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# Risk Behavior and Sexually Transmitted Infections Among Transgender Women and Men Undergoing Community-Based Screening for Acute and Early HIV Infection in San Diego

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**Abstract:** The transgender community represents an understudied population in the literature. The objective of this study was to compare risk behavior, and HIV and sexually transmitted infection (STI) rates between transgender women and transgender men undergoing community-based HIV testing.

With this retrospective analysis of a cohort study, we characterize HIV infection rates as well as reported risk behaviors and reported STI in 151 individual transgender women and 30 individual transgender men undergoing community based, voluntary screening for acute and early HIV infection (AEH) in San Diego, California between April 2008 and July 2014.

HIV positivity rate was low for both, transgender women and transgender men undergoing AEH screening (2% and 3%, respectively), and the self-reported STI rate for the prior 12 months was 13% for both. Although transgender women appeared to engage in higher rates of risk behavior overall, with 69% engaged in condomless receptive anal intercourse (CRAI) and 11% engaged in sex work, it is important to note that 91% of transgender women reported recent sexual intercourse, 73% had more than 1 sexual partner, 63% reported intercourse with males, 37% intercourse with males and females, and 30% had CRAI.

Our results indicate that in some settings rates of HIV infection, as well as rates of reported STIs and sexual risk behavior in transgender men may resemble those found in transgender women. Our findings

support the need for comprehensive HIV prevention in both, transgender women and men.

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**Abbreviations:** AEH = acute and early HIV infection, CDC = Center of Disease Control and Prevention, CRAI = condomless receptive anal intercourse, IQR = inter-quartile range, MSM = men who have sex with men, STI = sexually transmitted infections.

## INTRODUCTION

Transgender women are considered to be one of the highest risk groups for HIV infection.<sup>1–4</sup> In a recent meta-analysis, the pooled HIV prevalence was 19.1% in transgender women worldwide (n = 11,066), and 21.7% for transgender women in the United States (n = 2705, from 9 studies).<sup>1,5–12</sup> In another meta-analysis, large percentages of transgender women (range 27%–48%) reported engaging in risky behaviors, such as condomless receptive anal intercourse (CRAI), multiple casual partners, or sex work.<sup>13</sup> Notably, however, risk behavior and HIV prevalence data varied widely between studies.<sup>1,8–11,14,15</sup> Also HIV prevalence has been 11.8%, and therefore markedly lower in 18 other studies focusing on self-reported HIV seropositivity among transgender women.<sup>13</sup>

To date, very few studies evaluated HIV prevalence and risk behaviors among transgender men. Most of these studies reported that both, HIV prevalence rates (range 0–3%) and risk behaviors were low among transgender men.<sup>1,6,13</sup> In contrast, similar HIV prevalence rates (about 10%), risk behavior, and sexually transmitted infection (STI) rates in transgender men when compared to transgender women were reported in a more recent study.<sup>11</sup> The objective of this study was to compare risk behavior, HIV, and STI rates between transgender women and transgender men undergoing community-based HIV testing with detection of acute and early HIV infection (AEH).

## METHODS

This retrospective analysis of a cohort study comprises transgender persons who underwent voluntary HIV screening (single and repeat testers) in San Diego, California with the “Early Test” between April 2008 and July 2014. During this time, 181 transgender persons self-identified as transgender men or women and were included in the analysis.

The “Early Test” (<https://theearlytest.ucsd.edu>) is a community-based, voluntary, confidential AEH screening program that provides point-of-care rapid HIV antibody testing followed by reflex HIV nucleic acid amplification testing in all antibody negative persons.<sup>16–18</sup> With the “Early Test” program approximately 4000 individuals per month are screened free of charge

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at 5 regular plus additional mobile-testing sites (including sites at the Lesbian, Gay, Bisexual, Transgender Center; the Gay Men's Health Clinic; the San Diego County Health Department; the Antiviral Research Center; substance abuse treatment centers; and special community event venues) in San Diego, United States. Similar to other settings in the United States men who have sex with men (MSM) bear the greatest burden of HIV infection in San Diego, which is resembled in the "Early Test" where 72% of tests overall, 85% of repeat testing encounters, and 88% of HIV diagnoses are among MSM.<sup>16</sup> Risk behavior was collected by using a risk assessment form with 19 detailed survey questions (focusing primarily on sexual risk behavior, substance use, STI diagnoses – all reported for the prior 12 months – and demographics). Survey questions were assessed and the form filled out by the testing staff before each HIV-testing encounter, and data were later entered into the data system (always in duplicate to minimize data entry errors). After testing clients were recommended to come back 6 months later for the next testing encounter.

For statistical analysis SPSS 21 (SPSS Inc., Chicago, IL) was used. Outcome measures included risk behavior and STIs reported for the previous 12 months at every testing encounter, as well as HIV diagnoses. Outcome measures were compared between transgender women and transgender men using Chi-squared (for proportions) or Mann-Whitney *U* test (for continuous variables, such as numbers of partners). A *P*-value > 0.5 was considered statistically significant.

The University of California, San Diego Human Research Protections Program approved the study protocol and consent. All study participants provided voluntary, written informed consent before any study procedures.

## RESULTS

A total of 14,612 unique clients underwent HIV screening using the "Early Test" between April 2008 and July 2014, including 181 (1.23%) persons who self-identified as transgender persons (who had 278 voluntary HIV tests). Median age was 28 years (inter-quartile range [IQR] 23–35 years); 52% reported Hispanic ethnicity, 24% White race, and 24% other races (mainly Black and Asian).

The sample comprised 151 (83%) unique transgender women and 30 (17%) unique transgender men. Median age was significantly lower among transgender men when compared to transgender women (*P* = 0.001), while no difference was found for race or ethnicity. Twenty-eight (19%) of transgender women and 1 (3%) transgender man underwent repeat testing during the period of study (median of 3 tests/year). Demographic characteristics for transgender women and transgender men are depicted in Table 1.

Overall, 3 of 151 transgender women (1.99%, 1 AEH, 2 chronic) and 1 of 30 transgender men (3.33%, chronic) were newly diagnosed with HIV infection resulting in an HIV cumulative positivity rate of 2% for transgender women and 3% for transgender men. Self-reported STIs for both transgender women and men during the previous 12 months are depicted in Table 1, and included mostly gonorrhea, chlamydia (exclusively reported by transgender women), and syphilis. Proportions of clients reporting any recent STI diagnosis were the same among transgender women and men (13% for both).

At first test, the vast majority of transgender women (95%) and transgender men (91%) reported sexual intercourse during the previous 12 months. Sexual intercourse with males was reported by 91% of transgender women and 63% of transgender

men (*P* = 0.004, median 4 male partners, IQR 2–14), while sexual intercourse with females was reported by 63% of transgender men and 19% of transgender women (*P* > 0.001, median 1 female partner, IQR 1–3). Intercourse with both males and females was reported significantly more frequently among transgender men (37% vs 13% among transgender women; *P* = 0.001). In addition 25/181 transgender clients overall (14%, no significant difference between transgender women and men) reported sexual intercourse with transgender partners (median 1, IQR 1–3 partners); of whom 56% (14/25) also had intercourse with both males and females. Total number of sexual partners in the prior 12 months was slightly higher among transgender women, although this difference was not significant. CRAI was reported significantly more frequently among transgender women (69% vs 13%, *P* > 0.001), while condomless insertive anal intercourse was more frequently reported among transgender men (17% vs 5%, *P* = 0.031). The exchange of sex for money or goods was reported by 17 transgender women (11%) only. Rates of injected and noninjected substance use did not differ between transgender women and men. Table 1 provides prevalence of risk behaviors at first test reported for the prior 12 months in transgender women and men. With regard to STI rates or risk behavior no difference was observed between different ethnicities and races.

## DISCUSSION

This represents one of the largest samplings of transgender persons undergoing AEH screening. The HIV positivity rate, at 2.2%, found for transgender clients in the setting of a community-based AEH screening program, is much lower than previous studied and self-reported prevalence rates among transgender women,<sup>5,7–10,12,19,20</sup> but similar to self-reported prevalence reported for transgender men.<sup>1,6,13,14,21</sup> The overall HIV positivity rate (2.2%) was also similar to the rate (2.1%) reported by Center of Disease Control and Prevention (CDC) HIV-testing sites across the United States for transgender clients.<sup>3</sup> The transgender population reflected in the CDC report was at the highest risk of HIV when testers were broken down by gender, with cisgender females constituting 0.2% of new HIV diagnoses and cisgender males constituting 0.9%. Interestingly, the transgender group in our study has lower rates of new HIV diagnoses than the 4.69% found in our MSM population.<sup>16,17</sup>

When our cohort is broken down by gender, transgender women had a slightly lower (not significant) HIV rate (1.99%) than transgender men (3.33%) although this was based on only 1 case among transgender men. Nevertheless, this is an interesting finding in the context of the predominance of literature suggesting that transgender women represent a higher HIV risk group. Most studies describe much higher HIV rates in transgender women than transgender men, sometimes as high as 68%.<sup>1,5,7–10,12–14,19–21</sup> The CDC data, to which our numbers are most similar, simply use the blanket of "transgender" for its results and do not break down results further.<sup>3</sup> Because our data is the result of only a single individual in a small cohort of transgender men, the overall prevalence of HIV in transgender men may differ.

We also found that 13.3% of transgender men self-reported STIs (mostly gonorrhea), which is higher than the STI rates reported previously for transgender men (6% and 7%).<sup>13</sup> In contrast, cumulative self-reported STI rates of 13.2% in transgender women found in this study fall within the (lower) range of what have been previously reported.<sup>12</sup> In a 2008 meta-analysis of

**TABLE 1.** Demographic Characteristics and Prevalence of Self-Reported STIs/Risk Behaviors in the Prior 12 Months of Transgender Individuals Undergoing Community-Based Screening for Acute/Early HIV

	Transgender Women (n = 151)	Transgender Men (n = 30)	P Value*	All Subjects (n = 181)
Reported risk behavior				
Number of sex partners (median, IQR)	5 (2–15)	4 (1–6)	n.s.	5 (2–14)
10 or more partners	47/151 (31.1%)	5/30 (16.7%)	n.s.	52/181 (28.7%)
Sexual intercourse with males	137/151 (90.7%)	19/30 (63.3%)	0.004	156/181 (86.2%)
Sexual intercourse with females	27/151 (17.9%)	19/30 (63.3%)	<0.001	45/181 (24.9%)
Sexual intercourse with transgenders	18/151 (11.9%)	7/30 (23.3%)	n.s.	25/181 (13.8%)
CIAI	7/151 (4.6%)	5/30 (16.7%)	0.031	12/181 (6.6%)
CRAI	104/151 (69%)	9/30 (30%)	<0.001	113/181 (62.4%)
CRAI with HIV positive	4/151 (2.6%)	1/30 (3.3%)	n.s.	5/181 (2.8%)
CRAI with PWID	4/151 (2.6%)	1/30 (3.3%)	n.s.	5/181 (2.8%)
Condomless vaginal receptive intercourse	7/151 (4.6%)	5/30 (16.7%)	0.031	12/181 (6.6%)
Condomless vaginal insertive intercourse	9/151 (6.0%)	7/30 (23.3%)	0.007	16/181 (8.8%)
Worked as sex worker	17/151 (11.3%)	0	n.s.	17/181 (9.4%)
Methamphetamine, not injected	18/151 (11.9%)	3/30 (10%)	n.s.	21/181 (11.6%)
Nitrites, inhaled	14/151 (9.3%)	2/30 (6.7%)	n.s.	16/181 (8.8%)
Noninjection stimulant drug use (ie, methamphetamine, cocaine, poppers, GHB, ketamine, XTC)	29/151 (19.2%)	4/30 (13.3%)	n.s.	33/181 (18.2%)
IDU	1/151 (1%)	0	n.s.	1/181 (0.5%)
Self-reported STIs				
Any STI	20/151 (13.2%)	4/30 (13.3%)	n.s.	24/181 (13.2%)
Gonorrhoea	11/151 (7.3%)	4/30 (13.3%)	n.s.	15/181 (8.3%)
Chlamydia	15/151 (9.9%)	0	n.s.	15/181 (8.3%)
Syphilis	4/151 (2.6%)	1/30 (3.33%)	n.s.	5/181 (2.8%)
Other STIs	2/152 (1.3%)	0	n.s.	2/181 (1.1%)
Demographic data				
Age (years; median, IQR)	29 (25–35)	24 (21–27)	0.001	28 (23–34)
Hispanic ethnicity	83/151 (55.0%)	11/30 (36.7%)	n.s.	94/181 (51.9%)
Race White	33/151 (21.9%)	10/30 (33.3%)	n.s.	43/181 (23.7%)
Race other	35/151 (23.2%)	9/194 (30.0%)	n.s.	44/181 (24.3%)

CIAI = condomless insertive anal intercourse; CRAI = condomless receptive anal intercourse; GHB = gamma hydroxybutyrate; IDU = injection drug use; IQR = inter-quartile range; n.s. = not significant; PWID = person who injects drugs; STI = sexual transmitted infection; XTC = ecstasy. \* Calculated using Chi-square or Mann–Whitney U test.

transgender risk behavior, self-reported prior STI diagnosis in MTF was between 12% to 79% in 10 studies, with a weighted mean of 21.1%.<sup>13</sup>

Also notable were the high rates of risk behaviors seen in both groups. Although transgender women appeared to engage in higher rates of risk behavior overall, with 69% engaged in CRAI and 11% engaged in sex work, it is important to note that 91% of transgender women reported recent sexual intercourse, 73% had more than 1 sexual partner, 63% reported intercourse with males, 37% intercourse with males and females, and 30% had CRAI. This finding stands in contrast to a previous study, where 66% of transgender men reported either no sex at all or only intercourse with 1 sex partner.<sup>5</sup>

The most important limitation of the study is the small sample size, in particular of transgender men. Also, the age of the transgender women was significantly higher than the age of transgender men which might have influenced risk behavior and infection outcomes.

In conclusion, our results indicate that in some setting rates of HIV infection, as well as rates of reported STIs and sexual risk behavior in transgender men may resemble those found in transgender women. Our finding has also been supported by

another recent study.<sup>11</sup> Our results therefore highlight the need for comprehensive HIV prevention, including preexposure prophylaxis, in both transgender women and men in similar settings.

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