

## ORIGINAL ARTICLE

## Teenagers' use of sexual health services: perceived need, knowledge and ability to access

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**Abstract**

**Introduction** An individual teenager's use of services may depend on perceived need, on knowledge of sexual health and local services, and on ability to access. This paper presents the first UK large-scale quantitative analysis of these factors, comparing those who use services with those who do not.

**Methods** 15/16-year-olds ( $n = 5747$ ) were questioned about their use of sexual health services in the SHARE trial of a school sex education programme in 25 schools in Lothian and Tayside, Scotland, UK. Multilevel statistical models examined the role of different factors on service use.

**Results** One-third of teenagers had used a service, and use was strongly related to sexual experience. In addition, some family influences and being a school leaver were associated with service use, although we found no evidence for class, ethnic or religious barriers to use. Proximity to specialist clinics was linked with greater use, while low spending money and high parental monitoring were associated with less use. Teenagers with better knowledge, who rated their school sex education as effective, who were comfortable talking about sex and who had discussed contraception with peers were more likely to have used services. Differences in use relating to sexual experience, knowledge, feeling comfortable talking about sex and talking with peers helped to explain gender differences in service uptake.

**Conclusion** There is potential to influence service use through better knowledge and confidence imparted through school sex education, and by improving the links between services and schools.

**Key message points**

- Sexual experience, proximity to clinics, parental influences, knowledge and confidence were all associated with service use/non-use.
- Effective school sex education was associated with increased uptake of services.
- Boys' uptake of services may be improved through better knowledge, greater confidence and peer group discussion.

**Introduction**

Current UK policies aimed at increasing uptake and improving delivery of sexual health services among teenagers view availability, confidentiality and non-judgemental staff as key features of these services.<sup>1–3</sup> These supply-side attributes may encourage teenagers embarking on sexual relationships to use services, but individual uptake will also depend on perceived need for help, knowledge of local services and ability to access them. Teenagers in short-term relationships may feel less need to use services.<sup>4,5</sup> Girls need to use services more than boys, perhaps because of greater concerns over pregnancy,<sup>6</sup> but also because the pill is obtainable only on prescription.

Boys prefer to buy condoms<sup>7,8</sup> and to obtain advice from helplines or websites.<sup>9</sup> There is scope to influence perceived need through better sexual health knowledge<sup>10</sup> and information about local services. Many teenagers appear to hear about services from their friends rather than via publicity material.<sup>11–13</sup>

Teenagers' ability to access services is likely to depend on a number of interrelated factors. The first group is linked to where they live or go to school in relation to different services. Proximity may be important for rural teenagers<sup>14</sup> who also have fewer service options available to them;<sup>15</sup> although both rural and urban teenagers may prefer to travel to more distant services that provide greater anonymity.<sup>16,17</sup> There is debate over whether all types of existing sexual health provision are equally suitable for young people. With teenagers' concerns over general practitioners' (GPs') respect for confidentiality,<sup>18,19</sup> family planning clinics (FPCs) may be preferred because they appear to offer a more anonymous, confidential, non-judgemental specialist service.<sup>20,21</sup> A specialist youth service may be teenagers' ideal model of service provision,<sup>11,22–24</sup> although increasing FPC hours coupled with targeted outreach to schools dramatically increased young people's use of a mainstream service.<sup>13</sup> Some young peoples' services are more attractive to boys than mainstream services<sup>25–27</sup> but not all.<sup>11,28</sup>

A second group of factors affecting ability to access services includes cultural and language barriers,<sup>29,30</sup> family influences – for example, fear of parental disapproval<sup>14</sup> – and individual confidence in discussing sensitive issues.<sup>31</sup>

Studies of teenagers' use of sexual health services have typically been small-scale surveys and qualitative research. Profiles of those using particular types of service have not compared them with non-users or those visiting other services; and research on teenagers' views of an ideal service has not related these to actual patterns of use. We know relatively little in the UK about what, in practice, stimulates or discourages teenagers to use sexual health services of all types. The aim of this paper is to explore the hypothesis that use of sexual health services will depend on a range of factors related to perceived need, knowledge and ability to access. This study is the largest UK quantitative analysis to compare teenage users and non-users of services, examining the role of sociodemographic background, sexual experience, access, knowledge and school sex education.

**Methods****Sample**

Following approval by Glasgow University's Ethical Committee for Non-Clinical Research Involving Human Subjects, all 47 non-denominational state secondary schools within 24 km of the main cities in Lothian and Tayside, Scotland, UK were invited to participate in the

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**Table 1** Service use by teenagers aged 15/16 years in the SHARE dataset<sup>a</sup>

Parameter	Boys (%)		Girls (%)		Total (%)	
	All	Sexually experienced	All	Sexually experienced	All	Sexually experienced
Use of all sexual health services (all teenagers)						
No service	76	58	60	35	68	45
Service used	24	42	40	65	32	55
Total (n)	2673	870	3074	1262	5747	2132
Reason for service visit (all teenagers using a service) <sup>b</sup>						
Condoms	94	93	73	72	80	79
Other contraception	15	15	58	65	42	48
Pregnancy	18	19	33	39	27	32
Sexually transmitted disease	14	12	14	14	14	13
Other	6	5	3	2	4	3
Contraception only	78	77	69	65	73	69
Total (n)	622	382	1172	849	1794	1231
Use of different type of service (teenagers naming service type) <sup>c</sup>						
GP	30	33	50	53	45	48
FPC (no youth provision)	26	28	19	21	21	22
FPC (youth provision)	13	13	9	9	10	10
Specialist youth service	34	30	34	29	34	29
Youth service (specialist/family planning) used	47	42	42	38	43	39
Only used mainstream service without youth provision	53	59	58	62	57	61
Total naming service type (n)	200	177	792	727	992	904

<sup>a</sup>Percentages used data weighted for attrition at follow-up, frequencies used unweighted data.

<sup>b</sup>Services could be used for more than one reason, so percentages sum to more than 100.

<sup>c</sup>More than one type of service may be used. Service types used by more than 5% of teenagers shown in first four rows.

FPC, family planning clinic; GP, general practitioner.

SHARE (Sexual Health and Relationships: Safe, Happy and Responsible) controlled trial of school sex education,<sup>32,33</sup> with the exception of five pilot schools. Schools in the SHARE trial were allocated either the SHARE programme of sex education or continuing with their existing sex education. The SHARE programme consisted of a 5-day teacher training programme and a 20-session pack for third- and fourth-year students. Parents were given the opportunity to withdraw their children, and pupils were also given the option to withdraw or omit questions at any stage. At baseline (age 13/14 years), three pupils from the 24 schools who elected to join the study at baseline were excluded by teachers because of learning difficulties, seven pupils were withdrawn by their parents, and 32 pupils chose not to participate. Taking into account these opt-outs and absences from school, the participation rate at baseline was 94%.

This paper is based on data from a follow-up self-completed questionnaire administered by researchers under examination conditions at age 15 or 16 years (average age, 16 years 1 month), by which stage another school had joined the study (n = 5747). The response rate was 69% of the total eligible sample, the shortfall being mainly attributable to lower participation among school leavers completing postal questionnaires. Only 2% of those still at school chose to opt out. The analysis used weighted data to compensate for the greater attrition for boys, lower social class and those reporting sex at baseline, maintaining the representativeness of the sample compared to the 1991 census that was established at baseline.<sup>32,34</sup>

Respondents were asked whether they had used a sexual health service of any kind (including GP services) in

the previous 2 years, for each of five different purposes (for condoms, other contraceptives, advice about pregnancy, advice about sexually transmitted diseases or 'other' reasons), and for the name of the service used. From previous research<sup>35</sup> and teenagers' replies to the questionnaire, 39 sexual health clinics were identified in the study area in addition to GP services at the time of data collection (1996–1999). Ten of these were youth services: most were designated times for young people within FPCs, and four were exclusively for young people. The two most popular were the Brook Advisory Centre in Edinburgh (now Caledonia Youth) and The Corner, a multipurpose, drop-in centre in Dundee.

#### Statistical modelling of service use

Exploratory bivariate analysis of the data was performed using SPSS version 11.5 (SPSS Inc., Chicago, IL, USA). At this stage, existing research described in the Introduction and factors related to experience of sexual intercourse in the SHARE dataset<sup>36,37</sup> were used to inform the choice of variables that might be associated with service use. In the next stage, multilevel logistic regression models of service use were fitted using iterative generalised least squares with a second-order Taylor series expansion and penalised quasi-likelihood in MLWiN.<sup>38</sup> There were two levels in the models: individuals and schools. Dummies were included for missing values of the variables, so the same individuals were included in all models. Each model routinely controlled for cohort and age at questionnaire.

The first three stages of the analysis focused on individual-level predictors of service use. The final stage

**Table 2** Service use by teenagers aged 15/16 years in the SHARE dataset: use of youth (specialist/family planning) services by purpose of visit (all teenagers naming service type)

	Condoms	Other contraception	Pregnancy	Sexually transmitted disease	Other	All reasons for visit
Youth service ever used (%)	56	29	46	47	38	43
Mainstream service only (%)	44	71	54	53	62	57
Total naming service type (n)	617	551	298	106	72	992

**Table 3** Individual effects on sexual health service use at age 15/16 years: sociodemographic variables and sexual relationships (n = 5747)

Parameter		Model 1			Model 2		
		OR	95% CI (lower)	95% CI (upper)	OR	95% CI (lower)	95% CI (upper)
Gender (boys)	Girls (53.5%)	<b>2.09</b>	<b>1.70</b>	<b>2.58</b>	<b>2.00</b>	<b>1.73</b>	<b>2.31</b>
Housing (owner occupier)	Rented (22.1%)	1.03	0.88	1.21	0.99	0.82	1.19
	Housing missing (11.2%)	0.94	0.73	1.21	0.91	0.72	1.16
Ethnic group (white)	Indian subcontinent (2%)	0.96	0.68	1.37	1.29	0.77	2.16
	Other minority ethnic groups (2.7%)	<b>0.65</b>	<b>0.47</b>	<b>0.92</b>	0.74	0.47	1.18
	Ethnic group missing (3.4%)	1.13	0.75	1.70	0.88	0.55	1.42
Educational status (at school)	School leaver (15.6%)	<b>2.25</b>	<b>1.87</b>	<b>2.70</b>	<b>1.34</b>	<b>1.12</b>	<b>1.61</b>
Living arrangements (live with both parents)	Live with one or no parents (27.1%)	<b>1.65</b>	<b>1.41</b>	<b>1.92</b>	<b>1.38</b>	<b>1.19</b>	<b>1.62</b>
	Living information missing (4.4%)	1.05	0.42	2.66	0.69	0.31	1.51
Social class (non-manual)	Manual social class (23.3%)	<b>1.15</b>	<b>1.01</b>	<b>1.32</b>	1.06	0.89	1.25
	Social class missing (9.7%)	0.94	0.73	1.20	1.02	0.80	1.32
Mother's age (40+ years)	Mother <40 years (35.5%)	<b>1.41</b>	<b>1.17</b>	<b>1.71</b>	<b>1.18</b>	<b>1.01</b>	<b>1.39</b>
	Mother's age missing (16.2%)	1.08	0.90	1.31	1.22	0.98	1.53
Religious belief (religious)	Unsure (18.4%)	<b>1.53</b>	<b>1.18</b>	<b>1.99</b>	1.24	0.95	1.62
	Not religious (31.9%)	<b>1.51</b>	<b>1.26</b>	<b>1.82</b>	1.16	0.90	1.48
	Not at all religious (33.3%)	<b>1.63</b>	<b>1.29</b>	<b>2.07</b>	1.16	0.91	1.49
	Belief missing (4.5%)	0.04	0.01	0.12	<b>0.31</b>	<b>0.12</b>	<b>0.81</b>
Sexual experience (no sex)	Once (10.3%)				<b>2.76</b>	<b>2.18</b>	<b>3.49</b>
	More than once with same partner (9.2%)				<b>5.39</b>	<b>4.32</b>	<b>6.73</b>
	More than once, more than one partner (17.6%)				<b>10.39</b>	<b>8.61</b>	<b>12.54</b>
	Sexual experience missing (0.9%)				<b>6.26</b>	<b>3.34</b>	<b>11.74</b>
Boy/girlfriend (never had one)	Used to have one (52.9%)				<b>1.81</b>	<b>1.40</b>	<b>2.33</b>
	Currently have one (30.2%)				<b>2.42</b>	<b>1.83</b>	<b>3.21</b>
	Boy/girlfriend missing (1.8%)				<b>2.29</b>	<b>1.31</b>	<b>4.01</b>
Future expectations for 2 years ahead (none of these)	Steady relationship (30.6%)				1.12	0.94	1.34
	Living with partner (10.6%)				<b>1.43</b>	<b>1.19</b>	<b>1.73</b>
	Child(ren) (2.7%)				1.44	0.93	2.21
	Future expectations missing (4.6%)				0.13	0.04	0.46

Models control for age and cohort. Column 1 shows reference category in parentheses. Percentages indicate share of contrast category in sample. Bold type denotes OR significant at  $p < 0.05$  or less. CI, confidence interval, OR odds ratio.

focused on trying to explain the remaining between-school variation in service use, with a combination of individual-level and school-level variables.

Model 1 incorporated sociodemographic predictors of service use, identified through bivariate analysis: gender, social class, housing tenure, family structure, mother's age, ethnic group and religiosity.

Model 2 incorporated sociodemographic predictors as for Model 1, plus experience of sexual intercourse, boy/girlfriend and future expectations concerning relationships. At this stage, some sociodemographic predictors of service use in Model 1 became insignificant, because they helped predict sexual experience.<sup>36,37</sup> These were dropped before progressing to Model 3.

In Model 3, variables related to teenagers' ability to access clinics, confidence, knowledge and attitudes were added.

Postcodes were used to calculate straight-line distances between pupils' home address and their nearest undifferentiated and youth-specific sexual health clinics. Proximity to GPs was not used, but this is more uniform. The mean distance from home to the nearest clinic was 2.9 km, and to the nearest youth service was 7.2 km. The majority of pupils (60%) were within 3 km of a clinic of any type and 27% were within 3 km of a youth clinic. While fewer than one in ten pupils lived more than 10 km from a clinic of any type, around four in ten pupils lived more than 10 km from a youth clinic. Straight-line distances were transformed to standardised z-scores based on normal distributions, which were used as indexes of relative clinic proximity in the models.

Other variables that might have related to teenagers' ability to access clinics were levels of parental monitoring (mean scores for four questions concerning rules about

going out in the evening<sup>39</sup>) and spending money. Confidence was measured through self-esteem (mean scores for four questions) and how comfortable teenagers felt when talking about sex with others (mean scores for seven questions). There were two variables for knowledge, namely knowledge of sexual health (mean scores for eight questions) and knowledge of different places where contraception may be obtained on prescription. Other variables included whether teenagers had talked to friends about using contraception in the past year (from two questions about condoms and contraception in general) and whether they considered it important to plan protection against pregnancy/sexually transmitted diseases (two questions).

Significant school-level variance in Model 3 suggested that a school-level effect on service use remained. Variance significance is given by reference to its standard error in a one-sided test, a value greater than 1.64 × the standard error (SE) is significant at  $p < 0.05$ .<sup>40</sup>

In Model 4, four variables were added to see whether there was any reduction in school-level variance: school-level deprivation, school proximity to clinics, and individual opinions of both the coverage and effectiveness of school sex education. School-level deprivation was added because of its association with between-school variation in sexual experience.<sup>34</sup> This measure incorporates local unemployment rates, area deprivation score, pupils' post-school destination, paid school meals, staying on rates and attendance rates.<sup>35</sup> School straight-line distances to nearest clinic/youth clinic were used in a similar way to distances from home to clinic. The mean minimum distance from school to all types of clinic was 2.1 km, and to a youth clinic was 7.0 km, similar to the mean distances from home.





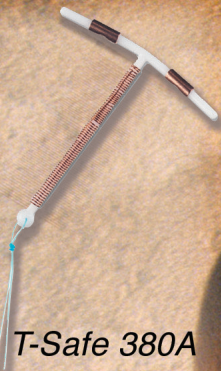
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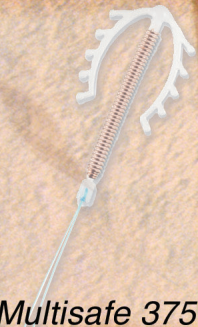
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**Table 4** Individual effects on sexual health service use at age 15/16 years: sociodemographic variables, sexual relationships, access, knowledge, confidence and attitudes (n = 5747)

Parameter		Model 3		
		OR	95% CI (lower)	95% CI (upper)
Gender (boys)	Girls (53.5%)	1.12	0.90	1.40
Educational status (at school)	School leaver (15.6%)	<b>1.36</b>	<b>1.13</b>	<b>1.64</b>
Living arrangements (live with both parents)	Live with one or no parents (27.1%)	<b>1.41</b>	<b>1.21</b>	<b>1.65</b>
	Living information missing (4.4%)	0.99	0.44	2.20
Mother's age (40+ years)	Mother <40 years (35.5%)	<b>1.23</b>	<b>1.04</b>	<b>1.44</b>
	Mother's age missing (16.2%)	<b>1.24</b>	<b>1.00</b>	<b>1.55</b>
Sexual experience (no sex)	Once (10.3%)	<b>2.34</b>	<b>1.67</b>	<b>3.27</b>
	More than once with same partner (9.2%)	<b>3.77</b>	<b>2.69</b>	<b>5.28</b>
	More than once, more than one partner (17.6%)	<b>5.72</b>	<b>4.35</b>	<b>7.53</b>
	Sexual experience missing (0.9%)	<b>5.60</b>	<b>2.53</b>	<b>12.35</b>
Interaction of gender with sexual experience	Girls*sex once	1.21	0.75	1.95
	Girls*sex more than once with same partner	1.40	0.91	2.16
	Girls*more than once, more than one partner	<b>1.95</b>	<b>1.37</b>	<b>2.80</b>
	Girls*sexual experience missing	0.92	0.24	3.45
Boy/girlfriend (never had one)	Used to have one (52.9%)	<b>1.40</b>	<b>1.07</b>	<b>1.81</b>
	Currently have one (30.2%)	<b>1.71</b>	<b>1.28</b>	<b>2.30</b>
	Boy/girlfriend missing (1.8%)	<b>2.04</b>	<b>1.15</b>	<b>3.62</b>
Future expectations for 2 years ahead (none of these)	Steady relationship (30.6%)	1.03	0.87	1.21
	Living with partner (10.6%)	<b>1.38</b>	<b>1.08</b>	<b>1.76</b>
	Child(ren) (2.7%)	<b>1.48</b>	<b>1.01</b>	<b>2.18</b>
	Future expectations missing (4.6%)	0.52	0.15	1.82
Access	Increasing distance of home from youth clinics	<b>0.86</b>	<b>0.77</b>	<b>0.97</b>
	Postcode missing (10.4%)	0.81	0.59	1.12
Pocket money (under £20 per week)	£20+ per week (40.5%)	<b>1.17</b>	<b>1.00</b>	<b>1.36</b>
	Pocket money missing (9.3%)	1.18	0.86	1.63
Parental monitoring (high)	Medium (35.3%)	<b>1.40</b>	<b>1.17</b>	<b>1.67</b>
	Low (27.2%)	<b>1.47</b>	<b>1.21</b>	<b>1.78</b>
	Parental monitoring missing (4.4%)	0.57	0.14	2.25
Knowledge of sexual health (low)	Medium (30.0%)	1.03	0.85	1.25
	High (36.5%)	<b>1.29</b>	<b>1.07</b>	<b>1.56</b>
	Knowledge missing (5.8%)	<b>1.96</b>	<b>1.15</b>	<b>3.35</b>
Knowledge of places prescribing contraceptives (none)	One place (21.0%)	1.16	0.94	1.44
	Two places (36.6%)	<b>1.23</b>	<b>1.01</b>	<b>1.51</b>
	Three or more places (11.7%)	<b>1.89</b>	<b>1.45</b>	<b>2.47</b>
Comfortable talking about sex (low)	Medium (29.4%)	<b>1.18</b>	<b>0.98</b>	<b>1.43</b>
	High (33.9%)	<b>1.60</b>	<b>1.33</b>	<b>1.93</b>
	Comfort missing (4.1%)	0.27	0.07	1.03
Talked to friends about using condoms/contraception (no)	Yes (53.9%)	<b>2.12</b>	<b>1.80</b>	<b>2.50</b>
	Talking missing (4.6%)	0.86	0.42	1.78
Self-esteem (low)	Medium (27.4%)	0.92	0.77	1.11
	High (33.8%)	0.97	0.81	1.16
	Self-esteem missing (4.2%)	0.37	0.10	1.32
Important to plan ahead for protection (don't agree)	Agree (42.2%)	1.09	0.94	1.27
	Attitude to planning ahead missing (4.9%)	0.72	0.37	1.40

Models control for age and cohort. Column 1 shows reference category in parentheses. Percentages indicate share of contrast category in sample. Asterisk denotes interaction. Bold type denotes OR significant at  $p < 0.05$  or less. CI, confidence interval, OR odds ratio.

Teenagers' opinions of effectiveness and coverage of school sex education were factor scores from 11 questions.

The analysis thus examined separate blocks of variables in an attempt to identify important independent predictors of service use from four main areas identified in the literature on sexual health services for young people: sociodemographic; relationships; access, knowledge and confidence; and school.

## Results

Table 1 shows that 32% of all teenagers had used a service, although use was higher for girls (40%) than boys (24%) ( $p < 0.001$ ). Among teenagers who reported sexual intercourse by age 15/16 years, 55% had used a service, again more girls (65%) than boys (42%) ( $p < 0.001$ ). A bigger majority of boys (78%) than of

girls (69%) ( $p < 0.001$ ) used services to obtain contraception only, most boys going exclusively for condoms. Advice about pregnancy and sexually transmitted diseases was sought by 27% and 14% of teenagers, respectively.

Girls were more likely to provide detailed information (68%) on service type than boys (32%), preventing us from establishing whether boys have a differential preference for youth services. Of those who provided the information, 43% reported using youth services, with no significant variation by gender. Among those using mainstream services with no youth provision, more girls (50%) than boys (30%) ( $p < 0.001$ ) used a GP, while more boys (26%) than girls (19%) ( $p < 0.05$ ) used family planning services. Teenagers who wanted contraceptives other than condoms (mainly the pill) were more likely to have used mainstream services,

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**Table 5** Gender differences in parental monitoring, knowledge and talking about sex

Parameter		Boys		Girls		p
		n	%	n	%	
Parental monitoring	Low/medium	1885	74.0	1704	57.8	<0.001
	High	662	26.0	1242	42.2	
Knowledge of sexual health	Low/medium	1757	70.5	1557	53.3	<0.001
	High	736	29.5	1364	46.7	
Knowledge of places prescribing contraceptives	0–2 places	2498	93.5	2574	83.7	<0.001
	3+ places	175	6.5	500	16.3	
Comfortable talking about sex	High/medium	1482	58.0	2156	72.9	<0.001
	Low	1072	42.0	800	27.1	
Talked with friends about using condoms/contraceptives	No	1525	60.0	860	29.2	<0.001
	Yes	1015	40.0	2085	70.8	

while teenagers who wanted condoms were more likely to use youth services, suggesting that youth services may have catered more for boys than mainstream services (Table 2).

The overall rate for service use for the modelling sample, after controlling for age at questionnaire and cohort, was found to be 33% with 95% confidence interval (CI) 22%, 46% (Table 1 not adjusted for age and cohort). The between-schools variance in service use accounted for 4% of the total variance ( $p < 0.001$ ).

The bivariate exploratory analysis found that all variables considered were associated with service use ( $p < 0.05$  or lower), with the exception of the six-fold urban–rural Scottish Household Survey classification for home postcode<sup>41</sup> and the SHARE sexual health education programme intervention. These two variables were not included in the multivariate analysis. In the following description of the results of multivariate Models 1 through 4, the level of significance used is  $p < 0.05$  or lower.

Table 3 shows sociodemographic variables associated with increased use of services (Model 1, first three columns): being a school leaver, female, not living with both parents, low religiosity, having a young mother and with parents in manual social classes. Those in minority ethnic groups (other than from the Indian subcontinent) were less likely to use services.

Controlling for sexual experience in Model 2 (Table 3, last three columns) resulted in some of these variables losing significance. School leavers, those not living with both parents and having a young mother remained significant at the  $p < 0.05$  level.

The amount of sexual experience was a strong predictor

of service use. Modelling only sexually experienced teenagers (data not shown) found that those who reported only having had sexual intercourse once were significantly less likely to have used services than those with more than one experience, suggesting that teenagers delayed using services until their sexual behaviour was more established.

Controlling for sexual experience, it appeared that those who anticipated an enduring sexual relationship were also more likely to have used a service: those with a current or previous boy/girlfriend, and those that expected to be living with a partner in the future, were both more likely to have used a service.

Some of the dummies for missing values in Model 2 (religious belief, sexual experience and boy/girlfriend) showed significant positive associations with service use. This may be because teenagers in these groups were more sexually involved than their family background would permit, and were reluctant to divulge sensitive information.

The interactions between gender and sexual experience were explored for Model 2. It was found that girls with more than one sexual partner were almost twice as likely to have used a service than boys with more than one partner [odds ratio (OR) 1.94, 95% CI 1.37–2.75]. This may reflect girls' greater concern with the risk of pregnancy from increased sexual activity, although even with the interactions, girls were still more likely to use services (OR reduced to 1.64, 95% CI 1.31–1.95). Boys may have less need to use services, since they can buy condoms whereas the pill is only available on prescription. Incorporating a variable indicating whether a teenager had bought condoms in the previous year (data not shown) did not, however, predict lower service use, even when an interaction effect

**Table 6** Comparison of school-level variance in different models

	Null model	Model 1	Model 2	Model 3	Model 4
School-level variance (SE)	0.154 0.050	0.133 0.045	0.163 0.056	0.183 0.062	0.111 0.041
Variables included	Age and cohort	Age and cohort Sociodemographics	Age and cohort Sociodemographics  Sexual experience Anticipated sexual relationship	Age and cohort Reduced set of sociodemographics Sexual experience Anticipated sexual relationship  Access Confidence Knowledge Attitudes	Age and cohort Reduced set of sociodemographics Sexual experience Anticipated sexual relationship  Access Confidence Knowledge Attitudes School-level deprivation School-level proximity to clinics Individual opinions of school sex education

SE, standard error.

**Table 7** School factors and use of sexual health services by teenagers at age 15/16 years

Parameter		OR	95% CI (lower)	95% CI (upper)
School-level deprivation	Decreasing	0.89	0.76	1.04
School proximity to clinics	Decreasing	<b>0.82</b>	<b>0.70</b>	<b>0.95</b>
Individual opinion of sex education coverage (low)	High (28.9%)	0.90	0.74	1.10
	Medium (29.0%)	0.97	0.88	1.07
	Missing (13.2%)	0.99	0.74	1.32
Individual opinion of sex education effectiveness (low)	High (28.9%)	<b>1.28</b>	<b>1.05</b>	<b>1.56</b>
	Medium (29.0%)	0.98	0.89	1.08
	Missing (13.2%)	1.00	1.00	1.00

Models control for variables in Model 3. Column 1 shows reference category in parentheses. Percentages indicate share of contrast category in sample. Bold type denotes OR significant at  $p < 0.05$  or less. CI, confidence interval, OR odds ratio.

with gender was included. Thus gender differences in the propensity to contact services with increased sexual experience and in sources for contraceptives did not appear to account for all of the gender difference in service use.

Model 3 (Table 4) suggested that variables related to better information and ease of access were associated with greater service use. Better knowledge of sexual health and places where contraception is prescribed, talking with friends about contraception, and medium/high levels of comfort in talking about sex were all linked with service use, as was proximity of home to youth services rather than to clinics in general (data not shown, OR 0.93, 95% CI 0.85–1.02), high spending money and medium/low levels of parental monitoring. However self-esteem and attitudes towards planning protection were not significant. As for Model 2, some of the dummies for missing values showed a significant positive association with service use (in particular, missing sexual experience).

The OR for girls using a service was reduced and no longer significant in Model 3, suggesting that some of the variables added in Model 3 helped to explain gender differences in service use. Despite the fact that boys were less likely to experience high levels of parental monitoring than girls, which would predict higher levels of service use, boys were less knowledgeable than girls, more likely to feel uncomfortable talking about sex than girls and were less likely to have talked about contraceptives with their friends than girls (Table 5).

In Model 4, with the addition of school characteristics there was a marked reduction in the school-level variance to below the level in the null model (Table 6). In this final model, R-square calculated following Snijders and Bosker<sup>40</sup> was 0.46. Increased school-level deprivation was not significantly associated with service use. Reduced school proximity to clinics was associated with a significant reduction in service use, with an OR similar to that in Model 3 for home–youth clinic distance. Because of its covariance with the home–youth clinic distance, the latter was omitted from Model 4. School–youth clinic distance did not help to predict service use (data not shown, OR 0.95, 95% CI 0.81–1.12). Teenagers with high opinions of the coverage of school sex education were no more likely to visit services, although those with high opinions of their sex education's effectiveness were more likely to have used a service (Table 7).

## Discussion

Our study confirmed the hypothesis that perceived need, knowledge and ability to access are all important factors in shaping patterns of service use. Although we lack information on the timing of service visits in relation to sexual intercourse, it was apparent that many teenagers delayed using services until they had intercourse more

than once, or with more than one partner. Encouraging teenagers to access services earlier may be achieved through improving knowledge about sexual health and service provision, since these were associated with service use. Information may come through a number of different channels: teenagers who had talked about contraception with their friends, who were comfortable talking about sex and those who rated their school sex education as highly effective were all more likely to use services. However, these variables may also reflect the positive effects of education and discussion on shaping norms and confidence to use services. Our analysis suggests that more effort needs to be devoted to enhancing boys' knowledge, confidence and talking with peers, as these factors helped to explain gender differences in service use in our models. Questions as to whether boys are as receptive to sex education as girls need to be set against our finding that boys gave higher ratings for school sex education coverage and effectiveness than girls. Although in a cross-sectional study causation is not clear, additional analysis of our data (not presented here) suggested that increased knowledge, talking with friends about contraception, feeling comfortable talking about sex and perceived effective school sex education among non-service users at age 15/16 years was associated with greater anticipated ease of future contact with sexual health services. This study found no evidence for a direct effect of the SHARE sex education programme on service use in bivariate exploration, but the programme may have indirectly promoted service uptake by increasing sexual health knowledge and raising the rating of school sex education.<sup>32</sup>

Physical proximity was one factor that influenced teenagers' ability to access clinics. Distance from home to youth clinics may be more critical than home distance to all clinics, if youth clinics are accessed mainly at weekends or evenings, and if teenagers prefer to use this type of clinic if it is within their home territory,<sup>42</sup> perhaps going with local friends. Conversely, the effect of school proximity to all specialist sexual health clinics on overall service use may reflect teenagers travelling directly there from school. Although our information on use of different service types was limited by low reporting among boys, exploratory modelling found that talking with friends about contraception and increased school proximity to youth clinics were significant factors predicting a preference for youth over mainstream services.

We found no evidence for ethnic, religious or class barriers to service use after controlling for sexual activity. School leavers, those in households with only one/no parent present, those with younger mothers and those with lower parental monitoring were more likely to use services, which may relate to lower parental surveillance.



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School-based clinics might help teenagers to use services more independently of family influences, and better links between school and medical staff may also increase service uptake. These may take the form of better information about local services at school; involving health service staff in sex education programmes; using school nurses or teachers to book appointments at services on behalf of teenagers; arranging school visits to clinics and trying out mock classroom clinics.<sup>2,43-47</sup> However, our research also suggests that talking with friends may be important, lending support to peer delivery of sex education to complement more traditional teacher-based methods (see, for example, the studies by Mellanby et al.<sup>48</sup> and Forrest et al.<sup>49</sup>).

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