ORIGINAL ARTICLE

Outreach health adviser in a community clinic screening programme improves management of genital chlamydia infection

K Jones, A Webb, H Mallinson, H Birley

Sex Transm Infect 2002;**78**:101–105

See end of article for authors' affiliations

Correspondence to: Kathy Jones, PACE, Bootle Health Centre, Park Street, Liverpool L20, UK; kjjonah@yahoo.co.uk

Accepted for publication 24 January 2002

Objective: To assess the effectiveness of an outreach health adviser on treatment, partner notification and outcome for clients diagnosed with genital chlamydia (CT) infection at a community young people's clinic.

Methods: From August 1999 to March 2000, a genitourinary medicine (GUM) based health adviser helped to develop testing and undertook outreach management of clients aged under 26 years diagnosed with CT infection. In addition to facilitating referral to GUM, she gave antibiotic treatment based on a GUM derived patient group direction to those not wishing to travel to the GUM clinic. She also advised them on contact tracing and the need for a compliance check (CC).

Results: Chlamydia positive tests with ligase chain reaction (LCR), on first void urine, were obtained for 62 (12.9%) of 481 female clients, one (5%) of 20 male clients, and nine (53%) of 17 male contacts of female positive cases. All 72 testing positive received their result and were treated. Two urine samples positive for CT showed positive LCR tests for gonorrhoea. Proportions of named contacts seen (67%) and reattendances for compliance checks (60%) were similar to those for women seen in GUM services.

Conclusions: Health adviser input with the ability to treat can be effective in reducing the growth of identified but untreated genital chlamydia infection consequent upon community based screening. Such a strategy appears comparable with, and can add to, GUM based treatment of infection. It helps to address the need for alternative management strategies in the light of the national sexual health strategy.

Genital *Chlamydia trachomatis* (CT) infection is the most prevalent bacterial sexually transmitted disease in the United Kingdom and probably worldwide.[1] The sequelae of chlamydia infection are well known and the effectiveness of population based management in reducing these is well described.[2–4]

Nucleic acid amplification tests (NAAT) have the advantage of much greater sensitivity (without loss of specificity) over culture or antigen based tests.[5] One advantage of such tests is that chlamydia can be detected from first void urine (FVU), avoiding the need for invasive samples.[6 7] Urinary ligase chain reaction (LCR) testing on FVU for gonorrhoea (GC) has been shown to have high specificity in both men and women, with better sensitivity in women than swab culture.[8]

During 1998–9, a survey of asymptomatic CT infection diagnosed by LCR tests on FVU, among 905 women aged under 21 attending Merseyside contraception and reproductive health clinics, revealed a prevalence of 8.5%.[9] However, only 25% of participants returned spontaneously for their results as agreed and despite the best efforts of the staff to recall them, 22.5% of women with known chlamydia infection remained untreated. At that time all positives had to be referred to the GUM clinic for treatment. Alternative options to try to improve the treatment rate were considered and a pilot outreach service from the GUM clinic was suggested at "PACE." This young person's clinic is situated in a district of Merseyside in the north west of England that has a high level of socioeconomic deprivation. As shown in the previous study young people from this area are especially unlikely to travel to the GUM clinic situated in the large city centre hospital, 4 miles away, involving at least two bus journeys and away from their usual social networks.

METHODS

The study was approved by the local research ethics committee.

From August 1999 to March 2000 all clients aged under 26 years attending PACE were offered urine testing for chlamydia. This new service was advertised within the clinic and posters giving information about the service were sent to local user groups and young person agencies. A leaflet concerning CT and the relevant test was given to all clients to read while they were waiting to be seen.

During each consultation a sexual history was taken and anyone considered at risk (sexually active and untested in current relationship) was offered testing. Consent was also obtained to test the same urine sample for gonorrhoea (GC) by LCR if the CT result was positive. Based on previous experience, many clients would not wish to go to a GUM clinic for further testing. By testing all those who had CT infection for GC, the possibility of missing GC was minimised.

Those clients who agreed to testing gave a first void sample of urine, using a Urikone (Rockett Medical, UK) which was refrigerated at 4°C, sent to the Liverpool Public Health Laboratory and tested for CT with LCR (Abbott Laboratories). Initially reactive LCR-CT tests were confirmed by repeat testing on the same urine. GC was tested with LCR (Abbott Laboratories).

Abbreviations: CC, compliance check; CT, *Chlamydia trachomatis*; FVU, first void urine; GUM, genitourinary medicine; GC, gonorrhoea; LCR, ligase chain reaction; NAAT, nucleic acid amplification tests; OHA, outreach health adviser; PCR, polymerase chain reaction; PGD, patient group direction; STIs, sexually transmitted infections

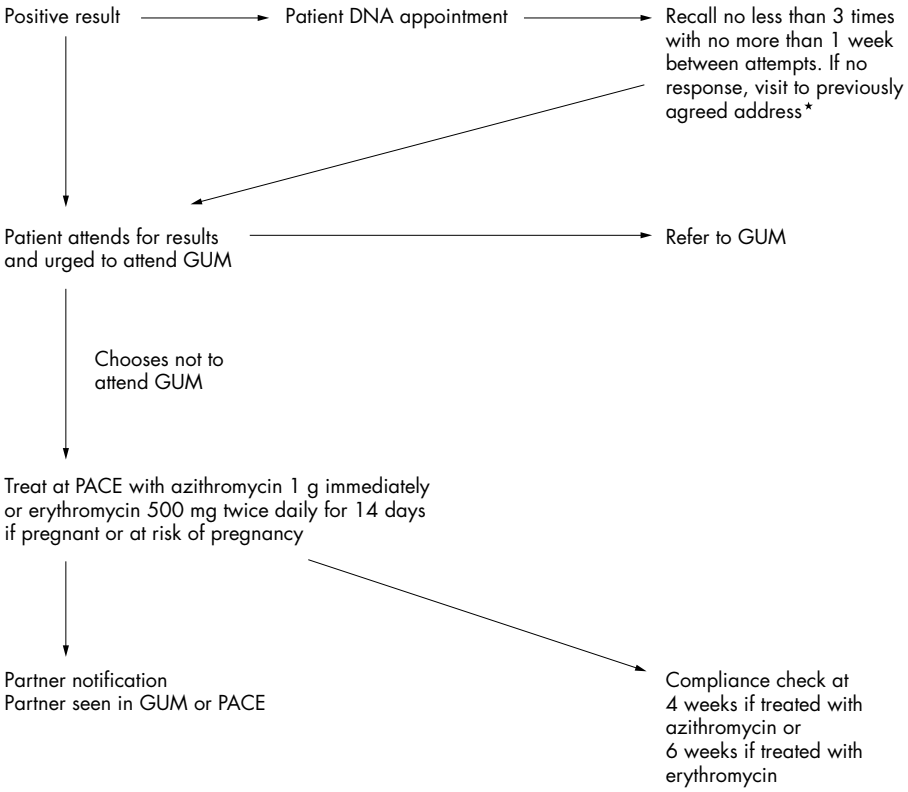

Figure 1 Flow chart of management of a positive chlamydia result at PACE.

*If no access was gained a letter was left. If there was no response to this a further attempt would be made to make verbal contact. If the client knew the result but did not attend for treatment as agreed, a further reminder was sent or phone call made, unless the client refused treatment. This is the same recall protocol as in the local GUM clinic although the catchment area at PACE is smaller making a home visit less time consuming.

An outreach health adviser (OHA) who also holds a family planning qualification was seconded to PACE half time while continuing to work at the GUM clinic. She was present at four out of seven of the weekly clinic sessions. Her fifth session was used to ensure all results had been received and all individuals with positive results informed and treated. Treatment could also be issued by a doctor present at two other sessions.

All clients tested for CT were given a date to return or telephone for their results 10 days after the test and at a time when the OHA was present. Testing was not performed unless an address or telephone number was given for contact to be made if necessary (fig 1).

All those clients testing positive for CT were invited to return to PACE to discuss their results. They were encouraged to attend the GUM clinic at the Royal Liverpool University Hospital, where they could see the same health adviser and be tested for other sexually transmitted infections (STIs). All newly attending patients at GUM are offered culture/microscopy for gonorrhoea and trichomoniasis, serology for syphilis and polymerase chain reaction (PCR) for chlamydia. Those in the pilot who chose not to attend the GUM clinic were offered treatment at PACE according to a patient group direction (PGD) agreed both by GUM and Abacus centres consultants. A single dose of 1 g of azithromycin was used to improve compliance. If there was a risk of pregnancy, a 14 day course of erythromycin 500 mg twice daily was issued. Clients attending PACE for emergency contraception are considered at risk of pregnancy until they have had a normal period following this, which may well be after they get the CT test result.

Clients were advised of the need to test and treat their partners. A contact slip specifically designed for PACE was issued to facilitate this. It had the OHA's telephone numbers at both GUM clinic and PACE and listed GUM clinic opening times. All partners attending to see the OHA were tested but were also advised to attend the GUM clinic to ensure treatment as the PGD did not allow the health adviser to treat them on the basis that they were at risk through being a sexual partner.

The client was advised about the need for avoidance of unprotected sexual intercourse until their compliance check (CC) and that of all current partners was negative.

To check if all appropriate clients were being approached an audit of all client notes was carried out for 2 weeks halfway through the pilot.

Records of women who first attended the GUM clinic during October 1999 were audited to assess positivity and treatment rates at initial and CC visits. The numbers of partners contactable, seen, and rates of infection were also noted.

RESULTS

Study population

During the pilot there were 2744 attendances at PACE by 1481 clients aged under 26 years, of whom 7.3% were male.

The audit of all 159 attendances over 2 weeks, halfway through the pilot, showed it was inappropriate to offer testing to 76 (47%): 47 had already been tested, 20 were too old, seven were attending for results, and two had no risk identified. Of the 83 eligible to be offered testing only nine (11%) were not (six didn't see the clinician and it was forgotten on three occasions). At first request 52% accepted immediately and 24% deferred testing on this occasion. A further 24% refused the test on first request.

Table 1 Total number of tests on clients during pilot and positivity rates

	No	Positive	% positive
Female clients	481	62	12.9
Male clients	20	1	5
Total clients	501	63	12.6

Table 2 Attendance for results by age and number of recalls

	Overall (%)	<21 years (%)	≥21 years (%)
Attended spontaneously	16 (25)	15 (28)	1 (10)
Attended with one recall	22 (35)	17 (32)	5 (50)
Attended with two recalls	12 (19)	11 (21)	1 (10)
Attended with 3–6 recalls	13 (20)	10 (19)	3 (30)
Total	63 (100)	53 (100)	10 (100)

Table 3 Delay from test to treatment and need for outreach health adviser intervention

Test to treatment interval	No	No needing OHA intervention	Average no of recalls needed
Up to 14 days	37	21	0.7
15–28 days	19	19	2.3
Over 28 days	7	7	4.6

Numbers tested

Tests for CT were carried out on 518 young people; 20 were on male clients, 17 were on male contacts of female clients testing positive; the rest, 481, on female clients. Clients are defined as young people attending the clinic spontaneously. Contacts are those whose reason for attending is because their partner has had a positive CT test.

Positivity rate

Over the 8 months, 501 tests were done on clients aged 13–25 years. Three quarters of the tests were on clients under 21 years. Twenty tests were on men (4%). The positivity rate was 12.6%. The results are shown in table 1. No positive results were obtained in clients aged under 16.

Test-treatment interval

All 63 clients with a positive test were informed of their results. Sixteen (25%) attended without a reminder. A greater proportion of those aged under 21 testing positive turned up spontaneously than the older clients, although there was no statistical difference based on these small numbers (p=0.22) (table 2). For the remainder the OHA made 67 phone calls, wrote 36 letters, and carried out six home visits. There was no difference related to age.

All clients testing positive were treated although for some there was a considerable delay (table 3) which was directly related to multiple recalls needed to inform them of their result. Two (3%) returned for treatment before the agreed date and 14 (22%) returned on the agreed date. Over half (59%) were treated within 2 weeks of having their test. The longest interval was 80 days.

The initial PGD did not allow the OHA to treat partners on the basis of risk. This led to a delay in treatment for the first two partners who chose to attend PACE, at 9 and 39 days respectively. To avoid further delays it was then agreed that the OHA could phone the consultants for permission to treat on the basis of risk if she felt this was appropriate.

Place and type of treatment

Of the 72 chlamydia positive clients and partners seen at PACE, 69 (96%) chose to have treatment at PACE. Despite the recommendation to go there only two (3%) attended the GUM clinic and one (1%) was treated by her general practitioner. She attended her general practitioner after finding out she had a positive test but before attending PACE to discuss it. The general practitioner's practice nurse phoned PACE to find out details and as there was a risk of pregnancy, the client was given erythromycin.

Forty eight (66.7%) received azithromycin and 22 received erythromycin because of risk of pregnancy. The two attending the GUM clinic were given doxycycline.

Other infections

Of the 72 people testing positive for CT only 55 were tested for GC by LCR on a urine sample owing to delayed introduction of the test in the laboratory. Three quarters (47/63) of the original clients and two thirds of the partners (6/9) were tested on the first urine sample and a further two were tested at the time of CC. One of the initial samples was positive and another was positive at CC. There was considerable delay in both attending GUM and both were negative when tested there. Of those that were not tested for gonorrhoea via PACE a further four were tested at GUM for GC (following CT treatment) and found to be negative.

Although only two out of 72 initially chose treatment at GUM, 17 eventually attended. One presented with herpes simplex infection 3 months after she had received treatment for CT. Another presented with pelvic pain and was treated for pelvic inflammatory disease 10 days after being tested for CT. No other infections were identified. Overall, the other infections identified amounted to only two unconfirmed GC and one herpes simplex. No other sexually transmitted infections were identified.

Compliance check

All clients and partners were advised to return for a CC on an agreed date but only 43 (60%) did so. Those who attended had a further LCR test for CT on FVU and the eight (19%) with a positive result all had a history of failure to comply with advice or treatment.

Partners

The 63 clients admitted to 75 partners in the past 6 months, of whom 16 (22%) were unable to be identified.

Of the known partners 39 (67%) definitely attended for screening and treatment: 17 (44%) at PACE, 20 (53%) at the local GUM clinic and two at another GUM clinic. CT was confirmed in 16 (41%) and non-specific urethritis in six (15%). Two (5%) had genital warts but were CT negative and 15 (39%) were CT negative with no other identifiable infection. All were given treatment for CT on the basis of their risk.

Comparison of attendance

Results of the outreach programme were compared with those of the earlier prevalence study[9] and with the results of 247 consecutive first attending women at the open access GUM clinic at RLUH in October 1999 (table 4). These latter women are routinely screened for chlamydia infection (using PCR from urethral and endocervical swabs). Of the 247 GUM clinic attenders 25 were chlamydia positive. These included seven (28%) who had already tested positive in the community (either at a GP surgery or a centre for contraception and reproductive health) and 12 (48%) who were sexual partners of chlamydia positive men. Concurrent with CT infection one woman was found to have gonorrhoea and one *Trichomonas*

Table 4 Proportions of chlamydia positive women returning for results as agreed and receiving treatment

	Prevalence study[9]	Outreach	GUM
Number	905	481	247
Number (%) positive	77 (8.5)	62 (12.9)	25 (10.1)
Positives spontaneous attending for result (%)	19 (25)	16 (25)	NA
Positives receiving treatment (%)	60 (78)	62 (100)	25 (100)

Table 5 Success of partner recall and of treatment

	Outreach	GUM
Mean number of recalls attempted	1.8	1.5
Partners contactable	78% (58/74)	96% (24/25)
Contactable partners seen	67% (39/58)	71% (17/24)
Partner positive	41% (16/39)	41% (7/17)

vaginalis. There was no statistically significant difference in the rates of spontaneous attendance for results between the prevalence study and the outreach pilot (χ^2 with Mantel-Haenszel correction 0.66, p=0.42).

Success of partner recall and treatment

A comparison of the number of attempts to recall chlamydia positive women and success of contact tracing between the outreach project and the GUM clinic is shown in table 5. Seventy eight per cent (58/74) of partners of outreach women were contactable as against 96% of GUM clinic partners. Nevertheless, similar proportions of those deemed contactable were actually seen. Equal proportions (41%) of partners of GUM clinic and of outreach women were found to be chlamydia positive.

DISCUSSION

Community diagnosis of genital chlamydia infection is likely to increase with the increasing availability of appropriate tests. Management has historically been undertaken by GUM clinics but many clients, especially the young, are reluctant to attend these.[9–12] This is especially so where accessibility is affected because of travel constraints.[13] As recently pointed out, detected prevalence can only be a measure of the success of a community screening programme when diagnosis generally results in treatment.[14]

The numbers of young people who attended for results without prompting in this study, were the same as in the earlier prevalence study[9]; the most notable difference was that all the index cases received treatment compared to only 76% before the introduction of the OHA. The difference was therefore not in the young people's behaviour but in the way positive results were dealt with within the clinic.

We established that virtually all (96%) eligible clients were being asked about testing, showing that community clinic staff had no problem offering testing. Half the clients accepted testing on the first occasion. Although 24% refused initially and 24% deferred on the first occasion the experience has been that many clients who initially are reluctant, agree at later visits. This seems to be because at the time of the pilot few clients knew about chlamydia testing, hadn't come with the idea of a test, and just wanted to address their issues. Of those eligible for testing more than three quarters eventually were tested. Further work is being carried out on current uptake rates.

There was concern before the pilot that if only CT was tested for and most clients chose to be treated at PACE, it would be possible to miss other important infections. Therefore, it was agreed to test all urine samples positive for CT for GC as well. Although it was felt that GC had a low prevalence in this population this had not been formally studied. This policy would also reduce the chance of missing a new outbreak of GC. Our initial assumption of low prevalence of GC was confirmed but we believe this policy should be considered in all tests for CT where GC is not also routinely tested for. This is more likely to occur as non-invasive testing becomes more frequent and more testing and screening are carried out away from GUM clinic.

Not being able to treat partners by PGD when they attended for testing led to delays in treatment. Although this was overcome by phoning one of the two consultants at the time of the visit, it was time consuming and cumbersome. The PGD was changed after the pilot and now allows for the treatment of partners on the basis of risk at the time of testing.

We found 19% of those who returned for CC to be positive for CT. All of them had in some way failed to comply with some of the advice. This could be non-completion of antibiotic treatment or re-exposure before completion of treatment by at least one partner. Although antibiotic resistance to CT is not a problem as it is with GC it is also best not to be complacent about it. We suggest that it is important to ask clients who have been treated to return for a further test. We also wish to investigate the reasons for non-compliance to see if any action on the clinician's side can reduce it.

We felt it was important to check if there was any obvious difference between the compliance and numbers of partners admitted to (75) and traced (39) at PACE when compared to clients attending a GUM clinic. Although no formal comparison could be made because the numbers were too small our partner contact and follow up rates were similar.

Our previous study[9] showed no evidence, among those aged 20 and under, that attendance for results or treatment was related to age. In this study those aged over 20 were less likely to attend for their results spontaneously although the difference does not reach statistical significance.

The effectiveness of contact tracing has been questioned[15] and the success rate is variable.[16] In a very large study a "disease intervention specialist" was able to locate 82% of their 13 845 named contacts.[17] Our study identified 78%. We tried to use a local comparator but nearly half (12/25) of the chlamydia positive GUM attenders were attending as contacts so were not strictly comparable.

GUM clinics have the greatest expertise in contact tracing but are not the only ones who can carry it out. General practitioners can treat partners even if they are not registered with them under "immediate and necessary treatment" but the partner has to be willing to access the general practitioner. Whoever carries out the contact tracing needs to have a tight protocol to maximise the number of identified and treated partners.

A dedicated OHA, in a discrete geographical area rather than the greater numbers and area usually covered by a large city GUM clinic team, was felt to be at an advantage and to improve the follow up rate.

The continued high positivity rate and the success in achieving treatment led to the health authority continuing to

Key messages

(1) High rates of chlamydia in young people attending family planning clinics
(2) Outreach health adviser improves treatment rates for community detected *Chlamydia trachomatis*
(3) Testing for gonorrhoea can also be done on the same urine samples as for chlamydia
(4) Partner notification can be carried out effectively in a community setting

fund the project, albeit with slightly reduced hours. This has not affected the rate of testing or treatment.

This model of work is felt to be transferable and we are currently looking at extending it to a large city centre clinic for contraception and reproductive health. Experienced health adviser input is felt to be necessary but the information giving and testing should be able to be incorporated into any contraceptive or reproductive health consultation. Certainly, the staff in PACE had no problem introducing the testing as shown by the mid study audit. The follow up of positive results, treatment under patient group directions, and information about partner notification should be able to be carried out by most of the clinical staff with some training. Many family planning trained nurses issue hormonal contraception with patient group directions so this does not represent a major change in working.

At present, because they are sent from one service to another it is difficult to know, without carrying out lengthy audits,[10–12 18] how many clients referred to the GUM clinic for treatment ever get there, whereas if they are "in house" this should be easier to monitor. There will always be some cases where the greater experience of a trained health adviser will be essential and a careful check will need to be kept so that no positive cases slip through the system. However, most clinicians who work in areas of sexual health should be able to contribute effectively. In this pilot 60% attended for treatment either spontaneously or with only one recall attempt. Outreach, as used in this context, is allowing expertise that is usually in genitourinary medicine to be more widely applied.

CONCLUSION

This pilot shows that use of a committed outreach health adviser can successfully achieve diagnosis and treatment of CT, via PGD, in a young population previously reluctant to attend a GUM clinic. Prevalence rates were, if anything, higher than previously shown and well above the level where screening is cost effective.[19] We believe this model can be used as a basis for developing local services to reduce the prevalence of a common disease affecting young people with many long term health consequences. This approach would fit well with the extension of GUM expertise into level 2 sexual health services as proposed in "The national strategy for sexual health and HIV."

ACKNOWLEDGEMENTS

We are very grateful to the trustees of the NMCT for the award, to all the clinic staff at PACE who entered into this work with great enthusiasm especially Dr A Darcy who had a pivotal role in the project and to Sally Wellsteed for her comments on the draft paper.

CONTRIBUTORS

KJ is the outreach health adviser who carried out all the work described in the paper, as well as maintaining databases of numbers. She was part of the writing team and made significant contributions to this; AW is the consultant in family planning and reproductive health care, who initially conceived the pilot and provided support in its development, execution and review. She has been the coordinator of the writing team; HM is the key link with the laboratory, who has offered support to previous studies, as well as this one, and helped in deciding the best tests to use and provided all the support regarding testing. He has been closely involved in the development, execution, and writing up of the pilot; HB is the consultant in genitourinary medicine who was involved from the beginning in the development and execution of the pilot. He collected the data for the women attending the GUM clinic and had significant input into the writing of the paper.

Authors' affiliations

K Jones, A Webb, PACE, Abacus Centres for Contraception and Reproductive Health, Liverpool L20 3RL, UK
H Mallinson, PHLS North West, Liverpool Laboratory, University Hospital Aintree, Liverpool L9 7AL, UK
H Birley, Department GUM, Royal Liverpool University Hospital, Liverpool L7 8XP, UK

REFERENCES

1 **Cates W**, Wasserheit JN. Genital chlamydia infections: epidemiology and reproductive sequelae. *Am J Obstet Gynecol* 1991;**164**:1771–81.
2 **Scholes D**, Stergachis A, Heidrich FE, *et al*. Prevention of pelvic inflammatory disease by screening for cervical chlamydia infection. *N Engl J Med* 1996;**334**:1362–6.
3 **Weström L**. Decrease in incidence in women treated in hospital for acute salpingitis in Sweden. *Genitourin Med* 1988;**64**:59–63.
4 **Paavonen J**. Is screening for Chlamydia trachomatis infection cost effective? *Genitourin Med* 1997;**73**:103–4.
5 **Stary A**. Chlamydia screening: which sample for which technique? *Geniturin Med* 1997;**73**:99–102.
6 **Lee HH**, Chernesky AA, Schachter J, *et al*. Diagnosis of Chlamydia trachomatis genitourinary infection in women by ligase chain reaction assay of urine. *Lancet* 1995;**345**:213–6.
7 **Stary A**, Tomazic-Allen S, Choueiri, *et al*. Comparison of DNA amplification methods for the detection of Chlamydia trachomatis in first void urine from asymptomatic military recruits. *Sex Transm Dis* 1996;**23**:97–102.
8 **Stary A**, Ching SF, Teodorowicz L, *et al*. Comparison of ligase chain reaction and culture for detection of Neisseria gonorrhoeae in genital and extragenital specimens. *J Clin Microbiol* 1997;**35**:239–42.
9 **Harvey J**, Webb A, Mallinson H. Chlamydia trachomatis screening in young people in Merseyside. *Br J Fam Plann* 2000;**26**:199–201.
10 **Wilkinson C**, Massil H, Evans J. An interface of Chlamydia testing by community family planning clinics and referral to hospital genitourinary medicine clinics. *Br J Fam Plann* 2000;**26**:206–9.
11 **Willmott F**, Tolcher R. Audit of outcome following positive chalmydial test results in family planning clinics in Southampton. *Int J STD AIDS* 2000;**11**:756–8.
12 **Ross JDC**, Sutherland S, Coia J. Genital Chlamydia trachomatis infections in primary care. *BMJ* 1996;**313**:1192–3.
13 **Clements S**, Stone N, Diamond I, *et al*. Modelling the spatial distribution of teenage conception rates within Wessex. *Br J Fam Plann* 1998;**24**:61–71.
14 **Simms I**, Mallinson H, Hopwood J, *et al*. Detection or treatment: which outcome measure. *Sex Transm Inf* 2001;**71**:150.
15 **Radcliffe K**, Clarke J. Contact tracing-where do we go from here? *Sex Transm Inf* 1998;**74**:313–15.
16 **Cowan F**, French R, Johnson AM. The role and effectiveness of partner notification in STD control: a review. *Genitourin Med* 1996;**72**:247–52.
17 **Katz BP**, Caine VA, Jones RB. Evaluation of field follow-up in a sexually transmitted disease clinic for patients at risk for infection with Neiserria gonorrhoea and Chlamydia trachomatis. *Sex Transm Dis* 1992;**19**:99–103.
18 **White C**, Wardropper AG. Chlamydia in a district general hospital: an audit of treatment and contact tracing. *Int J STD AIDS* 1999;**10**:57–9.
19 **Genc M**, Mardh P-A. A cost- effectiveness analysis of screening and treatment for Chlamydia trachomatis infection in asymptomatic women. *Ann Intern Med* 1996;**124**(1pt1):1–7.