ORIGINAL ARTICLE

Opportunistic screening for genital chlamydial infection. II: Prevalence among healthcare attenders, outcome, and evaluation of positive cases

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Objectives: To determine the prevalence and treatment outcomes among young women screened opportunistically for genital *Chlamydia trachomatis* and to evaluate the impact of screening in those participating.

Design: An opportunistic screening programme (1 September 1999 to 31 August 2000) using urine samples, tested by ligase chain reaction (LCR). In-depth interviews were used for programme evaluation.

Setting: Screening was offered in two health authorities at general practice, family planning, genitourinary medicine (GUM), adolescent sexual health, termination of pregnancy clinics and women's services in hospitals (antenatal, colposcopy, gynaecology and infertility clinics).

Main participants: Sexually active women (16–24 years) attending for any reason.

Main outcome measures: Screening data: prevalence of infection by age and healthcare setting; proportion of positive patients attending for treatment. Evaluation data: participants' attitudes and views towards screening and follow up.

Results: In total, 16 930 women (16–24 years) were screened. Prevalence was higher in younger women (16–20) than those aged 21–24 years and was highly variable at different healthcare settings (range 3.4%–17.6%). Prevalence was approximately 9% in general practice. The role of the project health advisers in managing results and coordinating treatment of positive individuals was essential; the vast majority of all positives were known to be treated. Women felt that screening was beneficial. Improving awareness and education about sexually transmitted infections is required to alleviate negative reactions associated with testing positive for infection.

Conclusions: Prevalence of infection outside GUM clinics is substantial and opportunistic screening using urine samples is an acceptable method of reaching individuals with infection who do not normally present at specialist clinics.

This paper presents data from a large scale pilot of opportunistic screening for genital *Chlamydia trachomatis* infection at a range of healthcare settings including primary care. Offering opportunistic screening at healthcare settings outside genitourinary medicine (GUM) clinics is likely to detect many infected individuals who may not consider themselves at risk of infection, or who are asymptomatic and so would not normally be diagnosed. The main aim of the pilot, which was undertaken in response to the recommendations of the chief medical officer's expert advisory group on *Chlamydia trachomatis*,[1] was to assess the feasibility and acceptability of screening in healthcare settings outside GUM clinics. In addition, the study has generated accurate estimates of prevalence in healthcare settings outside GUM clinics, which can be used to inform decision making on the cost effectiveness of screening and which settings should be utilised in a national screening programme. In this paper, we present results on the prevalence of infection, treatment outcomes, and the impact of screening on young people taking part in the programme.

METHODS

A full description of the methodology used has been previously reported.[2 3] In summary, an opportunistic screening programme was undertaken in two health authorities (HAs), Portsmouth and South East Hants and the Wirral as in existence before April 2002, for 1 year (1 September 1999 to 31 August 2000). Urine screening was offered mainly to sexually active women aged 16–24 years at participating healthcare settings (191 sites in total), including general practices (GP), family planning clinics (FPC), GUM, adolescent sexual health, termination of pregnancy and women's services in hospitals (antenatal, colposcopy, gynaecology and infertility clinics). Repeat attenders were eligible for another test on changing their sexual partner. Screening was offered to eligible attenders irrespective of their reason for attendance and the offer of screening was recorded whether or not the test was accepted. The presence of symptoms (pelvic pain, irregular bleeding, discharge, or cystitis) was recorded at each attendance. Specimens were tested using the ligase chain reaction (LCR, Abbott LCx) and all positive tests were confirmed by repeat LCR using the same urine specimen. PCR (Roche Cobas) was used as arbiter for discrepant LCR results. Participating laboratories were subject to external quality assessment at three points during the study to ensure the quality and validity of testing. In each site, project research nurses (PRNs) based at a local coordinating office were responsible for informing all participants of their results by letter or phone. In the Wirral, the PRNs were trained community health advisers and their office was located in a community hospital, 4 miles from the local GUM clinic. In Portsmouth, the office was situated within the same building as the local GUM clinic and adjacent to the main FPC. The PRNs discussed implications of test results

with participants and advised participants with positive results to attend the local GUM clinic for treatment, partner notification and further management. Alternative options for treatment (either at the coordinating office or at the original site of testing) were also presented; in these cases, the PRNs were also responsible for partner notification. For positive participants, data were sought on the reported number of partners during the past 3 months and where partners attended for treatment. To standardise results, data on treatment and partner notification were censored at 3 months from the original date of screening. In Portsmouth, screening was limited for logistical reasons to five specimens/day in each general practice during October 1999 and in FPCs between September and November 1999.

Quantitative data management and analysis

All results focus on the main target group of women aged between 16 and 24 years. To allow patient based analyses, episodes belonging to the same participant were matched, based on their identifying details (NHS number, name, date of birth, postcode); full details of the methodology used have been previously described.[3] Population size was determined using mid-1999 population data from the Office for National Statistics[4] and estimates of the proportion of women who were sexually active were calculated using data from the second National Survey of Sexual Attitudes and Lifestyles (NATSAL 2000).[5] The term "community screened/treated" refers to those screened or treated in any setting excluding GUM or where the healthcare setting was unspecified. No formal comparisons have been made between health authorities because geographic differences were confounded with differences in study methodology. In Portsmouth, all participating GPs started screening at the beginning of the survey, whereas in Wirral, GPs were phased in over 6 months. In addition, service provision and the age distribution of the sexually active 16–24 year old female population was different between health authorities. In Portsmouth, there was a higher proportion of older women (aged 20–24 years) in the target group than in Wirral (62% compared to 56%). The study design was dynamic; participants were recruited as they attended different healthcare settings and the probability that a participant was recruited by a setting depended on the order that they visited settings, service provision, area study methodology, and the participant characteristics. Prevalence and 95% confidence limits are therefore reported unadjusted. Prevalence estimates use one test result for each participant; participants with multiple tests where at least one result was positive, were taken as positive. All data were analysed using STATA version 7.0.[6] Logistic regression was used to provide adjusted odds ratios using first tests only to account for the multiple attendances.

Qualitative data collection and analysis

In-depth interviews were used to determine the views of those screened; full methodologies used in patient selection and analysis have been previously described.[3]

RESULTS

Screening data

Characteristics of participants

During the 1 year screening period, 11 999 women in the target age range were screened in Portsmouth and 4931 women in Wirral (see table 1). Those screened were predominantly of white ethnicity in both sites (>97%), reflecting the resident populations.

Prevalence of infection at healthcare settings

In women, the overall prevalence of infection in those screened was 9.8% (95% CI 9.3 to 10.3) in Portsmouth and was 11.2% (10.3 to 12.1) in Wirral. This varied by age and was higher in those aged less than 20 years old (see fig 1); peak prevalence was seen in 18 year old women in Portsmouth (13.0%; 11.4 to 14.8) and 20 year olds in Wirral (13.6%; 11.0 to 16.7). Prevalence decreased rapidly with age and was lowest in the oldest participants (24 years); 6.8% (5.4 to 8.4) in Portsmouth and 7.2% (5.1 to 9.7) in Wirral. Table 2 indicates the prevalence of infection in women screened at specific healthcare settings. The reported prevalence of infection in women within each healthcare setting was not significantly different between the two HAs. In both HAs, prevalence was highest in those attending GUM clinics (13.4% and 17.6% in Portsmouth and Wirral), TOP clinics (14.0% and 13.3%), and youth clinics (16.7% and 12.7% respectively). Prevalence at general practice and FPCs was respectively 8.5% and 9.8% in Portsmouth, and 8.7% and 10.1% in Wirral.

Table 1 Characteristics of all female participants tested for chlamydial infection during the chlamydia pilot programme

	Portsmouth	Wirral
	No (%)	No (%)
Characterisitic		
Total eligible participants screened*	12 262	5483
Age† (% eligible patients)		
<16 years	259 (2.1)	253 (4.6)
16–19 years	5262 (42.9)	2200 (40.1)
20–24 years	6737 (54.9)	2731 (49.8)
25–30 years	0	117 (2.1)
>30 years	0	166 (3.0)
Ethnicity (% known ethnicity)		
White	11 134 (97.5)	4502 (98.5)
Other‡	286 (2.5)	66 (1.5)
Unknown (% total eligible)	842 (6.9)	915 (16.7)

*Tabulated data excludes 1 participant from Portsmouth and 12 participants from Wirral where sex is unknown.
†Age breakdown excludes a further 4 participants from Portsmouth and 16 from Wirral where age is unknown.
‡Because of small sample sizes, all non-white ethnic groups have been combined.

In Portsmouth, 62% of positive episodes from women were recorded as asymptomatic compared to 53% in Wirral ($p<0.001$). After adjusting for age and healthcare setting using logistic regression analysing first tests only, prevalence of infection was 25% higher among symptomatic women than non-symptomatic women (OR 1.25; 95% CI 1.09 to 1.43) in Portsmouth and 35% higher among symptomatic women (OR 1.35; 1.11 to 1.65) in Wirral. The prevalence of infection in first accepted episodes from women (16–24 years) at defined healthcare settings depending on whether screening could be described as diagnostic testing or truly opportunistic screening are given in table 3. Episodes are grouped as follows:

(1) Those who either reported symptoms of chlamydial infection and attended for this reason or attended for GUM screening ("diagnostic")

(2) Those who attended for another reason but reported symptoms on the form ("opportunistic screening" as would not normally be tested)

(3) Those who were asymptomatic ("opportunistic screening").

Overall, prevalence tends to be higher in those reporting and attending with symptoms (group 1) than those screened opportunistically (groups 2 and 3). Although prevalence of infection is lower in those screened opportunistically, there is still a substantial burden of infection among these women. In general practice, prevalence was significantly higher at both sites in those tested for diagnostic reasons (group 1) compared to those who were asymptomatic (group 3).

In Portsmouth, 92% of women in the target age group (11 043/11 999) were screened only once during the study period; this was similar in Wirral at 91% (4495/4931).

Table 2 Prevalence of infection among female participants (16–24 years) at different healthcare settings

Healthcare setting	Portsmouth		Wirral*	
	Number positive (n)	Prevalence (%, 95% CI)	Number positive (n)	Prevalence (%, 95% CI)
General practice	641	8.5 (7.9 to 9.1)	138	8.7 (7.4 to 10.2)
Family planning	300	9.8 (8.8 to 10.9)	101	10.1 (8.4 to 12.1)
GUM	163	13.4 (11.6 to 15.4)	100	17.6 (14.7 to 20.9)
Youth sexual health clinics	25	16.7 (11.6 to 23.4)	131	12.7 (10.8 to 14.9)
Termination of pregnancy clinics	50	14.0 (10.8 to 17.9)	8	13.3 (6.9 to 24.2)
Antenatal clinics	16	9.7 (6.1 to 15.2)	43	9.9 (7.4 to 13.1)
Colposcopy clinics	3	8.3 (2.9 to 21.8)	17	7.8 (4.9 to 12.2)
Gynaecology clinics	3	7.3 (2.5 to 19.4)	1	3.4 (0.6 to 17.2)
Infertility clinics	0	0	0	0

*Excludes 26 women in Wirral who screened positive but where healthcare setting was unrecorded.

Table 3 Prevalence of infection among first accepted tests from female participants (16–24 years) depending on reason for testing

Healthcare setting	Portsmouth					
	Group 1*		Group 2*		Group 3*	
	Number positive (n)	Prevalence (%, 95% CI)	Number positive (n)	Prevalence (%, 95% CI)	Number positive (n)	Prevalence (%, 95% CI)
General practice	47	14.6 (11.0 to 19.0)	209	10.0 (8.8 to 11.4)	310	7.9 (7.1 to 8.8)
Family planning	9	15.8 (7.5 to 27.9)	88	9.6 (7.8 to 11.7)	163	8.8 (7.6 to 10.2)
GUM	176	14.1 (12.2 to 16.2)	5	18.5 (6.3 to 38.1)	42	12.1 (8.9 to 16.1)
Youth sexual health clinics	0	0	5	10.4 (3.5 to 22.7)	25	13.6 (9.0 to 19.4)
	Wirral					
	Group 1*		Group 2*		Group 3*	
Healthcare setting	Number positive (n)	Prevalence (%, 95% CI)	Number positive (n)	Prevalence (%, 95% CI)	Number positive (n)	Prevalence (%, 95% CI)
General practice	24	16.8 (11.1 to 23.9)	37	9.0 (6.4 to 12.2)	56	7.7 (5.8 to 9.8)
Family planning	0	0	29	9.8 (6.7 to 13.8)	63	8.8 (6.9 to 11.2)
GUM	90	19.4 (15.9 to 23.3)	88	24.9 (20.4 to 29.7)	23	15.9 (10.3 to 22.8)
Youth sexual health clinics	1	10.0 (0.3 to 44.5)	42	13.4 (9.8 to 17.7)	77	9.7 (7.7 to 12.0)

*Episodes from first accepted tested as categorised as: group 1: Those who either reported symptoms of chlamydial infection and attended for this reason or attended for GUM screening; group 2: Those who attended for another reason but reported symptoms on the form ("opportunistic screening" as would not normally be tested); group 3: Those who were asymptomatic ("opportunistic screening"). All groups are mutually exclusive and episodes where reason for test is unknown have been excluded.

Prevalence among women who had one test only was 8.3% (7.8 to 8.9) in Portsmouth and 9.2% (8.4 to 10.1) in Wirral. Of those who had multiple tests, prevalence was significantly higher at 26.6% (23.9 to 29.5) in Portsmouth and 30.5% (26.4 to 34.8) in Wirral.

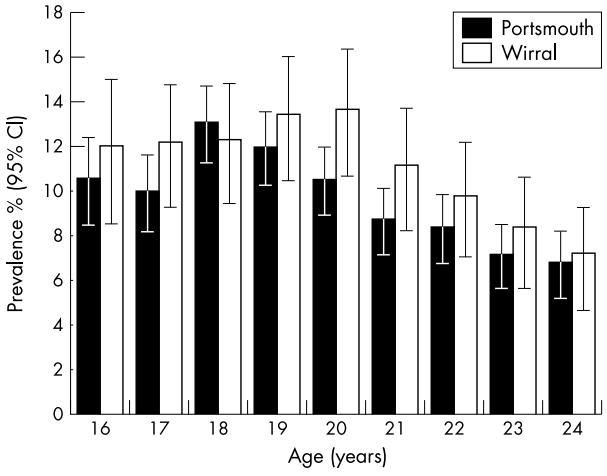

Figure 1 Overall prevalence of infection (95% CI) in women aged 16–24 years.

Effect of limiting healthcare settings where the screened programme was offered

Table 4 illustrates the proportion of positives that potentially could have been detected if screening had only been undertaken at single healthcare settings during the programme. We have derived the total number of positives among the population attending each setting by adding to those screened and found positive at the setting all positives who were detected through screening elsewhere during the study but who also attended the setting in question. In Portsmouth, over 60% of all positive women could have been detected by screening at general practice only. FPCs were also an important setting in Portsmouth; potentially, 47% could have been detected by screening only at this setting. Despite the phased introduction of general practice to the programme in Wirral, this setting remained the main site for screening; 30% of infections would have been detected by only screening here. Table 4 also shows the prevalence of infection among these populations and demonstrates that period prevalence estimates based only on those tested at specific settings (table 2) underestimates the true prevalence of infection of those attending healthcare settings.

Table 4 Effect of limiting screening to single healthcare settings: proportion of positive women (16–24 years) detected

Healthcare setting	Portsmouth*		Wirral†	
	Number positives detected (% total‡)	Prevalence of attending population (%, 95% CI)	Number positives detected (% total‡)	Prevalence of attending population (%, 95% CI)
General practice	719 (61%)	9.1 (8.5 to 9.7)	164 (30%)	9.8 (8.5 to 11.3)
Family planning	431 (37%)	10.8 (9.9 to 11.8)	127 (23%)	11.0 (9.3 to 13.0)
GUM	210 (18%)	17.2 (15.2 to 19.4)	123 (22%)	20.4 (17.3 to 23.8)
Youth sexual health clinics	33 (3%)	18.6 (13.6 to 25.0)	143 (26%)	13.3 (11.4 to 15.5)
Termination of pregnancy clinics	75 (6%)	13.5 (10.9 to 16.6)	15 (3%)	12.6 (7.8 to 19.8)
Women's services§	27 (2%)	–	75 (14%)	–

*Total positive women in Portsmouth = 1175. †Total positive women in Wirral = 551. ‡Note rows are not mutually exclusive therefore percentages sum to greater than 100%. §Combined data for antenatal, colposcopy, gynaecology, and infertility clinics; prevalence cannot be calculated as overall attending population unknown (groups not mutually exclusive).

Management of positives: treatment outcomes and partner notification

As some women had multiple positive results, this section refers to results from screen positive episodes not positive women. In Portsmouth, 98% of positive female episodes of infection were known to be treated and 92% in Wirral. The PRNs gave pretreatment advice and counselling to 59% of positive women in Portsmouth (67% of community screen positives and 5% of GUM screen positive episodes). This was similar in Wirral, where advice was given to 59% of positive episodes from women (71% of community screen positive and 2% of GUM screen positive episodes). Table 5 outlines the treatment outcomes for women (16–24 years) at both HAs depending on whether they were initially screened at the local GUM clinic or in the community. In both Portsmouth and Wirral, over 98% of positive women screened at the GUM clinic were also treated there. In Portsmouth, 84% of community screened positives received treatment at the GUM clinic, whereas only 25% of community screened women were treated at the GUM clinic in Wirral. The PRNs in Wirral treated the majority (61%) of community screened positive women at the coordinating office, whereas in Portsmouth the PRNs saw the majority of positive women in their office and then took them to the GUM clinic in the same building for treatment. A minority of women were treated in Portsmouth by the PRNs in their office (1%). In both HAs, approximately 15% of community screened positives were treated at a community setting; this was usually the site where screening had initially taken place.

No information was available on the number of partners from 5% of positive episodes in women from Portsmouth and 16% in Wirral. In Portsmouth, 52% of partners reported by women were verified as having been treated and this was significantly lower in Wirral, where 41% of partners from women were treated. However, it should be noted that not all reported partners were traceable as names or contact details could not be given. Prevalence of infection in partners of positive women was 47.3% (331/628) in Portsmouth and 42.7% (38/89) in Wirral.

Evaluation data

Expectation and management of results

All respondents interviewed had unprotected sex with one or more partners but took the test expecting a negative result. Contrary to expectations, some participants were positive and they were shocked at this (see quote 1 in box). Few women realised that referral to GUM for treatment would involve a full sexual health screen and partner notification and this made some women anxious about attending GUM clinics (quotes 2 and 3). All respondents receiving treatment in GUM clinics accepted full sexual health screening, believing it to be in their best interest because of a high likelihood of concurrent STIs. When questioned, however, women did not recall information or names of infections for which they had been tested. None the less, although the stigma associated with STIs also gave rise to concerns about accessing treatment, others felt GUM clinics offered anonymity and flexibility (quote 4). Women's responses to their experience at GUM clinics were often bound up with their feelings about having an STI and, consequentially, there was little consistency of response to the quality of care received.

Partner notification

Respondents were not always clear about the mechanics of partner notification—that is, whether they could notify ex-partners themselves or leave contact to GUM clinics. Women created a distinction between current and past partners and expressed reluctance to contact former partners themselves. Most women had told their current partner that they been screened and felt obliged to inform them of their result, despite being concerned about partner response (quote 5). Common responses to a positive test result included feeling dirty, ashamed at passing on the infection, and suspicion about where the infection had originated. For some, this led to tension and suspicion within relationships but no repercussions within relationships resulted (quote 6). However, most said their partner had been understanding and rational.

Table 5 Management of positive women (16–24 years): treatment outcomes

Setting	Positive episodes in women (16–24 years)*				
	Total screened at setting	Total untreated (% total)	Treated at GUM (% total treated)	Treated by PRNs (% total treated)	Treated at other community setting (% total treated)
Portsmouth (GUM screened)	167	10 (6.0%)	156 (99.3%)	0	1 (0.7%)
Wirral (GUM screened)	104	2 (1.9%)	102 (98.1%)	0	0
Portsmouth (community screened)	1052	16 (1.5%)	866 (83.6%)	10 (1.0%)	158 (15.3%)
Wirral (community screened)†	447	41 (9.2%)	101 (24.9%)	248 (61.1%)	57 (14.0%)

*As some women had more than one positive test, data are presented for each positive episode.
†Excludes those treated where health setting was unspecified in Wirral.

What participants said: Original quotes from interviews

Expectation and management of results

Quote 1: "It made me think because it is more common and you think 'I know about it now and managed to catch it, so how many people that don't know about it have it?' Do you know what I mean? It did make me think." Female, GUM clinic, Portsmouth (positive)
Quote 2: "When I walked in there was a lot of young people on that day. There was loads of male and females and I was sitting in the waiting room and I was a bit scared actually." Female, GP, Wirral (negative)
Quote 3: "There is still a stigma because, at the end of the day, these places tackle issues that none of us want to talk about." Female, FPC, Portsmouth (negative)
Quote 4: "It's (the GUM clinic) out of the way and I know I'm less likely to bump into someone I might know. You can choose when you go, what time's available to get there." Female, FPC, Wirral (positive)

Partner notification

Quote 5: "I didn't tell him on the day actually. I don't know why. I think I thought at the back of my mind that maybe he would think that I had asked for it or something. I don't know actually. I think that was probably it—at the time—but I told him afterwards" Female, youth clinic, Wirral (negative)
Quote 6: "He didn't have it until he started going out with me and it made me feel I was to blame for passing it on to him. He didn't blame me, but I felt I was to blame" Female, GUM clinic, Wirral (positive)

Impact of screening

It is difficult to judge the impact that screening might have on long term behaviour. Several women said the experience of screening had been thought provoking, heightened their awareness of chlamydia, and the need to practise safer sex. They were also aware that they needed to be screened if they changed sexual partner. Overall, women generally felt screening was beneficial and believed it was important for people to be screened and treated (if infected) to protect both their own sexual health and fertility, and to prevent the spread of disease to others.

DISCUSSION

This is the first time an opportunistic screening programme has been piloted on a large scale in England. As such, it forms the largest survey of *Chlamydia trachomatis* prevalence carried out in England to date, giving estimates of the prevalence of infection of attenders at a range of healthcare settings using the same inclusion criteria and testing methodology. Prevalence estimates from different healthcare settings are broadly commensurate with other studies,[1] tending towards the higher end of reported ranges. This is expected, given the relatively young age group screened (16–24 years) and the use of a highly sensitive test. The ligase chain reaction on urine is known to identify 20% more infections than one enzyme immunoassay (Chlamydiazyme) on endocervical swabs,[7] which is the most commonly used test/specimen combination in PHLS laboratories.[8] Given the similarity in prevalence estimates within healthcare settings in the two areas taking part in this study, it is likely that equivalent prevalence would be found elsewhere in the country in comparable healthcare populations. The highest burden of infection was seen in the young sexually active population (< 20 years) and prevalence declined in older women. However, there was still a major burden of infection in 20–24 year old women at over 6%. Macmillian *et al* reported similar prevalence and decreasing trend with age, where infection levels only dramatically decreased in women aged 30 and above.[9] This suggests that the upper age limit for screening in this study, as proposed by the chief medical officer's expert advisory group on *C trachomatis*[1] and thus likely to be used in a national programme, needs to be reviewed. Bias due to the self selection of cases will influence the prevalence seen; however, uptake of testing was universally high among all age groups and healthcare settings. Crude prevalence in Wirral is higher than Portsmouth; this is expected given that 44% of the sexually active 16–24 year old female population are aged 20 years or less compared to 38% in Portsmouth. In addition, the phased introduction of GPs to the programme in Wirral meant that those who would only access health care via general practice were less likely to be recruited.

This screening programme was targeted at women attending healthcare settings for any reason. Although a proportion of women (13% of all accepted first tests in Portsmouth and 11% in Wirral) were known to be screened for diagnostic reasons, it is likely that more symptomatic women were tested than would have been if the programme was not in place. The results of this study demonstrate the significant population burden of this infection; 90% of infections were diagnosed outside GUM in Portsmouth and 86% in Wirral. Analysis of the potential impact of limiting screening to single healthcare settings indicates that general practice is a key site for screening; although prevalence of infection was among the lowest of healthcare settings, service utilisation is by far the highest.[3] Planning future screening initiatives will need to take into account the estimated prevalence of infection at healthcare settings, in addition to local service provision and service utilisation. As service utilisation varies with age, a range of services will be required to best reach the younger and older ends of the population. In addition, given the limited population level attendance rates at most healthcare settings, screening is only likely to achieve significant population coverage and reduce long term prevalence if it is offered widely using general practice as the key setting or if attendance at other settings is significantly increased.

Screening was regarded as constructive by participants in the programme, whereby they felt they were safeguarding their own sexual health. The views of participants were in keeping with similar studies,[10 11] indicating that improvements in public awareness and greater education on STIs are necessary to help to alleviate perceived stigma and distress associated with positive results. Increased publicity generated by the screening programme aided normalisation of the topic of infection in the target group; this should be maintained and the role of GUM services needs to be actively promoted.

Clinical audits of non-GUM settings have previously highlighted problems associated with management of chlamydia positive patients, both within and between healthcare settings, where poor treatment rates, lack of referral to GUM, and low partner notification rates are commonly seen.[12–16] Over 90% of positives were known to be treated during the programme, a significant achievement given the number of women screened. Further follow up of positives after the 3 month cut-off point used for results in this paper indicates that almost all positives did receive treatment. The extremely high levels of treatment suggested that this model of care (utilising coordinating PRNs to manage results and a collaborative, defined management plan between healthcare settings) is very effective in managing infection on a large scale. The majority of community screened positives received pretreatment counselling from the PRNs and it would appear that the actual site of treatment may be determined to some extent by the location of the PRNs. It should be noted that the partner notification rate was lower in Wirral where fewer positives were managed in the GUM clinic and the high prevalence of infection in partners reiterates the importance of effective partner notification to prevent reinfection and onward transmission.

Although this study provides evidence of the feasibility and acceptability of a screening programme, little meaningful information can be gained on screening intervals, reinfection rates, or the effect of screening on the long term outcomes of infection because of the study design. A prospective follow up study has now been implemented in the pilot sites to provide reliable estimates of chlamydia incidence and reinfection rates, which will be used to inform whether the proposed national screening programme should incorporate a recall component for groups at high risk of reinfection.[17] Once a national programme has been implemented, further studies will be required to evaluate the effect on rates of pelvic inflammatory disease. Health professionals were financially remunerated in this study to offer testing and this may have influenced the uptake of testing. The extent to which financial inducements to professionals are sustainable in terms of a national programme remains to be seen.

In conclusion, this study has demonstrated that large scale opportunistic screening for genital chlamydial infection is achievable at a wide range of healthcare settings in England. Urine screening is acceptable to patients and professionals and the role of coordinating health advisers was vital in achieving successful treatment of positives, especially in those screened outside GUM. A national screening programme will be rolled out from 2002 and will require the infrastructure for managing large numbers of positives; however, this must be seen within the context of already overstretched GUM services.[18]

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CONTRIBUTORS

JMP participated in protocol development, coordinated data management, and was the lead writer; MC developed the protocol, critical revision of paper, and is the guarantor of the study in addition to JH (Wirral) and SR (Portsmouth); PAR participated in protocol development, undertook the statistical analysis of the uptake data (with assistance from JMP) and critical revision of paper; EP, NJ, and CC coordinated, implemented, conducted interviews, and analysed the qualitative study and paper preparation; JH and SR were lead local study coordinators and participated in protocol development, management and implementation of the study; HM, GH, and GU participated protocol development and were responsible for laboratory aspects and service provision; HM and GH were responsible for local data management; LM and TG organised patient coordination and follow up; VH, JT, and AG participated in protocol development and were responsible for GUM patient management along with Mary Hernon (clinical research fellow) in GUM Wirral. All authors commented on the paper.

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