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## Medical Gender Affirmation and HIV and Sexually Transmitted Disease Prevention in Transgender Youth: Results from the Survey of Today's Adolescent Relationships and Transitions, 2018

Jack Andrzejewski, MPH<sup>1,2</sup>, Richard Dunville, MPH<sup>3</sup>, Michelle M. Johns, MPH, PhD<sup>3</sup>, Stuart Michaels, PhD<sup>4</sup>, Sari L. Reisner, ScD<sup>5,6,7,8</sup>

<sup>1</sup>Oak Ridge Associated Universities, Oak Ridge, Tennessee, USA.

<sup>2</sup>San Diego State University—University of California, San Diego, Joint Doctoral Program in Public Health, San Diego, California, USA.

<sup>3</sup>Division of Adolescent and School Health, Centers for Disease Control and Prevention, Atlanta, Georgia, USA.

<sup>4</sup>NORC at the University of Chicago, Chicago, Illinois, USA.

<sup>5</sup>Division of Endocrinology, Diabetes and Hypertension, Brigham and Women's Hospital, Boston, Massachusetts, USA.

<sup>6</sup>Department of Medicine, Harvard Medical School, Boston, Massachusetts, USA.

<sup>7</sup>Department of Epidemiology, Harvard T.H. Chan School of Public Health, Boston, Massachusetts, USA.

<sup>8</sup>The Fenway Institute, Fenway Health, Boston, Massachusetts, USA.

### Abstract

**Purpose:** We assessed the association of receipt of medical gender affirmation services (e.g., hormones, surgery) with HIV and other sexually transmitted disease (STD) prevention and knowledge indicators among transgender youth.

**Methods:** A United States online sample of sexually experienced transgender youth ages 13–24 years ( $N = 1029$ ) in 2018 completed a cross-sectional survey, including questions about

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Address correspondence to: *Michelle M. Johns, MPH, PhD, Division of Adolescent and School Health, Centers for Disease Control and Prevention, 1600 Clifton Road, US8-1, Atlanta, GA 30329, USA, mjohns1@cdc.gov.*

#### Author Contributions

R.D., M.M.J., and S.M. conceptualized and designed the study, oversaw data collection, provided input on the analysis, helped interpret findings, and participated in drafting and editing the article. S.L.R. provided input on the analysis, helped interpret findings, and participated in drafting and editing of the article. J.A. led the analysis, helped interpret the findings, and was the primary author drafting the article and incorporating co-author feedback. All authors approved the final article as submitted and agree to be accountable for all aspects of the work.

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The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention or the National Institutes of Health.

#### Author Disclosure Statement

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sociodemographics, medical gender affirmation, and HIV and STD prevention outcomes (HIV testing, STD testing, pre-exposure prophylaxis [PrEP] awareness, and nonoccupational postexposure prophylaxis [nPEP] awareness). Logistic regression models were fit to assess the association of medical gender affirmation with HIV and STD prevention outcomes. Interaction terms and stratified models assessed differences in the association between medical gender affirmation and outcomes by gender identity.

**Results:** Participants' mean age was 19.1 (standard deviation = 2.7), 45% were transgender female, 29% transgender male, 26% nonbinary, 53% were youth of color, and 19% accessed medical gender affirmation services. Medical gender affirmation was associated with increased odds of STD testing (adjusted odds ratio [aOR] = 1.90; 95% confidence interval [CI] = 1.33–2.73) with no significant interactions by gender identity. Associations between medical gender affirmation and awareness of PrEP and nPEP varied by gender identity. Among transgender male youth, medical gender affirmation was associated with awareness of PrEP (aOR = 2.65; 95% CI = 1.50–4.71) and nPEP (aOR = 2.03; 95% CI = 1.12–3.71). Among nonbinary youth, medical gender affirmation was associated with awareness of PrEP (aOR = 3.47; 95% CI = 1.26–11.27).

**Conclusion:** Medical gender affirmation was associated with uptake and awareness of sexual health services. Bolstering medical gender affirmation for transgender youth may also bolster preventive health services broadly.

### Keywords

gender affirmation; gender identity; health services; HIV; STD; transgender

## Introduction

Transgender youth are at disproportionate risk for HIV and other sexually transmitted diseases (STDs). A recent meta-analysis of studies, including laboratory-confirmed HIV testing, estimated an HIV prevalence of 9.2% for all transgender persons in the United States, with prevalence for transgender women (14.2%) significantly higher than for transgender men (3.2%).<sup>1</sup> Although transgender men appear to have a lower HIV prevalence than transgender women, research suggests that they may also be at risk for contracting HIV, particularly transgender men who have sex with cisgender men.<sup>2,3</sup> Fewer data have been published on nonbinary youth, yet aggregate measures of transgender youth that include nonbinary individuals suggest increased HIV risk behaviors compared with cisgender youth.<sup>4</sup> Furthermore, transgender youth are at disproportionate risk for syndemic factors,<sup>5</sup> which increase the risk of HIV acquisition, such as poor mental health, substance use, and violence victimization.<sup>4</sup> Studies suggest that transgender men and women are disproportionately impacted by STDs as well.<sup>6,7</sup> Furthermore, one study found that transgender teens were more likely to have ever had sex and less likely to use a condom at last sex than their cisgender peers, potentially increasing their risk for STDs.<sup>8</sup>

These health-related risk factors demonstrate a need for gender-affirming and youth-friendly health services, which transgender youth have also identified as important.<sup>9–11</sup> Gender affirmation refers to a process by which individuals are recognized as and supported in living their gender identity and/or expression,<sup>12</sup> and includes four dimensions: social,

psychological, medical, and legal.<sup>13</sup> In particular, medical gender affirmation involves treatments such as puberty blockers, hormone replacement therapy, and surgical and other procedures meant to feminize or to masculinize the body. Although not all transgender individuals want or will seek medical gender affirmation, these services play a large role in the health and wellbeing of those experiencing gender dysphoria. Indeed, the World Professional Association for Transgender Health has deemed medical gender affirmation as medically necessary for the treatment of gender dysphoria.<sup>14</sup> In addition, the American Academy of Pediatrics released a policy statement recommending that transgender youth have access to gender-affirming and developmentally appropriate health care.<sup>15</sup> Given the importance of medical gender affirmation services in the lives of transgender youth, investigation of the association between receipt of medical gender affirmation services and health outcomes is warranted.

Medical gender affirmation is associated with improvements in mental distress (i.e., lower levels of depression, suicidal ideation, anxiety, and stress), health-related quality of life, and lower frequency of alcohol use, binge drinking, and other substance use.<sup>16–19</sup> A few studies have examined the association between accessing medical gender affirmation services and HIV- and STD-related behaviors with somewhat mixed results. Among seronegative transgender youth, medical gender affirmation was not associated with HIV prevention behaviors (e.g., HIV testing),<sup>20</sup> or risk factors for HIV.<sup>21</sup> Another study found medical gender affirmation to be associated with increased likelihood of condomless vaginal and/or anal intercourse.<sup>22</sup> Among transgender women of color living with HIV, gender affirmation in health care was related to increased rates of viral suppression.<sup>23</sup> Such limited research calls for further investigations of gender affirmation services in relation to health-promoting behaviors (e.g., STD testing), as well as awareness of biomedical prevention strategies such as pre-exposure prophylaxis (PrEP). Furthermore, work in this area is generally limited to transgender women or does not investigate distinctions in these relationships across diverse gender identities.

Our analysis begins to fill these gaps by using a U.S. national online sample of transgender youth, ages 13–24 years, to examine the associations between accessing medical gender affirmation services and four prevention outcomes: lifetime HIV testing, lifetime STD testing, awareness of PrEP, and awareness of nonoccupational postexposure prophylaxis (nPEP). We hypothesized that receipt of medical gender affirmation would be associated with uptake of HIV and STD testing and awareness of PrEP and nPEP. Furthermore, we expected that the association between medical gender affirmation services and these outcomes would differ by gender identity.

## Methods

### Sample

Data were from the Survey of Today's Adolescent Relationships and Transitions, a U.S. national, one-time, cross-sectional online survey of 3108 youth comprising sexual minority males ages 13–18 years and transgender youth ages 13–24 years. Transgender participants ( $n = 1567$ ) were eligible for this study if their gender identity was different from their sex assigned at birth.

Recruitment occurred online between January and April of 2018 through social media advertisements posted on Facebook, Instagram, and Snapchat. Participants clicked on the advertisements taking them to the survey-landing page where they were screened for eligibility and given information about the study, incentive for participation, and their rights as a participant. Youth provided informed consent or assent depending on age. A waiver of parental permission for youth younger than age 18 as well as a waiver of documentation of consent was granted. Upon completion of the survey, participants were awarded a \$10 Amazon gift card. All study procedures were in English. The research protocol was reviewed and approved by the NORC at the University of Chicago Institutional Review Board. More information about the study design, recruitment, implementation, and data management can be found elsewhere.<sup>24</sup>

We restricted the sample to sexually experienced transgender youth who self-reported being HIV negative or did not know their status and provided answers to all questions included in our analysis. Our analytic sample contained 1029 participants.

## Measures

**Sociodemographic variables.**—We assessed gender identity using a two-step method that first asked the participants their sex assignment at birth and then gender identity with the question, “How do you currently describe your gender?” with response options “male,” “female,” “genderqueer/gender nonconforming,” “transgender female-to-male,” “transgender male-to-female,” or “something else.” Participants were considered transgender if their current gender identity differed from their sex assignment at birth. We aggregated the categories “male” with “transgender female-to-male” to define transgender male youth, “female” with “transgender male-to-female” for transgender female youth, and “genderqueer/gender nonconforming” with “something else” for nonbinary youth. Previous sexual experience was assessed with the question, “During your life, with whom have you had sexual contact?” with response options I have never had sexual contact, females, males, females and males, do not know, and prefer not to answer. We defined sexually experienced as those who responded females, males, or females and males.

We combined race and ethnicity into a single item with the categories non-Hispanic/Latinx White, non-Hispanic/Latinx Black, Latinx, and other, which included non-Hispanic/Latinx American Indian or Alaska Native, non-Hispanic/Latinx Native Hawaiian or other Pacific Islander, non-Hispanic/Latinx Asian, and non-Hispanic/Latinx participants who selected more than one race (i.e., multiracial). We chose non-Hispanic/Latinx White as our reference group because it was the largest and represents the racial/ethnic category with the most privilege. Participants who selected “do not know” or “prefer not to answer” for both race and ethnicity were excluded from the analysis ( $n = 14$ ). Age was assessed with the open response question “How old are you?” and was treated as a continuous variable.

We assessed potential socioeconomic barriers to health care with the following three questions: “In the past 12 months, was there a time where there wasn’t enough money in your house or apartment for rent, food, or utilities such as gas, electric, or phone?,” “Do you currently have health care coverage of any kind, government, or private?,” and “During the past 12 months, was there any time when you needed medical care but didn’t get it because

it costs too much money?” with the response options “yes,” “no,” “don’t know,” and “prefer not to answer.” Each question was used as a single item measure, and participants who responded “don’t know” or “prefer not to answer” were excluded from the analysis ( $n = 124$ ).

**Medical gender affirmation services.**—We assessed receipt of medical gender affirmation services with the question, “Have you taken cross-sex hormones or pubertal blockers or had any surgery to affirm your gender?” with the response options “yes,” “no but I plan to,” “no and I do not plan to,” “this does not apply to me,” “don’t know,” and “prefer not to answer.” We created a binary medical gender affirmation variable “yes” and “no” (comprising “no but I plan to” and “no and I do not plan to” response options). Participants who responded, “this does not apply to me,” “don’t know,” and “prefer not to answer” were excluded from the analysis ( $n = 45$ ) to ensure that participants understood the question and that it was relevant to them.

**HIV prevention.**—We assessed lifetime HIV testing with the question, “Have you ever been tested for HIV, the virus that causes AIDS?” with response options “yes,” “no,” “do not know,” and “prefer not to answer.” We measured lifetime STD testing with the question, “Have you ever been tested for other sexually transmitted diseases (STDs) such as gonorrhea, chlamydia, genital herpes, syphilis, or genital warts?” with response options “yes,” “no,” “do not know,” and “prefer not to answer.” We evaluated PrEP awareness with the question, “Before today, had you heard of PrEP or Truvada?” with response options “yes,” “no,” “do not know,” and “prefer not to answer.” We assessed nPEP awareness with the question, “Before today, had you heard of nPEP (sometimes just called PEP)?” with response options “yes,” “no,” “do not know,” and “prefer not to answer.” In each case, we excluded participants who selected “do not know” or “prefer not to answer” for the specific HIV prevention-related outcome being examined.

## Data analyses

Analyses were conducted in R version 3.5.<sup>25</sup> After removing cases with missing data on demographics and medical gender affirmation, we conducted bivariate analyses to assess the relationship between receipt of medical gender affirmation services and our sociodemographic variables using the chi-square test of independence for all variables, except age. For age, we used an independent sample *t*-test with equal variance (confirmed by visual inspection of boxplots, data not shown) to test mean differences in age by medical gender affirmation services accessed. We then used the chi-square test of independence to assess the relationship between receipt of medical gender affirmation services and each of our four outcome variables.

For our multivariable analyses, we first regressed the outcomes on receipt of medical gender affirmation services, gender identity, race/ethnicity, age, not enough money for basic needs in the past 12 months, health insurance status, and not receiving medical care in the past 12 months because of costs. We then added interaction terms for receipt of medical gender affirmation services by gender identity. In the cases where interaction terms were significant, we stratified our data by gender identity and again regressed the outcomes on receipt of

medical gender affirmation services along with our other covariates, separately for each gender identity group. All models were constructed using the “glm” function in R. We report adjusted odds ratios (aORs) and 95% confidence intervals (95% CIs) for each model, excluding models without significant interaction terms. We considered findings with a  $p$  value of  $<0.05$  to be statistically significant.

## Results

Approximately half of the sample (45.5%) was transgender female (identified as female or transgender male-to-female), whereas 28.9% were transgender male (identified as male or transgender female-to-male), and 25.6% were nonbinary (identified as genderqueer, gender nonconforming, or some other nonbinary gender). Nearly one-fifth (19.1%) of respondents had ever accessed medical gender affirmation services. In bivariate analyses, having accessed medical gender affirmation services was significantly associated with gender identity, race/ethnicity, health insurance status, having not received medical care in the past 12 months because of cost, and age (Table 1).

As shown in Table 2, 47.1% of participants had ever been tested for HIV, 34% had ever been tested for STDs, 50.1% had heard of PrEP, and 31.7% had heard of nPEP. Bivariate analyses found that participants who had ever accessed medical gender affirmation services were significantly more likely to have ever been tested for HIV, to have ever been tested for STDs, to have heard of PrEP, and to have heard of nPEP (Table 2).

For the full sample, having accessed medical gender affirmation services was significantly associated with increased odds of lifetime STD testing (aOR = 1.90; 95% CI = 1.33–2.73) and having heard of PrEP (aOR = 1.85; 95% CI = 1.29–2.65) (Table 3). For the outcomes heard of PrEP and heard of nPEP, statistically significant interaction terms suggested that the effect of medical gender affirmation services on these outcomes varied by gender identity. These interactions were not statistically significant for lifetime HIV or STD testing. In stratified models (Table 4), transgender male participants who had accessed medical gender affirmation services were more likely to have heard of PrEP (aOR = 2.65; 95% CI = 1.50–4.71) and to have heard of nPEP (aOR = 2.03; 95% CI = 1.12–3.71) than transgender males who had not accessed medical gender affirmation services. For nonbinary participants, those who had accessed medical gender affirmation services were more likely to have heard of PrEP (aOR = 3.47; 95% CI = 1.26–11.27) than nonbinary participants who had not accessed medical gender affirmation services.

For the covariates in our models, Black participants were more likely than White participants to have ever been tested for HIV (aOR = 1.74; 95% CI = 1.08–2.82) and to have ever been tested for STDs (aOR = 1.83; 95% CI = 1.14–2.94). Latinx participants were more likely than White participants to have tested for HIV (aOR = 1.61; 95% CI = 1.13–2.31), yet less likely to have heard of PrEP (aOR = 0.66; 95% CI = 0.47–0.92). Having health insurance was significantly associated with increased odds of all four outcomes (aORs ranged from 1.48–3.05). Similarly, for age, older participants had significantly increased odds of all four outcomes (aORs ranged from 1.10–1.37).

## Discussion

In this U.S. national online study of diverse transgender youth, findings demonstrated that receipt of medical gender affirmation services was associated with greater odds of lifetime STD testing, awareness of PrEP, and awareness of nPEP, thus contributing to a growing body of research on the relationship between positive health outcomes or behaviors and medical gender affirmation.<sup>23,26–28</sup> In contrast to our hypothesis, medical gender affirmation was not associated with lifetime HIV testing. One possible explanation is that STD testing may be an indicator of health services broadly, whereas HIV testing is more frequently available in nonclinical settings (e.g., Pride events, thrift stores). This may suggest that health care access explains the relationship between medical gender affirmation and STD testing; however, our findings were similar after adjusting for health insurance. Overall, our findings suggest that medical gender affirmation is associated with uptake and awareness of health services.

Among transgender youth in our sample, 19% had accessed medical gender affirmation services with differences by gender identity (transgender male 33%; transgender female 15%; nonbinary 10%). Overall, 47% had been tested for HIV, 34% had been tested for STDs, 50% had heard of PrEP, and 32% had heard of nPEP. Participants in our sample reported having ever tested for HIV more frequently than estimates of transgender adults,<sup>29</sup> transgender teens,<sup>4</sup> and adolescent sexual minority males.<sup>30</sup> Yet compared with an estimate of lifetime STD testing in transgender youth (72%),<sup>22</sup> the proportion in our sample was lower. Estimates of PrEP and nPEP awareness among men who have sex with men and transgender women vary widely (PrEP 21%–59%; nPEP 34%–63%),<sup>31–35</sup> and our findings appear to be within the range for PrEP, yet lower for nPEP awareness.

Medical gender affirmation may lead to improved uptake or awareness of HIV and STD prevention and related health services through multiple pathways. Medical gender affirmation may increase transgender youth's engagement with medical services in general, thereby increasing the potential for sexual health service delivery and awareness. Medical gender affirmation may also lead to increased self-actualization in transgender youth, so that once affirmed in their gender identity, youth may be more inclined to engage in self-care or health-promoting behaviors.<sup>12</sup> Indeed, given research showing improvements in mental health following medical gender affirmation,<sup>16,26,28,36</sup> transgender youth receiving medical gender affirmation may feel empowered to engage with other health care services such as STD testing.<sup>23</sup> Future work should test these explanatory pathways.

Associations between medical gender affirmation and HIV knowledge indicators varied by gender identity. Among transgender male youth, medical gender affirmation was associated with elevated odds of PrEP awareness and nPEP awareness, and among nonbinary youth, medical gender affirmation was associated with PrEP awareness. However, for transgender female youth, there did not appear to be an association between medical gender affirmation and awareness of PrEP or nPEP. Although unclear, it is possible that transgender female youth are more likely to be the target of HIV prevention programs, independent of accessing medical gender affirmation; thus, medical gender affirmation may not have as much impact on awareness of PrEP and nPEP. Heterogeneity of effects by gender identity indicates a need

to better understand and evaluate HIV risk and targeted prevention efforts among transgender male and nonbinary youth. Future research exploring HIV risk and prevention across diverse genders can inform the development of guidelines for HIV prevention (e.g., PrEP guidelines) that are both inclusive of and specific to transgender male, transgender female, and nonbinary youth.

In terms of our covariates, older age and having health insurance consistently predicted greater odds of HIV/STD prevention and awareness indicators. This finding suggests that health insurance may be an intervention target for HIV/STD prevention for transgender youth and more work is needed to investigate these relationships further. For race and ethnicity, Black and Latinx transgender youth were more likely to have tested for HIV than White transgender youth. Furthermore, Black and other youth of color (but not Latinx youth) were more likely than White youth to have ever tested for STDs. While it is unclear from the literature which racial/ethnic groups test for HIV/STDs more frequently,<sup>20,29,37</sup> it is promising to see those disproportionately impacted by HIV/STDs engaged in prevention services.<sup>38</sup> However, youth of color were less or no more likely than White youth to be aware of PrEP and nPEP, similar to previous findings.<sup>39</sup> Targeted health promotion messages about PrEP and nPEP are needed, as lack of awareness of these prevention technologies may be a barrier to uptake of such services among transgender people of color.<sup>40</sup> Future research is needed to understand the complex relationships between racial/ethnic identity and use/awareness of HIV/STD prevention services among transgender youth and may benefit from being informed by intersectionality frameworks.<sup>41–43</sup>

## Limitations

We used convenience sampling, and therefore our findings cannot be generalized to all transgender youth living in the United States. Given that these data are cross-sectional, temporality of medical gender affirmation and our outcomes could not be assessed. We did not assess need for medical gender affirmation services, which may be less salient for some transgender youth than for others. Furthermore, we were not able to disentangle the type of medical gender affirmation that transgender youth accessed. It may be that transgender youth accessing hormones only have very different experiences from those accessing hormones and surgery. In addition, all items were self-report and responses to HIV/STD prevention services items may be impacted by social desirability. Future research would benefit from continued exploration of the components of medical gender affirmation services, use of HIV and STD prevention services, and potential mechanisms driving the observed relationships. Finally, we were unable to assess how these relationships may vary among different racial/ethnic groups, an important consideration for future work.

## Conclusions

Many transgender youth, including those with binary and nonbinary gender identities, access medical gender affirmation services, which are medically necessary for the treatment of gender dysphoria. The relationships between medical gender affirmation and HIV/STD prevention services observed in this study may suggest that bolstering medical gender affirmation services for transgender youth who desire them may also improve uptake and



awareness of sexual health and other health services. Certainly, others have found that evidence-based interventions, including referral and linkage to health care services (e.g., PrEP) may be less effective if medical gender affirmation needs are not met,<sup>44</sup> lending further support to the idea that transgender youths' health care needs are best approached holistically. Still, more research is needed to understand the drivers of the relationship between medical gender affirmation services and HIV/STD prevention, including why and in what contexts these relationships exist. Longitudinal studies are needed and future research should explore the causal mechanisms through which medical gender affirmation is connected to other health-seeking behaviors. Providers should assess the need for medical gender affirmation and preventive sexual health services and refer youth to these services as appropriate.

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**Table 1.** Sociodemographic Characteristics by Ever Having Accessed Medical Gender Affirmation Services Among Sexually Experienced Transgender Youth (Age 13–24 Years)—United States Survey of Today’s Adolescent Relationships and Transitions, 2018

| <i>Ever accessed medical gender affirmation services?</i>               |                                 |                        |                       |                      |
|-------------------------------------------------------------------------|---------------------------------|------------------------|-----------------------|----------------------|
|                                                                         | <i>Total Sample<sup>a</sup></i> | <i>Yes<sup>b</sup></i> | <i>No<sup>b</sup></i> | <i>p<sup>*</sup></i> |
|                                                                         | <i>1029</i>                     | <i>197, 19.1%</i>      | <i>832, 80.9%</i>     |                      |
| Gender identity                                                         |                                 |                        |                       | <0.001               |
| Transgender female (female or transgender male-to-female), <i>n</i> (%) | 468 (45.5)                      | 70 (15.0)              | 398 (85.0)            |                      |
| Transgender male (male or transgender female-to-male), <i>n</i> (%)     | 297 (28.9)                      | 100 (33.7)             | 197 (66.3)            |                      |
| Nonbinary (genderqueer/gender nonconforming or other), <i>n</i> (%)     | 264 (25.6)                      | 27 (10.2)              | 237 (89.8)            |                      |
| Race/ethnicity                                                          |                                 |                        |                       | <0.001               |
| Non-Hispanic/Latinx White, <i>n</i> (%)                                 | 487 (47.3)                      | 100 (20.5)             | 387 (79.5)            |                      |
| Non-Hispanic/Latinx Black, <i>n</i> (%)                                 | 119 (11.6)                      | 8 (6.7)                | 111 (93.3)            |                      |
| Hispanic/Latinx, <i>n</i> (%)                                           | 267 (25.9)                      | 47 (17.6)              | 220 (82.4)            |                      |
| Other, <i>n</i> (%)                                                     | 156 (15.2)                      | 42 (26.9)              | 114 (73.1)            |                      |
| Not enough money for basic needs in the past 12 months                  |                                 |                        |                       | 0.318                |
| Yes, <i>n</i> (%)                                                       | 386 (37.5)                      | 80 (20.7)              | 306 (79.3)            |                      |
| No, <i>n</i> (%)                                                        | 643 (62.5)                      | 117 (18.2)             | 526 (81.8)            |                      |
| Has health insurance                                                    |                                 |                        |                       | <0.001               |
| Yes, <i>n</i> (%)                                                       | 750 (72.9)                      | 169 (22.5)             | 581 (77.5)            |                      |
| No, <i>n</i> (%)                                                        | 279 (27.1)                      | 28 (10.0)              | 251 (90.0)            |                      |
| Did not receive medical care because of costs in the past 12 months     |                                 |                        |                       | 0.002                |
| Yes, <i>n</i> (%)                                                       | 370 (36.0)                      | 90 (24.3)              | 280 (75.7)            |                      |
| No, <i>n</i> (%)                                                        | 659 (64.0)                      | 107 (16.2)             | 552 (83.8)            |                      |
| Age, mean (standard deviation)                                          | 19.1 (2.7)                      | 19.7 (2.5)             | 18.9 (2.7)            | <0.001               |

\* All *p* values are from chi-squared tests, except for age. The *p* value for age was derived from an independent sample *t*-test with equal variance.

<sup>a</sup> Column percentages.

<sup>b</sup> Row percentages.

**Table 2.**

HIV Testing, Sexually Transmitted Disease Testing, Awareness of Pre-exposure Prophylaxis, and Awareness of Nonoccupational Postexposure Prophylaxis by Ever Having Accessed Medical Gender Affirmation Services Among Sexually Experienced Transgender Youth (Age 13–24 Years)—United States Survey of Today’s Adolescent Relationships and Transitions, 2018

|                                         | <i>Ever accessed medical gender affirmation services?</i> |            | <i>P</i> <sup>*</sup> |
|-----------------------------------------|-----------------------------------------------------------|------------|-----------------------|
|                                         | <i>Total sample</i>                                       | <i>Yes</i> | <i>No</i>             |
| Ever tested for HIV ( <i>n</i> = 1013)  |                                                           |            | 0.005                 |
| Yes, <i>n</i> (%)                       | 477 (47.1)                                                | 109 (56.2) | 368 (44.9)            |
| No, <i>n</i> (%)                        | 536 (52.9)                                                | 85 (43.8)  | 451 (55.1)            |
| Ever tested for STDs ( <i>n</i> = 1015) |                                                           |            | <0.001                |
| Yes, <i>n</i> (%)                       | 345 (34.0)                                                | 96 (49.7)  | 249 (30.3)            |
| No, <i>n</i> (%)                        | 670 (66.0)                                                | 97 (50.3)  | 573 (69.7)            |
| Heard of PrEP ( <i>n</i> = 1021)        |                                                           |            | <0.001                |
| Yes, <i>n</i> (%)                       | 512 (50.1)                                                | 127 (64.8) | 385 (46.7)            |
| No, <i>n</i> (%)                        | 509 (49.9)                                                | 69 (35.2)  | 440 (53.3)            |
| Heard of nPEP ( <i>n</i> = 1018)        |                                                           |            | 0.002                 |
| Yes, <i>n</i> (%)                       | 323 (31.7)                                                | 80 (40.8)  | 243 (29.6)            |
| No, <i>n</i> (%)                        | 695 (68.3)                                                | 116 (59.2) | 579 (70.4)            |

\* All *p* values are from chi-squared tests.

nPEP, nonoccupational postexposure prophylaxis; PrEP, pre-exposure prophylaxis; STDs, sexually transmitted diseases.

**Table 3.**

Multivariable Models Regressing HIV and Sexually Transmitted Disease Prevention Outcomes on Receipt of Medical Gender Affirmation Services in Sexually Experienced Transgender Youth (Age 13–24 Years)—United States Survey of Today’s Adolescent Relationships and Transitions, 2018

|                                                            | Ever tested HIV (n = 1013)   |                     | Ever tested STD (n = 1015)   |                     | Heard of PrEP (n = 1021)     |                     | Heard of nPEP (n = 1018)     |                             |
|------------------------------------------------------------|------------------------------|---------------------|------------------------------|---------------------|------------------------------|---------------------|------------------------------|-----------------------------|
|                                                            | Main effects<br>aOR (95% CI) |                     | Main effects<br>aOR (95% CI) |                     | Main effects<br>aOR (95% CI) |                     | Main effects<br>aOR (95% CI) | Interaction<br>aOR (95% CI) |
| Medical gender affirmation services                        |                              |                     |                              |                     |                              |                     |                              |                             |
| No                                                         | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | —                           |
| Yes                                                        | 1.28 (0.89–1.85)             | 1.90 (1.33–2.73)*** | 1.85 (1.29–2.65)***          | 1.38 (0.96–1.96)    | —                            | —                   | —                            | —                           |
| Gender                                                     |                              |                     |                              |                     |                              |                     |                              |                             |
| Transgender female                                         | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | —                           |
| Transgender male                                           | 0.77 (0.52–1.16)             | 1.69 (1.12–2.54)*   | 0.71 (0.48–1.03)             | 0.78 (0.52–1.15)    | —                            | —                   | —                            | —                           |
| Nonbinary                                                  | 1.04 (0.71–1.53)             | 2.13 (1.45–3.14)*** | 0.84 (0.58–1.20)             | 0.69 (0.47–1.02)    | —                            | —                   | —                            | —                           |
| Race/ethnicity                                             |                              |                     |                              |                     |                              |                     |                              |                             |
| White                                                      | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                        |
| Black                                                      | 1.74 (1.08–2.82)*            | 1.83 (1.14–2.94)*   | 1.12 (0.71–1.77)             | 1.11 (0.70–1.77)    | 1.06 (0.67–1.69)             | 1.11 (0.70–1.77)    | 1.06 (0.66–1.69)             | —                           |
| Hispanic/Latinx                                            | 1.61 (1.13–2.31)**           | 0.92 (0.64–1.34)    | 0.66 (0.47–0.92)*            | 0.70 (0.48–1.01)    | 0.66 (0.47–0.92)*            | 0.70 (0.48–1.01)    | 0.70 (0.48–1.00)             | —                           |
| Other                                                      | 1.21 (0.80–1.83)             | 1.73 (1.15–2.60)**  | 0.69 (0.47–1.03)             | 0.88 (0.58–1.32)    | 0.73 (0.49–1.08)             | 0.88 (0.58–1.32)    | 0.92 (0.60–1.38)             | —                           |
| Not enough money                                           |                              |                     |                              |                     |                              |                     |                              |                             |
| No                                                         | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                        |
| Yes                                                        | 1.18 (0.87–1.61)             | 1.61 (1.18–2.18)**  | 1.14 (0.85–1.52)             | 1.07 (0.78–1.45)    | 1.12 (0.83–1.50)             | 1.07 (0.78–1.45)    | 1.05 (0.77–1.43)             | —                           |
| Health insurance                                           |                              |                     |                              |                     |                              |                     |                              |                             |
| No                                                         | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                        |
| Yes                                                        | 3.05 (2.16–4.35)***          | 1.48 (1.04–2.11)*   | 2.02 (1.46–2.80)***          | 2.00 (1.41–2.87)*** | 2.07 (1.49–2.88)***          | 2.00 (1.41–2.87)*** | 2.03 (1.42–2.92)***          | —                           |
| Health costs                                               |                              |                     |                              |                     |                              |                     |                              |                             |
| No                                                         | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                | Ref.                         | Ref.                        |
| Yes                                                        | 1.04 (0.76–1.41)             | 1.13 (0.83–1.54)    | 1.45 (1.09–1.95)*            | 1.31 (0.96–1.77)    | 1.50 (1.12–2.01)**           | 1.31 (0.96–1.77)    | 1.33 (0.98–1.80)             | —                           |
| Age                                                        | 1.37 (1.29–1.45)***          | 1.21 (1.14–1.28)*** | 1.17 (1.11–1.24)***          | 1.11 (1.05–1.18)*** | 1.16 (1.10–1.23)***          | 1.11 (1.05–1.18)*** | 1.10 (1.04–1.17)**           | —                           |
| Medical gender affirmation services-yes × transgender male | —                            | —                   | —                            | —                   | 3.30 (1.54–7.12)**           | —                   | 2.55 (1.18–5.59)*            | —                           |

|                                                     | Ever tested HIV (n = 1013) | Ever tested STD (n = 1015) | Heard of PrEP (n = 1021)  | Heard of nPEP (n = 1018) |
|-----------------------------------------------------|----------------------------|----------------------------|---------------------------|--------------------------|
|                                                     | <i>Main effects</i>        | <i>Main effects</i>        | <i>Main effects</i>       | <i>Main effects</i>      |
|                                                     | <i>aOR (95% CI)</i>        | <i>aOR (95% CI)</i>        | <i>aOR (95% CI)</i>       | <i>aOR (95% CI)</i>      |
| Medical gender affirmation services-yes × nonbinary | —                          | —                          | <b>4.23 (1.39–14.82)*</b> | —                        |
|                                                     |                            |                            |                           | 1.72 (0.62–4.75)         |
|                                                     |                            |                            |                           | <i>Interaction</i>       |
|                                                     |                            |                            |                           | <i>aOR (95% CI)</i>      |

Medical gender affirmation services-yes × nonbinary

Bold indicates statistical significance. Transgender female: female or transgender male-to-female. Transgender male: male or transgender female-to-male. Nonbinary: genderqueer, gender nonconforming or nonbinary other. Not enough money: not enough money for basic needs in the past 12 months. Health insurance: has health insurance. Health costs: did not receive medical care because of costs in the past 12 months. Medical gender affirmation services-yes × transgender male: interaction between having accessed medical gender affirmation services and transgender male gender identity. Medical gender affirmation-yes × nonbinary: interaction between having accessed medical gender affirmation services and nonbinary gender identity.

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

95% CI, 95% confidence interval; aOR, adjusted odds ratio.

**Table 4.**

Multivariable Models Regressing Awareness of Pre-exposure Prophylaxis and Awareness of Nonoccupational Postexposure Prophylaxis on Receipt of Medical Gender Affirmation Services in Sexually Experienced Transgender Youth (Age 13–24 Years) Stratified by Gender Identity—United States Survey of Today’s Adolescent Relationships and Transitions, 2018

|                                     | Heard of PrEP                                   |                                               | Heard of nPEP                                   |                                               |
|-------------------------------------|-------------------------------------------------|-----------------------------------------------|-------------------------------------------------|-----------------------------------------------|
|                                     | Transgender female<br>(n = 461)<br>aOR (95% CI) | Transgender male<br>(n = 296)<br>aOR (95% CI) | Transgender female<br>(n = 460)<br>aOR (95% CI) | Transgender male<br>(n = 296)<br>aOR (95% CI) |
| Medical gender affirmation services |                                                 |                                               |                                                 |                                               |
| No                                  | Ref.                                            | Ref.                                          | Ref.                                            | Ref.                                          |
| Yes                                 | 0.92 (0.53–1.62)                                | <b>2.65 (1.50–4.71) ***</b>                   | 0.89 (0.49–1.60)                                | <b>2.03 (1.12–3.71) *</b>                     |
| Race/ethnicity                      |                                                 |                                               |                                                 |                                               |
| White                               | Ref.                                            | Ref.                                          | Ref.                                            | Ref.                                          |
| Black                               | 0.81 (0.45–1.45)                                | 2.65 (0.53–19.90)                             | 0.72 (0.40–1.28)                                | 2.04 (0.41–10.16)                             |
| Hispanic/Latinx                     | 0.62 (0.38–1.01)                                | 1.12 (0.56–2.26)                              | <b>0.45 (0.27–0.76) **</b>                      | <b>2.81 (1.36–5.81) **</b>                    |
| Other                               | <b>0.47 (0.25–0.89) *</b>                       | 1.82 (0.87–3.84)                              | <b>0.42 (0.21–0.82) *</b>                       | <b>3.01 (1.41–6.46) **</b>                    |
| Not enough money                    |                                                 |                                               |                                                 |                                               |
| No                                  | Ref.                                            | Ref.                                          | Ref.                                            | Ref.                                          |
| Yes                                 | 1.52 (0.98–2.36)                                | 0.92 (0.51–1.62)                              | <b>1.69 (1.06–2.68) *</b>                       | <b>0.38 (0.20–0.72) **</b>                    |
| Health insurance                    |                                                 |                                               |                                                 |                                               |
| No                                  | Ref.                                            | Ref.                                          | Ref.                                            | Ref.                                          |
| Yes                                 | <b>2.34 (1.57–3.52) ***</b>                     | <b>2.92 (1.27–7.20) *</b>                     | <b>2.70 (1.74–4.25) ***</b>                     | 0.87 (0.39–2.06)                              |
| Health costs                        |                                                 |                                               |                                                 |                                               |
| No                                  | Ref.                                            | Ref.                                          | Ref.                                            | Ref.                                          |
| Yes                                 | 1.31 (0.84–2.05)                                | 1.59 (0.91–2.79)                              | 1.20 (0.75–1.92)                                | <b>2.00 (1.10–3.68) *</b>                     |
| Age                                 | 1.06 (0.97–1.15)                                | <b>1.24 (1.11–1.40) ***</b>                   | 1.04 (0.95–1.13)                                | <b>1.22 (1.09–1.38) ***</b>                   |

Bold indicates statistical significance. Transgender female: female or transgender male-to-female. Transgender male: male or transgender female-to-male. Nonbinary: genderqueer, gender nonconforming or nonbinary other. Not enough money: not enough money for basic needs in the past 12 months. Health insurance: has health insurance. Health costs: did not receive medical care because of costs in the past 12 months.

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .



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<math>p</math>  
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