Opportunistic and systematic screening for chlamydia: a study of consultations by young adults in general practice

Chris Salisbury, John Macleod, Matthias Egger, Anne McCarthy, Rita Patel, Aisha Holloway, Fowzia Ibrahim, Jonathan AC Sterne, Paddy Horner and Nicola Low, on behalf of the ClaSS Study Group

INTRODUCTION
A National Chlamydia Screening Programme is being phased in throughout England to reduce the transmission of and morbidity associated with genital Chlamydia trachomatis infection.¹ The screening programme is based on opportunistic screening of men and women under 25 years attending selected healthcare settings.² The programme pilot only targeted women,²,³ so research is needed to determine the settings in which men would be most efficiently covered by opportunistic screening. Primary care is likely to be a key location since nearly half the cases of infection in women in the pilot studies were identified in general practices.²

Systematic screening, in which all individuals in the target group are invited by post to take part, is an alternative to opportunistic testing. The NHS cervical

ABSTRACT
Background
Opportunistic screening for genital chlamydia infection is being introduced in England, but evidence for the effectiveness of this approach is lacking. There are insufficient data about young peoples’ use of primary care services to determine the potential coverage of opportunistic screening in comparison with a systematic population-based approach.

Aim
To estimate use of primary care services by young men and women; to compare potential coverage of opportunistic chlamydia screening with a systematic postal approach.

Design of study
Population based cross-sectional study.

Setting
Twenty-seven general practices around Bristol and Birmingham.

Method
A random sample of patients aged 16–24 years were posted a chlamydia screening pack. We collected details of face-to-face consultations from general practice records. Survival and person-time methods were used to estimate the cumulative probability of attending general practice in 1 year and the coverage achieved by opportunistic and systematic postal chlamydia screening.

Results
Of 12 973 eligible patients, an estimated 60.4% (95% confidence interval [CI] = 58.3 to 62.5%) of men and 75.3% (73.7 to 76.9%) of women aged 16–24 years attended their practice at least once in a 1-year period. During this period, an estimated 21.3% of patients would not attend their general practice but would be reached by postal screening, 9.2% would not receive a postal invitation but would attend their practice, and 11.8% would be missed by both methods.

Conclusions
Opportunistic and population-based approaches to chlamydia screening would both fail to contact a substantial minority of the target group, if used alone. A pragmatic approach combining both strategies might achieve higher coverage.

Keywords
chlamydia trachomatis: family practice; mass screening; primary health care.
How this fits in

Opportunistic screening for genital chlamydia in young adults is being implemented in selected settings in England, although evidence of effectiveness from randomised trials is lacking. There are insufficient data about young people’s use of primary care services to determine whether the coverage achieved by opportunistic chlamydia screening would be greater than that of a systematic population approach. The majority (60%) of men aged 16–24 years were estimated to have visited their general practice each year: this is more often than is assumed. A chlamydia screening strategy combining systematic and opportunistic elements would have the highest coverage.

Participants mailed their samples in prepaid envelopes to their local Public Health Laboratory Service (now Health Protection Agency) laboratory. Study packs were sent out between February 2001 and July 2002 using the contact addresses held by general practices. Packs were sent by either recorded delivery (first four practices) or courier (23 practices). Couriers made up to five attempts to deliver packs, including at least one visit after 6 pm or at a weekend, and research staff made the same number of visits to non-responders whose packs had been delivered by mail. We also sent reminder letters and made up to three telephone calls to people who did not return a specimen. A random 5% sample of households contacted by couriers were recontacted by research staff to check the data for accuracy. We classified individuals as ‘participants’ (returned a postal specimen), ‘refusers’ (responded to indicate they did not wish to participate), ‘non-responders’ (known to have received a pack but did not respond) or ‘ghosts’ (confirmed as not resident at the address held by the practice or not contactable by any method).

Consultation patterns in primary care

Between June and August 2002 we obtained details of doctor–patient or nurse–patient contacts for all selected patients. Practice staff provided anonymised details of whether the patient was still registered with the practice and the date of their most recent attendance. Data collection in each practice took place after all packs had been delivered. Those collecting data were unaware of whether or not patients had participated in the study.

Statistical analysis

Analysis was restricted to 16–24 year olds. We used survival analysis to take into account the variable follow-up period and the fact that some individuals changed practices during the study period. For each individual invited to participate in the screening study, we measured time at risk of consulting from the date his or her study pack was sent out. We censored observations at the date of the last attendance, or at the date of data collection, whichever was first. For individuals no longer registered with the practice who had no recorded attendance, we did not know the date that they had left, so we censored these observations at the midpoint between the pack being sent out and the date of data collection.

We used Kaplan–Meier methods to estimate the cumulative probability (with 95% confidence interval [CI]) of patients aged 16–24 years consulting the practice at least once within 1 year of the study pack being sent out, and stratified estimates according to age group, sex, chlamydia test result, and whether they could be contacted by post. We used the cumulative
probabilities of consulting stratified by whether patients could be contacted by post or not, to estimate the proportions of patients aged 16–24 years who would be covered by opportunistic and systematic screening strategies over a 1-year period.

All statistical analyses were conducted using Stata 8.2 (Stata Corporation, Austin, TX, US).

RESULTS

Of 19 773 patients invited to participate in the ClaSS project screening study, 15 319 were aged 16–24 years. We excluded data from 2084 (13.6%) patients from three practices that provided no data, and 262 (1.7%) records with implausible dates. We therefore analysed data from 12 973 (84.7%) patients aged 16–24 years in 24 practices. The distribution of patients by age and sex was similar for those with and without complete data. Among patients with complete data, 2705 (20.9%) were found to be ‘ghosts’. Of the remaining 10 268 patients, 3318 (32.3%) returned a specimen, 1364 (13.3%) declined to participate, and 5586 (54.4%) did not respond in any way.

Table 1 shows the estimated cumulative probabilities of consulting general practice in 1 year, men and women aged 16–24 years.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Consulted, % Consulting by 1 year (95% CI)</th>
<th>P value</th>
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<th>P value</th>
<th>Consulted, % Consulting by 1 year (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>2152 (60.4 (58.3 to 62.5)</td>
<td>0.196</td>
<td>3435 (75.3 (73.7 to 76.9)</td>
<td>0.340</td>
<td>5587 (68.6 (67.3 to 69.9)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16–19 years</td>
<td>975 (64.0 (60.9 to 67.1)</td>
<td>0.004</td>
<td>1441 (75.5 (73.1 to 77.9)</td>
<td>0.340</td>
<td>2416 (70.3 (68.3 to 72.3)</td>
<td>0.0001</td>
</tr>
<tr>
<td>20–24 years</td>
<td>1177 (57.5 (54.7 to 60.4)</td>
<td></td>
<td>1994 (75.0 (72.8 to 77.2)</td>
<td></td>
<td>3171 (67.2 (65.4 to 69.0)</td>
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<tr>
<td>Participation status</td>
<td></td>
<td>&lt;0.0001</td>
<td></td>
<td>&lt;0.0001</td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Responded</td>
<td>597 (69.1 (65.0 to 73.2)</td>
<td></td>
<td>1238 (79.9 (77.4 to 82.3)</td>
<td></td>
<td>1835 (75.9 (73.7 to 78.1)</td>
<td></td>
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<tr>
<td>Refused</td>
<td>238 (50.6 (45.2 to 56.3)</td>
<td></td>
<td>404 (65.5 (60.8 to 70.1)</td>
<td></td>
<td>642 (58.8 (55.2 to 62.5)</td>
<td></td>
</tr>
<tr>
<td>Did not respond</td>
<td>1052 (69.2 (66.1 to 72.3)</td>
<td></td>
<td>1401 (81.9 (79.4 to 84.2)</td>
<td></td>
<td>2453 (75.7 (73.7 to 77.7)</td>
<td></td>
</tr>
<tr>
<td>Ghost</td>
<td>265 (33.7 (29.3 to 38.5)</td>
<td></td>
<td>392 (55.3 (49.9 to 60.9)</td>
<td></td>
<td>657 (44.1 (40.5 to 47.8)</td>
<td></td>
</tr>
<tr>
<td>Contactability*</td>
<td></td>
<td>&lt;0.0001</td>
<td></td>
<td>&lt;0.0001</td>
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<td>&lt;0.0001</td>
</tr>
<tr>
<td>Contactable</td>
<td>1887 (65.9 (63.7 to 68.2)</td>
<td></td>
<td>3043 (78.4 (76.7 to 80.0)</td>
<td></td>
<td>4930 (72.9 (71.6 to 74.3)</td>
<td></td>
</tr>
<tr>
<td>Not contactable</td>
<td>265 (33.7 (29.3 to 38.5)</td>
<td></td>
<td>392 (55.3 (49.9 to 60.9)</td>
<td></td>
<td>657 (44.1 (40.5 to 47.8)</td>
<td></td>
</tr>
<tr>
<td>Chlamydia result*</td>
<td></td>
<td>0.036</td>
<td></td>
<td>0.969</td>
<td></td>
<td>0.154</td>
</tr>
<tr>
<td>Positive</td>
<td>39 (71.7 (56.7 to 85.1)</td>
<td></td>
<td>76 (73.8 (62.9 to 83.7)</td>
<td></td>
<td>115 (73.3 (64.5 to 81.4)</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>557 (69.1 (64.8 to 73.3)</td>
<td></td>
<td>1161 (80.4 (77.8 to 82.8)</td>
<td></td>
<td>1718 (76.2 (73.9 to 78.4)</td>
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</tbody>
</table>

*Patients who could be contacted included everyone except those classified as ‘ghost’ patients. Based on a subsample of 3318 responders who provided a specimen.

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Figure 1 illustrates the estimated proportion of people who would potentially be contacted in 1 year of an opportunistic or a systematic chlamydia screening programme. Slightly more than half (57.7%) would be contacted by either strategy. However, 21.3% of people would not attend the practice but would receive an invitation at their home address, whereas 9.2% of people would not have received a postal invitation, but would attend their surgery. The remaining 11.8% of people would not be reached by either strategy. These figures do not take into account the proportions attending primary care who would actually be tested, or whether a specimen was actually returned.
DISCUSSION

Summary of main findings
In this study, the majority of both men and women aged 16–24 years attended their general practice at least once in a 1-year period. Four-fifths of patients received an invitation to participate in postal chlamydia screening. An estimated 21% of patients would not be reached by opportunistic screening in primary care but would receive a postal invitation.

Comparison with existing literature
The standard method of calculating and presenting consultation rates demonstrates relative differences by age and sex but does not show who does or does not attend the practice. It was estimated in 1991–1992 that 78% of all patients attend their practice each year, but proportions stratified by age and sex were not provided. We applied survival methods to estimate primary care use in a way that is more useful to those planning interventions: the cumulative proportion of patients attending the practice in a 1-year period. This showed that that the majority of both men and women aged 16–24 years attended their practice at least once during the 1-year study period.

About one-fifth of young men and women were not contactable at the address registered with their general practice, but 44% of them continued to use that practice as their source of primary medical care. This suggests that many of these ‘ghost’ patients are temporarily away from home or have moved locally but have not informed their practice of their new address. Our estimate of the proportion of ‘ghost’ patients in 16–24 year olds is consistent with those in older age groups, reflecting both the inaccuracies of general practice registers and patient mobility. This study highlights the need to improve the accuracy of registers maintained by general practices, which also constitute the central patient register used by the NHS and men’s perceived responsibility for sexual health would increase. In fact, the under-representation of men in opportunistic chlamydia screening in Sweden was one reason why men were originally not to be included in a chlamydia screening programme. Instead men would be captured in genitourinary clinics either due to symptomatic infection, or through contact tracing. Although the National Chlamydia Screening Programme encourages the involvement of men, of 17 000 samples received in the first year of screening in 10 locations, only 10% came from primary care and only 10% were from men. Our findings strengthen the arguments for offering chlamydia screening to men in primary care: prevalence is as high in men as in women, partner notification is often not done, and men’s perceived responsibility for sexual health

Implications for general practice and future research
The presumptive poor use of primary care by young men was one reason why men were originally not to be included in a chlamydia screening programme. Randomised trials have shown that systematic chlamydia screening can reduce the incidence of pelvic inflammatory disease, but these results cannot necessarily be extrapolated to opportunistic screening, for which trials of effectiveness have not been conducted. The effectiveness of both opportunistic and systematic screening approaches depends in part on coverage (whether people receive an offer of testing) and also the uptake of the offer of screening. The effective screening rate for opportunistic programmes depends on the proportion of those consulting who are offered and accept a test. In the national chlamydia screening pilots, the proportion of women offered a test in primary care was not recorded, but an estimated 46% of sexually active women under
25 years in the Portsmouth site were tested, and 9% had chlamydia. The high screening rate in general practice was probably assisted by substantial financial incentives, which will not be available in the National Chlamydia Screening Programme. This is one of several obstacles to introducing opportunistic chlamydia screening in primary care. Systematic home-based testing can provide chlamydia screening for people who do not use health services, or who are not offered opportunistic tests. In the main ClaSS project the uptake of systematic postal screening (35%) was low, but similar to that in comparable studies of home-based screening, and of opportunistic screening studies where incentives were not offered. The low response rate might have been partly due to the complexity of the research project and lack of familiarity with home sampling. Widespread publicity would probably increase participation if systematic screening were introduced as part of a national programme.

Opportunistic and systematic screening approaches are not mutually exclusive. In practice, the cervical screening and childhood immunisation programmes both use general practice registers as the basis for systematic screening, and offer smear tests or vaccination opportunistically to those missed by postal invitation. A combined approach to chlamydia screening should also be considered. The English National Chlamydia Screening Programme is currently based on opportunistic testing, but coverage could be increased by sending periodic invitations to young adult men and women who have not attended the practice recently, inviting them to either mail a home-collected specimen or attend their general practice. Further research would be required to establish the screening interval. To optimise the effectiveness of chlamydia screening, further research about the acceptability to patients, and the population impact and cost-effectiveness of alternative strategies is also required. The ClaSS project will provide important information about these issues.

In summary, by calculating a new measure of primary care use we showed that young men consult more frequently than previously believed. Empirical data about the potential coverage of opportunistic and systematic chlamydia screening approaches suggest that a combined approach might achieve higher coverage than either strategy alone.

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Ethics committee
The study was approved by the South West Multicentre Research Ethics Committee (MREC/00/6/30)

Competing interests
The authors have stated that there are none

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REFERENCES