Rapid HIV Testing in Transgender Communities by Community-Based Organizations in Three Cities

Jeffrey D. Schulden, MD[a]
Binwei Song, MS[a]
Alex Barros[b]
Azul Mares-DelGrasso, MA[c]
Charles W. Martin[d]
Ramon Ramirez[e]
Linney C. Smith, MPA[f]
Darrell P. Wheeler, PhD, MPH[g]
Alexandra M. Oster, MD[a]
Patrick S. Sullivan, DVM, PhD[a]
James D. Heffelfinger, MD, MPH[a]

SYNOPSIS

Objectives. This article describes the demographic and behavioral characteristics, human immunodeficiency virus (HIV) testing history, and results of HIV testing of transgender (TG) people recruited for rapid HIV testing by community-based organizations (CBOs) in three cities.

Methods. CBOs in Miami Beach, Florida, New York City, and San Francisco offered TG people rapid HIV testing and prevention services, and conducted a brief survey. Participants were recruited in outreach settings using various strategies. The survey collected information on demographic characteristics, HIV risk behaviors, and HIV testing history.

Results. Among 559 male-to-female (MTF) TG participants, 12% were newly diagnosed with HIV infection. None of the 42 female-to-male participants were newly diagnosed with HIV. A large proportion of MTF TG participants reported high-risk behaviors in the past year, including 37% who reported unprotected receptive anal intercourse and 44% who reported commercial sex work. Several factors were independently associated with increased likelihood of being newly diagnosed with HIV infection among MTF TG participants, including having a partner of unknown HIV status in the past year; being 20–29 or ≥40 years of age; having last been tested for HIV more than 12 months ago; and having been recruited at the New York City site.

Conclusions. Based on the high proportion of undiagnosed HIV infection among those tested, TG people represent an important community for enhanced HIV testing and prevention efforts. MTF TG people should be encouraged to have an HIV test at least annually or more often if indicated, based upon clinical findings or risk behaviors. Efforts should continue for developing novel strategies to overcome barriers and provide HIV testing and prevention services to TG people.

[a]Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA

[b]Alaskan AIDS Assistance Association, Anchorage, AK

[c]AIDS Healthcare Foundation, Los Angeles, CA

[d]South Beach AIDS Project, Miami Beach, FL

[e]Previously with AIDS Healthcare Foundation, Los Angeles, CA

[f]Housing Works, Inc., New York, NY

[g]Hunter College School of Social Work, New York, NY

Address correspondence to: Jeffrey D. Schulden, MD, Centers for Disease Control and Prevention, 1600 Clifton Rd. NE, MS E-46, Atlanta, GA 30333; tel. 404-639-6416; fax 404-639-8640; e-mail <schuldenj@nida.nih.gov>.

Although there are no national surveillance estimates of the prevalence of human immunodeficiency virus (HIV) among transgender (TG) people in the United States, several studies have suggested a high burden of HIV infection among male-to-female (MTF) TG people. In four studies looking at HIV infection among MTF TG people, the proportion who were confirmed to be HIV-positive ranged from 16% to 68%.[1–4] A recent meta-analysis of multiple studies of HIV infection in TG populations found that the proportion of MTF TG people with self-reported HIV infection was 12% in 18 studies that asked respondents to report their HIV status; the proportion of MTF TG people with laboratory-confirmed HIV infection was 28% in the four studies that included HIV testing.[5] Further, the estimated proportions of non-Hispanic black MTF TG respondents with self-reported HIV infection (31%) and laboratory-confirmed HIV infection (56%) were substantially higher than they were for all MTF TG respondents.[5] The discrepancy between self-reported and laboratory-confirmed infection suggests that a substantial percentage of HIV-positive MTF TG people are not aware that they are infected, and underscores the importance of increasing access to and use of HIV testing and prevention services by MTF TG people.[5,6] Fewer studies have evaluated HIV prevalence in female-to-male (FTM) TG people.[5] In several studies, the proportion of FTM TG respondents with self-reported HIV infection ranged from 0% to 3%.[5] The proportion of FTM TG people with laboratory-confirmed infection was 2% in one study, which included HIV testing.[1]

The word *transgender* is an umbrella term that refers to individuals who identify with and/or express a gender or sex different from their birth sex. This term encompasses a range of people who, to varying degrees, do not follow traditional gender roles.[7,8] Broadly, the term includes the following groups: transsexuals, people who may pursue (or would like to pursue) hormone therapy or sex reassignment surgery to change their physical characteristics; transgenderists, people who express characteristics of another gender, but do not necessarily pursue changes to their physical characteristics; bigenderists, people who identify with and/or express characteristics of both genders; cross-dressers or transvestites, people who desire to wear the clothes of another gender; drag queens or kings, often gay men or lesbians who dress as and take on behaviors of another gender; and female or male impersonators, generally men or women who impersonate another gender for entertainment.[7–10] The meaning and usage of these terms has varied over time and can vary among individuals.[10] The range of terminology reflects the varying degrees to which individuals do not follow traditional gender roles and the multiplicity of factors that bear upon how individuals experience and express gender, including biological, psychological, and sociocultural factors.[10]

Multiple studies have reported high rates of HIV risk behaviors among MTF TG people.[1–5,11,12] In a meta-analysis, a substantial proportion of MTF TG people were found to report multiple sex partners (32%), unprotected receptive anal intercourse (URAI) (44%), unprotected insertive anal intercourse (UIAI) (27%), sex while high or drunk (39%), commercial sex work (42%), and injection of hormones (27%) or silicone (25%).[5] A lower proportion of MTF TG people reported injecting street drugs (12%) or sharing needles (6% for injecting hormones or silicone, and 2% for injecting street drugs) in this meta-analysis.[5] A number of studies have found that HIV infection among MTF TG people is independently associated with being African American,[1–4,11] having less than a high school degree,[1,4] having multiple sex partners,[1] having URAI,[3] and injecting street drugs other than hormones,[1] but not associated with exchange of sex for money.[1,3,4,11]

Fewer studies have reported the HIV risk behaviors of FTM TG people. A study including 123 FTM TG people showed that recent HIV risk behaviors were less common in this group, with 66% reporting ≤1 partner in the past six months and 31% reporting that they had engaged in sex work.[1]

TG people report high levels of stigma and discrimination from potential employers and often describe commercial sex work as survival sex when other sources of income are not available.[1,5,13] In addition, discrimination can make finding housing difficult among TG people, with many reporting a history of homelessness as a contributing factor to engaging in commercial sex work.[1,5,13] TG people are also at potentially increased risk for HIV infection because of unsafe injection practices, in particular injecting hormones, silicone, or botulinum toxin type A/Botox® (BTX) outside the supervision of health-care providers to change their physical appearance.[1–5,11,12]

TG people have a unique constellation of risks for HIV infection, but the availability and capacity of prevention programs to address these unique issues have been limited. Several studies have shown that a large proportion of TG people have experienced discrimination from health and social service providers.[13–15] Many providers have little or no training in managing the health issues of transgender people.[13,14,16,17] This discrimination and lack of awareness by providers, along with competing priorities such as securing stable housing and income, may pose a substantial barrier

to some TG people using HIV testing and prevention services.[1,5,13–15]

In April 2003, the Centers for Disease Control and Prevention (CDC) announced the Advancing HIV Prevention initiative, which was aimed at reducing barriers to early diagnosis of HIV infections and increasing access to quality medical care, treatment, and ongoing prevention services.[18] A key strategy of this initiative was to implement new models for diagnosing HIV infections outside of medical settings, with particular attention to diagnosing infections in minority populations and other communities that may have decreased access to or use of existing HIV testing services. As a part of this initiative, CDC funded community-based organizations (CBOs) in three cities to provide HIV testing services to TG people to help identify risk and HIV testing behaviors in this community. This article summarizes the demographic characteristics, HIV risk behaviors, and HIV testing behaviors of TG people who were tested for HIV in this project, and describes factors associated with a new diagnosis of HIV infection.

METHODS

CDC funded CBOs in Miami Beach, Florida, New York City, and San Francisco. The three participating CBOs were South Beach AIDS Project (SoBAP) in Miami Beach, Housing Works (HW) in New York City, and AIDS Healthcare Foundation (AHF) in San Francisco. The three CBOs offered voluntary HIV testing to TG people as a routine part of services provided to local TG communities during the period of January 2005 to December 2006. People self-identifying as TG who were at least 13 years of age and who were not known to be infected with HIV were recruited to participate by each of the CBOs. HIV testing and pre- and posttest counseling were provided by trained HIV counseling and testing staff.

At all sites, preliminary testing was conducted using OraQuick Advance® Rapid HIV-1/2 Antibody Tests (OraSure Technologies, Bethlehem, Pennsylvania) with oral mucosal transudate specimens or fingerstick whole-blood specimens. All clients received risk-reduction counseling, and those who had reactive rapid tests were asked to provide an oral specimen for confirmatory testing by Western blot. At all three sites, outreach staff provided people with confirmed positive HIV test results with further HIV risk-reduction information, partner counseling and referral services, and linkage to medical care appointments, through relationships with either HIV-care settings affiliated with participating CBOs or unaffiliated HIV-care providers. TG people who reported a prior diagnosis of HIV were not surveyed or offered HIV testing, but were offered assistance with linkage to HIV-care services as needed. All sites had project staff who were culturally sensitive and had experience providing services to TG people, including staff who identified as TG. HIV counseling and testing services were available in English and Spanish at all three participating CBOs.

Although the general approach to providing HIV testing services was similar at all sites, the specific methods used for recruitment varied. The HW program in New York City uniquely employed two distinct strategies to recruit TG people to participate—a venue-based outreach approach and a social network approach. The venue-based strategy consisted of providing HIV testing in a mobile testing unit that was driven to areas of the city frequented by TG people, including TG commercial sex work venues. For the social network approach, TG participants were asked to recruit their fellow TG acquaintances for participation, and people recruited via the social network approach were also asked to recruit their TG acquaintances.

SoBAP in Miami Beach also used a venue-based approach, with outreach workers recruiting participants at places frequented by TG people. In addition, SoBAP outreach staff worked with TG community members to host social events in community members' homes, at the SoBAP offices, or at local bars or restaurants. SoBAP also employed Internet-based outreach, using static and video advertisements on TG-oriented Internet sites to recruit participants. SoBAP staff regularly conducted Internet-based outreach by accessing these TG-oriented Internet chat rooms and social network sites, including sites visited by TG commercial sex workers. Outreach workers contacted potential participants at these online sites, offering HIV testing and prevention services in a manner similar to outreach in other settings.

The AHF program in San Francisco was based in a social service agency that serves the TG community in the Bay Area. AHF staff provided HIV testing as an integrated part of several services that the agency regularly provides to the TG community, including social support meetings, vocational trainings, and religious services. They also used a venue-based approach to recruitment and testing.

The survey used by each of the participating CBOs collected information on general demographic characteristics, TG-specific characteristics, HIV risk behaviors, HIV testing history, and use of health services. Except where otherwise indicated, all questions regarding HIV risk behaviors asked respondents to answer whether they had engaged in the behavior in the past year. Outreach workers collected data in face-to-face interviews, using paper forms, prior to the delivery

of rapid HIV test results. Staff at sites entered data into a QDS™ (Questionnaire Development System) database.[19] Data were analyzed using SAS version 9.1 at CDC.[20] Chi-square tests of association were used to determine differences in characteristics of participants by project site. Calculation of odds ratios and 95% confidence intervals were used to evaluate factors associated with new diagnoses of HIV among MTF TG people. Multivariate analysis was conducted using logistic regression to determine factors independently associated with new HIV diagnoses. Factors that were associated ($p<0.1$) with newly confirmed HIV-positive test results in the bivariate analyses were eligible for inclusion in the multivariate model; forward stepwise addition was performed to select eligible factors that were significantly associated ($p<0.05$) with being newly diagnosed with HIV infection.

This project was determined by CDC to be a public health program implementation rather than research. As such, the project was not reviewed by CDC's Institutional Review Board. All participants provided CBOs with written informed consent for HIV testing as required by state and local laws.

RESULTS

Participant characteristics and HIV test results

During the project period, CBO staff tested and surveyed 601 eligible TG people, of whom 559 (93%) identified as MTF TG and 42 (7%) identified as FTM TG. Among the MTF TG participants, 474 (85%) identified as being members of racial/ethnic minority groups, including 206 (37%) non-Hispanic black and 235 (42%) Hispanic respondents (Table 1). More than one-third of MTF TG participants were aged 20 to 29 years, and nearly one-quarter were aged 30 to 39 years. A total of 155 (28%) MTF TG participants identified as heterosexual, 217 (39%) as homosexual, and 68 (12%) as bisexual. Forty-six percent of MTF TG participants reported using female hormones in the past year, and 23% indicated that they had undergone some form of sex reassignment surgery, most commonly breast implants (20%).

The characteristics of participants differed substantially across sites (Table 1). A greater proportion of participants at the New York City site were African American, and they tended to be younger and less educated when compared with participants at the other two sites. Overall, 67 (12%) MTF TG participants were newly diagnosed with HIV infection. Among those with newly diagnosed infection, 63 (94%) were known to have returned to receive their confirmatory HIV test results, though limited additional information on follow-up HIV care was obtained by CBOs because of difficulties tracking referral information.

Among the 42 FTM TG people who were tested and completed surveys, 34 (81%) identified as being members of racial/ethnic minority groups, including 22 (52%) non-Hispanic black and seven (17%) Hispanic respondents. A total of 14 (33%) FTM TG participants were aged 13 to 19 years, and 12 (29%) were aged 20 to 29 years. Most (67%) FTM TG participants identified as homosexual. Twenty-one percent of FTM TG participants reported having used male hormones in the past year, and 12% reported having had breast reduction or removal surgery. None of the FTM TG participants had positive HIV test results.

HIV risk and health-seeking behaviors among MTF TG participants

A substantial proportion of MTF TG participants indicated that they had engaged in high-risk behavior during the past year. A total of 209 (37%) people reported having URAI, 119 (21%) reported having UIAI, and 244 (44%) reported engaging in commercial sex work (Table 2). Thirteen (2%) participants reported having no partners, 98 (18%) reported having one partner, 129 (23%) reported having two to five partners, and 193 (35%) reported having more than five partners in the past year. A total of 183 (33%) people reported injecting hormones outside the supervision of a health-care provider, and 38 (7%) reported injecting street drugs. Overall, 18 (3%) participants reported sharing needles for injecting street drugs, hormones, silicone, or BTX. Forty-six percent of respondents indicated that they had seen a physician, and 299 (54%) reported having been tested for HIV in the past year.

The characteristics and risk behaviors of MTF TG respondents also varied by reported sexual orientation (Table 3). MTF TG respondents who identified as homosexual/gay tended to be younger than those who identified as heterosexual/straight or bisexual. A greater proportion of participants who identified themselves as heterosexual/straight reported having undergone sex reassignment surgery or having used hormones than those who identified themselves as homosexual/gay or bisexual. In addition, a greater proportion of participants who identified as heterosexual/straight reported having had URAI, UIAI, a partner of unknown HIV status, or anonymous sex in the past year than those identifying as homosexual/gay or bisexual.

On multivariate analysis, several factors were independently associated with increased likelihood of being newly diagnosed with HIV infection among MTF TG participants. These factors included:

Table 1. Characteristics and HIV test results of male-to-female transgender participants by site—New York City, San Francisco, and Miami Beach, Florida, January 2005–December 2006[a]

	All sites combined		*San Francisco*		*New York City*		*Miami Beach*	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Total	559	100.0	129	100.0	259	100.0	171	100.0
Age (in years)								
13–19	88	15.7	1	0.8	79	30.5	8	4.7
20–29	202	36.1	28	21.7	109	42.1	65	38.0
30–39	133	23.8	48	37.2	36	13.9	49	28.7
40–49	74	13.2	26	20.2	22	8.5	26	15.2
≥50	29	5.2	21	16.3	3	1.2	5	2.9
Unknown or refused	33	5.9	5	3.9	10	3.9	18	10.5
Race/ethnicity								
Black, non-Hispanic	206	36.9	28	21.7	170	65.6	8	4.7
White, non-Hispanic	44	7.9	32	24.8	3	1.2	9	5.3
Hispanic	235	42.0	43	33.3	64	24.7	128	74.9
Multiracial	15	2.7	7	5.4	5	1.9	3	1.8
Other	18	3.2	9	7.0	9	3.5	0	0.0
Unknown or refused	41	7.3	10	7.8	8	3.1	23	13.5
Education								
Less than high school	162	29.0	28	21.7	96	37.1	38	22.2
High school graduate	209	37.4	41	31.8	111	42.9	57	33.3
Some college	94	16.8	39	30.2	25	9.7	30	17.5
College degree or higher	25	4.5	12	9.3	9	3.5	4	2.3
Unknown or refused	69	12.3	9	7.0	18	6.9	42	24.6
Transgender identification[b]								
Transsexual	202	36.1	39	30.2	58	22.4	105	61.4
Transgender/transgenderist	235	42.0	72	55.8	155	59.8	8	4.7
Bigender/gender-bender	10	1.8	4	3.1	6	2.3	0	0.0
Gender-queer	13	2.3	7	5.4	4	1.5	2	1.2
Cross-dresser/transvestite	16	2.9	3	2.3	8	3.1	5	2.9
Drag queen	23	4.1	4	3.1	10	3.9	9	5.3
Female impersonator	14	2.5	4	3.1	9	3.5	1	0.6
Other transgender identity	8	1.4	6	4.7	2	0.8	0	0.0
Unknown or refused	66	11.8	7	5.4	14	5.4	45	26.3
Sexual orientation								
Heterosexual/straight	155	27.7	53	41.1	41	15.8	61	35.7
Bisexual	68	12.2	26	20.2	34	13.1	8	4.7
Homosexual/gay	217	38.8	33	25.6	155	59.8	29	17.0
Other	55	9.8	11	8.5	7	2.7	37	21.6
Unknown or refused	64	11.4	6	4.7	22	8.5	36	21.1

continued on p. 106

Table 1 (continued). Characteristics and HIV test results of male-to-female transgender participants by site—New York City, San Francisco, and Miami Beach, Florida, January 2005–December 2006[a]

	All sites combined		*San Francisco*		*New York City*		*Miami Beach*	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Use of hormones, silicone, or BTX[b]								
Hormones	258	46.2	85	65.9	100	38.6	73	42.7
Silicone	67	12.0	3	2.3	29	11.2	35	20.5
BTX	13	2.3	2	1.6	5	1.9	6	3.5
None of the above	190	34.0	41	31.8	105	40.5	44	25.7
Unknown or refused	96	17.2	3	2.3	43	16.6	50	29.2
Sex reassignment surgery[b]								
Breast implantation	111	19.9	22	17.1	21	8.1	68	39.8
Penis/testicle removal	19	3.4	6	4.7	5	1.9	8	4.7
Vagina construction	13	2.3	4	3.1	6	2.3	3	1.8
Facial feminization surgery or other unspecified plastic surgery	10	1.8	0	0.0	2	0.8	8	4.7
None of the above	345	61.7	97	75.2	191	73.7	57	33.3
Unknown or refused	85	15.2	4	3.1	36	13.9	45	26.3
HIV test results								
Newly diagnosed HIV infection	67	12.0	9	7.0	52	20.1	6	3.5
HIV-negative	492	88.0	120	93.0	207	79.9	165	96.5

[a]Percentages might not add to 100% due to rounding. Chi-square test of association for all listed categories of variables showed significant differences ($p<0.01$) across sites.

[b]Categories are not mutually exclusive.

HIV = human immunodeficiency virus

BTX = botulinum toxin type A/Botox®

Table 2. Behavioral characteristics of male-to-female transgender participants by site—New York City, San Francisco, and Miami Beach, Florida, January 2005–December 2006[a]

	All sites combined		*San Francisco*		*New York City*		*Miami Beach*	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Total	559	100.0	129	100.0	259	100.0	171	100.0
Sexual risk behaviors in past 12 months[b]								
Unprotected receptive anal intercourse	209	37.4	72	55.8	78	30.1	59	34.5
Unprotected insertive anal intercourse	119	21.3	36	27.9	53	20.5	30	17.5
Unprotected receptive vaginal intercourse	12	2.1	2	1.6	8	3.1	2	1.2
Commercial sex work	244	43.6	58	45.0	97	37.5	89	52.0
Partner who is HIV-positive	37	6.6	20	15.5	12	4.6	5	2.9
Partner of unknown HIV status	123	22.0	42	32.6	27	10.4	54	31.6
Anonymous sex	142	25.4	43	33.3	31	12.0	68	39.8
Sex while high on drugs or drunk	95	17.0	44	34.1	26	10.0	25	14.6
Number of sexual partners (vaginal or anal), past 12 months								
0	13	2.3	3	2.3	8	3.1	2	1.2
1	98	17.5	26	20.2	58	22.4	14	8.2
2–5	129	23.1	41	31.8	75	29.0	13	7.6
6–10	58	10.4	17	13.2	25	9.7	16	9.4
>10	135	24.2	30	23.3	30	11.6	75	43.9
Unknown or refused	126	22.5	12	9.3	63	24.3	51	29.8
Drug injection behaviors in past 12 months[b,c]								
Hormones	183	32.7	39	30.2	81	31.3	63	36.8
BTX	54	9.7	3	2.3	25	9.7	26	15.2
Street drugs	38	6.8	22	17.1	6	2.3	10	5.8
Needle sharing	18	3.2	7	5.4	10	3.9	1	0.6
Health-seeking behaviors[b]								
Seen a physician for any reason in past 12 months	256	45.8	93	72.1	110	42.5	53	31.0
Have a primary care provider	247	44.2	83	64.3	112	43.2	52	30.4
Diagnosed with a sexually transmitted disease in past 12 months	32	5.7	10	7.8	17	6.6	5	2.9
HIV testing history								
Never tested for HIV	45	8.1	5	3.9	39	15.1	1	0.6
Tested for HIV in past 12 months	299	53.5	79	61.2	109	42.1	111	64.9
Tested for HIV more than 12 months ago	85	15.2	24	18.6	49	18.9	12	7.0
Unknown or refused	130	23.3	21	16.3	62	23.9	47	27.5

[a]Percentages might not add to 100% due to rounding.

[b]Categories are not mutually exclusive.

[c]Injection of hormones, silicone, or BTX that was not done under the supervision of a health-care provider.

HIV = human immunodeficiency virus

BTX = botulinum toxin type A/Botox®

Table 3. Demographic and behavioral characteristics of male-to-female transgender participants by reported sexual orientation—New York City, San Francisco, and Miami Beach, Florida, January 2005–December 2006[a]

	Heterosexual/straight		*Bisexual*		*Homosexual/gay*		*Other*	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Total	155	100.0	68	100.0	217	100.0	55	100.0
Age (in years)								
13–19	12	7.7	10	14.7	57	26.3	4	7.3
20–29	50	32.3	23	33.8	81	37.3	18	32.7
30–39	48	31.0	20	29.4	38	17.5	14	25.5
40–49	32	20.6	6	8.8	19	8.8	8	14.5
≥50	9	5.8	7	10.3	9	4.1	2	3.6
Unknown or refused	4	2.6	2	2.9	13	6.0	9	16.4
Race/ethnicity								
Black, non-Hispanic	33	21.3	31	45.6	120	55.3	9	16.4
White, non-Hispanic	16	10.3	11	16.2	11	5.1	4	7.3
Hispanic	85	54.8	15	22.1	71	32.7	34	61.8
Multiracial	8	5.2	4	5.9	2	0.9	0	0.0
Other	5	3.2	4	5.9	8	3.7	1	1.8
Unknown or refused	8	5.2	3	4.4	5	2.3	7	12.7
Transgender identification[b]								
Transsexual	83	53.5	36	52.9	44	20.3	30	54.5
Transgender/transgenderist	61	39.4	22	32.4	123	56.7	13	23.6
Bigender/gender-bender	0	0.0	7	10.3	0	0.0	1	1.8
Gender-queer	1	0.6	3	4.4	8	3.7	1	1.8
Cross-dresser/transvestite	1	0.6	5	7.4	7	3.2	1	1.8
Drag queen	1	0.6	4	5.9	18	8.3	0	0.0
Female impersonator	2	1.3	1	1.5	11	5.1	0	0.0
Other transgender identity	2	1.3	3	4.4	1	0.5	1	1.8
Unknown or refused	10	6.5	1	1.5	11	5.1	9	16.4
Use of hormones, silicone, or BTX[b]								
Hormones	104	67.1	35	51.5	76	35.0	29	52.7
Silicone	21	13.5	12	17.6	18	8.3	12	21.8
BTX	3	1.9	7	10.3	2	0.9	1	1.8
None of the above	37	23.9	23	33.8	102	47.0	16	29.1
Unknown or refused	14	9.0	4	5.9	33	15.2	9	16.4

continued on p. 109

Table 3 (continued). Demographic and behavioral characteristics of male-to-female transgender participants by reported sexual orientation—New York City, San Francisco, and Miami Beach, Florida, January 2005–December 2006[a]

	Heterosexual/straight		*Bisexual*		*Homosexual/gay*		*Other*	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Sex reassignment surgery[b]								
Breast implantation	54	34.8	13	19.1	22	10.1	16	29.1
Penis/testicle removal	10	6.5	3	4.4	5	2.3	0	0.0
Vagina construction	7	4.5	3	4.4	3	1.4	0	0.0
Facial feminization surgery or other unspecified plastic surgery	3	1.9	3	4.4	3	1.4	1	1.8
None of the above	80	51.6	48	70.6	167	77.0	30	54.5
Unknown or refused	14	9.0	6	8.8	20	9.2	9	16.4
Sexual risk behaviors in past 12 months[b]								
Sex with a man	143	92.3	58	85.3	184	84.8	44	80.0
Sex with a woman	5	3.2	32	47.1	23	10.6	0	0.0
Sex with a transgender person	6	3.9	15	22.1	8	3.7	3	5.5
Unprotected receptive anal intercourse	78	50.3	24	35.3	71	32.7	28	50.9
Unprotected insertive anal intercourse	42	27.1	14	20.6	40	18.4	16	29.1
Commercial sex work	68	43.9	36	52.9	76	35.0	33	60.0
Partner of unknown HIV status	48	31.0	17	25.0	34	15.7	16	29.1
Anonymous sex	56	36.1	18	26.5	42	19.4	18	32.7
Sex while high on drugs or drunk	36	23.2	20	29.4	23	10.6	11	20.0
Number of sexual partners (vaginal or anal), past 12 months								
0	1	0.6	2	2.9	7	3.2	2	3.6
1	23	14.8	10	14.7	51	23.5	6	10.9
2–5	37	23.9	28	41.2	51	23.5	6	10.9
6–10	21	13.5	6	8.8	25	11.5	3	5.5
>10	46	29.7	16	23.5	38	17.5	28	50.9
Unknown or refused	27	17.4	6	8.8	45	20.7	10	18.2
Drug injection behaviors in past 12 months[b,c]								
Hormones	68	43.9	19	27.9	61	28.1	21	38.2
Silicone or BTX	14	9.0	11	16.2	15	6.9	11	20.0
Street drugs	7	4.5	11	16.2	12	5.5	5	9.1
Needle sharing	2	1.3	5	7.4	9	4.1	2	3.6

[a]Percentages might not add to 100% due to rounding.

[b]Categories are not mutually exclusive.

[c]Injection of hormones, silicone, or BTX that was not done under the supervision of a health-care provider.

HIV = human immunodeficiency virus

BTX = botulinum toxin type A/Botox®

(1) Having had a partner of unknown HIV status in the past year (adjusted odds ratio [AOR]=4.5, 95% confidence interval [CI] 2.1, 9.3);

(2) Being 20 to 29 years of age (AOR=3.5, 95% CI 1.4, 8.6) or ≥40 years of age (AOR=8.0, 95% CI 2.7, 23.3), compared with being 13 to 19 years of age;

(3) Having last been tested for HIV more than 12 months previously (AOR=2.3, 95% CI 1.1, 4.8), compared with having been tested for HIV during the previous 12 months; and

(4) Having been recruited at the New York City site (AOR=11.7, 95% CI 5.3, 25.9), compared with having been recruited at the other two sites (Table 4).

HIV risk and health-seeking behaviors among FTM TG participants

Among the 42 FTM TG participants, 12 (29%) reported URAI, 15 (36%) reported unprotected receptive vaginal intercourse, and 10 (24%) reported commercial sex work in the past year. One (2%) participant reported having no sexual partners, 13 (31%) reported having one partner, 11 (26%) reported having two to five partners, and 11 (26%) reported having more than five partners. A total of seven (17%) people reported injecting male hormones outside the supervision of a health-care provider, and five (12%) reported injecting street drugs in the past year. Overall, two (5%) participants reported sharing needles. Fifty-seven percent of FTM TG respondents indicated that they had seen a physician, and 20 (48%) reported having been tested for HIV in the past year.

DISCUSSION

Consistent with other reports,[1,3,4,9,12] these findings suggest that a high proportion of MTF TG people are infected with HIV. Approximately 12% of MTF TG participants overall and 20% of non-Hispanic black MTF TG participants who were tested in this project were newly diagnosed with HIV infection. Only people who were HIV-negative or who did not know their HIV status were eligible to be tested or complete surveys in this project. Though our findings are thus not directly comparable to findings from studies of HIV prevalence among MTF TG individuals,[1,3,4] like these other studies, they suggest that there is a high proportion of unrecognized HIV infection among MTF TG people. Although FTM TG participants reported substantial risk behaviors, none had a positive HIV test result in this project, which is consistent with findings from studies that have found comparatively lower prevalence of HIV infection among FTM TG people than among MTF TG people.[1,5]

Among MTF TG people tested in this project, several characteristics were independently associated with increased risk of new HIV diagnosis. On multivariate analysis, people who received a new HIV diagnosis were more likely to have participated in the survey in New York City; to be 20 to 29 or ≥40 years of age; to have reported sex with a partner of unknown HIV status in the past year; and to have last been tested for HIV more than 12 months previously. The three sites had different outreach and recruitment strategies, and characteristics of participants differed substantially across sites. Differences in participants' characteristics likely accounted for the differences in the proportion of participants who were newly diagnosed with HIV infection at the three sites.

Nevertheless, all three sites identified a substantial proportion of MTF TG people with previously undiagnosed HIV infection, ranging from 4% at the Miami Beach site to 20% at the New York City site. These findings suggest that expanding HIV prevention and testing opportunities in TG communities would be an important strategy for identifying TG people with undiagnosed HIV infection who might not otherwise access HIV testing services through traditional HIV service organizations or primary care clinics. These findings also suggest the importance of encouraging annual HIV testing and using recruitment strategies that can reach younger and older TG populations.

A substantial proportion of MTF participants reported engaging in one or more risk behaviors in the past year, including URAI (37%), UIAI (21%), and commercial sex work (44%). Multiple prior studies have shown that TG people often resort to commercial sex work for survival when other sources of income are not available. Difficulty finding employment is exacerbated by discrimination from potential employers.[1,5,13] HIV outreach and prevention programs serving TG communities should consider the need to incorporate referrals to job training and placement programs as a part of risk-reduction strategies.[1,11,13,15] In addition, among MTF TG people in this project, 34% reported injecting hormones, silicone, or BTX outside the supervision of a health-care provider; 7% reported injecting street drugs. Among FTM TG people in this project, 17% reported injecting hormones, silicone, or BTX outside the supervision of a health-care provider; 12% reported injecting street drugs. HIV prevention programs serving TG clients should actively engage TG people in reducing HIV risk from unsafe injection practices, including referrals to substance-abuse

Table 4. HIV test results of male-to-female transgender people by selected demographic, risk, and health-seeking characteristics—New York City, San Francisco, and Miami Beach, Florida, January 2005–December 2006[a]

	HIV-positive		*HIV-negative*		*Unadjusted odds ratio*	*Adjusted odds ratio[b]*
	Number	*Percent*	*Number*	*Percent*	*(95% CI)*	*(95% CI)*
Total	67	100.0	492	100.0		
Age (in years)						
13–19	7	10.4	81	16.5	Referent	Referent
20–29	30	44.8	172	35.0	2.02 (0.85, 4.79)	3.45 (1.38, 8.64)[c]
30–39	10	14.9	123	25.0	0.94 (0.34, 2.57)	2.03 (0.67, 6.14)
≥40	18	26.9	85	17.3	2.45 (0.97, 6.18)	7.99 (2.74, 23.27)[c]
Race/ethnicity						
Hispanic	18	26.9	217	44.1	Referent	—
Black, non-Hispanic	42	62.7	164	33.3	3.09 (1.71, 5.56)[c]	—
White, non-Hispanic	1	1.5	43	8.7	0.28 (0.04, 2.16)	—
Other or multiracial	4	6.0	29	5.9	1.66 (0.53, 5.25)	—
Education						
Less than high school	20	29.9	142	28.9	0.87 (0.47, 1.61)	—
High school graduate	29	43.3	180	36.6	Referent	—
Some college, college degree, or higher	15	22.4	104	21.1	0.90 (0.46, 1.75)	—
Sexual orientation						
Heterosexual/straight	13	19.4	142	28.9	Referent	—
Bisexual	10	14.9	58	11.8	1.88 (0.78, 4.54)	—
Homosexual/gay	32	47.8	185	37.6	1.89 (0.96, 3.73)	—
Sexual risk behaviors in past 12 months[d]						
Unprotected receptive anal intercourse	24	35.8	185	37.6	0.93 (0.54, 1.58)	—
Unprotected insertive anal intercourse	13	19.4	106	21.5	0.88 (0.46, 1.67)	—
Commercial sex work	29	43.3	215	43.7	0.98 (0.59, 1.65)	—
Partner who is HIV-positive	8	11.9	29	5.9	2.16 (0.95, 4.95)	—
Partner of unknown HIV status	21	31.3	102	20.7	1.75 (0.99, 3.05)	4.45 (2.12, 9.33)[c]
Anonymous sex	14	20.9	128	26.0	0.75 (0.40, 1.40)	—
Sex while high on drugs or drunk	11	16.4	84	17.1	0.95 (0.48, 1.90)	—
Number of sexual partners (vaginal or anal), past 12 months						
0	2	3.0	11	2.2	1.30 (0.26, 6.61)	—
1	12	17.9	86	17.5	Referent	—
2–5	13	19.4	116	23.6	0.80 (0.35, 1.85)	—
6–10	10	14.9	48	9.8	1.49 (0.60, 3.71)	—
>10	17	25.4	118	24.0	1.03 (0.47, 2.27)	—
Use of hormones or silicone[d]						
Hormones	28	41.8	230	46.7	0.82 (0.49, 1.37)	—
Silicone	9	13.4	58	11.8	1.16 (0.55, 2.47)	—

continued on p. 112

Table 4 (continued). HIV test results of male-to-female transgender people by selected demographic, risk, and health-seeking characteristics—New York City, San Francisco, and Miami Beach, Florida, January 2005–December 2006[a]

	HIV-positive		*HIV-negative*		*Unadjusted odds ratio*	*Adjusted odds ratio[b]*
	Number	*Percent*	*Number*	*Percent*	*(95% CI)*	*(95% CI)*
Sex reassignment surgery[d]						
Breast implantation	12	17.9	99	20.1	0.87 (0.45, 1.68)	—
Penis/testicle removal	1	1.5	18	3.7	0.55 (0.13, 2.38)	—
Drug injection behaviors in past 12 months[d,e]						
Hormones	22	32.8	161	32.7	1.01 (0.58, 1.73)	—
Silicone or BTX	5	7.5	49	10.0	0.73 (0.28, 1.90)	—
Street drugs	3	4.5	35	7.1	0.61 (0.18, 2.05)	—
Needle sharing	3	4.5	15	3.0	1.49 (0.42, 5.29)	—
Health-seeking behaviors[d]						
Seen a physician for any reason in past 12 months	34	50.7	222	45.1	1.25 (0.75, 2.09)	—
Have a primary care provider	33	49.3	214	43.5	1.26 (0.76, 2.10)	—
Diagnosed with sexually transmitted disease in past 12 months	3	4.5	29	5.9	0.75 (0.22, 2.53)	—
HIV testing history						
Never tested for HIV	5	7.5	40	8.1	1.31 (0.48, 3.61)	1.10 (0.36, 3.30)
Tested for HIV in past 12 months	26	38.8	273	55.5	Referent	Referent
Tested for HIV longer than 12 months ago	19	28.4	66	13.4	3.02 (1.58, 5.79)[c]	2.26 (1.07, 4.77)[c]
HIV testing history unknown or refused	17	25.4	113	23.0	1.58 (0.83, 3.02)	1.74 (0.83, 3.65)
Site						
Miami Beach and San Francisco (combined)	15	22.4	285	57.9	Referent	Referent
New York City	52	77.6	207	42.1	4.77 (2.62, 8.71)[c]	11.74 (5.33, 25.88)[c]

[a]Unknown and refused categories have not been included; percentages might not add to 100% due to rounding.

[b]Adjusted odds ratio in final adjusted model

[c]Statistically significant at $p<0.05$

[d]Categories are not mutually exclusive.

[e]Injection of hormones, silicone, or BTX that was not done under the supervision of a health-care provider.

HIV = human immunodeficiency virus

CI = confidence interval

BTX = botulinum toxin type A/Botox®

treatment programs and to clinicians who regularly work with TG clients on issues of hormonal treatments. HIV prevention programs should make efforts to increase their capacity to address the unique HIV risks among TG people.

Limitations

The findings in this article were subject to several limitations. Although attempts were made to recruit people for HIV testing and surveys as systematically as possible, participants represented a convenience sample of TG people. Therefore, participants were not representative of all TG people living in the three cities served by these CBOs or even all TG people served by the participating CBOs. In addition, all data on risk behaviors and testing history were self-reported. Although interviews were conducted to provide maximum privacy, respondents might have inaccurately reported HIV risk, testing history, and status to outreach staff due to issues of social desirability or recall bias. Additionally, data on linkage to medical care and other HIV services were incomplete because of difficulties tracking referral information.

CONCLUSIONS

The high proportion of newly diagnosed HIV infection among MTF TG participants in this project suggests that providing expanded HIV testing in outreach settings and finding novel and more effective ways to engage TG people are important public health activities. CBOs should consider offering HIV prevention and testing services in a range of outreach settings to increase the availability and use of these services by TG people who are at high risk for HIV infection. Recruitment strategies could incorporate a variety of approaches, including venue-based recruitment, Internet-based outreach, and social network strategies. By utilizing rapid HIV testing technologies, CBOs can provide clients with their results in a single visit, increasing the number of people who receive negative and preliminary positive test results. In addition, rapid HIV tests, which can be performed on oral fluid rather than blood specimens, allow CBOs to more easily administer HIV testing in the field at venues frequented by TG people. By identifying people with undiagnosed HIV infection and linking them to care, HIV disease progression can be delayed and the risk of acquiring opportunistic infections can be reduced.[18,21] Moreover, individuals who are aware of their HIV status have been shown to reduce their risk behaviors, which could decrease the risk of further HIV transmission.[18]

Current CDC testing guidelines recommend annual HIV testing for people at high risk for HIV infection, including men who have sex with men, injection drug users, and commercial sex workers.[21] Likewise, MTF TG people should be encouraged to have an HIV test at least annually, or more frequently if indicated by clinical findings or risk behaviors. CBOs and clinical sites should be encouraged to develop strategies to improve outreach and HIV services to TG communities and to recruit staff who are culturally competent in working with TG people. Efforts should also be continued to develop and evaluate novel strategies to address barriers that TG people may have to receiving HIV prevention and testing services and to being linked to follow-up care after being diagnosed with HIV infection.

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

REFERENCES

1. Clements-Nolle K, Marx R, Guzman R, Katz M. HIV prevalence, risk behaviors, health care use, and mental health status of transgender persons: implications for public health intervention. Am J Public Health 2001;91:915-21.
2. Elifson KW, Boles J, Posey E, Sweat M, Darrow W, Elsea W. Male transvestite prostitutes and HIV risk. Am J Public Health 1993; 83:260-2.
3. Kellogg TA, Clements-Nolle K, Dilley J, Katz MH, McFarland W. Incidence of human immunodeficiency virus among male-to-female transgendered persons in San Francisco. J Acquir Immune Defic Syndr 2001;28:380-4.
4. Simon PA, Reback CJ, Bemis CC. HIV prevalence and incidence among male-to-female transsexuals receiving HIV prevention services in Los Angeles County. AIDS 2000;14:2953-5.
5. Herbst JH, Jacobs ED, Finlayson TJ, McKleroy VS, Neumann MS, Crepaz N. Estimating HIV prevalence and risk behaviors of transgender persons in the United States: a systematic review. AIDS Behav 2008;12:1-17. Epub 2007 Aug 13.
6. Number of people tested for HIV—United States, 2002. MMWR Morb Mortal Wkly Rep 2004;53(47):1110-3.
7. Bockting WO, Simon Rosser BR, Coleman E. Transgender HIV prevention: a model education workshop. J Gay and Lesbian Med Assoc 2000;4:175-83.
8. Bockting WO, Robinson BE, Simon Rosser BR. Transgender HIV prevention: qualitative evaluation of a model prevention education program. J Sex Educ and Therapy 1998;23:125-33.
9. Kenagy GP. HIV among transgendered people. AIDS Care 2002; 14:127-34.
10. Lombardi E. Enhancing transgender health care. Am J Public Health 2001;91:869-72.
11. Garofalo R, Deleon J, Osmer E, Doll M, Harper GW. Overlooked, misunderstood, and at-risk: exploring the lives and HIV risk of ethnic minority male-to-female transgender youth. J Adolesc Health 2006;38:230-6.
12. Nemoto T, Luke D, Mamo L, Ching A, Patria J. HIV risk behaviours among male-to-female transgenders in comparison with homosexual or bisexual males and heterosexual females. AIDS Care 1999;11:297-312.
13. Nemoto T, Operario D, Keatley J, Nguyen H, Sugano E. Promoting health for transgender women: Transgender Resources and Neighborhood Space (TRANS) program in San Francisco. Am J Public Health 2005;95:382-4.
14. Bockting WO, Robinson BE, Forberg J, Scheltema K. Evaluation of a sexual health approach to reducing HIV/STD risk in the transgender community. AIDS Care 2005;17:289-303.
15. Lombardi EL, Wilchins RA, Priesing D, Malouf D. Gender violence:

transgender experiences with violence and discrimination. J Homosex 2001;42:89-101.
16. Lombardi EL, van Servellen G. Building culturally sensitive substance use prevention and treatment programs for transgendered populations. J Subst Abuse Treat 2000;19:291-6.
17. Nemoto T, Operario D, Keatley J, Han L, Soma T. HIV risk behaviors among male-to-female transgender persons of color in San Francisco. Am J Public Health 2004;94:1193-9.
18. Advancing HIV prevention: new strategies for a changing epidemic—United States, 2003. MMWR Morb Mortal Wkly Rep 2003; 52(15):329-32.
19. Nova Research Co. QDS™ (Questionnaire Development System): Version 2.5. Bethesda (MD): Nova Research Co.; 2005.
20. SAS Institute Inc. SAS: Version 9.1. Cary (NC): SAS Institute Inc.; 2003.
21. Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR Recomm Rep 2006;55(RR-14):1-17.