related to the men's own educational attainment at the time of survey, although many men had not completed their education, which may affect the validity of these results.

A subanalysis (not shown in the tables) among men who had completed their education indicates similar results in that there was no association between educational attainment and unintended pregnancy. Some studies have shown that young women who give birth are more likely to drop out of school than others (Upchurch and McCarthy, 1990; Grant and Hallman, 2008). However, to our knowledge, studies have not examined this phenomenon among young men, and further exploration is thus warranted to assess the role of education on young men's reproductive health outcomes. Beyond men's individual education, the effect of (higher) mother's education on unintended pregnancy is surprising. As a possible explanation, men raised by mother's with greater educational attainment may have higher expectations in terms of controlling their own reproductive goals; thus, they may be more likely to consider a pregnancy as unintended if the pregnancy did not fit their reproductive calendar. However, these results need to be further investigated and confirmed in other studies.

Beyond individual characteristics, the contextual circumstances such as financial constraints and relationship characteristics at the time of conception were strongly associated with pregnancy intentions and contraceptive behaviours. Previous research has shown that contraceptive failures are more likely to occur when starting a method (Fu et al., 1999; Moreau et al., 2007), which is likely the case when one engages in a new relationship. Likewise, abortions commonly occur as a result of short gaps in contraceptive use (Bajos et al., 2006), a situation that is common in the case of infrequent sexual activity and partnership instability. As previously reported in a qualitative study of unwanted pregnancies in France (Bajos et al., 2002), our analysis provides further evidence for the importance of relationship status, associated with both pregnancy intentions and patterns of contraceptive use at the time of conception of an unintended pregnancy. While the use of contraception by relationship status needs further exploration in the light of the diverging results according to relationship stability (greater non-use at the time of conception for breaking relationships but lower non-use for unstable relationships, although these associations were marginally significant), a more consistent pattern emerged when considering the reasons for non-use of contraception. In contrast to those in stable relationships, a vast majority of men in non-stable relations who experienced an unintended pregnancy had assumed their partner was using contraception when they were not. These differences mirror previous findings from Catalozzi et al. (2013) who indicated that men aged 16–36 years in casual relationships were less likely to know about their partner's use of birth control than others. Based on the national Longitudinal Study of Adolescent Health in the USA, Manlove et al. (2011) also reported greater odds of contraceptive use among adolescent males in relationships they considered as 'intimate'. Given the small sample size in our analysis, future studies should confirm our findings about the reason for non-use of contraception among men who report an unintended pregnancy. Nevertheless, these results call for gender-inclusive family planning programmes, which fully engage men as active participants in pregnancy prevention in their own rights. In this respect, particular efforts should address the needs of men who are in dissolving or unstable relationships, who seem less likely to be in control of their reproductive goals. Efforts should also be made to adopt gender-inclusive comprehensive sexuality education at earlier stages in the education system than is currently being done in many settings. So too, such sexuality education should integrate family planning information and connection to services for both young men and women.

A vast majority of unintended pregnancies, however, started in a month when respondents or their female partners were using contraception, a figure that is consistent with the reports of women in France who have experienced an unintended pregnancy (Bajos *et al.*, 2002) or an abortion (Moreau *et al.*, 2010). Similar findings are reported in other countries, such as Spain where a majority of unintended pregnancies are due to inconsistent method use (Serrano *et al.*, 2012). In our study, men identified inconsistent or incorrect use more than method failure as the major contributor to these pregnancies, reflecting the significant gap between typical use and perfect use failure rates (Moreau *et al.*, 2007). Efforts to promote non-user-dependent methods (LARC or sterilization) are important in reducing unintended pregnancy rates (Winner *et al.*, 2012). However, additional male-oriented strategies are also needed to help men take control over their reproductive goals while lifting some of the burden of contraceptive responsibilities carried by women, who also suffer the greatest health consequences of unintended pregnancies.

In conclusion, our study echoes the growing emphasis on men's individual fertility intentions and sexual reproductive practices. While the perspectives of couples in family planning studies is essential (Becker, 1996; Miller *et al.*, 2004; Sassler *et al.*, 2009), the challenge in future research lies not only in recognizing men's fertility intentions in their own rights, but in further understanding the factors that shape their individual trajectories as well as the outcomes that follow. In a time where sexual trajectories are more diversified and the timing of parenthood is increasingly delayed (Toulemon, 2012), more research is needed on factors that shape and promote men's sexual and reproductive health and well-being. Our results indicate that the need for family planning services might thus be greatest among economically disadvantaged young men outside of stable relationships. Part of our agenda for future work will be to further explore the circumstances surrounding men's contraceptive perspectives and experiences as it relates to their pregnancy intentions in the presence or absence of a pregnancy.

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Authors' roles

A.K. and C.M. conceptualized the study, conducted the data analysis and drafted the manuscript. N.B., co-PI of the FECOND survey, and A.B., coordinator of the FECOND survey, were both involved in the study design, and contributed to the conceptualization of the manuscript and revision of the draft manuscript.

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Conflict of interest

None declared.

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