

## ORIGINAL ARTICLE

## Sex difference in partner notification: results from three population based surveys in France

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**Objectives:** To estimate the proportion of individuals in the general population who did not notify their sexual partners at the time of an STD diagnosis, according to the sex of the patient and the type of partner.

**Methods:** We analysed behaviour at the time of diagnosis of a self reported STD, using data from three large French national population based surveys of adults (ACSF, Baromètre Santé) and adolescents (ACSJ). Univariate and multivariate analyses took into account the complex sampling design.

**Results:** In the ACSF, 14% (95% CI: 4% to 24%) of men reported that they had not informed their main sexual partner compared with only 2% (95% CI: 0% to 5%) of women ( $p = 0.03$ ). This sex difference was independent of the nature of the STD, the patient's age, level of education, and number of partners. Similarly, in the ACSJ, 51% (95% CI: 21% to 81%) of boys reported that they had not talked about this STD with their current sexual partner compared with only 9% (95% CI: 0% to 26%) of girls ( $p = 0.04$ ). Notification by a sexual partner had led to discovery of the STD more frequently in male subjects than in female subjects, both in adults (32% of men compared with 4% of women ( $p=0.04$ )), and adolescents (36% of boys compared with 12% of girls). Most subjects, irrespective of sex, had not informed partners other than their main or current partner: 73% (95% CI: 62% to 84%) of adults and 86% (95% CI: 77% to 95%) of adolescents.

**Conclusions:** Procedures must be developed urgently to improve the notification of sexual partners, particularly female partners and adolescents, who are unlikely to be tested early without such notification.

## INTRODUCTION

Partner notification is one of the strategies used to control sexually transmitted diseases (STDs). The aims of this strategy are to encourage early treatment, to reduce the length of the infectious period, to limit the spread of STDs, and to prevent complications.<sup>1</sup> In several countries, partner notification is mandatory or recommended for certain curable STDs (chlamydia infection, gonorrhoea, syphilis).<sup>2</sup> There are two kinds of procedures, which may be combined: asking patients to notify their sexual partners themselves ("patient referral") and asking patients to provide the identity of their sexual partners so that a disease intervention specialist (DIS, known as a health adviser in the United Kingdom), trained in this activity, can contact and inform them ("provider referral"). DIS services are available almost exclusively at STD clinics. The geographic dispersion of private practitioners and doctors in primary care units, the lack of specific training of these doctors, and the fact that they each see only a small number of STD cases are obstacles to the development of these programmes outside such structures.

Most STDs are treated outside the STD clinics in the United States,<sup>3</sup> as is the case in the United Kingdom for *Chlamydia trachomatis* infections.<sup>4</sup> In France, less than 20% of STDs are seen within the public health service.<sup>5</sup> Few studies have investigated management of the partners of patients treated in systems other than public STD clinics. Previous studies have reported that most physicians ask their patients to inform their partners but rarely examine these partners themselves.<sup>6-8</sup> In a survey carried out in England and Scotland, only 30% of general practitioners would have referred their patients to partner notification services following the diagnosis of chlamydia infection.<sup>9</sup> Another survey in Scotland showed that only 13% of patients with chlamydia infection diagnosed by general practitioners had been referred to such a service.<sup>10</sup> In France, where there are no national recommenda-

tions concerning the management of partners, no data are available concerning the practices of doctors and the behaviour of patients with respect to their partners.

We included some questions about STD history in three national population based surveys to study the behaviour of patients at the time of STD diagnosis. We aimed to estimate, for adults and adolescents, the proportion of individuals who did not notify their partners at the time of diagnosis, according to the type of partner, paying particular attention to sex differences.

## METHODS

## Description of the surveys

Standardised questionnaires were administered to samples obtained by complex sampling designs.

(1) The "ACSF survey" (Analyse des Comportements Sexuels en France, Analysis of Sexual Behaviour in France) was carried out by telephone between September 1991 and February 1992. The initial sampling frame was the official telephone directory. A detailed questionnaire was administered to 4820 adults aged 18-69 selected by two phase for stratification sampling with unequal probabilities. The methodology has been described elsewhere.<sup>11</sup>

(2) The "Baromètre Santé 93 survey" (Health Barometer), carried out in 1993 by telephone, was designed to assess opinions, attitudes, and behaviour with respect to major health aspects. The study population consisted of 1950 adults aged 18-75. Sampling design and data collection were identical to those used in ACSF first phase sampling.<sup>12</sup>

(3) The "ACSJ survey" (Analyse des Comportements Sexuels des Jeunes; Analysis of the Sexual Behaviour of Young People) was a face to face survey, carried out between January and March 1994, in schools. The sampling frame was the list of all

**Table 1** Percentage\* of subjects who had not notified their sexual partners on diagnosis of an STD, according to the type of partner†

	Total		According to sex				p Value	
			Male		Female			
	No	%	95% CI	%	95% CI	%		95% CI
<i>Adults</i>								
ACSF survey (n = 145), percentage of subjects who had not notified:								
their main partner at the time	15	8	3 to 13	14	4 to 24	2	0 to 5	0.002
other partners‡	60	73	62 to 84	71	58 to 84	75	56 to 94	0.30
any of their sexual partners	13	7	2 to 12	12	3 to 21	1	0 to 3	0.006
Baromètre Santé survey (n = 32), percentage of subjects who had not talked about this STD with:								
any current partner at the time	4	11	0.2 to 22	15	0 to 36	9	0 to 21	0.60
some but not all current partners	7	20	5 to 35	25	0.4 to 49	16	0 to 34	0.70
any previous partner	30	96	89 to 100	95	85 to 100	96	88 to 100	0.90
any of their sexual partners	3	9	0 to 20	10	0 to 30	9	0 to 21	0.90
<i>Adolescents</i>								
ACSJ survey (n = 45), percentage of subjects who had not talked about this STD with:								
their current partner at the time	10	32	14 to 50	51	21 to 81	9	0 to 26	0.04
previous partners	36	86	77 to 95	86	73 to 99	85	70 to 100	0.90
any of their sexual partners	8	27	9 to 45	42	12 to 72	6	0 to 15	0.01

\*Percentages are weighted to take into account unequal probabilities 95% confidence intervals (95% CI) were estimated and tests were carried out taking into account sampling design. They therefore cannot be directly calculated as the ratio of observed frequencies; †questions concerning partner notification were asked differently in the three surveys; ‡among the 102 subjects who had other partners than a main partner.

academic and technical high schools, both public and private, and various vocational centres attended by educationally disadvantaged young people. A sample of 6182 adolescents aged 15–18 was obtained by two stage sampling with unequal probabilities.<sup>13</sup>

The overall response rate was 77% for ACSF and Baromètre Santé and 86% for ACSJ.<sup>11–13</sup>

### Study population

This analysis concerned subjects who reported a history of STD (during the last 5 years in adults and during their lifetime in adolescents). They were asked to indicate the type of infection that they had had from a list, and this enabled us to distinguish between curable and non-curable STDs in some analyses. Subjects who reported genital mycosis only were not included in this analysis.

### Variables

The questions concerning partner notification were asked differently in the three surveys:

- ACSF survey (adults): “the last time you had an STD, did you inform your main sexual partner? And your other sexual partners?”
- Baromètre Santé survey (adults): “The last time you had an STD, did you talk about it to at least one of the sexual partners that you had at the time or previously? To all your partners at the time? To some but not all? To previous partners?”
- ACSJ survey (adolescents): “The last time you had an STD, did you talk about it to the partner that you had at the time? Did you talk to previous partners? Did you not inform any of your partners?”

The ACSF survey (adults) distinguished the main partner from other partners, whereas the Baromètre Santé survey (adults) and the ACSJ survey (adolescents) distinguished the partner or partners at the time of the diagnosis from previous partners. The percentage of subjects who did not inform anyone could be directly estimated from the Baromètre Santé and ACSJ, and indirectly from the ACSF.

The Baromètre Santé and the ACSJ surveys also contained a question concerning the circumstances leading to the diagnosis: “Did you discover this disease because your partner informed you that he or she had it? Because you had

symptoms or suspicions that led you to consult a physician? During a consultation for another reason?”

The following characteristics of the patients were taken into account: sex, age (at the time of diagnosis for adolescents, and at the time of the survey for adults because the exact date of diagnosis was not available), level of education (not having compared with having at least a high school graduation certificate for adults; attending a vocational centre compared with an academic or technical high school for adolescents), multiple sexual partners (based on the number of sexual partners in the last 5 years for adults and in their lifetime for adolescents). We also distinguished curable STDs (*Chlamydia trachomatis*, gonorrhoea, syphilis, and trichomoniasis) from the other STDs.

### Statistical analysis

In all the surveys, the percentages were weighted to take into account the unequal selection probabilities. In the ACSF, they were also post-stratified according to census. Confidence intervals were calculated, percentages compared, and logistic regressions performed according to the sampling design, with the *svy* module of the *STATA* software.<sup>14</sup>

### RESULTS

A history of STD in the last 5 years was reported by 145 adults in the ACSF: 1.1% (95% CI = 0.8 to 1.4) and 32 adults in the Baromètre Santé: 1.5% (1 to 2). A lifetime history of STD was reported by 45 adolescents in the ACSJ: 0.8% (0.4 to 1.2).

### Partner notification

Less than 10% of adults (7% in the ACSF and 9% in the Baromètre Santé) stated that they had not informed any of their sexual partners of a diagnosis of STD (table 1). This was the case for 27% of the adolescents (ACSJ).

When the type of partner informed was considered (table 1), we found that only 8% of the subjects interviewed for the ACSF had not informed their main partner whereas 73% had not informed other partners (table 1, ACSF). In the Baromètre Santé, 11% of the subjects said that they had not informed their current partners, 20% said that they had informed some, but not all, of their partners, and 96% had not informed any of their previous partners (table 1, Baromètre Santé). It should, however, be pointed out that the patients were not asked when

**Table 2** Factors associated with the non-notification of the main sexual partner in adults (ACSF) or the current sexual partner in adolescents (ACSJ) on diagnosis of an STD

	No	Univariate analysis			Multivariate analysis†		
		%*	95% CI†	p Value	Adj OR	95% CI	p Value
<i>Percentage* of adults who had not notified their MAIN sexual partner at the time (ACSF survey):</i>							
Sex							
Male	81	14	4 to 24	0.002	7.1	1.4 to 35.6	0.02
Female	58	2	0 to 5		1		
Type of STD							
Curable‡	66	9	0 to 17	0.80	1.4	0.3 to 5.6	0.70
Other	73	7	1 to 13		1		
Level of education							
Low	22	16	0 to 35	0.10	3.5	0.8 to 15.6	0.09
Medium or high§	117	6	2 to 10		1		
Age at the time of the survey							
30 years or over	67	9	0 to 18	0.70	1.1	0.3 to 4.3	0.90
18 to 29 years	72	7	1 to 13		1		
Number of partners in the last 5 years							
5 or more	65	10	3 to 17	0.60	1.2	0.3 to 4.9	0.80
1 to 4	53	7	0 to 15		1		
<i>Percentage* of adolescents who had not talked to the CURRENT partner at the time (ACSJ survey):</i>							
Sex							
Male	23	51	21 to 81	0.04			
Female	22	9	0 to 26				
Type of STD							
Curable‡	9	51	7 to 95	0.30			
Other	36	27	8 to 46				
School							
Vocational school or training centre	22	38	9 to 67	0.60			
High school (theoretical or practical)	23	27	4 to 50				
Age at diagnosis of STD							
17 or 18 years	20	5	0 to 13	0.003			
16 years or younger	22	41	15 to 67				
Number of partners in the last 5 years							
5 or more	22	19	0 to 43	0.11			
1 to 4	22	37	16 to 58				

\*Percentages are weighted to take into account unequal probabilities. They therefore cannot be directly calculated as the ratio of observed frequencies. 95% confidence intervals (95% CI) were estimated and tests were carried out taking into account sampling design; †odds ratios (adj OR) are adjusted in a logistic regression for factors presented in the table; ‡self reported curable STD are *Chlamydia trachomatis*, gonorrhoea, syphilis, trichomoniasis; §at least high school graduation certificate.

they had last had sexual intercourse with these previous partners. In the ACSJ, 32% of the adolescents said that they had not talked about this STD with their current partner and 86% had not talked about it with previous partners (table 1, ACSJ).

In the three surveys, the proportion of subjects who had not informed *any* of their partners was lower for female than for male subjects (significantly so in the ACSF and ACSJ surveys) (table 1). This difference concerned the main partner for adults and the current partner for adolescents. In the ACSF, 14% of men had not informed their main partner compared with only 2% of women ( $p = 0.03$ ; table 2, ACSF). This association remained significant in logistic regression after adjustment for all of the factors presented in table 2. Not informing the main partner also tended to be associated with a low level of education (as opposed to a medium or high level of education), but was not associated with age at the time of the survey (less than 30 years old compared with 30 years old or older). Similar results were obtained if a cutoff point of 25 years of age was used, although there were only 29 adults aged 18–24. In the ACSJ, 51% of the boys did not talk about this STD with their partner at the time, compared with only 9% of the girls ( $p = 0.04$ ; table 2, ACSJ). The subjects who were 16 years old or younger at the time of diagnosis were less likely than subjects who were 17 or 18 years old to have spoken to their partner about the STD ( $p < 0.01$ ).

A high proportion of adults (73%), similar for male and female subjects, said that they had not informed any partners other than their main partner (table 1, ACSF). Most people had not informed previous partners (table 1, Baromètre Santé, table 1, ACSJ).

### Circumstances of the diagnosis

Two of the three surveys asked about the circumstances that led to the discovery of the reported STD episode. The circumstances of diagnosis differed according to sex (significantly so in Baromètre Santé): the presence of symptoms was the most frequent origin of the diagnosis in adolescents and in male adults and was almost as frequent as consultation for another reason in female adults. Male adults and adolescents were more frequently notified by a partner than were female adults and adolescents (32% of men and 36% of male adolescents compared with 4% of women and 12% of female adolescents) (table 3).

### DISCUSSION

This work provides the first insight into the notification of sexual partners following an STD diagnosis in France. It involves an original approach based on general population surveys, which provided us with samples of patients most of whom were diagnosed with STDs by private practitioners whereas most of the other studies in this field involved patients treated at STD clinics.<sup>8</sup> The internal consistency and reliability of responses were specifically studied in the ACSF survey. No major contradictions have been observed in the answers given by an individual to questions in different parts of the questionnaire dealing with the same subject.<sup>15</sup> The reliability of self reporting of STDs has also been studied in seven European national population based surveys including the ACSF survey<sup>16</sup>: self reported STDs were strongly correlated with multiple partners, paying for sex, homosexuality, and

**Table 3** Circumstances leading to diagnosis of the self reported STD\*

	Male			Female		
	No	%	95% CI	No	%	95% CI
<i>Baromètre Santé survey</i>						
% of adults tested because they:						
were notified by an infected sexual partner	4	32	5 to 60	1	4	0 to 12
presented symptoms or suspected that they had an STD	8	52	23 to 80	7	41	16 to 67
consulted for another reason	2	16	0 to 37	10	55	29 to 80
p Value				0.04		
<i>ACSJ survey</i>						
% of adolescents tested because they:						
were notified by an infected sexual partner	5	36	5 to 67	2	12	3 to 27
presented symptoms or suspected that they had an STD	13	60	28 to 92	17	73	56 to 90
consulted for another reason	2	4	0 to 10	3	15	0 to 31
p Value				0.23		

\*Percentages are weighted to take into account unequal probabilities. They therefore cannot be directly calculated as the ratio of observed frequencies; 95% confidence intervals (95% CI) were estimated and tests were carried out taking into account each sampling design.

were independent of a series of key sociodemographic characteristics. The sex ratio and distribution of the various self reported pathogens were similar to those obtained by epidemiological surveillance in industrialised countries.

Our results suggest that, although most adults said that they had notified at least one partner, occasional partners were rarely alerted following the diagnosis of an STD. More than two thirds of the patients did not inform partners other than their main partner (in the ACSF), which is consistent with the results of a recent qualitative study in patients with chlamydial infection, gonorrhoea or non-gonococcal urethritis.<sup>17</sup> In-depth interviews showed that the typical pattern of behaviour involved notification of the main partner but not of other partners.

CDC recommendations extend to all partners with whom there has been sexual contact in the 60 days preceding the diagnosis of chlamydia infection or gonorrhoea, or the last sexual partner if more than 60 days have passed since the last sexual contact.<sup>18</sup> The data collected here did not allow us to estimate precisely the proportion of partners targeted by the CDC recommendations who were not notified. In the Baromètre Santé, one quarter of adults had notified only some of their partners at the time; almost none of the adults had informed their previous partners, but they were not asked how long ago sexual contact with these partners had occurred. Nevertheless, our results are consistent with those of a study of patients tested for chlamydia infection by private physicians in Seattle-King County: 61% of the patients who had had more than one sexual partner in the previous 60 days neglected to inform at least one of these partners.<sup>8</sup>

The situation for adolescents, particularly for the youngest subjects, is worrying: 32% had not talked to the partner they had at the time of the STD episode, and this percentage reached 41% in adolescents aged 16 or younger at the time of diagnosis. Very few had talked about this STD with previous partners. It is a matter of some concern that a large proportion of these non-notified partners may well have been recent partners at the time of diagnosis. It has been shown that subjects who become sexually active early are more likely to have two or more recent partners and that partner acquisition in adolescents tends to follow a pattern of serial monogamy.<sup>19</sup> We observed such a pattern in the ACSJ survey: among sexually active adolescents, 39% of boys and 28% of girls reported having at least two partners in the last year whereas a small minority of adolescents reported having several partners simultaneously for a period of 2 months or more.<sup>20</sup>

Overall, these results are all the more worrying in that they probably underestimate the true situation. Firstly, our analysis concerns only subjects who reported a history of STDs. Individuals who did not declare such a history might be less

likely to inform their partners for the same reasons that they did not declare their STD history: embarrassment, lack of understanding concerning the nature of the diagnosis, or oversight. In addition, these surveys did not cover individuals from very poor socioeconomic backgrounds (adults without telephones, adolescents not in education and training) who might be less able to integrate a preventive element into their behaviour. Finally, we cannot exclude the possibility that certain subjects did not tell the truth when they affirmed that they had notified their current partner, whereas the converse is unlikely.

Having been alerted by a sexual partner led to the discovery of the STD more frequently in male than in female subjects, both in adults (Baromètre Santé) and adolescents (ACSJ). This result is important in that women are unlikely to be tested early without such notification. Firstly, the clinical signs of most STDs are transient and moderate in women: two thirds of *Chlamydia trachomatis* infections are asymptomatic, whereas cervical carriage of the infection may last for up to a year.<sup>21-22</sup> Secondly, the opportunities for screening, which are more frequent in women than in men, are not systematic, occur at discrete time points, and occur late with respect to infection. Systematic screening of the patients of gynaecologists in France showed that half the women infected with *C. trachomatis* had not had a new partner in the preceding year.<sup>23</sup>

Our analysis shows that sex differences in terms of partner notification essentially concern the main partner. In the ACSF, men notified their main partner less frequently than did women. This difference was independent of the nature of the STD, the age of the individual and their level of education or number of partners. In adolescents, more than half the boys did not talk about the STD with their current partner whereas this was the case for only 10% of the girls. This difference was even greater (75% compared with 11%) if adolescents who had themselves been notified by a partner were excluded from the analysis.

Further investigations involving physicians and patients are required to increase our understanding of the obstacles to partner notification. Procedures must urgently be developed to improve the notification of sexual partners, particularly female partners and adolescents, to prevent complications such as infertility and extrauterine pregnancy.

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JW and LM analysed the data and wrote the paper; JW is a member of the scientific investigators team of the ACSF, ACSJ, and Baromètre Santé surveys.

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