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PERSPECTIVE

Considerations on Sampling in Transgender Health Disparities Research

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Abstract

Collection of gender identity data in national probability-based surveys began in 2014, an important first step toward the inclusion of gender identity measurements in public health surveillance. However, the findings about health disparities from probability-based samples do not align with those from nonprobability samples traditionally used to study transgender populations. These contradictions have yet to be understood fully. In this article, we suggest that the truth about disparities lies somewhere between nonprobability and probability samples. We discuss why generalizability from studies using probability sampling may remain limited for transgender populations and describe potential improvements in sampling methodology for transgender populations.

Keywords: gender nonconforming, methodology, sampling, transgender

Introduction

The U.S. Department of Health and Human Services' *Healthy People 2020*[1] and the 2011 Institute of Medicine (IOM) report[2] have emphasized that nationally representative health surveys include gender identity data. In 2014, an optional module assessing gender identity was included for the first time in the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS),[3] providing researchers with probability samples to document sociodemographic and health-related data on transgender individuals.[4–10] In contrast, earlier research about transgender people relied upon nonprobability samples, such as community and clinical samples.[11,12]

Probability sampling is the gold standard for representative survey research.[13] However, challenges in sampling marginalized minority populations, such as transgender individuals, may lead to biases in probability samples. In this article, we (1) consider how and why generalizability from studies using probability sampling may be limited for transgender populations, (2) discuss potential improvements in sampling that are particularly germane to marginalized populations, and (3) describe how both probability and nonprobability sampling can add to quality data on transgender populations. This article is not a systematic or narrative review of sampling transgender populations; as such, we focus on nonclinical samples in the United States to reduce selection biases.

Considerations About Generalizability: Inconsistent Patterns in Data

Findings from probability and nonprobability samples reveal several inconsistencies that have yet to be understood. Studies using nonprobability sampling of the U.S. transgender population have reported significant health and health risk disparities compared with the cisgender population, including poor mental health and suicidality,[14] HIV,[14] unemployment and poverty,[15,16] violence victimization,[15,16] substance use,[17] and barriers to health care.[14–16] Many of these disparities were noted in the 2008–2009 National Transgender Discrimination Survey (NTDS)[15] and the 2015 U.S. Transgender Survey (USTS),[16] the largest nonprobability samples of transgender adults to date, with nearly 6500 and 28,000 respondents from all 50 states and U.S. territories, respectively. In contrast, studies using BRFSS data—currently the only probability sample of adults including gender identity—have not consistently replicated the disparities documented in nonprobability samples.[4–10]

Sociodemographics

In brief, earlier studies using BRFSS data found no significant differences in age distribution, unemployment, and home ownership between transgender and cisgender individuals.[4,7] However, more recent studies using BRFSS data pooled over several years found that transgender individuals were more likely to be younger, unemployed, living in

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poverty, and less likely to own a home than cisgender individuals[6,8]—results that are more consistent with the NTDS and USTS.[15,16] Nevertheless, the magnitude of disparities between transgender and cisgender individuals suggested by nonprobability samples regarding rates of unemployment, poverty, and housing instability is largely absent in probability samples.

Compared with nonprobability samples, probability samples have also described a larger proportion of transgender individuals who live in traditionally hetero- or cisnormative arrangements. For example, BRFSS samples universally contain a larger proportion of transgender individuals who identify as heterosexual, are married, and have children in the household than transgender individuals in nonprobability samples.[6–8]

Health and health risk

Both probability and nonprobability samples have found that transgender individuals are less likely to be insured and more likely to report a financial barrier to health care.[7,8,16] However, health factors such as smoking are widely inconsistent, even among nonprobability samples.[16,17] Studies using BRFSS data have found no differences in smoking, except for Downing and Przedworski who found that transgender men were more likely to be current smokers than cisgender men.[6] The USTS reported a higher prevalence of binge drinking[16] than among early BRFSS samples,[7] but not later samples using aggregate data.[6] Studies using BRFSS data have found no differences in binge drinking, except for among transgender women who had higher odds of binge drinking than cisgender women.[6] However, in one study, transgender individuals were more likely than cisgender individuals to report heavy alcohol use.[8]

Overall, probability samples have found no differences in chronic conditions between transgender and cisgender individuals, except that prevalence of myocardial infarction appeared to be elevated among transgender women and gender nonconforming individuals.[6,7,18] In contrast, studies using BRFSS data have consistently reported a higher prevalence of disability and activity limitation in the transgender population than in the cisgender population[5–8]; however, the magnitude of this disparity was less than that implied by the findings for transgender people in the USTS.[16]

Notably, 41% and 40% of transgender respondents in the NTDS and USTS, respectively, reported at least one lifetime suicide attempt.[15,16] Unfortunately, there are no data currently from probability samples that contain both self-reported suicidal ideation or attempt and gender identity. Studies using BRFSS data have found a higher prevalence of self-rated poor mental health among transgender individuals than among cisgender individuals, but differences in physician-diagnosed depression only emerged in some studies.[6–8] In addition, Streed Jr et al. found that gender-nonconforming individuals experienced worse self-rated mental health than binary transgender individuals (i.e., transgender men and women).[9]

Similarly, transgender individuals reported worse self-rated general health than cisgender individuals.[7,8] However, this disparity is heightened for transgender gender-nonconforming individuals who reported worse self-rated health than cisgender men,[6,10] cisgender women,[6] and binary transgender individuals.[9] Likewise, although no differences have emerged between cisgender and transgender individuals for self-rated physical health,[7] transgender gender-nonconforming individuals reported worse self-rated physical health than cisgender men.[6]

Possible Reasons for Discrepant Findings

Studies of probability samples seemingly temper the extant corpus of health disparities suggested by studies of transgender people using nonprobability samples. Sampling and response bias may be partially responsible for the inconsistencies. If poverty, unemployment, housing instability, incarceration, and mental health issues are more prevalent in the transgender community, then address-based probability sampling methods may be less apt to find them because they exclude institutionalized populations and undomiciled individuals. In addition, barriers to research participation among transgender individuals include the lack of a cell phone and lack of time due to their need to work multiple jobs; to respond to a survey request, individuals must be reachable and have time to complete the survey.[19]

Stigmatization of transgender identities and skepticism toward the research community may increase refusal rates among transgender individuals or reluctance to disclose one's transgender identity.[19] Research in Canada has found that nearly one-third of gay and bisexual men would not reveal their sexual orientation on a government survey.[20] Transgender people living in the United States may be even less willing to disclose their identity in a government survey.

Inconsistencies may also result from differences in how gender identity is defined and assessed. Nonprobability samples that use the two-step method ask questions about both sex assigned at birth and current gender identity. This method is recommended by the World Professional Association for Transgender Health as the preferred procedure for collecting gender identity data.[21] BRFSS respondents must first identify as transgender (yes/no), and those who answer affirmatively are asked whether they identify as male-to-female, female-to-male, or gender nonconforming. The two-step method identifies twice as many transgender people and results in fewer respondent refusals than the single-item method used by the BRFSS.[22] (also Becker T, Herman J, Wilson BDM, Hughes T: Methods for measuring the transgender population and implications of policy changes for population survey data collection. Paper presented at the 146th Annual Meeting of the American Public Health Association; November 13, 2018; San Diego, CA.). The one-step measure used by the BRFSS fails to recognize individuals who do not identify as transgender.

Only 43% of USTS respondents felt ''very comfortable'' with using the word *transgender* to describe themselves.[16] The misclassification may result in an under-representation of segments of the transgender population, particularly gender-nonconforming individuals, and may bias the burden of disease in the transgender population as a whole. Disaggregating samples into transgender subgroups has revealed notable within-group differences.[6] Within-group disparities underscore the importance of disaggregating the sample, when possible, to understand the unique health needs of transgender subpopulations.

Strategies to Improve Sampling of Marginalized Populations

Consumers of research should appraise inconsistencies between probability and nonprobability samples. Based on the

current challenges to sampling transgender populations described herein, we make these recommendations:

(1) Probability and nonprobability samples should be used in tandem to inform the body of literature on transgender health. Nonprobability sampling can obtain a larger sample size of transgender participants, which can facilitate analysis of subgroups of transgender individuals including those with different gender identities. Studies of sampling methods for transgender populations, a research objective currently supported by the National Institutes of Health,[23] will illuminate biases and help direct best practices for researchers.
(2) Exploring strategies of data integration from institutionalized populations (e.g., prisons and long-term care facilities) with federal health surveillance will add another vantage point and can help build a more comprehensive view of national health metrics of transgender populations.
(3) Population parameters of the U.S. transgender population are necessary to facilitate weighting samples in federal health surveillance and strategies for oversampling. BRFSS weighting relies on the sex composition of the U.S. Census, which lacks gender identity data. If oversampling would be used for representation of transgender individuals in federal surveys, parameters are necessary to augment the survey representation to the U.S. population. However, until gender identity data are included in the U.S. Census, using the two-step method for all participants of national surveys can increase accuracy of identifying transgender respondents.[24]
(4) Studies about transgender individuals' willingness to disclose their gender identity in government surveys and cognitive studies on response patterns to different question formats can guide instrument development and implementation.

Conclusion

We advocate for the collection of gender identity information in federal health surveillance and show that nonprobability samples should not be undervalued. Studies using nonprobability samples that involve rigorous and careful design, execution, and analysis provide rich and valuable data that contribute significantly to the progression of the field. As creators—and consumers—of scientific knowledge, we must recognize that, for transgender populations, the truth about disparities must be assessed by learning from both nonprobability and probability samples. Although we must advocate to keep gender identity measures and increase their use so that we can find vulnerable populations in our data sets, we must also develop better ways for vulnerable populations to find us.

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Disclaimer

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