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Health and Health Care Access in the U.S. Transgender Population Health (TransPop) Survey

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Abstract

Background: Probability and nonprobability-based studies of U.S. transgender persons identify different disparities in health and health care access.

Objectives: We used TransPop, the first U.S. national probability survey of transgender persons, to describe and compare measures of health and health access among transgender, nonbinary and cisgender participants. We directly compared results with 2015 U.S. Transgender Survey (USTS) data and with previously published analyses from the Behavioral Risk Factor Surveillance System (*BRFSS*).

Methods: All participants were screened by Gallup, Inc., which recruited a probability sample of U.S. adults. Transgender people were identified using a two-step screening process. Eligible participants completed self-administered questionnaires (transgender n=274, cisgender n=1,162). We obtained weighted proportions/means, then tested for differences between gender groups. Logistic regression was performed to evaluate associations. Bivariate analyses were conducted using the weighted USTS data set for shared variables in USTS and TransPop.

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Author Contributions

JF conceptualized the research for the paper, analyzed data, wrote and revised paper and approved final version. WL analyzed the data and wrote the paper. JH acquired data, critically revised the manuscript, and approved of submitted version. TP revised the paper and approved of the final version. IM conceptualized the research, performed data collection, outlined the first draft, critically revised the manuscript, and approved.

Disclosure Statement

The authors have no conflicts of interest to disclose.

Results: Transgender participants were younger and more racially diverse compared to cisgender participants. Despite equally high insurance coverage, transgender people more often avoided care due to cost. Nonbinary persons were less likely to access transgender related health care providers/clinics than transgender men and women. Transgender respondents more often rated health as fair/poor, with more poor physical and mental health days than cisgender respondents. Health conditions including HIV, emphysema, and ulcer, were higher among transgender people. TransPop and USTS, unlike BRFSS-based analyses, showed no differences in health or health access outcomes.

Discussion: Transgender persons experience health access disparities centered on avoidance of care due to cost beyond insured status. Nonbinary persons appear to have distinct health/health access patterns. Health disparities appear consistent with models of minority stress. Despite different sampling methods, USTS and TransPop appear more similar than BRFSS across measures of health and health access.

Conclusion: Future research should elucidate health care costs for transgender and nonbinary people, while addressing methodologic issues in national studies of transgender health.

Keywords

Transgender; nonbinary; access to care; health; probability sample

Introduction

Transgender individuals, whose gender differs from their sex assigned at birth, experience significant health disparities.¹ Transgender people present across a gender spectrum, including transgender men, transgender women, and nonbinary. Studies based on nonprobability samples in the United States have identified inequities in access to health care, general mental and physical health, and a variety of health conditions.¹ The 2015 U.S. Transgender Survey (USTS), the largest nonprobability study of transgender adults to date, utilized a two-step method to identify transgender participants: self-identified gender and sex assigned at birth. The USTS sample was national, consistent with the distribution of the U.S. general population.² Results showed that transgender people experience significant difficulties with insurance, cost of care, and overall health. While USTS addressed transgender-specific health concerns, it did not have a direct cisgender (i.e., gender congruent to sex assigned at birth) comparison sample or explore specific health conditions.

The Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS) is one of the few existing probability samples of transgender adults. In 2014, the BRFSS offered an optional module to identify transgender respondents using a one question method ("Do you consider yourself to be transgender?"). The number of states adopting this module has varied, from nineteen states in 2014 to thirty-one in 2019.³ The BRFSS includes a cisgender sample and standardized questions about specific health conditions,⁴⁻⁸ (but does not specifically target transgender health issues, such as access to knowledgeable providers or LGBT clinics. Studies using the BRFSS data have not consistently reflected USTS results regarding disparities in access to care or physical

health,⁹ with variable results among BRFSS-based studies. Neither USTS nor BRFSS alone addressed significant elements of primary care access, such as having an identified place of care, a personal care provider, or level of satisfaction with care. Primary care access is associated with positive health outcomes.¹⁰

General health, health conditions and access to health care differ by sex assigned at birth and gender, for transgender and cisgender persons.^{11–13} Important differences exist across the gender spectrum in risks for harassment and violence, access to gender affirming interventions, everyday discrimination, and health care experiences.^{12, 14} Studies using BRFSS data variously compared access to care and health between 1) transgender and cisgender samples^{6, 15} 2) transgender men, transgender women and nonbinary respondents and cisgender comparison groups^{15,16} and 3) among the transgender men, transgender women and nonbinary groups.^{8,12,13, 16} USTS data has been used across transgender men, transgender women and nonbinary people, but not in comparison to a cisgender sample.¹⁷ No national study has compared health and health access among transgender people both across the gender spectrum and with cisgender men and women.

We utilized results from TransPop, the first U.S. probability survey targeting transgender and gender diverse individuals, to describe and compare health access, general health, and prevalence of specific health conditions among transgender, nonbinary, and cisgender participants. In addition, we directly compared health and health access data for transgender and nonbinary people between TransPop and USTS and contrasted these results with relevant BRFSS-based studies.

Methods

Participants and Recruitment

TransPop—Transgender and cisgender participants were screened by Gallup, Inc., which recruited a probability sample of U.S. adults by using random digit dialing (RDD) to reach both cellphone and landline users and by address-based sampling (ABS). Transgender people were identified using a two-step screening process that first asked for sex assigned at birth and then asked about gender identity. Transgender individuals were recruited during two periods: April 2016–August 2016 (Period 1) and June 2017–December 2018 (Period 2), while cisgender individuals were recruited between February 2018–December 2019. The data set comprised 1,436 respondents representing the U.S. population of transgender (n = 274) and cisgender (n = 1,162) individuals as defined by the TransPop survey measures. The study protocol was reviewed and approved by the Gallup Institutional Review Board (IRB); the University of California, Los Angeles (UCLA) IRB; and the IRBs of collaborating institutions through reliance on the UCLA IRB. All respondents were sent English language questionnaires, as Gallup data has shown that only 5% of their sample would require a Spanish survey. The complete methodological procedure, demographic data³ and the questionnaire for transgender and cisgender respondents have been published in “TransPop—US Transgender Population Health Survey (methodology and technical notes),”¹⁷ available at <http://www.transpop.org/methods>. We excluded respondents from this study who reported they were assigned male at birth and their gender was transgender man

(n=1), and those who reported they were assigned female at birth and their gender was transgender woman (n=2), resulting in a final transgender data set (n=271).

U.S. Transgender Survey (USTS)—An online survey of transgender adults recruited via purposive sampling in the United States was fielded between August–September 2015. We applied the same exclusion criteria as for TransPop. Additionally, we excluded respondents who were “crossdressers” due to lack of a similar category in TransPop. The final data set is comprised of 26,864 respondents. The complete methodological procedure and demographic data can be found in the USTS report.²

Measures

Several items from the TransPop study are part of validated scales, designed to measure constructs relevant to identity, stress, and health. Each of the scales within the TransPop survey have been calculated from individual variables. Full description of all scales and individual measures is available in the Methods paper.¹⁸

Sociodemographic Variables—We included respondent’s age, sex assigned at birth, and gender identity. Nonbinary respondents were further dichotomized into those who are assigned male at birth (AMAB) and assigned female at birth (AFAB).

Health Care Access—We reported the following measures as is: Did not see doctor due to cost in the past 12 months, Have personal healthcare provider, and Have place for health care. The following measures were reported with modifications:

Insurance status: Respondents were categorized as having no health insurance or having any health insurance. Respondents were further categorized as to whether they were insured through a spouse/partner or not and whether they were insured through a parent or not.

Satisfied with place for health care: Respondents who indicated having a place for health care had their responses dichotomized to satisfied (“Very satisfied” or “Mostly satisfied”) and not satisfied (“Neutral”, “Mostly dissatisfied”, “Very dissatisfied”).

Have transgender-related health care (TRHC) provider: Responses were dichotomized to no (“I don’t have a transgender-related health care provider”) and yes if the respondent selected other options.

Provider’s knowledge of transgender care: Among those who indicated having a TRHC provider, responses were dichotomized into knowledgeable (“They know almost everything about transgender care”, “They know most things about transgender care”) and not knowledgeable (“They know some things about transgender care”, “They know almost nothing about transgender care”, “I am not sure how much they know about transgender care”).

How often have been to LGBT- or transgender-specific health care provider: Responses to were dichotomized to “Often/sometimes” and “Never”.

Importance of going to LGBT- or transgender-specific health care

provider: Responses were dichotomized into “Very/somewhat important” and “Not important”.

Health and Health Conditions—We reported the following measures as is: Days in poor physical health and Days in poor mental health. The following measures were reported with modifications:

General health: Responses were dichotomized to “Excellent/very good/good” and “Fair/poor”.

Health conditions: Included are measures for high cholesterol, emphysema, asthma, ulcer, cancer, diabetes, prediabetes, arthritis, osteoporosis, thyroid problems, liver disease, COPD, Crohn’s disease, kidney disease, HIV/AIDS, other STI, and sleep disorder. Cardiovascular related health conditions were excluded from this analysis, to be addressed in a separate publication.

Data Analysis

Bivariate analyses were conducted on the weighted transgender and cisgender data set to obtain weighted proportions or means for health care access, general health, and health condition variables, then tested for differences within the transgender sample (transgender man vs. transgender woman vs. nonbinary), between transgender and cisgender samples, and among gender groups across the transgender and cisgender samples. Logistic regression was performed to evaluate associations (in odds ratios [ORs]) between aforementioned variables across various gender identities, including one model controlling for age.

Additionally, bivariate analyses were conducted using the weighted USTS data set for variables that exist in both USTS and TransPop: insurance status, not seeing a doctor due to cost, general health, and having a TRHC provider. Significant differences between the two data sets were determined if the confidence interval of the proportions did not overlap. Stata 14.2 was used for analyses.

Results

Demographics

Sample proportion, age distribution, race/ethnicity, sexual orientation, poverty status, and geographic distribution are summarized in Table 1. Both transgender and cisgender participants were distributed across all census regions, consistent with 2017 census data.¹⁹ Transgender people were significantly younger than cisgender participants, with 48.9% of transgender participants ages 18-29 years, compared to 18.9% of cisgender participants. Transgender men and nonbinary people were significantly younger than transgender women. Transgender participants were more racially/ethnically diverse than cisgender participants, notably as Latino, multiracial or another racial/ethnic group. Transgender participants were also less likely to identify as straight and more likely to live in poverty than cisgender participants. Full demographic description of both samples can be found in the TransPop Methods document.¹⁸

Health Care Access

Differences between transgender and cisgender participants—As seen in Table 2, 90.5% of transgender and 89.5% of cisgender people had health insurance. Transgender people across the spectrum were less likely to be insured through a spouse or partner compared to the cisgender sample overall, though not compared to cisgender men (not shown). Transgender people were more likely to be insured by parents, but this difference is not significant when adjusted for age. Despite the high level of insurance coverage, transgender people were more likely than cisgender people to have avoided care due to cost. When adjusted for age, transgender and cisgender people demonstrated no difference in having a personal health care provider and having an identified place for health care. Cisgender and transgender participants who had an identified place for health care reported equally high levels of satisfaction with their healthcare.

Differences among transgender men, transgender women and nonbinary participants: Table 3 shows results related to health care access among transgender men, transgender women and nonbinary people. Nonbinary participants were more likely to be insured compared to transgender women. There were no significant differences among the groups in being insured through partner/spouse. Transgender men and nonbinary participants were more likely to be insured through a parent than transgender women, consistent with the younger age of these groups, and current ineligibility for parental insurance over age 26. Nonbinary persons were more likely to have avoided care due to cost compared to either transgender women or transgender men, however, the difference compared to transgender women was not significant after adjusting for age. There were no differences among the transgender groups for having a personal care provider, an identified place for health care, or satisfaction with their place of care.

Only 55.9% of transgender people overall had a transgender-related health care (TRHC) provider, with nonbinary participants significantly less likely to have one than either transgender men or transgender women. 67.3% of participants with a TRHC provider felt this provider knew almost everything or most things about transgender care, with no difference among gender groups.

Of transgender participants, 63.9% had not been to a LGBT or transgender-specific clinic or provider in the last 5 years; nonbinary persons less likely to have done so than transgender men or transgender women. However, 82.4% of participants overall, including 77.3% of nonbinary individuals, said they would like to access a LGBT/transgender clinic or provider in the future if it were available to them.

Health and Health Conditions

General Health—Results for general health and days of poor mental and physical health are presented in Table 4. More transgender than cisgender people rated their overall health as fair or poor. Both transgender men and women reported poorer health than cisgender men, but not compared to cisgender women. There were no differences among transgender men, transgender women and nonbinary people.

Transgender people had more poor physical health days per month (7.9) than cisgender people (4.4). Transgender women had more poor physical health days compared to both cisgender women and cisgender men, while in contrast, transgender men demonstrated no difference in poor physical days compared to either cisgender men or cisgender women. Within the transgender population, any differences in poor physical health days resolve when adjusted for age.

The contrast in poor mental health days between overall transgender and cisgender samples is notable. Transgender people experienced greater numbers of poor mental health days (14.8) compared to cisgender people (6.0). This difference persisted across the gender spectrum (transgender women, transgender men, and nonbinary persons) when compared to either cisgender men or cisgender women. There were no differences among gender groups within the transgender population (Table 4).

Health Conditions—Prevalence of reported health conditions are listed in Table 5. HIV, other STI's, emphysema, ulcer, liver disease and sleep disorders were significantly more likely to be reported by transgender than cisgender people. There were no significant differences between transgender men and women for any of the health conditions. While HIV prevalence appears higher for transgender women (6.5%) than transgender men (0.8%), this difference was not statistically significant due to the large confidence intervals, indicating lack of precision in this measure. More nonbinary persons than transgender men and women reported asthma and ulcer, more reported COPD and osteoporosis than transgender men, and more reported kidney disease than transgender women. More transgender women reported cancer than nonbinary AMAB persons, but regression failed when adjusted for age. Nonbinary AFAB and nonbinary AMAB did not differ in any of the reported health conditions.

TransPop and USTS

Comparisons between participants in TransPop and USTS (Table 6) showed no significant differences in the health access measures including proportion of insured, unable to see provider due to cost in past 12 months, having a provider for transgender-related health care (TRHC), or the transgender health knowledge of that provider. USTS did not include the other health access measures assessed in TransPop (Tables 2 and 3).

USTS and TransPop did not differ in prevalence of fair/poor general health among transgender participants. USTS did not evaluate number of poor physical or mental days per month, nor reported health conditions.

Discussion

TransPop, USTS and BRFSS all demonstrate a younger, more racially diverse transgender population than either a cisgender sample (TransPop and BRFSS) or U.S. Census data (USTS).^{2,4,15} In TransPop and USTS,^{2, 17} transgender and cisgender populations share several similarities: high rates of insurance coverage, equal likelihood of having a personal health provider and identified place for health care. Surprisingly, transgender and cisgender participants were also equally likely to be satisfied with their identified place for health care.

These findings contrast with BRFSS-based studies, which show lower rates of insurance coverage and personal care providers for transgender people.^{4,13,16}

Our results also confirm important health access disparities for transgender people. Despite high rates of insurance, transgender people experience a clear disparity in accessing health care due to cost in both TransPop and USTS, suggesting economic barriers to care beyond insurance. In contrast, BRFSS-based studies show similar levels of delay in care due to cost, but in combination with lower prevalence of insurance.^{4,7,13,16,20} Similar findings cost-related barriers to care are seen among sexual and racial/ethnic minorities^{21,22}, transgender people have fewer socioeconomic resources to manage increasing co-pays, out of pocket costs, and health care affiliated expenses such as transportation and time off work. Transgender people may experience greater impact, given the higher prevalence of sexual and racial/ethnic diversity. In addition, access to gender affirming care plays a significant role in health for many transgender people.² These medical interventions may not be covered by insurance, compounding cost-related delay of care.^{23–25}

TransPop, USTS and BRFSS-based studies consistently indicate a younger age demographic for transgender people. Age significantly affects insurance coverage and health access in the U.S., with young adults less likely to have adequate insurance.^{24, 26} Young adults are more dependent on parents for insurance coverage,²⁴ as is reflected in TransPop. Transgender young adults specifically may be less likely to access that insurance due to lack of family support/family conflict over their gender or medical transition, resulting in reduced access to care and increased cost. As young adults age out of parental insurance, they may not themselves be able to afford adequate, gender affirming care under policies.

Both TransPop and USTS indicate that nonbinary people experience higher insurance but age related delay in care due to cost compared to transgender men and women.¹⁷ BRFSS-based studies show variable disparities across transgender groups with either no difference in insured status and/or delay to due to cost,¹⁶ transgender men more likely to be uninsured^{5,8, 13} and nonbinary persons more likely to delay care due to cost.¹³ Other BRFSS-based studies did not examine the same health access measures or did not perform comparisons among gender subgroups.^{4, 7} TransPop and USTS also demonstrate disparities in use of TRHC providers and LGBT/transgender clinics among nonbinary people, despite a high level of desire for future use. Multiple factors may underlie these differences between nonbinary people and transgender men and women: financial disparities, less need for gender affirming interventions,² higher levels of stigma, discrimination, or social barriers due to gender nonconforming identity or presentation.^{27, 28}

Similar to USTS and BRFSS-based studies, we found that transgender people overall are more likely to report fair/poor health compared to cisgender people,^{4, 7} but less likely when compared to cisgender women.¹² Self-reported and clinically derived health measures can vary considerably between cisgender men and cisgender women, impacted by age, and gender self-concept.^{11,29} Future comparisons should account for differences across genders in both transgender and cisgender populations. While our results did not find significant differences across gender groups, likely due to small transgender group size, both BRFSS-based studies and USTS indicated higher levels of poor overall health for

nonbinary people.^{4,7, 8, 12, 30} Poor mental health appears to account for more of the burden for decreased overall health than poor physical health, though both are significant. This pattern is consistent with models of minority stress, in which experiences such as violence, discrimination, expectations of rejection, or internalized transphobia require an individual to adapt but also cause significant stress, ultimately affecting physical and mental health.^{29,31}

Our results reinforce findings of most BRFSS-based studies that transgender persons appear to have more chronic health conditions,^{4,7,8} and that nonbinary persons experience more chronic health conditions than transgender men and women.^{8,30} While HIV status is not included in BRFSS, self-reported HIV prevalence for TransPop falls in between the self-reported prevalence noted in USTS,² and the laboratory-confirmed estimated prevalence of HIV infection of 9.2%.³² The difference with USTS may be due to sampling methods and survey dates. The higher prevalence of ulcer has not been identified in other studies and merits further investigation. The higher prevalence of COPD and emphysema found in TransPop would be consistent with reports of higher prevalence of tobacco use,^{33, 34} while the higher prevalence of liver disease may be associated with possible elevated prevalence of hepatitis and alcohol use in transgender populations.³⁵ Mediating factors in these health conditions—tobacco use, alcohol, or substance use—are maladaptive coping strategies to minority stress processes.³¹ Nonbinary people appear to be more vulnerable, experiencing higher numbers of health conditions than transgender women or transgender men.⁸ Decreased access to health care, along with different and more frequent experiences of stigma and discrimination may account for these health differences.^{27, 28, 36}

TransPop, USTS and BRFSS share measures of health access and health, and despite different sampling methods, USTS and TransPop share significant similarities in results. Both are national samples, with a geographic distribution approximating that of the overall population. BRFSS, in contrast, variously uses data from transgender respondents from 16-31 states, and did not include California until 2016.³ USTS and TransPop, unlike BRFSS, share a two-step gender identification process. The effect of this difference on BRFSS sampling weights has only recently been evaluated.^{9, 37} The smaller sample size in TransPop is associated with less precision in estimates as reflected in the wider confidence intervals we reported, representing a potential limitation. USTS achieved a large, geographically, and demographically diverse nonprobability sample that approximated the characteristics of a probability sample. The majority of relevant BRFSS studies used data from 2014-2018, the three studies are closely related in time period (4 years). Health access, social and legal changes during this period, which included both ongoing implementation of the Affordable Care Act (ACA) and then policies restricting the ACA, likely balance out overall. Only the cisgender sample of TransPop occurred entirely during the administration of President Trump, a time of increasing restrictions on transgender rights.³⁸ Further analysis of USTS, TransPop and BRFSS, and the impact of methodological differences on transgender health measures is warranted.

The use of a nationally representative sample of transgender people is an important strength of this study, as is the use of the two-step method for gender identification. Additional strengths are the focus on measures of structural health access beyond insured status, TRHC providers and clinics, and comparisons across the gender spectrum. Notable limitations of

this study include the relatively small size of the transgender group, which the precision of estimated effect sizes and, in particular, estimates across the gender subgroups. Sampling methods precluded the ability to recruit participants who did not have an address. Finally, like the other studies, our study is limited by self-reported measures of health and health conditions.

Conclusion

While transgender and cisgender people share similarities in health access, including insurance coverage, transgender people consistently demonstrate avoidance of care due to cost. Further research is needed to elucidate these costs and how they might vary across the transgender population. Policy initiatives addressing cost issues beyond health insurance will be vital to addressing health access disparities.

There is a marked disconnect between current use of TRHC providers and clinics by transgender persons, and a desire to access these services, even among nonbinary people. Again, studies are needed to establish the underlying factors, whether cost, geographic distribution, or discrimination and stigma, to develop solutions across the diversity of the transgender population.

This national probability survey supports findings that transgender people experience worse overall health, with more mental health and physical health challenges than cisgender people. These health disparities, including the types of physical health conditions, are in line with effects of minority stress. Nonbinary people emerge as a population with unique health and health access needs. Given differences in demographics, social support, and use of gender-affirming care compared with transgender men and transgender women,⁷ additional research with this population is clearly indicated.

Finally, the remarkable similarity in findings between this study and USTS, provides an exciting stimulus for refining methodological approaches to research with transgender populations. Sample size, age, gender and geographic diversity, and the use of a two-step identification method appear to be critical issues in national probability and nonprobability studies.

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TABLE 1.

Demographic Information across Gender Groups

Measure	Transgender (n=271)	Cisgender (n=1,162)	Design-based F	Transgender men (n=77)	Transgender women (n=118)	Nonbinary(n=76)	Design-based F
	Weighted % (95% CI)			Weighted % (95% CI)			
Sample proportion	0.4 (0.3, 0.5)	99.6 (99.5, 99.6)	N/A	30.6 (23.8, 38.5)	37.7 (30.5, 45.5)	31.7 (24.7, 39.6)	N/A
Age							
18-29	48.9 (41.1, 56.8)	18.9 (15.3, 23.0)	32.37***	57.1 (42.6, 70.5)	28.5 (18.3, 41.6)	65.3 (51.2, 77.2)	4.07***
30-49	33.0 (26.1, 40.7)	31.7 (27.9, 35.7)		31.2 (19.4, 46.1)	41.5 (30.0, 54.0)	24.6 (14.8, 38.0)	
50-64	13.0 (8.9, 18.5)	26.6 (23.4, 30.1)		10.9 (5.1, 21.8)	20.5 (12.8, 31.2)	6.1 (1.9, 17.4)	
65+	5.1 (3.1, 8.3)	22.9 (20.1, 25.8)		0.9 (0.3, 2.7)	9.5 (5.3, 16.2)	4.0 (1.2, 12.9)	
	Mean (95% CI)			Mean (95% CI)			
Age (mean)	34.2 (32.1, 36.4)	49.4 (47.8, 51.0)	124.53***	30.6 (26.9, 34.4)	40.4 (36.9, 43.9)	30.4 (26.9, 33.9)	9.99***
	Weighted % (95% CI)			Weighted % (95% CI)			
Race/ethnicity							
White	56.5 (48.5, 64.3)	72.3 (68.1, 76.1)	5.85***	54.5 (39.9, 68.4)	60.1 (47.2, 71.7)	54.2 (39.6, 68.2)	0.77
Black	9.2 (5.4, 15.1)	11.1 (8.3, 14.6)		12.9 (5.7, 26.5)	6.7 (2.4, 17.7)	8.5 (3.3, 20.2)	
Latino	15.9 (10.5, 23.4)	9.2 (6.9, 12.3)		16.9 (7.7, 33.2)	10.2 (4.9, 19.9)	21.7 (11.3, 37.7)	
Multi racial	10.4 (6.2, 17.0)	4.5 (3.1, 6.4)		5.9 (2.6, 12.9)	13.1 (6.0, 26.3)	11.6 (4.4, 26.9)	
Other	8.0 (4.5, 13.7)	3.0 (1.8, 4.7)		9.8 (3.7, 23.4)	9.8 (4.1, 21.6)	4.0 (1.2, 12.7)	
Sexual orientation							
Heterosexual	17.8 (12.7, 24.3)	90.1 (87.0, 92.6)	595.13***	28.8 (17.8, 43.0)	23.6 (14.8, 35.5)	0.6 (0.1, 2.3)	14.22***
Sexual minority	82.2 (75.7, 87.3)	9.9 (7.4, 13.0)		71.2 (57.0, 82.2)	76.4 (64.5, 85.2)	99.4 (97.7, 99.9)	
In poverty	28.0 (21.3, 35.8)	16.1 (12.9, 19.9)	10.25**	32.5 (20.3, 47.7)	27.7 (17.7, 40.6)	24.0 (13.8, 38.5)	0.41
Census region							
Northwest	18.9 (13.4, 25.9)	17.7 (14.9, 21.0)	1.95	14.5 (6.9, 27.7)	10.8 (5.9, 18.8)	33.4 (20.8, 48.9)	2.38*
Midwest	20.1 (14.4, 27.4)	22.5 (19.3, 25.9)		15.5 (7.5, 29.2)	29.7 (19.4, 42.5)	13.0 (5.9, 26.3)	
South	29.9 (23.0, 37.8)	37.1 (33.2, 41.2)		37.4 (24.6, 52.4)	25.9 (16.6, 38.0)	27.1 (15.5, 43.0)	
West	31.1 (24.5, 38.7)	22.7 (19.5, 26.3)		32.6 (20.8, 47.2)	33.7 (23.2, 46.0)	26.5 (16.4, 40.0)	
Urbanicity							

Measure	Transgender (n=271)	Cisgender (n=1,162)	Design- based F	Transgender men (n=77)	Transgender women (n=118)	Nonbinary(n=76)	Design- based F
	Weighted % (95% CI)			Weighted % (95% CI)			
Non-urban	16.7 (11.8, 23.0)	20.0 (17.1, 23.4)	0.99	11.9 (5.8, 22.9)	23.4 (14.8, 35.0)	13.3 (6.2, 26.2)	1.73
Urban	83.3 (77.0, 88.2)	90.0 (76.6, 82.9)		88.1 (77.1, 94.3)	76.6 (65.0, 85.2)	86.7 (73.8, 93.8)	

* p<0.05

** p<0.01

*** p<0.001

CI = confidence intervals

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TABLE 2.

Health Care Access Transgender/Cisgender Comparisons

Measure	Transgender (n=271)	Cisgender (n=1,162)	Design-based F	Transgender vs. Cisgender (ref: cisgender)
	Weighted % (95% CI)			aOR (95% CI)
Insured	90.5 (85.0, 94.2)	89.5 (86.2, 92.0)	0.15	1.45 (0.73, 2.86)
Through spouse/partner	5.2 (2.6, 10.1)	15.5 (12.9, 18.4)	11.24 ^{***}	0.33 (0.15, 0.70) ^{***}
Through parent	27.5 (20.5, 35.9)	9.8 (7.1, 13.4)	24.85 ^{***}	0.89 (0.37, 2.12)
Did not see doctor due to cost in past 12 months	32.5 (25.4, 40.5)	14.6 (11.6, 18.2)	23.95 ^{***}	1.88 (1.15, 3.08) [*]
Have personal doctor/healthcare provider	60.7 (52.7, 68.2)	76.4 (72.5, 79.8)	14.71 ^{***}	0.78 (0.49, 1.22)
Have place to go for health care	80.1 (72.0, 86.2)	88.4 (85.1, 91.0)	5.87 [*]	0.86 (0.47, 1.58)
Satisfaction with place for health care	81.8 (72.9, 88.2)	88.4 (85.1, 91.1)	3.19	0.83 (0.43, 1.61)

*
p<0.05**
p<0.01***
p<0.001

CI = confidence intervals; ref = reference; aOR = age-adjusted odds ratios

TABLE 3.

Health Care Access across Gender Groups

Measure	Transgender men (n=77)	Transgender women (n=118)	Nonbinary (n=76)	Design-based F	Transgender men vs. Transgender women (ref: transgender men)	Transgender men vs. Nonbinary (ref: transgender men)	Transgender women vs. Nonbinary (ref: transgender women)
	Weighted % (95% CI)				aOR (95% CI)		
Insured	91.7 (77.9, 97.2)	84.3 (73.2, 91.4)	96.8 (92.0, 98.7)	3.15	0.50 (0.11, 2.32)	2.70 (0.61, 12.01)	5.41 (1.52, 19.32)**
Through spouse/partner	5.1 (1.3, 18.7)	5.4 (2.2, 12.6)	5.1 (1.3, 17.6)	0.00	0.45 (0.05, 3.75)	1.04 (0.14, 7.51)	2.29 (0.29, 18.41)
Through parent	43.8 (29.7, 59.0)	9.7 (4.0, 21.7)	30.9 (18.9, 46.2)	6.74***	0.28 (0.07, 1.11)	0.54 (0.20, 1.50)	1.97 (0.59, 6.57)
Did not see doctor due to cost in past 12 months	21.9 (12.2, 36.1)	26.3 (16.7, 38.9)	50.0 (35.6, 64.4)	4.99**	1.59 (0.60, 4.20)	3.66 (1.45, 9.26)**	2.30 (0.95, 5.55)
Have personal doctor/healthcare provider	64.8 (49.4, 77.6)	61.9 (49.1, 73.2)	55.4 (40.9, 69.0)	0.45	0.57 (0.22, 1.47)	0.66 (0.26, 1.67)	1.15 (0.48, 2.74)
Have place to go for health care	79.1 (61.5, 90.0)	81.9 (68.3, 90.4)	79.2 (65.1, 88.6)	0.06	1.05 (0.29, 3.78)	1.01 (0.32, 3.14)	0.96 (0.33, 2.79)
Satisfied with place for health care	79.1 (60.5, 90.3)	89.2 (77.3, 95.2)	77.1 (59.2, 88.6)	1.04	1.83 (0.48, 6.91)	0.86 (0.24, 3.01)	0.47 (0.14, 1.54)
Have transgender-related healthcare provider	69.5 (52.1, 82.6)	71.4 (57.4, 82.2)	30.7 (18.7, 46.0)	9.29***	1.08 (0.40, 2.88)	0.19 (0.07, 0.52)***	0.18 (0.07, 0.47)***
Provider knows most things about transgender care	61.6 (41.0, 78.7)	79.7 (63.0, 90.0)	51.9 (26.6, 76.2)	1.98	2.99 (0.88, 10.19)	0.75 (0.17, 3.27)	0.25 (0.06, 1.10)
Sometimes/often went to LGBT/transgender-specific provider in past 5 years	49.1 (33.4, 65.1)	45.0 (31.3, 59.6)	17.3 (9.04, 30.7)	5.78**	0.91 (0.36, 2.32)	0.22 (0.08, 0.59)***	0.24 (0.08, 0.70)**
Important to go to LGBT/transgender-specific provider in the next year	90.9 (75.9, 96.9)	80.4 (68.1, 88.8)	77.3 (60.6, 88.3)	1.35	0.52 (0.13, 2.04)	0.34 (0.08, 1.41)	0.65 (0.22, 1.97)

* p<0.05

** p<0.01

*** p<0.001

CI = confidence intervals; ref = reference; aOR = age-adjusted odds ratios

TABLE 4.

General, Mental, and Physical Health

Measure	Transgender (n=271)	Cisgender (n=1,162)	Design-based F	Transgender men (n=77)	Transgender women (n=118)	Nonbinary (n=76)	Design-based F	Cisgender men (n=556)	Cisgender women (n=606)	Design-based F
	Weighted % (95% CI)			Weighted % (95% CI)				Weighted % (95% CI)		
General health (fair/poor)	26.2 (19.8, 33.7)	14.7 (12.1, 17.7)	11.71 ***	22.7 (12.5, 37.8)	21.3 (13.0, 33.0)	35.2 (23.0, 49.8)	1.50	12.8 (9.6, 17.0)	16.4 (12.6, 21.0)	1.58
Poor physical health days	7.89 (6.36, 9.42)	4.41 (3.73, 5.09)	16.67 ***	5.62 (3.99, 7.25)	8.72 (6.12, 11.31)	9.44 (6.07, 12.82)	3.23 *	3.83 (2.83, 4.84)	4.94 (4.03, 5.86)	2.58
Poor mental health days	14.82 (12.98, 16.66)	6.00 (5.23, 6.76)	75.33 ***	13.97 (10.79, 17.14)	14.35 (11.11, 17.60)	16.03 (12.94, 19.11)	0.48	4.80 (3.77, 5.84)	7.10 (6.00, 8.19)	8.92 *
<i>Transgender</i>				<i>Transgender vs. Cisgender</i>						
Measure	Transgender men vs. Transgender women (ref: transgender men)	Transgender men vs. Nonbinary (ref: transgender men)	Transgender women vs. Nonbinary (ref: transgender women)	Nonbinary AMAB vs. Nonbinary AFAB (ref: nonbinary AMAB)	Transgender vs. Cisgender (ref: cisgender)	Transgender women vs. Cisgender women (ref: cisgender women)	Transgender women vs. Cisgender men (ref: cisgender men)	Transgender men vs. Cisgender men (ref: cisgender men)	Transgender men vs. Cisgender women (ref: cisgender women)	Nonbinary AFAB vs. Cisgender women (ref: cisgender women)
	aOR (95% CI)									
General health (fair/poor)	1.08 (0.40, 2.87)	0.54 (0.21, 1.39)	0.50 (0.29, 1.27)	4.00 (1.18, 13.55) *	2.50 (1.51, 4.12) ***	1.52 (0.74, 3.15)	2.12 (1.02, 4.40) *	2.67 (1.09, 6.57) *	1.82 (0.73, 4.50)	4.54 (1.11, 11.03) *
Coef (95% CI)										
Poor physical health days	2.42 (-0.68, 5.51)	3.68 (-0.12, 7.48)	1.26 (-3.02, 5.55)	5.34 (0.41, 10.27) *	3.87 (2.11, 5.62) ***	4.07 (1.34, 6.81) **	5.09 (2.25, 7.94) ***	2.17 (-0.04, 4.38)	1.20 (-0.76, 3.17)	6.35 (1.04, 10.84)
Poor mental health days	1.82 (-2.90, 6.54)	1.99 (-2.17, 6.16)	0.17 (-4.63, 5.00)	-5.97 (-13.06, 1.11)	7.09 (4.90, 9.27) ***	5.61 (2.05, 9.17) **	8.78 (5.23, 12.33) ***	7.80 (4.21, 11.38) ***	4.07 (0.61, 7.52) *	4.83 (1.84, 8.45) *

* p<0.05
 ** p<0.01
 *** p<0.001

CI = confidence intervals; ref = reference; aOR = age-adjusted odds ratios; coef = regression coefficients (after adjusting for age)

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TABLE 5.

Prevalence of Health Conditions

Measure	Transgender (n=271)	Cisgender (n=1,162)	Design- based F	Transgender men (n=77)	Transgender women (n=118)	Nonbinary (n=76)	Design- based F	Cisgender men (n=556)	Cisgender women (n=606)	Design- based F
	Weighted % (95% CI)			Weighted % (95% CI)				Weighted % (95% CI)		
High cholesterol	16.9 (12.2, 22.9)	24.4 (21.4, 27.7)	4.89 *	13.6 (6.7, 25.6)	19.8 (12.7, 29.4)	16.6 (8.5, 29.7)	0.41	24.8 (20.6, 29.4)	24.1 (19.9, 28.8)	0.05
Emphysema	2.4 (0.9, 6.3)	1.6 (1.0, 2.7)	0.48	0.8 (0.1, 5.4)	1.7 (0.6, 4.9)	4.8 (1.1, 18.6)	1.77	1.1 (0.5, 2.2)	2.1 (1.1, 4.1)	1.93
Asthma	14.6 (10.0, 20.8)	11.5 (9.1, 14.5)	1.12	9.8 (4.8, 18.8)	9.0 (4.8, 16.0)	25.0 (15.0, 41.2)	5.19 **	7.6 (4.6, 12.3)	15.1 (11.5, 19.5)	6.24 *
Ulcer	9.1 (5.4, 14.9)	4.2 (2.8, 6.3)	5.66 *	4.9 (1.9, 11.8)	5.1 (2.0, 12.4)	18.1 (8.8, 33.4)	2.66 *	3.3 (1.6, 6.6)	5.1 (3.2, 8.2)	1.11
Cancer	3.6 (1.8, 7.3)	7.2 (5.7, 9.1)	3.50	-	8.1 (3.7, 16.9)	1.8 (0.3, 9.2)	3.93 *	7.6 (5.2, 10.8)	6.9 (5.1, 9.2)	0.17
Diabetes	5.9 (3.2, 10.4)	11.4 (9.2, 14.0)	4.80 *	3.1 (1.0, 9.1)	7.8 (3.5, 16.6)	6.2 (1.9, 18.7)	0.70	10.2 (7.5, 13.6)	12.5 (9.4, 16.5)	0.98
Prediabetes	8.7 (5.3, 14.0)	11.5 (9.3, 14.1)	1.08	6.0 (2.5, 13.9)	7.7 (3.9, 14.7)	12.6 (5.2, 27.5)	0.92	11.1 (8.3, 14.8)	11.9 (8.8, 15.8)	0.09
Arthritis	17.2 (12.1, 23.7)	23.2 (20.2, 26.5)	2.8	12.6 (6.1, 24.3)	19.6 (11.9, 30.7)	18.7 (9.7, 32.9)	0.55	17.1 (13.5, 21.4)	28.8 (24.2, 33.8)	13.34 ***
Osteoporosis	4.8 (2.4, 9.1)	6.2 (4.6, 8.3)	0.54	1.3 (0.5, 3.8)	6.2 (2.6, 14.0)	6.4 (1.9, 19.3)	1.45	1.2 (0.6, 2.4)	10.9 (7.9, 14.7)	49.86 ***
Thyroid problems	11.4 (7.6, 16.8)	12.5 (10.3, 15.1)	0.15	8.2 (4.0, 16.0)	10.9 (5.7, 20.1)	15.1 (7.4, 28.5)	0.78	4.9 (3.2, 7.6)	19.4 (15.7, 23.8)	37.75 ***
Liver disease	4.0 (1.9, 8.3)	1.6 (0.9, 2.9)	3.82	3.2 (0.6, 15.6)	2.8 (1.1, 7.1)	6.1 (1.8, 18.6)	0.51	1.6 (0.6, 4.1)	1.6 (0.7, 3.4)	0.00
COPD	2.7 (1.1, 6.4)	3.3 (2.3, 4.6)	0.17	0.6 (0.1, 2.3)	2.7 (1.2, 5.8)	4.8 (1.1, 18.6)	1.85	3.0 (1.8, 4.8)	3.6 (2.2, 5.8)	0.34
Crohn's disease	2.4 (0.9, 6.3)	3.0 (0.9, 10.2)	1.74	1.7 (0.3, 8.4)	0.9 (0.2, 4.3)	4.8 (1.2, 17.9)	1.60	1.1 (0.5, 2.4)	1.2 (0.5, 2.5)	0.00
Kidney disease	2.1 (0.7, 6.3)	2.2 (1.3, 3.8)	0.01	-	1.6 (0.4, 5.3)	4.9 (1.1, 18.7)	1.72	1.8 (0.9, 3.5)	2.6 (1.3, 5.4)	0.52
HIV/AIDS	4.3 (2.0, 9.0)	0.2 (0.1, 0.5)	47.28 ***	0.8 (0.1, 5.6)	6.5 (2.5, 16.1)	5.1 (1.3, 18.4)	1.39	0.3 (0.1, 1.1)	-	2.92
Other STI	7.1 (4.2, 12.0)	2.1 (1.2, 3.7)	10.92 ***	7.9 (2.9, 19.8)	4.9 (1.9, 12.1)	9.1 (3.8, 20.5)	0.45	1.6 (0.5, 5.2)	2.5 (1.4, 4.4)	0.44
Sleep disorder	23.8 (17.9, 30.8)	15.6 (13.1, 18.6)	6.27 *	30.1 (18.6, 44.8)	22.8 (14.8, 33.4)	18.8 (10.1, 32.4)	0.93	16.0 (12.4, 20.4)	15.3 (11.8, 19.5)	0.08

*
p<0.05**
p<0.01***
p<0.001

CI = confidence intervals; "-" = no observations

Table 6

TransPop-USTS comparisons

Measure	<i>Transgender (all)</i>		<i>Transgender men</i>		<i>Transgender women</i>		<i>Nonbinary</i>				
	TransPop (n=271)	USTS (n=27,657)	TransPop (n=77)	USTS (n=7,950)	TransPop (n=118)	USTS (n=9,180)	TransPop (n=76)	USTS (n=9,769)			
	Weighted % (95% CI)										
Insured	90.5 (85.0, 94.2)	87.5 (87.0, 87.9)	91.7 (77.9, 97.2)	88.2 (87.4, 88.9)	84.3 (73.2, 91.4)	86.1 (85.4, 86.9)	96.8 (92.0, 98.7)	88.0 (87.2, 88.7)			
Did not see doctor due to cost in past 12 months	32.5 (25.4, 40.5)	31.9 (31.3, 32.5)	21.9 (12.2, 36.1)	34.6 (33.5, 35.7)	26.3 (16.7, 38.9)	27.7 (26.8, 28.7)	50.0 (35.6, 64.4)	35.3 (34.2, 36.4)			
General health condition (fair/poor)	26.2 (19.8, 33.7)	20.8 (20.3, 21.3)	22.7 (12.5, 37.8)	18.7 (17.8, 19.7)	21.3 (13.0, 33.0)			17.3 (16.5, 18.1)	35.2 (23.0, 49.8)	26.8 (25.8, 27.8)	
Have transgender- related healthcare provider	55.9 (46.9, 64.6)	55.4 (54.8, 56.1)	69.5 (52.1, 82.6)	72.0 (70.9, 73.1)	71.4 (57.4, 82.2)	74.4 (73.4, 75.3)	30.7 (18.7, 46.0)	26.0 (25.0, 27.1)			
Provider knows most things about transgender care	67.3 (55.1, 77.6)	64.4 (63.6, 65.2)	61.6 (41.0, 78.7)	68.2 (66.9, 69.4)	79.7 (63.0, 90.0)	69.2 (68.1, 70.3)	51.9 (26.6, 76.2)	45.1 (42.8, 47.3)			

CI = confidence intervals