Community-Based Chlamydia and Gonorrhea Screening Through the United States Mail, San Francisco

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Background: **Because gonococcal and chlamydial infections are often asymptomatic, disease control requires population-based screening. This report describes the feasibility of home-based testing for sexually transmitted diseases (STDs) and of specimen transport via the US mail.**

Goal: **This project sought to establish the efficacy and acceptability to the public of screening by means of urine kits made available in public places and mailed in for STD testing.**

Study Design: **Self-selected community participants obtained STD test kits from local businesses, collected urine specimens at home, and mailed kits to the health department for nucleic acid amplification testing.**

Results: **Participants picked up 209 test kits and returned 80 (38%): 3 (3.8%) of 76 were positive for gonorrhea and 1 (1.3%) of 76 was positive for chlamydia. The majority (95%) of participants were white gay men. The cost of specimen collection and transport was similar to that of other population-based screening programs.**

Conclusion: **Using the mail for home-based testing for gonorrhea and chlamydia was feasible and may be a useful addition to STD control efforts.**

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CHLAMYDIA AND GONORRHEA are the most common bacterial sexually transmitted diseases (STDs) in the United States. In addition, chlamydia is the most commonly reported disease in the United States.[1] The majority of chlamydial and gonococcal infections in both males and females are asymptomatic.[2–6] Thus, most infected persons have no impetus to seek medical care, allowing infections to persist and spread in subsequent sexual encounters. The sequelae of chlamydia and gonorrhea include urethritis, proctitis, and epididymitis in men and cervicitis, endometritis, salpingitis, acute urethral syndrome, ectopic pregnancy, and pelvic inflammatory disease in women.[7–11] Infection with chlamydia and gonorrhea have also been shown to be risk factors for HIV infection.[12] The immense scale of infection, the broad deleterious health effects, and the impact on HIV transmission all make chlamydia and gonorrhea a significant public health issue.

Population-based screening for chlamydia and gonorrhea is an effective means of disease control. Recent studies have shown chlamydia screening to be cost-effective, feasible, and acceptable to patients in a multitude of clinical environments.[13–15] Innovations in testing techniques have increased the feasibility of screening. Earlier invasive urethral swabbing and pelvic examinations with specula have given way to the use of urine sampling as a more comfortable way of collecting specimens.[16–20] As patients have found collection methods more acceptable, population-based screening has increased. Screening has expanded from traditional clinical sites to nonclinical venues such as schools, streets, and nightclubs to reach at-risk individuals not likely to be tested elsewhere.[21,22]

A theoretical next step in removing barriers for population screening is changing the responsibility and venue of specimen collection to the individual at home, using the mail to transport samples. By avoiding the stigma of clinic attendance and decreasing the involvement of health care staffs, home-based screening may encourage testing, diagnosis, and treatment among those least likely to seek medical evaluation under other circumstances. This concept has precedent in studies conducted outside the United States. Researchers in the United Kingdom[23,24] and in Denmark[25] have shown that mailing samples is cost-effective and acceptable. In addition, a recent study in the United States showed that mailing vaginal swab specimens was feasible and did not affect the validity of diagnostic testing.[26]

This project sought to use home screening to test indi-

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viduals who would otherwise not be screened for chlamydia and gonorrhea. The target population was individuals living in the Castro, the neighborhood in San Francisco in which the rates of gonorrhea and syphilis were highest in 1999. This neighborhood is the cultural center for men who have sex with men in San Francisco. Because pharmacies are a center of health maintenance and have precedent as a site for health interventions[27] and gyms are a meeting place for health-conscious persons, STD test kits and surveys were made available at a local pharmacy and gym as a means of assessing community participation in home-based screening for bacterial STDs.

Methods

Arrangements were made through the regional office of Walgreen's Pharmacy to obtain permission and pharmacy shelf space to dispense specimen-shipping kits to interested individuals. We also obtained permission from a Gold's Gym, where the kits were made available away from the main entrance. Both site managers agreed to make free testing kits available for 2 weeks in August 2000.

Community awareness of free home testing for gonorrhea and chlamydia was generated through several avenues. First, we placed a half-page advertisement in consecutive weekly publications of a local gay newspaper. Second, we posted flyers in the neighborhood where the kits were available. Finally, information about the project was shared with several community-based AIDS organizations to spread the word among their clients. Persons were informed to pick up a testing kit from a participating business, provide a urine specimen, and mail it to the health department. Testing kits were available to all interested individuals; however, the locations, advertising, and community-awareness efforts targeted men who have sex with men.

Specimen-shipping kits (Doxtech, Inc., Portland, OR) were obtained and prepared for use for home testing. These kits are approved for sending urine specimens through first-class mail by their compliance with US Postal Service (USPS) publication number 52, "Hazardous, Restricted, and Perishable Mail" (July 1999) and with the USPS/Centers for Disease Control and Prevention regulation 42 CFR 72 (last revised in 1995), which address the shipment of diagnostic specimens. Kits included the following information in English and Spanish: a letter explaining the project, basic health information about chlamydia and gonorrhea, detailed instructions explaining the collection process, and a tamper-resistant urine-specimen cup. Each specimen cup was marked with a line to indicate that 30 cc of urine be provided. The kit also included a one-page questionnaire on which the user was to indicate his or her address, telephone number, other demographic data, recent sexual behavior, time and date of sample collection, and level of concern about the confidentiality, privacy, and safety of the screening method. All kits were postage-paid and addressed to the Department of Public Health.

Urine specimens were tested at the public health laboratory by the nucleic acid amplification technique known as strand displacement amplification (ProbeTec SDA; Becton-Dickinson, Sparks, MD), according to the manufacturer's guidelines, with use of the ProbeTec internal control to detect specimen inhibition. The guidelines allow specimens to be at room temperature (15–27 °C) for 2 days, with the use of a preservative pouch containing resins that absorb inhibitors in urine. All specimens that arrived intact were tested. We notified all individuals whose specimens were unsuitable for testing because of either spillage or inhibition.

We notified persons whose test results were positive, according to San Francisco Department of Public Health protocol. We offered infected persons several treatment options, including coming in to the municipal STD clinic, having therapy delivered, or picking up medication at their local pharmacy. Partner-care management followed routine methods. We did not directly notify subjects whose test results were negative. However, we provided a telephone number to all participants to enable them to receive their results over the telephone. We calculated the costs of specimen collection and transportation to determine the cost of the program. We did not include laboratory costs, because they remain constant regardless of the specimen-transportation method.

Results

During the 2-week period, participants picked up 193 testing kits from Walgreen's Pharmacy and 16 from Gold's Gym, for a total of 209. Of these, participants returned 80 (38%) to the health department. Of the 72 kits for which the time of specimen collection was known, 32 (44%) arrived in the laboratory within the target of 48 hours, and 40 (56%) arrived within 52 hours. An additional 25% of specimens arrived within 96 hours, totaling 81%.

Table 1 summarizes the demographic and behavioral characteristics of participants. Most persons (95%) submitting specimens were white men who have sex with men (MSM). The median age of participants was 43 years; the mean, 41 years; and the range, 16 to 67 years. The majority (66%) of participants had had four or more sex partners in the previous 6 months, and 63% reported always or usually using a condom during intercourse.

We tested 76 (95%) of the 80 specimens for chlamydia and gonorrhea and found 1 (1.3%) positive for chlamydia and 3 (3.9%) positive for gonorrhea. The total positivity rate (for either gonorrhea or chlamydia) was 5.3% (4 of 76 specimens). Two of the positive specimens arrived within 48 hours of specimen collection and two after. We did not obtain results for four specimens (5%): three were not tested

TABLE 1. Demographic and Behavioral Characteristics of Persons Participating in Community-Based Postal Screening for Chlamydial Infection and Gonorrhea, San Francisco, 2000

Characteristic	No. (%) of Persons
Sex (n = 80)	
Male	77 (96)
Female	3 (4)
Sexual orientation (n = 78)	
Gay	69 (87)
Bisexual	6 (8)
Heterosexual	3 (4)
Race/ethnicity (n = 78)	
White	64 (82)
Asian	7 (9)
Black	4 (5)
Hispanic	3 (4)
Condom use in past 6 months (n = 76)	
Always/usually	48 (63)
Sometimes	15 (20)
Rarely/never	13 (17)
No. of partners in past 6 months (n = 79)	
0	1 (1)
1	8 (10)
2 or 3	18 (23)
4+	52 (66)

because of improper sealing of the collection cup and 1 was not evaluable because of inhibition. The four persons with chlamydia or gonorrhea were all MSM, and their ages were between 30 and 37 years. All four men elected to have a prescription for antibiotic treatment phoned into their pharmacy rather than coming to the STD clinic or having medication delivered to them.

Persons mailing in specimens ranked their concerns about this type of testing with regard to confidentiality, privacy, and safety. About confidentiality, 56% (45/80) were very concerned, 29% (23/80) were somewhat concerned, and 15% (12/80) were not concerned. Fifty-four percent (43/79) were very concerned about privacy, 27% (21/79) were somewhat concerned, and 19% (15/79) were not concerned. Finally, 36% (28/78) were very concerned about safety, 18% (14/78) were somewhat concerned, and 46% (36/78) were not concerned.

Forty-three persons commented about this method of STD testing. Eleven respondents suggested making more test kits available to more people. Seven suggested including other STDs, and six suggested testing anonymously. Four suggested increasing confidentiality and awareness of the screening program, three suggested informing participants regardless of test result, and one suggested providing faster results. Three persons responded negatively, stating that the cup was difficult to use (n = 2) or that the instructions were confusing (n = 1). Nine made general comments supporting the program. Staff members at Walgreen's Pharmacy approved of the project and offered to continue indefinitely, stating that participants had convenient access to kits with relative anonymity. Staff members at Gold's Gym indicated that the small number of kits taken might be due to the lack of privacy for individuals concerned about anonymity.

The cost of this project included the costs of the tamperproof specimen cups and shipping boxes ($1.46), postage ($.99), educational materials ($.57), and staff time assembling the kit ($.83). The cost per kit totaled $3.86. The cost per sample received was $10.08. In addition, two advertisements placed in a local newspaper cost $1588.00. This brought the total cost of the project to $2,251, excluding laboratory costs, and brought the cost per received sample to $29.93, including advertising.

Discussion

In August 2000, we made available postage-paid self-collection testing kits for chlamydia and gonorrhea at two community venues: a pharmacy and a health club. Over a 2-week period, participants picked up 209 kits and returned 80 (38%) by mail. Persons returning specimens reported substantial behavioral risk for STDs. The use of the mail to ship urine specimens was feasible and resulted in about half of specimens arriving at the laboratory within 2 days. The overall STD positivity rate was 5.3%. Favorable comments about self-collected urine STD testing were received from participants returning specimens.

Limitations of this method of screening include the lost opportunity for STD education, counseling, and expanded testing that ideally would occur during a clinical encounter. Opportunities for clinical examination and tests for other STDs such as syphilis, genital herpes, and HIV were missed. A number of participants indicated that avoiding the inconvenience and wait for STD evaluation and treatment at the municipal STD clinic was an advantage of mailing specimens. This method of screening should not supplant clinic- or institution-based screening: it should be seen as a supplement to more traditional screening methods, with the intent to enhance STD control efforts among hard-to-reach populations that would otherwise not be tested at all.

Although the majority of responses from participants were favorable, some responses suggested a number of possible improvements to this system. One suggestion was to test for more STDs than just gonorrhea and chlamydia. Methods are now available for testing for *Trichomonas* (under a research protocol) and for HIV with urine specimens. Consideration should be given to the feasibility of making these tests available.

A concern of responders was a desire for anonymity. This suggests that anonymity might increase participation in STD screening projects. The benefit of increased participation must be weighed against the loss of epidemiologic information and verification of treatment. We are currently offering anonymous STD testing at anonymous HIV testing and counseling sites. However, since the primary objective of any screening activity is to identify and treat infected

persons, evaluation of treatment in an anonymous setting is critical.

Although 80 participants returned kits, 129 did not. One possible reason for nonparticipation was the short duration of the project. Others who picked up free kits possibly either lost interest or decided not to provide a sample. Charging a nominal fee for the testing kits would likely increase the proportion of those returned. The number of kits picked up at each site and the comments from staff members suggest that the pharmacy was the more desirable site for this intervention.

Another concern was the effect of ambient temperature on mailed clinical specimens. Although the local climate during summer in San Francisco rarely deviated from room temperature (15–27 °C, a range within that specified in the testing guidelines), it would be appropriate for other locales with more extremes in temperature to do their own assessment of the effects of climate on the validity of test results. Prior research has shown that elevated ambient temperatures were not detrimental to specimens tested by nonamplified chlamydial antigen–detection methods.[26]

In conclusion, STD screening with use of home-collected urine specimens mailed to the health department was feasible. This method represents an important aspect of the evolution of disease control from clinical settings to community venues and now to homes. Recent technological advances have changed an invasive screening procedure into one that is noninvasive and painless. It is the responsibility of public health authorities to use these technological advances to enhance STD control efforts by making population-based screening easier and more accessible.

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