Where Do People Go for Treatment of Sexually Transmitted Diseases?

By Robert M. Brackbill, Maya R. Sternberg and Martin Fishbein

Context: *Major public health resources are devoted to the prevention of sexually transmitted diseases (STDs) through public STD clinics. However, little is known about where people actually receive treatment for STDs.*

Methods: *As part of the National Health and Social Life Survey, household interviews were performed from February to September 1992 with 3,432 persons aged 18–59. Weighted population estimates and multinomial response methods were used to describe the prevalence of self-reported STDs and patterns of treatment utilization by persons who ever had a bacterial or viral STD.*

Results: *An estimated two million STDs were self-reported in the previous year, and 22 million 18–59-year-olds self-reported lifetime STDs. Bacterial STDs (gonorrhea, chlamydia, nongonococcal urethritis, pelvic inflammatory disease and syphilis) were more common than viral STDs (genital herpes, genital warts, hepatitis and HIV). Genital warts were the most commonly reported STD in the past year, while gonorrhea was the most common ever-reported STD. Almost half of all respondents who had ever had an STD had gone to a private practice for treatment (49%); in comparison, only 5% of respondents had sought treatment at an STD clinic. Respondents with a bacterial STD were seven times more likely to report going to an STD clinic than were respondents with a viral STD—except for chlamydia, which was more likely to be treated at family planning clinics. Men were significantly more likely than women to go to an STD clinic. Young, poor or black respondents were all more likely to use a family planning clinic for STD treatment than older, relatively wealthy or white respondents. Age, sexual history and geographic location did not predict particular types of treatment-seeking.*

Conclusions: *The health care utilization patterns for STD treatment in the United States are complex. Specific disease diagnosis, gender, race and income status all affect where people will seek treatment. These factors need to be taken into account when STD prevention strategies are being developed.*

Family Planning Perspectives, 1999, 31(1):10–15

More than 85% of the communicable diseases reported annually in the United States are sexually transmitted diseases (STDs). The majority of these diseases affect men and women during their reproductive years. Eighty-six percent of STDs occur among persons 15–29 years of age, with 35% occurring in people younger than 19.[1] The health and economic costs of STDs are heightened because many STDs, especially those among women, produce no symptoms and can remain undetected until more serious health complications, such as pelvic inflammatory disease (PID) or cervical cancer, have developed.

Publicly funded STD clinics have been the primary location for public health prevention and control of STDs in the United States. These clinics have served as the primary avenue for assessing disease patterns in high-risk groups and implementing control programs.[2] Since most data about persons with STDs have been obtained from public STD clinics, little is known about patterns of seeking medical care for STDs outside of public clinics. National surveillance data based on STD clinic data may not provide reliable information about the treatment of STDs, because an estimated 40–60% of STD cases are treated outside of STD clinics.[3]

Our objectives in this article are to provide population-based estimates of the prevalence of patient-reported STDs and to characterize patterns of treatment utilization according to specific STDs and client characteristics. The analyses use data from the National Health and Social Life Survey (NHSLS), a population-based survey of the sexual behavior of Americans. This survey obtained information directly from respondents about which STDs they had had and where they had received treatment for their STD.

A conceptual model of health care–seeking behavior for STDs may help us understand where people go for treatment of an STD, and who goes where.[4] For instance, where people choose to go for treatment could be influenced by their previous experience with health care providers, as well as by the perceived efficacy of prevention and treatment provided by specific types of providers. Other factors that could influence where people go for treatment include patient characteristics, such as education, income, health insurance coverage, age, sex, race or ethnicity, religion and marital status. Characteristics of providers could also influence patient choice, such as their geographic distribution, availability of support services, quality of care, convenience and privacy.

Behavioral theory may also afford some understanding of where people choose to go for treatment of an STD, although the NHSLS was not originally designed to test a theoretical model. Nonetheless, a component of an integrated model of behavioral theories—the health-belief model, the theory of reasoned action and social cognitive theory—referred to as "outcome expectancy or belief about costs or benefits" may be useful for understanding choice of STD treatment provider.[5] People's expectations about the likely outcomes, as well as their beliefs about the costs or benefits concerning the treatment they may receive from different types of providers, probably influence where they choose to go for treatment more than whether they seek treatment.

Given the above considerations, people with higher incomes might be more likely to choose a private practice for STD treatment over other locations, such as a public STD clinic.[6] Women might be more likely to choose a private practice because they seek health care more routinely than do men and are thus more likely to have an established relationship with a doctor.[7] Other possibilities are that choice of care may be influenced by the expectation that STD clinics offer better treatment because they specialize in treatment of STDs or that a private doctor may be preferable because of greater confidentiality or privacy than

Robert M. Brackbill is a behavioral epidemiologist, Maya R. Sternberg is a statistician and Martin Fishbein is a visiting scientist, all with the Division of STD Prevention at the Centers for Disease Control and Prevention, Atlanta, GA. The authors acknowledge Stuart Michaels, the project manager of the National Health and Social Life Survey, for his provision of additional information on sampling weights and design, and Dr. Stuart Berman for his astute comments on the manuscript, which greatly improved the final product.

an STD clinic. Geographic location could also be a factor, because STD clinics are more common in metropolitan areas.[8]

The symptoms associated with different types of STDs may also influence where someone goes for treatment. For instance, men with gonorrhea often experience painful urination and may be more likely to go an emergency room for treatment.[9] Many lower income women of reproductive age obtain prenatal care from family planning clinics, where they are screened for asymptomatic chlamydia. Thus, poor women will be more likely to receive a chlamydia diagnosis at a family planning clinic.[10] Genital herpes and genital warts (human papillomavirus) produce skin lesions, and patients with these symptoms may be more inclined to seek care from a specialist such as a dermatologist or other private practitioner.[11]

Data and Methods

In the 1992 NHSLS, households were sampled using a multistage area probability sampling design based on the 1980 Survey Research Center–National Opinion Research Center sampling frame, which included the 50 states and the District of Columbia. Persons living in institutions or in group quarters were excluded. An 18–59-year-old adult was randomly selected from each household in a geographic unit and asked to participate in the study.

A total of 3,432 face-to-face interviews were completed between February and September 1992 among 3,159 respondents from the cross-sectional sample and 273 from an oversample of blacks and Hispanics.[12] The overall response rate for the NHSLS was 96%. Weighting factors were used to compensate for household size, oversampling of blacks and Hispanics and a poststratification adjustment for nonresponse. The weighting factors, which were used to obtain population-based estimates of the prevalence of patient-reported STDs, were designed to give unbiased estimates for noninstitutionalized U.S. adults aged 18–59.

The survey obtained a wide variety of information about the respondent's sexual and social history. It included questions about the respondent's demographic characteristics, marriage and cohabitation history, fertility experiences, partner identification and sexual activity in the past year, last sexual act, lifetime sexual activity, history of STDs, sexual fantasies, early sexual experiences, sexual victimization, physical health and attitudes. The analysis in this article is based primarily on the information obtained from a series of questions on respondent-reported STDs, including where the respondent received treatment for each reported STD.*

Because of the design and wording of the questions, a few issues need to be addressed. First, the reported treatment location was for each STD that the respondent had "ever been told" that he or she had. In addition, some respondents identified more than one treatment location for the STDs that they mentioned. Moreover, some respondents reported more than one type of STD, with a separate treatment location for each STD type. Thus, 614 respondents reported ever having had an STD, and 718 separate STDs were reported. Fifty-three respondents reported having had an STD in the past year.

Population Estimates

We used the weights available from the survey to produce all percentages and estimates from the NHSLS. To estimate (for the entire population and for subgroups) the proportion of people who reported ever having had an STD, we used the 1990 population census to break out the denominator by age, sex and race. SUDAAN, a statistics software designed for handling design effects that result from complex surveys, was used to compute all estimates and standard errors.[13]

Data Structure Issues

The primary dependent variable used was the place where people indicated they went for treatment for an STD. Individual respondents could mention either several STDs (with a place of treatment for each) or more than one place for treatment for the same STD.

We were only able to use one STD and its associated treatment location for each respondent in the multivariate analysis (although bivariate analyses were based on all the data for each STD). We used the following priority order for choosing treatment categories for the multivariate analysis: combined (several locations for the same STD), STD clinic, emergency room, family planning clinic, private practice, other clinic and no place mentioned. In addition, we used the following order to assign a specific STD to each respondent who mentioned an STD: gonorrhea, genital herpes, chlamydia, genital warts, syphilis, hepatitis, HIV, nongonococcal urethritis and PID. The results were not altered by varying orders.

Multinomial Response Model

The main goal of this analysis is to characterize patterns of treatment utilization for STDs. Because the analysis uses a nominal categorical dependent variable with more than two levels (respondents could choose to receive treatment for their STD at either a private practice, family planning clinic, STD clinic, emergency room, "other" clinic or no place), we used the unified approach of a multinomial response model, a multivariate statistical technique that can simultaneously fit all levels of the dependent variable. In this case, the dependent variable is a nominal categorical variable with six levels.

A multinomial response model with baseline-category logits (also known as generalized logits) was used to produce the estimated odds of choosing one treatment site over another for different levels of an independent variable, while simultaneously controlling for the effects of several explanatory variables. These included sex, race or ethnicity,† age, income and urban-rural setting. Thus, we calculated odds ratios by varying the levels of the independent variable.‡

To account for the complexity of the sample design used in the NHSLS, we used SUDAAN version 7.5 (procedure PROC MULTILOG) to generate accurate variance estimates and significance levels.[14]

Results

Incidence of STDs

Based on the 1992 NHSLS, 2.1 million people indicated that they had been informed by a physician in the past year that they had

*Respondents were asked: "There are several diseases or infections that can be transmitted during sex. These are sometimes called venereal diseases or VD. We will be using the term sexually transmitted diseases or STDs to refer to them. Now I would like to ask you a few questions about these diseases. As I read each STD, tell me whether you have ever been told by a doctor that you had it. How many times have you ever been told by a doctor you had (name of STD)? Have you been told you had (name of STD) in the past 12 months? Where did you go for treatment? Was it a private doctor or group practice? A hospital emergency room? A family planning clinic? An STD clinic? Some other clinic? Somewhere else?" Respondents were asked about gonorrhea (clap, drip), syphilis (bad blood), herpes (genital herpes), chlamydia, genital warts (venereal warts, human papillomavirus or HPV), hepatitis, AIDS or HIV, vaginitis (such as yeast infection or candidiasis), trich or trichomonas, pelvic inflammatory disease (PID), nongonococcal urethritis or any other disease not listed (which they were asked to specify).

†Racial or ethnic groups other than blacks or whites were excluded from this phase of our analysis because of unstable odds ratio estimates due to small cell sizes.

‡ An odds ratio is a measure of association that can give us an idea of the direction and magnitude of the relative odds of choosing one place of treatment over another for different levels of some explanatory variable. By inspecting the odds ratios, we can identify which places of treatment relative to any of the other places of treatment are more or less likely to be chosen when comparing different characteristics of the respondents.

Table 1. Population estimates (in 000s) of number of U.S. men and women with a self-reported STD in past year and in his or her lifetime (and 95% confidence intervals), by type of STD, 1992 National Health and Social Life Survey

Disease	N	Total	Men	Women
STDS IN PAST YEAR				
All	**53**	**2,102 (1,294–2,911)**	**1,150 (491–1,809)**	**952 (525–1,378)**
Bacterial†	29	1,229 (658–1,801)	685 (220–1,150)	555 (237–853)
Viral‡	21	884 (364–1,404)	465 (6–924)	419 (174–664)
Gonorrhea	7	304 (47–561)	156 (0–373)	148 (101–286)
Genital warts	17	750 (240–1,260)	465 (6–924)	284 (63–505)
Chlamydia	17	748 (288–1,209)	398 (18–778)	350 (122–578)
STDS IN LIFETIME				
All	**614**	**21,788 (18,214–25,363)**	**11,585 (9,247–13,923)**	**10,203 (8,508–11,899)**
Bacterial†	399	13,381 (10,950–15,812)	8,160 (6,324–9,995)	5,221 (4,335–6,107)
Viral‡	215	10,769 (8,583–12,954)	4,690 (3,418–5,961)	6,079 (4,721–7,437)
Gonorrhea	242	7,555 (5,901–9,209)	5,706 (4,250–7,164)	1,848 (1,418–2,278)
Genital warts	159	6,149 (4,634–7,664)	2,450 (1,467–3,434)	3,698 (2,705–4,691)
Chlamydia	115	3,846 (2,766–4,927)	1,494 (772–2,216)	2,352 (1,666–3,038)
Genital herpes	72	2,360 (1,525–3,194)	960 (476–1,443)	1,400 (887–1,914)
Hepatitis	68	2,893 (1,941–3,845)	1,635 (1,072–2,196)	1,258 (608–1,908)
Nongonococcal urethritis	33	1,616 (1,037–2,195)	1,616 (1,037–2,195)	na
PID	57	1,477 (947–2,008)	na	1,477 (947–2,008)
Syphilis	27	280 (23–537)	147 (0–330)	133 (0–300)
HIV	7	280 (23–537)	147 (0–330)	133 (0–300)

†Gonorrhea, chlamydia, nongonococcal urethritis, PID and syphilis. ‡Genital warts, herpes, hepatitis and HIV. *Note:* For estimates of STDs in the past year, certain STDs are omitted, as the estimates are unreliable because of small Ns—genital herpes (3), nongonococcal urethritis (3), PID (2), syphilis (1) and HIV (1). The sum of individual estimates of bacterial and viral STDs is slightly larger than the total shown because of rounding. na=not applicable.

a specific STD (Table 1). Of these respondents, nearly 1.2 million were men and almost one million were women. Bacterial STDs were more common among the respondents than viral STDs. Genital warts and chlamydia were the most commonly reported STDs during the preceding year.

Overall, about 22 million adults aged 18–59 had ever had an STD. Bacterial STDs were more common than viral STDs (13.4 million vs. 10.8 million), and gonorrhea was the most commonly reported STD (by 7.6 million respondents).

Where Do People Seek Treatment?

Among those who reported ever having had an STD, a private practice (49%) was the most frequently mentioned place to which the respondents had gone for treatment (Table 2). Respondents who said they had been told in the past year that they had an STD also were more likely to report having gone to a private doctor or group practice for treatment (62%, not shown). Among the remaining respondents who had ever had an STD, 8% had gone to an "other clinic," 7% to an emergency room, 5% to an STD clinic and 5% to a family planning clinic; 23% did not mention a place where they had been treated for their STD and 3% mentioned multiple sites.

Figure 1 shows that the pattern of STD treatment choice for the younger members of the sample (18–29-year-olds) was very similar to that of older respondents (30–59-year-olds). The main difference was that a higher percentage of the younger group than of the older group chose family planning clinics (12% vs. 2%).

Forty-nine percent of respondents with genital herpes, 59% of those with genital warts and 62% of those with hepatitis reported receiving treatment from a private practice. In contrast, only 26% of respondents who reported ever having gonorrhea indicated that they had received treatment from a private practitioner (Table 2).

STDs for which a relatively large percentage of respondents reported going to an emergency room included syphilis (13%), PID (13%), hepatitis (11%) and gonorrhea (11%). Ten percent of the respondents who reported ever having had chlamydia had gone to a family planning clinic for treatment, while no respondents with hepatitis or nongonococcal urethritis reported having gone to such a clinic.

Ten percent of the respondents who reported ever having had gonorrhea and 9% of those who had ever had chlamydia indicated they received treatment at an STD clinic. Eighteen percent of the male respondents who ever had nongonococcal urethritis had gone to some "other" clinic, as had 15% of all respondents who reported ever having had gonorrhea.

A varying proportion of respondents mentioned more than one place where they received treatment for a specific STD. More than 6% of the respondents who reported genital herpes had received treatment at multiple sites, compared with 3% of those who had had gonorrhea or who had nongonococcal urethritis.

More than 35% of the respondents who had ever had gonorrhea had had this STD more than once (not shown). Nongonococcal urethritis (16%) and chlamydia (14%) were the next most often reported diseases that respondents had had repeatedly. In addition, respondents who reported having gone to an STD clinic or a family planning clinic were most likely to have had any STD more than once (31% and 29%, respectively).

Who Goes Where for Treatment?

Table 3 (page 14) shows odds ratios calculated from a multinomial response model (N=495). These odds ratios can give us an idea of the direction and magnitude of the relative odds that a respondent chose a particular treatment site. For instance, compared with respondents having a viral infection (genital herpes, genital warts, hepatitis or HIV), respondents with a bacterial infection (gonorrhea, chlamydia, nongonococcal urethritis, PID or syphilis) were 7.1 times more likely to choose an STD clinic instead of a private practice. Again, compared to those who had a viral infection, respondents who had a bacterial infection were 5.2 times more likely to choose an STD clinic over an emergency room.

Men were significantly more likely than women to go to an emergency room, family planning clinic, STD clinic or some "other" clinic than to a private practice. In other words, the estimated odds that a woman would choose a private practice versus any other treatment site were higher than the same estimated odds for men. Therefore, women were more likely to choose a private practice for treatment of an STD than were men.

Respondents who reported having gone to a family planning clinic for treatment of an STD were significantly younger than those who reported having visited a private practice (an odds ratio of 0.8 for each year of age). However, those respondents who said they had gone to an STD clinic, who had visited some "other" clinic or who did not mention any place of treatment were significantly older than those who had visited a family planning clinic.

White respondents were significantly less likely than black respondents to have gone to an emergency room or a family planning clinic than to a private practice. On the other hand, whites were more likely than blacks to report having gone to an STD clinic, having visited some "other" clinic or having mentioned no place of treatment compared with a family planning clinic.

We also found that respondents with an

Table 2. Percentage distribution of respondents who had ever had an STD, by where they said they had gone to receive treatment for the STD, according to age and STD reported

Disease	N†	Private MD/ group practice	Emergency room	Family Planning clinic	STD clinic	Other clinic	Multiple sites	Site not mentioned	Total
Total	**614**	**48.6 (43.3–53.9)**	**7.2 (4.5–9.9)**	**5 (3.0–9.2)**	**5.4 (3.4–7.4)**	**7.6 (5.4–9.8)**	**2.8 (1.8–4.6)**	**23.4 (22.4–24.4)**	**100.0**
STD									
Gonorrhea	242	26.1 (21.4–31.4)	10.7 (5.8–15.6)	6.7 (3.7–10.4)	10.3 (5.6–15.0)	14.7 (9.4–20.0)	3.3 (0.8–5.8)	28.3 (21.0–35.6)	100.0
Syphilis	28	28.9 (7.3–50.5)	13.2 (1.0–25.4)	8.7 (0.0–24.6)	8.9 (0.0–20.1)	22.7 (8.2–37.2)	0.0	17.7 (2.6–32.8)	100.0
Genital herpes	72	48.9 (36.3–61.4)	1.6 (0.0–4.7)	2.9 (0.0–6.6)	6.4 (0.0–15.6)	4.2 (0.0–8.7)	6.5 (0.2–12.8)	29.5 (20.3–38.7)	100.0
Chlamydia	115	46.8 (36.2–57.4)	4.1 (0.0–9.4)	10.1 (3.0–17.2)	8.7 (2.8–14.6)	2.9 (0.4–5.4)	2.1 (0.0–4.5)	25.3 (14.4–30.8)	100.0
Genital warts	159	58.5 (49.7–67.3)	1.0 (0.0–2.6)	5.0 (0.3–9.7)	5.3 (1.4–9.2)	6.0 (1.7–10.3)	1.5 (0.0–3.7)	22.6 (14.4–30.8)	100.0
Hepatitis	68	61.5 (45.8–67.3)	11.0 (1.0–21.0)	0.0 (0.0)	0.0 (0.0)	4.8 (0.0–10.1)	0.5 (0.0–1.5)	22.3 (20.3–34.6)	100.0
PID‡	57	49.0 (32.9–65.1)	12.7 (1.9–23.5)	2.5 (0–6.2)	0.0 (0.0)	2.5 (0.0–6.2)	0.0	33.4 (15.0–51.8)	100.0
Nongonoccocal urethritis§	33	31.1 (14.0–48.2)	4.8 (0.0–11.9)	0.0(0.0)	5.5 (0.0–12.8)	17.5 (4.4–30.6)	3.3 (0.0–9.8)	37.8 (21.5–54.1)	100.0
HIV	7	57.1 (0.0–135.7)	14.3 (0.0–39.8)	0.0(0.0)	14.3 (0.0–39.8)	14.3 (0.0–39.8)	0.0	0.0	100.0

†Total number of each STD reported. ‡Female respondents only. §Male respondents only. *Notes:* All percentages are weighted. Confidence intervals are shown in parentheses.

annual income of $20,000 or less were 4.7 times more likely than higher income respondents to have gone to a family planning clinic, 4.1 times more likely to have gone to an emergency room, and 3.4 times more likely to have gone to some "other" clinic than to a private practice. Compared with higher income individuals, respondents who had incomes of no more than $20,000 were less likely to report having gone to no place for treatment compared to an emergency room.

Education and number of sex partners in the past year were not significantly associated with where respondents reported receiving treatment for an STD (not shown). Place of residence (urban vs. rural) was not significantly associated with where respondents reported going for treatment for an STD, but was retained in the model because it was found to be confounded with race.

Discussion

Using data from a nationally representative population survey, we have characterized the incidence of respondent-reported STDs and where people reported receiving treatment for STDs. Chlamydia and genital warts were the most commonly reported STDs in the year preceding the survey, with an estimated 2.2 million persons having had any STD in the preceding year. However, no further breakdowns of data on STDs in the past year could be done from the NHSLS, because of the small number of specific occurrences.

Using population census weights, we estimated that more than 22 million people aged 18–59 were aware that they ever had an STD, with gonorrhea being the most commonly reported STD during their lifetime and chlamydia and genital warts being the most prevalent during the past year. These results mirror the changing epidemiology of STDs, in that rates of gonorrhea have been declining over recent years and chlamydia is being diagnosed more frequently because of increased screening with more advanced diagnostic technology.[15]

For the most part, our population estimates based on respondents' reports of being examined for STDs seriously underestimate the burden of STD disease, notwithstanding the fact that the survey excluded reported STDs for people younger than 18 or older than 59. For instance, a widely used incidence extrapolation method estimated that there are 12 million new cases of STDs each year.[16] A large portion of this extrapolation is based on the number of case reports of such communicable diseases as gonorrhea, chlamydia, sexually transmitted hepatitis B and syphilis, adjusted by estimates of underreporting and the proportion of asymptomatic cases. In addition, seroprevalence data available from the 1992 National Health and Nutrition Examination Survey (NHANES) indicated that in 1991, 22% of persons aged 12 years or older (45 million persons) were carrying the antibody to herpes simplex.[17] Our respondent-report data, on the other hand, indicate that only 2.3 million persons reported ever having had genital herpes.

There are several possible reasons for the large differences between estimates based on population-based respondent-reported data and those based on national surveillance data. Information based on respondents' reports is limited, in general, by the biases inherent in relying on their truthfulness and on their accurate recall. Also, individuals' reports of having had an STD are further limited by whether they were told by a health professional that they had had an STD (given that an STD may be asymptomatic), and whether they understand the reference to the disease in the question in the interview.

Overall, our finding that 49% of respondents who reported having had an

Figure 1. Percentage of respondents who went for treatment of an STD, by place of treatment, according to age-group

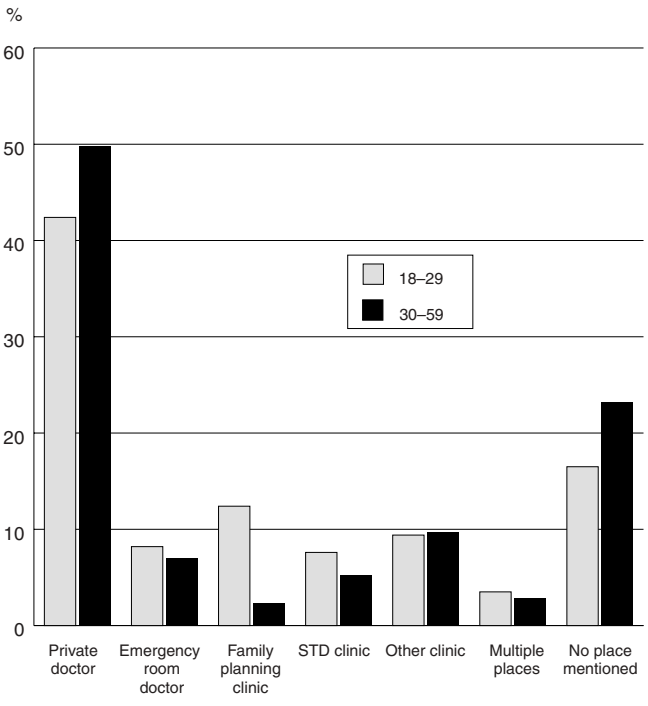

Table 3. Odds ratios (and 95% confidence intervals) showing where people are likely to go for treatment of an STD, by comparison site, according to selected variables (N=495)

Variable and comparison site	Emergency room	FP clinic	STD clinic	Other clinic	No place
Compared with private MD/group practice					
Bacterial infection†	1.4 (0.5–3.5)	1.3 (0.4-4.2)	7.1 (1.9–26.7)*	2.0 (0.7-6.1)	1.3 (0.8-2.2)
Male‡	2.2 (1.0–4.8)*	4.3 (1.8–10.2)*	4.3 (1.8–10.7)*	4.5 (1.9–10.7)*	1.6 (0.9–2.8)
Age§	1.0 (0.9–1.0)	0.8 (0.7–0.9)*	1.0 (0.9–1.0)	1.0 (0.9-1.0)	1.0 (0.98–1.03)
White††	0.3 (0.1–0.9)*	0.08 (0.02–0.23)*	0.8 (0.2–3.2)	0.4 (0.2–1.0)	0.5 (0.2–1.1)
Annual income ≤$20,000‡‡	4.1 (1.7–9.9)*	4.7 (1.3–16.6)*	2.1 (0.9–5.0)	3.4 (1.4–8.3)*	1.3 (0.7–2.5)
Urban§§	0.7 (0.3–1.4)	0.5 (0.1–1.5)	1.6 (0.4–6.1)	1.4 (0.5–3.6)	0.8 (0.5–1.3)
Compared with emergency room					
Bacterial infection†	na	1.0 (0.2–4.1)	5.2 (1.2–23.0)*	1.5 (0.3–7.0)	1.0 (0.3–2.9)
Male‡	na	1.9 (0.7–5.6)	2.0 (0.8–5.1)	2.0 (0.6–7.1)	0.7 (0.3–1.8)
Age§	na	0.8 (0.7–0.9)*	1.0 (0.9–1.0)	1.02 (0.98–1.08)	1.04 (0.99–1.08)
White††	na	0.3 (0.0–0.8)*	2.6 (0.5–14.7)	1.3 (0.4–4.3)	1.6 (0.6–4.3)
Annual income ≤$20,000‡‡	na	1.1 (0.2–5.5)	0.5 (0.2–1.4)	0.8 (0.3–2.3)	0.3 (0.1–0.9)*
Urban§§	na	0.7 (0.1–3.2)	2.4 (0.5–12.5)	2.1 (0.7–5.9)	1.2 (0.5–2.9)
Compared with FP clinic					
Bacterial infection†	na	na	5.5 (0.9–34.5)	1.6 (0.4–6.8)	1.0 (0.3–3.5)
Male‡	na	na	1.0 (0.3–2.9)	1.0 (0.4-3.1)	0.4 (0.1–1.0)
Age§	na	na	1.2 (1.1–1.3)*	1.2 (1.1–1.4)*	1.3 (1.1–1.4)*
White††	na	na	10.1 (1.9–53.0)*	5.1 (1.5–17.2)*	6.3 (1.9–21.2)*
Annual income ≤$20,000‡‡	na	na	0.4 (0.1–1.8)	0.7 (0.2–3.1)	0.3 (0.0–1.0)
Urban§§	na	na	3.6 (0.7–18.9)	3.0 (0.7–13.5)	1.7 (0.5–6.4)
Compared with STD clinic					
Bacterial infection†	na	na	na	0.3 (0.0–1.5)	0.2 (0.0–0.7)*
Male‡	na	na	na	0.9 (0.3–3.3)	0.3 (0.1–1.0)*
Age§	na	na	na	1.0 (1.0–1.1)*	1.1 (1.0-1.1)*
White††	na	na	na	0.5 (0.1–2.2)	0.6 (0.2–2.5)
Annual income ≤$20,000‡‡	na	na	na	1.6 (0.6–4.1)	0.7 (0.3–1.6)
Urban§§	na	na	na	1.0 (0.2–4.4)	0.5 (0.1–1.8)

*p<.05. †Compared with viral infection. ‡Compared with female. §In one-year increments. ††Compared with black. ‡‡Compared with income >$20,000. §§Compared with rural residence.

STD were treated by a private practitioner or group practice is similar to that of other research relying on population-based survey data.[18] Specifically, one study that surveyed providers from Louisiana, Maryland, Massachusetts and Oklahoma for their treatment of gonorrhea, chlamydia and syphilis found that 35–61% of STD patients were seen by private physicians.[19] Most of the patients seen by these practitioners were accounted for by physicians specializing in obstetrics and gynecology, family practice and internal medicine.

In our study, the percentage of respondents who mentioned an STD clinic (5%) is much smaller than what would have been expected based on national surveillance data.[20] The actual proportion of people who were treated for an STD at an STD clinic may have been higher if those who mentioned "other clinic" or "no place" actually were treated at an STD clinic.

The analysis of the NHSLS extends our understanding of where people go for treatment beyond the findings of other studies. It was possible to demographically and behaviorally profile where a respondent was treated, given a particular STD. For instance, the multinomial response analysis found that bacterial STDs are more likely than viral STDs to be treated at an STD clinic, relative to other treatment locations. Viral STDs are also more likely to be treated in a private practice, not unexpected given that people with viral STD skin lesions may prefer to seek treatment from private practitioners (such as dermatologists or gynecologists).

There were variations in treatment-seeking for specific bacterial STDs, such as chlamydia and gonorrhea. For treatment locations other than a private practice, a relatively large percentage of respondents reported going to a family planning clinic (10%) for treatment of chlamydia and a large percentage of respondents reported going to an "other" clinic (14%) or an STD clinic (10%) for treatment of gonorrhea.

Other important patterns that emerged include that women are more likely than men to report having been treated at a private practice. This finding is not unexpected, given that women more often seek routine care than do men.[21] Whites are more likely than blacks to report having gone to a private practice, and respondents in poorer households are more likely than higher income respondents to report being treated at places other than a private practice. This pattern probably reflects the fact that people with higher incomes use a private practice more frequently than they do other treatment locations.[22]

Our findings agree with what is known about family planning clinics, which are defined as organizations that have a primary responsibility for providing contraceptive counseling, education and services.[23] For the most part, these agencies serve younger women and they have increasingly been providing STD diagnosis and treatment, partially because of the funds these agencies have received to screen women for chlamydia.[24] An ancillary outcome of this activity is that male partners of women treated in family planning clinics are also receiving STD treatment.[25]

The primary purpose of public STD clinics is to provide STD services. A recent survey of entities that might provide STD services found that 50% of local health departments directly provided STD services,[26] and that more than 60% of these health departments are located in nonmetropolitan areas. Agencies that had separate clinics for STD services were usually in metropolitan areas. Therefore, we might expect more people in metropolitan areas to use STD clinics, but we did not find that geographic location predicted choice of STD treatment location. One reason could be that the NHSLS may have underestimated central city populations.

The higher percentage of respondents who reported being treated for more than one STD at family planning clinics or STD clinics, compared with other sites, suggests that these respondents were more likely to have been exposed to prevalent STDs. A detailed epidemiologic study of STD clinic patients found a high level of repeat infections with STDs; 27% of clients had two or more episodes of gonorrhea (defined as infections occurring at least two weeks apart).[27]

It is difficult to interpret the responses of the relatively large number of respondents who cited "other clinic" or who mentioned no place at which they obtained STD treatment. These may have included respondents who did not know either where they had received treatment or how to categorize their place of treatment. Some respondents may not have mentioned an STD clinic because of embarrassment.

Others may have received treatment at a type of clinic that was not included as one of the response categories, such as a school health clinic, a military clinic or a prison. The fact that a high percentage of the respondents who chose an "other"

clinic were older than 30 suggests that many respondents could have been referring to an STD for which they had received treatment in the far past. Some respondents may also have confused a private doctor's "clinic" with the "other" clinic category.

About 16% of the respondents did not report their income, which resulted in a comparable proportion of observations being excluded in the regression analysis due to missing data for the income variable. Those respondents who did not report their income had significantly fewer lifetime STDs (t=2.9, p=.03). We also assessed the effect of excluding some observations from the analysis of respondents who ever had an STD because of missing income, by comparing those observations with income information to those without income information. Whites (11.1%) were significantly less likely than blacks (17.8%) to have had income data missing (t=2.11, p=.03).

Some of the limitations regarding respondents' reports of STDs have already been noted. Other possible limitations include the fact that the survey asked only about treatment of the last STD, without also asking when that STD was experienced. On the other hand, an instrument that obtained data for when each STD had occurred would have been very complex to design and difficult to administer.

An important limitation of our analysis is that many older respondents were more likely to have reported an STD that occurred many years in the past. Thus, we cannot elucidate the influence of changes in the epidemiology of STDs, in diagnosis or in the availability of treatment sites without knowing the date of their most recent STD. Nonetheless, patterns of treatment site utilization between younger and older respondents were very similar. Notable differences are that a higher percentage of younger respondents than of older respondents cited family planning clinics and a larger percentage of the older group did not mention a treatment location.

Regardless of these limitations, it is apparent that a large proportion of people obtain treatment for an STD from a private physician or a group practice. Given that significant resources have traditionally focused on the prevention of STDs via public STD clinics, more attention needs to be paid to assuring that STD clients of private practitioners receive appropriate risk-reduction counseling and contact tracing.[28]

References

1. Division of STD Prevention, *Sexually Transmitted Disease Surveillance*, 1996, Atlanta: Centers for Disease Control and Prevention (CDC), Sept. 1997.

2. Institute of Medicine, *The Hidden Epidemic: Confronting Sexually Transmitted Diseases*, Washington, DC: National Academy Press, 1997.

3. Abt Associates, Sexually transmitted disease (STD) prevention in the United States: Integrated evaluation of public and private sector disease reporting and service delivery, CDC#200-93-0633, 1996.

4. Amaro H and Gornemann I, Health care utilization for sexually transmitted diseases: influence of patient and provider characteristics, in Wasserheit JN et al., eds., *Research Issues in Human Behavior and Sexually Transmitted Diseases in the AIDS Era*, Washington, DC: American Society of Microbiology, 1991.

5. Fishbein M et al., Factors influencing behavior and behavior change, *Report from NIMH Workshop*, 1992. (This manuscript can be obtained from the NIMH Office on AIDS, 5600 Fishers Lane, Room 1075, Rockville, MD, 20857.)

6. Arday LA and Shortell SM, Indicators and predictors of health services utilization, in Williams SJ and Torrens PR, eds., *Introduction to Health Services*, 3rd ed., 1988, Albany, NY: Delmar Publications, pp. 51–81.

7. Nathanson C, Sex, illness, and medical care: a review of data, theory, and methods, *Social Science and Medicine*, 1977,11(1):13–25.

8. Landry DJ and Forrest JD, Public health departments providing sexually transmitted disease services, *Family Planning Perspectives*, 1996, 28(6):261–266.

9. Levi MH, Current concepts in the laboratory diagnosis of gonorrhea, in Borchardt KA and Noble MA, eds., *Sexually Transmitted Diseases: Epidemiology, Pathology, Diagnosis, and Treatment*, Boca Raton, FL: CRC Press, 1997.

10. Frost JJ, Family planning clinic services in the United States, 1994, *Family Planning Perspectives*, 1996, 28(3):92–100; and Landry DJ and Forrest JD, 1996, op. cit. (see reference 8).

11. Sokol DM and Garry RF, Herpesviruses, in Borchardt KA and Noble MA, eds., 1997, op.cit. (see reference 9); and Rosemberg SK, Sexually transmitted papilloma viral infection in men: an update, *Dermatologic Clinics*, 1991, 9(2):317–331.

12. Laumann EL et al., 1992, National Health and Social Life Survey (Data Set 12-13, McKean, EA, Muller, KL and Lang) [machine-readable files and documentation], University of Chicago: National Opinion Research Center (producer); Los Altos, CA: Sociometrics Corporation, AIDS/STD Data Archive (producer and distributor), 1994.

13. Shah BV et al., *SUDAAN User's Manual*, Release 5.50, Research Triangle Park, NC: Research Triangle Institute, 1991.

14. Ibid.

15. Division of STD Prevention, 1997, op. cit. (see reference 1).

16. CDC, Division of STD/HIV Prevention, *Annual Report 1992*, Atlanta: CDC, 1993.

17. Fleming DT et al., Herpes simplex virus type 2 in the United States, 1976 to 1994, *New England Journal of Medicine*, 1997, 337(16):1105–1111.

18. Abt Associates, 1996, op. cit. (see reference 3); Anderson JA, McCormick L and Fichtner R, Factors associated with self-reported STDs: data from a national survey, *Sexually Transmitted Diseases*, 1994, 21(6):303–308; and Moran JS, Kaufman JA and Felsenstein D, Survey of health care providers: who sees patients needing STD services, and what services do they provide? *Sexually Transmitted Diseases*, 1995, 22(1):67–69.

19. Abt Associates, 1996, op. cit. (see reference 3).

20. Division of STD Prevention, 1997, op. cit. (see reference 1).

21. Nathanson C, 1977, op. cit. (see reference 7).

22. Arday LA and Shortell SM, 1988, op. cit. (see reference 6).

23. Frost JJ, 1996, op. cit. (see reference 10).

24. Landry DJ and Forrest JD, 1996, op. cit. (see reference 8).

25. Schulte MM and Sonenstein FL, Men at family planning clinics: the new patients? *Family Planning Perspectives*, 1995, 27(5):212–225.

26. Landry DJ and Forrest JD, 1996, op. cit. (see reference 8).

27. Hamers FF et al., Syphilis and gonorrhea in Miami: similar clustering, different trends, *American Journal of Public Health*, 1995, 85(8):1104–1108.

28. Boekeloo BO et al., Frequency and thoroughness of STD/HIV risk assessment by physicians in a high risk metropolitan area, *American Journal of Public Health*, 1991, 81(12):1645–1648; and Gunn RA et al., The changing paradigm of sexually transmitted disease control in the era of managed care, *Journal of the American Medical Association*, 1998, 279(9):680–684.