

# Tracing a Syphilis Outbreak Through Cyberspace

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**P**ARTNER NOTIFICATION AND community awareness campaigns are the cornerstones of public health strategies to control syphilis in the United States.<sup>1-4</sup> Traditionally, health departments identify sexual partners through interviews with case patients and notify their partners by telephone, personal contact, or mail. Health departments have also been successful in modifying these techniques for situations in which partners are primarily anonymous. For example, partner notification has been accomplished by sending disease intervention specialists to bars, sex clubs, bathhouses, and other establishments to inform partners that they have been exposed to a sexually transmitted disease (STD). Other effective strategies for informing an at-risk community include posting notices in popular venues, talking to group leaders, and advertising in local community newspapers.

A recent syphilis outbreak in San Francisco, Calif, challenged existing models of partner notification and community education. The outbreak occurred among gay men who met their sexual partners through an Internet chat room. Because the partners had met in cyberspace, partner information was usually limited to handles (screen names). Moreover, the strongly held

See also pp 443 and 485 and Patient Page.

**Context** A recent outbreak of syphilis among users of an Internet chat room challenged traditional methods of partner notification and community education because locating information on sexual partners was limited to screen names and privacy concerns precluded identifying sexual partners through the Internet service provider.

**Objectives** To determine the association of Internet use and acquisition of syphilis and to describe innovative methods of partner notification in cyberspace.

**Design, Setting, and Patients** Outbreak investigation conducted at the San Francisco (Calif) Department of Public Health (SFDPH) in June-August 1999 of 7 cases of early syphilis among gay men linked to an online chat room; case-control study of 6 gay men with syphilis reported to SFDPH in July-August 1999 (cases) and 32 gay men without syphilis who presented to a city clinic in April-July 1999 (controls).

**Main Outcome Measures** Association of syphilis infection with Internet use, Internet use among cases vs controls, and partner notification methods and partner evaluation indexes.

**Results** During the outbreak, cases were significantly more likely than controls to have met their sexual partners through use of the Internet (67% vs 19%; odds ratio, 8.7;  $P = .03$ ). We notified and confirmed testing for 42% of named partners; the mean number of sexual partners medically evaluated per index case was 5.9.

**Conclusions** In this study, meeting sexual partners through the Internet was associated with acquisition of syphilis among gay men. Public health efforts must continually adapt disease control procedures to new venues, carefully weighing the rights to privacy vs the need to protect public health.

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right to privacy of information accessible through the Internet precluded us from directly learning the identity of partners through the Internet service provider (ISP).<sup>5</sup>

This article describes the syphilis outbreak and the case-control methods used to establish that meeting partners through the Internet was strongly associated with acquisition of syphilis. We also report our strategies for performing partner notification and increasing community awareness through the Internet without violating privacy concerns.

## METHODS

In June and July 1999, the San Francisco Department of Public Health (SFDPH) received 2 reports of new cases of early-stage syphilis in gay men.

During the interview process, we learned that both men met a majority of their sexual partners within the past year in an Internet chat room named San Francisco M4M (SFM4M). Patients reported chat room screen names as the only identifiers for most of their sexual partners.

We contacted the ISP that hosted this chat room and were informed that it would not release identifying informa-

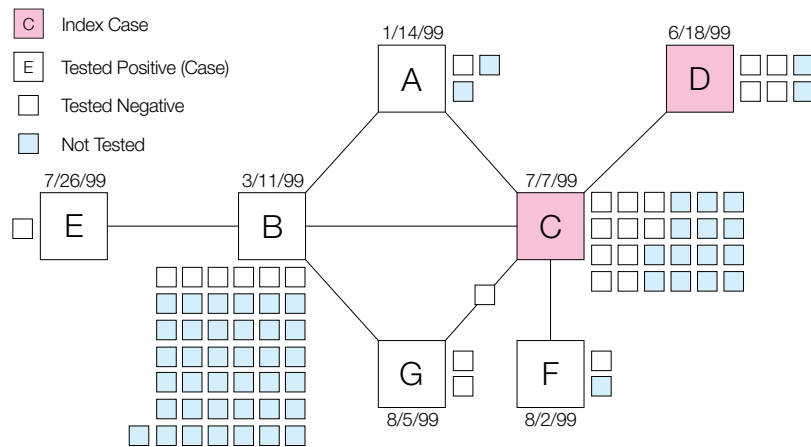
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**Table.** Characteristics of Men With Early Syphilis Associated With Meeting Partners in an Internet Chat Room, San Francisco, Calif, 1999

Case	County of Residence, California	Age, y	HIV Infection Status*	Date of First Positive Syphilis Titer	Serologic Titer (Rapid Plasma Reagin)	Stage of Syphilis	No. of Named Partners During Interview Period	No. of Named Partners Tested
A	San Francisco	38	Positive	1/14/99	1:128	Early latent	5	3
B	Marin	47	Negative	3/11/99	1:2	Early latent	47	10
C	San Francisco	37	Positive	7/7/99	1:128	Secondary	29	15
D	San Francisco	30	Positive	6/18/99	1:64	Early latent	7	5
E	Contra Costa	26	Negative	7/26/99	1:32	Early latent	2	2
F	San Francisco	40	Positive	8/2/99	1:16	Early latent	3	2
G	San Francisco	38	Negative	8/5/99	1:64	Early latent	4	4

\*HIV indicates human immunodeficiency virus.

**Figure.** Sexual Network of Internet-Associated Syphilis Cases and Partners by Testing Status, San Francisco, Calif, July-August 1999



Dates indicated are the dates of first seroreactive syphilis titer. Cases C and D were the index cases. Cases B, E, F, and G were new cases identified through the outbreak investigation.

tion without a federal subpoena. On request to initiate an awareness campaign within the chat room, the ISP referred us to a San Francisco marketing firm that maintains an Internet portal for gay, bisexual, and transgender persons. For 2 weeks, this firm's staff entered the SFM4M Internet chat room site, electronically contacted hundreds of users and informed them of the syphilis cluster, and encouraged persons who may have met sexual partners in the chat room to seek medical evaluation.

To notify partners of their possible exposure to syphilis, the SFDPH sent e-mail messages to the screen names and requested a reply. The screen names of persons who replied or presented to SFDPH City Clinic were compared with a list of screen names of reported partners; persons whose screen name

matched a name on the list were considered notified.

In addition to using the Internet, SFDPH staff faxed a syphilis alert to physicians, clinics, and hospitals in San Francisco that serve gay clients and placed an advertisement echoing the alert in a local newspaper that has a primarily gay readership. Serological testing was performed at SFDPH City Clinic or results were confirmed by contacting a partner's personal physician. Persons presenting to SFDPH City Clinic underwent STD/human immunodeficiency (HIV) risk reduction counseling and screening for HIV and other STDs as indicated.

To evaluate the impact of our outreach efforts, staff at the Internet portal polled a convenience sample of clients about the appropriateness of the infor-

mation campaign. We also compared the weekly average number of gay men presenting to SFDPH City Clinic during July and the first 2 weeks of August 1999.

To confirm the role of meeting sexual partners on the Internet in the risk of acquiring syphilis infection, we conducted a case-control study of frequency of use of the Internet to meet sexual partners among cases and gay male SFDPH City Clinic clients. Case subjects were early-stage syphilis cases among gay men reported to SFDPH in July and August 1999 and were not necessarily part of the outbreak cluster. Gay male control subjects were selected from an ongoing survey of sexual behavior and social networks from April to July 1999 at SFDPH City Clinic. Control subjects were asked whether they had met any sexual partners through the Internet during the past year.

Odds ratios were calculated using Epi Info Version 6.0 (Centers for Disease Control and Prevention, Atlanta, Ga). The Fisher exact test was used to compare proportions.

## RESULTS

By interviewing index cases (cases C and D), notifying sexual partners, and raising community awareness, 5 related cases were identified, including a previous case from January 1999 (case A) and 4 new cases (cases B, E, F, and G), resulting in 7 SFM4M chat room-related cases among gay white men (TABLE). An unrelated case in a San Francisco resident who had met sexual partners in a different chat room was also reported during this period. The sexual network of the 7 SFM4M cases is shown in the FIGURE.

One case (case B) may have been responsible for at least 3 secondary infections (cases C, E, and G). The partner index, the number of unique named partners divided by the number of cases, was 12.4. The mean number of sexual partners medically evaluated per index case was 5.9. Forty-two percent of named partners were notified and underwent serologic tests.

The case-control study revealed that 4 (67%) of 6 case patients (syphilis cases among gay men in July and August 1999) vs 6 (19%) of 32 control patients met sexual partners on the Internet (odds ratio, 8.7;  $P=.03$ ). Control patients were similar to case patients in age, race/ethnicity, and sexual risk behavior (data not shown).

The syphilis control efforts during late July 1999 resulted in an 18% increase in the number of gay men evaluated at SFDPH City Clinic in early August compared with in July. The online survey revealed that 25 (71%) of 35 respondents thought that the awareness campaign on the Internet was useful and appropriate.

## COMMENT

We report a syphilis outbreak associated with a sexual network defined by use of the Internet. The Internet allows people to interact with large numbers of persons with similar social or sexual interests. Chat rooms for persons with similar interests in a specific geographic area (eg, SFM4M) enable persons who otherwise might not meet each other to

initiate contact in cyberspace and then to meet in person. To facilitate notification of exposed partners in areas where Internet use is common, patients with STDs should be asked if they meet partners through the Internet. If so, the specific chat room should be determined.

This syphilis outbreak provided a unique opportunity to conduct public health control activities in cyberspace. The Internet may offer opportunities for control of other communicable diseases by allowing rapid posting of information and wide geographic availability. In conducting partner notification and community education in any setting, officials must balance the privacy rights of individuals with the need to protect public health.<sup>6</sup>

Our collaboration with an Internet business enabled us to educate and inform a large number of at-risk persons about syphilis while also protecting Internet users' privacy. This novel educational effort, in conjunction with our use of the Internet to perform partner notification, enabled us to notify and evaluate more than 40% of named partners. In our investigation, an average of 5.9 partners per index case underwent medical evaluation. Previous studies among similar populations reported a substantially smaller number of partners per index case undergoing medical evaluation (2.2).<sup>4</sup>

A majority of the surveyed Internet users reported that outreach was an appropriate and helpful activity. It should be noted, however, that our public in-

formation campaign was not without a downside. Following news reports of the syphilis cyberspace outbreak,<sup>7,8</sup> the SFM4M chat room was deluged by online antigay hate messages.<sup>9</sup>

The United States has made significant progress in the control of syphilis, so much so that the Centers for Disease Control and Prevention has initiated a program to eliminate syphilis.<sup>10</sup> In San Francisco, there were only 40 cases of early-stage syphilis reported in 1998—the lowest number ever reported—and 41 cases in 1999.<sup>11,12</sup> However, continued success of the campaign may be tempered by the resurgent cases of syphilis among gay men reported in urban areas such as Seattle, Wash, and Philadelphia, Pa.<sup>13,14</sup> These outbreaks, along with reports of increased rates of rectal gonorrhea and unprotected anal intercourse among gay men in San Francisco, are ominous signs of increased HIV risk among these populations.<sup>15,16</sup>

To eliminate syphilis it is crucial for public health departments to respond rapidly in innovative ways to clusters of disease and newly identified social-sexual networks. This outbreak indicates that the Internet is a technology that may facilitate transmission of syphilis but may also provide targeted awareness and enhance control of STDs.

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