Population-Based Strategies for Outreach Screening of Urogenital Chlamydia trachomatis Infections: A Randomized, Controlled Trial

Berit Andersen,¹ Frede Olesen,¹ Jens K. Møller,² and Lars Østergaard³

The effect of 2 population-based outreach screening strategies that used in-home sampling was compared with usual care practices for Chlamydia trachomatis infection. All 30,439 persons 21–23 years old in Aarhus County, Denmark, were divided randomly into 3 groups: group 1 (n = 4500) had a home sampling kit mailed directly to their centrally registered home address; group 2 (n = 4500) had a reply card mailed to their home address with which a home sampling kit could be ordered; and group 3 (n = 21,439) had access to usual care. For women in groups 1 and 2, the relative risks of being tested were 4.1 (95% confidence interval [CI], 3.8–4.4) and 3.5 (95% CI, 3.2–3.9), respectively, compared with usual care. The corresponding figures for men were 19.1 (95% CI, 16.0–22.8) and 11.8 (95% CI, 9.8–14.2), respectively. Both screening strategies were highly effective, but men benefited the most from having the home sampling kit provided directly.

Urogenital Chlamydia trachomatis infection is the most common treatable sexually transmitted disease (STD) in industrialized countries [1], but often it is not recognized by the infected person. If not treated, it may result in serious complications [2], such as female infertility and ectopic pregnancy [3]. Moreover, the spread of human immunodeficiency virus is facilitated by coinfection with Chlamydia trachomatis [4]. Unfortunately, no parameter except age can be used to define persons who would benefit from testing [5], and, despite years of intensive case-finding strategies, the prevalence of C. trachomatis infection remains high in many countries [6, 7]. In Aarhus County, Denmark, the prevalence of infection in persons tested routinely in 1999 was highest among 21-year-old men (23.7%) and 22-year-old women (8.7%) (authors’ unpublished data). New strategies are needed to identify and treat those infected, to limit the spread of the disease, and to reduce complications [8].

Molecular amplification techniques enable testing for C. trachomatis with noninvasive procedures [9–14]. Such test strategies have been applied successfully outside clinics [7, 15–18]. In comparative studies, we evaluated the efficacy of screening programs in which persons could obtain samples at home and mail them directly to the diagnostic laboratory [19, 20]. However, the effectiveness of home sampling as a population-based universal screening strategy has not been assessed and has not been compared with usual care results. In the present study, we assessed the effectiveness of 2 different outreach screening strategies by targeting all young inhabitants in a Danish county and compared this to usual care.

Subjects, Materials, and Methods

The study was done in Aarhus County, which has a population of 631,000 (12% of the Danish population). All county residents are listed in the county health service register by personal identification number (CPR number).

Participants. All women and men born during 1974–1976 who lived in Aarhus County on 13 October 1997 were included in the study (figure 1). The 15,459 women and 14,980 men who fulfilled the inclusion criteria were identified from the county health service register. A group of 4000 women and 5000 men was selected randomly from the 15,459 women and 14,980 men. The 4000 women and 5000 men were randomized further into 2 intervention groups of 2000 women and 2500 men. The remaining 11,459 women and 9980 men had the opportunity to visit a physician for usual care (control group).

Intervention groups. The names and addresses of all subjects in the intervention groups were extracted from the county health service register. Between 31 October and 6 December 1997, all men and women in the intervention groups received a direct mailing inviting them to be tested for C. trachomatis by taking a sample at home and mailing it directly to a diagnostic laboratory. The invitation contained a letter describing the outreach program and a leaflet about the infection. The difference between intervention groups 1 and 2 was that persons in group 1 received the test package together with the invitation, whereas those in group 2 had to return a
prestamped, preaddressed reply card to the study center in order to receive the test package. Persons in the intervention groups also had the opportunity of receiving usual care, which consisted of swab samples obtained at a physician’s office.

Contents of test package. The test package included a collection tube for a first-void urine sample for men and a vaginal pipette for women, written instructions on how to obtain the sample, and a laboratory request form. The vaginal pipette is made of soft plastic. In one end there is a container with a saline solution; in the other end there is a tip with a covering lid. The women were instructed to remove the lid and to lead the tip 2 cm into the vagina. When pressure is applied on the container, saline is flushed into the vagina, and when the pressure is released, the saline is sucked back into the container. The lid is then replaced. The diagnostic efficacy of this method has been described elsewhere [14, 21].

Sample submission. Samples were mailed, together with the laboratory request form, directly to the Department of Clinical Microbiology, Aarhus University Hospital, in prestamped, preaddressed envelopes. On the laboratory request form, the participants were asked to state their CPR number (mandatory for medical service in Denmark), symptoms (if any), and the address to which the test result should be sent. Persons who submitted a sample could have their test results sent to any address, including to their home or to their family doctor. Subjects in both intervention groups had to return their samples before 5 February 1998 for study inclusion. No reminders were used. Persons with a positive test result were asked to visit a general practitioner or an STD clinic for treatment and contact tracing.

Usual care. Persons in the intervention groups and in the control group had the opportunity of usual care (an endocervical and/or urethral swab sample taken by a physician in his/her office). Free testing is generally available in Denmark. There are no recommendations with regard to repeated testing in any age group, but, as a general rule, samples are taken because of symptoms or intrauterine procedures such as induced abortion or insertion of an intrauterine device (authors’ unpublished data). All samples obtained in Aarhus County as part of usual care for detection of *C. trachomatis* are analyzed at the Department of Clinical Microbiology, Aarhus University Hospital, and are registered individually by a person’s CPR number. Therefore, from the database at the Department of Clinical Microbiology, we were able to extract data about conventional testing in all groups, including the control group. These data were collected for the period 31 October 1997 to 5 February 1998.

Sample analysis. All samples were analyzed at the Department of Clinical Microbiology, Aarhus University Hospital. Samples taken at home were analyzed by a transcription-mediated amplification assay (TMA; Gen-Probe) [21, 22], according to the manufacturer’s instructions. Swab samples obtained by physicians were analyzed by a ligase chain reaction (LCx; Abbott), according to the manufacturer’s instructions.

Nonparticipant analyses. At the end of January 1998, a questionnaire was mailed to 400 randomly selected persons (100 men}
<table>
<thead>
<tr>
<th>Test procedure</th>
<th>Women (n = 2000)</th>
<th>Men (n = 2000)</th>
<th>Control group (n = 11,459)</th>
<th>Women (n = 2500)</th>
<th>Men (n = 2500)</th>
<th>Control group (n = 9980)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samples taken at home only&lt;sup&gt;a&lt;/sup&gt;</td>
<td>589 (29.5), 27.5–31.5&lt;sup&gt;b&lt;/sup&gt;</td>
<td>481 (24.1), 22.2–25.9</td>
<td>—</td>
<td>633 (25.3), 23.6–27.0&lt;sup&gt;c&lt;/sup&gt;</td>
<td>377 (15.1), 13.7–16.5</td>
<td>—</td>
</tr>
<tr>
<td>Sample taken at home plus conventional examination</td>
<td>60 (3.0), 2.3–3.8</td>
<td>45 (2.3), 1.5–2.9</td>
<td>—</td>
<td>14 (0.6), 0.3–0.9</td>
<td>9 (0.4), 0.1–0.6</td>
<td>—</td>
</tr>
<tr>
<td>Conventional examination only</td>
<td>122 (6.1), 5.1–7.2</td>
<td>133 (6.7), 5.6–7.7</td>
<td>1076 (9.4), 8.9–9.9</td>
<td>23 (0.9), 0.6–1.3</td>
<td>27 (1.1), 0.7–1.5</td>
<td>140 (1.4), 1.2–1.6</td>
</tr>
<tr>
<td>Total</td>
<td>771 (38.6), 36.4–40.7&lt;sup&gt;d&lt;/sup&gt;</td>
<td>659 (33.0), 30.9–35.0</td>
<td>1076 (9.4), 8.9–9.9</td>
<td>670 (26.8), 25.1–28.5&lt;sup&gt;e&lt;/sup&gt;</td>
<td>413 (16.5), 15.1–18.0</td>
<td>140 (1.4), 1.2–1.6</td>
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</table>

NOTE. Data are no. (%) of subjects, 95% confidence interval. Subjects in group 1 received material for home sampling plus an invitation to participate in the study; subjects in group 2 had to return a prestamped, preaddressed reply card before receiving the material for home sampling. Persons in the intervention group had access to usual care in the same way as persons in the control group.

<sup>a</sup> Women were tested by vaginal flush sample, and men were tested by first-void urine sample. Detection of *C. trachomatis* was by transcription-mediated analysis. In conventional swab samples, *C. trachomatis* was detected by ligase chain reaction.

<sup>b</sup> Difference between women in groups 1 and 2: $\chi^2, 14.6; P < .01$.

<sup>c</sup> Difference between men in groups 1 and 2: $\chi^2, 80.7; P < .01$.

<sup>d</sup> Difference between women in groups 1 and 2: $\chi^2, 13.4; P < .01$.

<sup>e</sup> Difference between men in groups 1 and 2: $\chi^2, 77.2; P < .01$. 
Table 2. Relative risk of being tested during the screening period (31 October 1997 to 5 February 1998).

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Women</th>
<th>Men</th>
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<tbody>
<tr>
<td>Group 1 vs. control</td>
<td>4.1 (3.8–4.4)</td>
<td>19.1 (16.0–22.8)</td>
</tr>
<tr>
<td>Group 2 vs. control</td>
<td>3.5 (3.2–3.8)</td>
<td>11.8 (9.8–14.2)</td>
</tr>
<tr>
<td>Group 1 vs. group 2</td>
<td>1.2 (1.1–1.3)</td>
<td>1.6 (1.5–1.8)</td>
</tr>
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</table>

NOTE: Data are relative risk (95% confidence interval). Subjects in group 1 received material for home sampling plus an invitation to participate in the study; subjects in group 2 had to return a preaddressed, prestampen reply card before receiving the material for home sampling. Persons in the intervention group had access to usual care in the same way as persons in the control group.

and 100 women from each of the 2 intervention groups) who did not submit a sample in the screening program. They were asked why they did not participate in the screening program and about the acceptability of the invitation. The questionnaire was returned in a preaddressed, prestamped envelope. Persons who did not return the questionnaire within 14 days were contacted by telephone and were asked the same questions as those on the previously mailed questionnaire.

Outcome measures. The main outcome measure was the proportion of persons tested in the “intention-to-screen” populations (rate). Secondary outcome measures were the number of detected infections in each group. For nonparticipants, the outcome measures were reasons for not participating and the acceptability of the invitation.

Handling of data and statistics. For statistical analysis, we used SPSS/PC software (version 8.0; SPSS). For categorical data, we used a chi-square test with Yates correction and Fisher’s exact test, as appropriate. The level of significance was set at \( P < 0.05 \). The relative risk for testing was calculated by dividing the proportion of tested persons in the screening group by the proportion tested in the usual care group (control group), and 95% confidence intervals (95% CIs) were obtained. Ages were equal in the 3 randomized groups.

Results

Test Activity

Women. Of the 2000 women in group 1, 771 (38.6%) submitted a vaginal flush sample to the laboratory and/or were tested by conventional swab sampling at a physician’s office (table 1). This was significantly more than the 659 (33.0%) of the 2000 women in group 2 (chi-square test, 13.4; \( P < 0.01 \)). Only 9.4% of the women in the control group were tested (difference between group 1 and control group: chi-square test, 1220; \( P < 0.01 \); difference between group 2 and control group: chi-square test, 840; \( P < 0.01 \)). The relative risks of being tested in the intervention groups, compared with the control group, were 4.1 (95% CI, 3.8–4.4) and 3.5 (95% CI, 3.2–3.8) in groups 1 and 2, respectively (table 2).

Men. Of the 2500 men in group 1, 670 (26.8%) submitted a first-void urine sample to the laboratory and/or were tested by conventional swab sampling at a physician’s office (table 1). This was significantly more than the 413 (16.5%) of 2500 men in group 2 (chi-square test, 77.2; \( P < 0.01 \)). Only 1.4% of the men in the control group were tested (difference between group 1 and control group: chi-square test, 2121; \( P < 0.01 \); difference between group 2 and control group: chi-square test, 1075; \( P < 0.01 \)). The relative risks of being tested in the intervention groups, compared with the control group, were 19.1 (95% CI, 16.0–22.8) and 11.8 (95% CI, 9.8–14.2) in groups 1 and 2, respectively (table 2).

Detected Infections

Women. Table 3 shows that 6.5% (42/649) and 8.0% (42/526) of the women who submitted samples taken at home in groups 1 and 2, respectively, tested positive for C. trachomatis (chi-square test, 0.787; \( P = 0.37 \)). The prevalence of infection was higher for swab samples obtained at physician offices—12.6% (23/182), 9.0% (16/178), and 10.0% (108/1076) in intervention groups 1 and 2 and in the control group, respectively—than for samples taken at home (table 3). Among women participating in the screening program, 42 infections were detected in both intervention groups (table 3). In group 1, 54.8% (23/42) infections were asymptomatic; in group 2, 50.0% (21/42) were asymptomatic.

Men. In samples taken by men at home, the prevalence of infection was 5.9% (38/647) and 5.7% (22/386) in groups 1 and 2, respectively (table 3). The prevalence of infection among men tested by conventional examination was 27.0% (10/37),

Table 3. Prevalence of Chlamydia trachomatis infection in samples analyzed during the screening period (31 October 1997 to 5 February 1998).

<table>
<thead>
<tr>
<th>Analyzed samples</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1</td>
<td>Group 2</td>
</tr>
<tr>
<td>No. of infections detected</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Prevalence of infection</td>
<td>42/649 (6.5)a</td>
<td>42/526 (8.0)</td>
</tr>
<tr>
<td>Infected without symptoms</td>
<td>23/42 (54.8)</td>
<td>21/42 (50.0)</td>
</tr>
</tbody>
</table>

Conventional examination, prevalence of infection | 23/182 (12.6) | 16/178 (9.0) | 108/1076 (10.0) | 10/37 (27.0) | 7/36 (19.4) | 27/140 (19.3) |

NOTE. Data are no. of infections detected/total no. of subjects tested (%), except where noted. Subjects in group 1 received material for home sampling plus an invitation to participate in the study; subjects in group 2 had to return a preaddressed, preaddressed reply card before receiving the material for home sampling. Persons in the intervention group had access to usual care in the same way as persons in the control group.

a Difference between prevalence among women in groups 1 and 2: chi-square test, 0.787; \( P = 0.37 \).

b Difference between no. of infections detected among men in the 2 intervention groups: chi-square test, 3.80; \( P = 0.051 \).
Table 4. Analysis of persons not submitting a sample in the screening program.

| Variable                              | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 | Group 1 | Group 2 |
|---------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Reasons for not participating        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Forgot                                | 26 (34.2) | 32 (40.0) | 25 (30.9) | 24 (33.8) | 107 (34.7) |
| Recently examined by physician        | 30 (39.5) | 5 (6.3) | 34 (42.0) | 8 (11.3) | 77 (25.0) |
| (within 12 months)                    |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Did not feel at risk                  | 11 (14.5) | 21 (26.3) | 12 (14.8) | 23 (32.4) | 67 (21.8) |
| Preferred to be tested by physician   | 14 (18.4) | 10 (12.5) | 15 (18.5) | 12 (16.9) | 51 (16.6) |
| Did not want to be tested             | 7 (9.2) | 10 (12.5) | 5 (6.2) | 9 (12.7) | 31 (10.1) |
| Never had sexual intercourse          | 8 (10.5) | 11 (13.8) | 7 (8.6) | 2 (2.8) | 28 (9.1) |
| Too inconvenient to take sample       | 9 (11.8) | 1 (1.3) | 2 (2.5) | 1 (1.4) | 13 (4.2) |
| Skeptical of test reliability         | 5 (6.6) | 1 (1.3) | 1 (1.2) | 2 (2.8) | 9 (2.9) |
| Other                                 | 3 (7.0) | 6 (7.5) | 1 (1.2) | 5 (7.0) | 15 (4.9) |

Is it a good idea to offer a test by mail?

|                    |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Yes                 | 59 (77.6) | 64 (80.0) | 69 (85.2) | 63 (88.7) | 255 (82.8) |
| No                  | 10 (13.2) | 6 (7.5) | 3 (3.7) | 2 (2.8) | 21 (6.8) |
| Do not know         | 7 (9.2) | 9 (11.3) | 7 (8.6) | 5 (7.0) | 28 (9.1) |
| Missing             | 0       | 1 (1.3) | 2 (2.5) | 1 (1.4) | 4 (1.3) |

NOTE. Data are no. (%) of subjects. Subjects in group 1 received material for home sampling plus an invitation to participate in the study; subjects in group 2 had to return a prestamped, preaddressed reply card before receiving the material for home sampling. Persons in the intervention group had access to usual care in the same way as persons in the control group. Reasons given for not participating were not verified (e.g., physician testing). Multiple reasons could be given for not providing a sample.

a Difference between men and women: χ², 40.8; P < .01.

b Difference between men and women: χ², 8.66; P < .01.

c Difference between women in groups 1 and 2: Fisher’s exact test, P < .01.

d Other reasons include was traveling, lost the material, had no time, or did not like the “open reply card.”

e Difference between subjects in groups 1 and 2: χ², 2.92; P = .09.

1 Difference between subjects in groups 1 and 2: χ², 4.84; P = .04.

19.4% (7/36), and 19.3% (27/140) in intervention groups 1 and 2 and in the control group, respectively. Although the difference was not statistically significant, more infections were diagnosed in group 1 than in group 2 (χ² test, 3.80; P = .051). More than three-quarters of the infections diagnosed by urine samples obtained at home were asymptomatic: 76.3% (29/38) and 77.3% (28/36) in groups 1 and 2, respectively.

Nonparticipants

The 400 questionnaires mailed to persons who did not participate in the study were answered by 78.5% (157/200) of the women contacted and by 75.5% (151/200) of the men contacted (data not shown). Of the 92 persons who did not answer the questionnaire, 51.1% (47/92) could not be reached by mail or phone, 21.7% (20/92) did not want to answer the questions, and 27.2% (25/92) did not answer for other reasons (disabled, did not speak Danish, or claimed never to have received the screening offer; data not shown).

The main reasons for not submitting a sample were as follows: forgot the test offer (107 [34.7%] of 308), recently was examined by a physician for C. trachomatis (77 [25.0%] of 308), or did not feel at risk (67 [21.8%] of 308) (table 4). Women were significantly more likely than men to have had a recent test for C. trachomatis (χ² test, 40.8; P < .01), whereas men were significantly more likely than women to state that they did not feel at risk (χ² test, 8.66; P < .01). In total, 16.6% (51/308) of nonparticipants stated that they would prefer to have the test done by a physician, a reason given equally frequently by men and women.

The majority of nonparticipants (255 [82.8%] of 308) thought that invitation by mail was a good approach for information and the offer of a test. Women in group 1 were more likely to state that they did not like the approach, compared with those in group 2 (10 [13.2%] of 76 vs. 3 [3.7%] of 81, respectively; Fisher’s exact test, P = .04). Among men there was no significant difference between the proportion who did not like the approach (6 [7.5%] of 80 and 2 [2.8%] of 71 in groups 1 and 2, respectively; Fisher’s exact test, P = .28).

Discussion

In this study, we evaluated and compared the effectiveness of 2 outreach strategies in which all young adults in a specific age group had equal access for C. trachomatis testing by use of samples taken at home and mailed to a laboratory for analysis. The use of either of the 2 screening strategies, in which persons were offered testing by direct mail, increased the test rates several times, compared with usual care. Among women, an equal number of infections was detected in the 2 intervention groups. However, more infections were detected among men when the test package was mailed directly to the subject (group 1) than
when the subject had to complete and return a reply card in order to receive the test package by mail (group 2). Most infected persons were asymptomatic. The screening strategies were widely accepted, with a tendency toward a lower acceptance rate among women in group 1 than in group 2. For men, there was equal acceptance in the 2 intervention groups.

In this study, we did not have any follow-up and, therefore, we do not know how many infected persons were treated for the detected infection. However, in an earlier study of home sampling in the same area, ≥95% of detected infections were treated [19]. There is no reason to believe that the rate should differ in this study.

For women, the same number of infections was found in both intervention groups, but more women in group 1 disliked the intervention strategy. Thus, the use of a reply card (group 2) would be better for women, because this strategy is more cost-effective than the strategy use for group 1. For men, the direct mailing of test packages (group 1) may be preferred over the reply card system (group 2), because more infections were detected by the former strategy.

In group 1, 36% of the women and 27% of the men participated. Although this may be considered a low participation rate, our analysis of nonparticipants showed that it was reasonable for many persons not to submit a sample: 9.1% had never had sexual intercourse, 25.0% said they were recently tested for C. trachomatis, and 21.8% did not feel at risk. A reminder might have increased the participation rate; one-third of those who did not participate noted that they forgot to submit the sample. However, this should be weighed against the possibility of the procedure becoming less acceptable if we had introduced higher pressure on the subjects. Higher participation rates have been achieved in community-based settings where 59% of adolescents in a school program [23] and 80.0% of female military recruits [7] were tested. This may be explained by the personal contact between the persons tested and the physician and by group pressure. However, screening strategies based on school or military settings allow for only a subgroup of the society to be tested, and the test offer could be given only when a person attends school or is in the military. The Centers for Disease Control and Prevention now recommends yearly testing for C. trachomatis [24]. A strategy based on direct mail allows for repeated annual testing.

We chose the vaginal pipette for women because, in our setting, it is well assessed with regard to acceptability [25] and diagnostic efficacy [14, 21]. However, self-administered vaginal swab [11, 26] or urine samples would probably have the same efficacy with regard to participation.

The home sampling method in our study was evaluated against invasive procedures used by physicians, and, therefore, the effect of the screening procedure could be overestimated. However, urine samples have been a routine method for testing for C. trachomatis in men in general practice in Aarhus County, without an increased test activity (authors’ unpublished data).

In our study, 80% of infected men and 50% of infected women did not report any symptoms. The high proportion of asymptomatic patients justifies the need for universal screening programs. Only 1.4% of men in the control group were examined by usual care, so there is a substantial need for intensified testing of asymptomatic men. The current lack of testing of asymptomatic persons may be one reason for the failure of the attempt to eradicate the infection by screening in STD and family practice clinics [1].

Genc and Mardh [27] found that screening in family planning clinics by use of DNA amplification techniques and swab samples was cost-effective if the prevalence was 6% or higher [27]. The prevalence in our study was 6%–8%, and the costs may be considerably lower than those of Genc and Mardh [27], because health care providers were involved in our strategy only when a participant was found to be infected. To resolve this question, it will be necessary to carry out a cost-effectiveness analysis, taking into account aspects of acceptability.

Population-based screening programs based on direct mail will probably be feasible as the main strategy in areas with a good infrastructure and a well-educated population. In other areas and where many young people live in the streets, a population-based screening program could be supplemented by field-based [16, 17] and school-based screening [15, 19] or by screening in military settings [7]. However, the strategy chosen for screening for urogenital C. trachomatis must be evaluated with respect to people living in the area before it is implemented.

We conclude that there is medical benefit of population-based screening strategies involving invitation by direct mail and samples taken at home. Men should have a test kit mailed directly to their home address, and women should be sent a reply card by which they can request a test kit for home use. The approach allows for systematic screening that targets the specific age groups at highest risk of infection. Further studies are needed, to elucidate the cost-effectiveness of the strategies and to assess how frequently the offer of home testing should be made.

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References