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Sociodemographic Differences by Survey Mode in a Respondent-Driven Sampling Study of Transgender People in Ontario, Canada

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Abstract

Purpose: To describe survey mode uptake and sociodemographic differences by mode among respondents to a respondent-driven sampling survey of transgender people in Ontario, Canada. Survey mode was left to participant choice.
Methods: Data were collected from 433 transgender Ontarians in 2009–2010 through a self-administered questionnaire, available online, by paper copy, or by telephone with language interpretation.
Results: Paper respondents (9.5%) were significantly more likely to be Aboriginal or persons of color, underhoused, sex workers, and unemployed or receiving disability benefits.
Conclusion: In Canada and similar high-income countries, sampling transgender populations that are diverse with respect to social determinants of health may be best carried out with multimode surveys.

Keywords: respondent-driven sampling, survey mode, transgender, Trans PULSE.

Introduction

Research on the health of trans (transgender, transsexual, transitioned) communities has historically relied on convenience samples of those most accessible to researchers, such as patients seeking medical transition at gender clinics, or clients of social service agencies that serve socioeconomically marginalized trans persons.[1,2] Online surveys have been proposed as a means of remedying the reliance of trans health research on such unrepresentative samples and also have greater potential to reach the large subgroup of trans people who are not living day-to-day in their felt gender.[3] However, ethnoracial and socioeconomic inequities in internet access persist, particularly with regard to the at-home broadband connections that best facilitate completion of lengthy web-based surveys.[4] Thus, as widely acknowledged, web-based surveys may generate samples biased in the direction of higher socioeconomic status.

Indeed, online ($n = 6021$) and in-person paper ($n = 435$) respondents to the National Transgender Discrimination Survey (NTDS), the largest United States convenience sample of trans adults, were found to differ on a number of sociodemographic and health variables.[5] In-person respondents were significantly younger, and significantly higher proportions were on the male-to-female (transfeminine) gender spectrum, persons of color, of lower socioeconomic status, and HIV positive.

However, in the absence of population-based statistics for comparison, it is difficult to draw conclusions about the magnitude of sampling bias induced by the survey mode in trans research. Convenience sampling methods further complicate interpretation of sociodemographic differences. In the NTDS, paper surveys were not available to any potential participant, but rather were purposively distributed to organizations serving homeless and low-income trans communities, and stipends were paid to workers in such settings to host group survey completion events.[6] Thus, in-person paper respondents were sociodemographically different from online respondents by design, and it is impossible to know to what degree differences in internet access and technological literacy affected these differences.

We report here on survey mode uptake, missing data, and sociodemographic differences by survey mode in a multimode (online, paper, and telephone with language interpretation) respondent-driven sampling (RDS) survey of trans people in Ontario, Canada. In 2009, 81% of Ontario residents aged 16 and above had internet access in any location and 78% had access at home.[7] Barriers to access in the Canadian context

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include limited infrastructure in remote and northern areas, digital illiteracy, and poverty. Notably, the socioeconomic ''digital divide'' appears smaller in Canada than in the United States.[8] However, at the time of data collection, internet costs in Canada were among the highest in the developed world.[9] In this context, and taking advantage of a sampling process in which the survey mode was left to participant choice, we aimed to inform the design and implementation of future trans health research.

Methods

Data source

The Trans PULSE Project was a community-based research project exploring the impacts of social exclusion on the health of trans people in Ontario, Canada. As part of the project, 433 trans people aged 16 and above who lived, worked, or received healthcare in Ontario completed a cross-sectional RDS survey in 2009–2010. Trans was broadly defined to include transgender, transsexual, genderqueer, and gender nonbinary identified individuals, with no requirements for social or medical transition.

Ethical approval was provided by Research Ethics Boards at The University of Western Ontario and Wilfrid Laurier University. Research ethics approval allowed parental consent to be waived for participants aged 16–17. Participants indicated consent by completing and returning the completed survey (paper version) or provided consent by clicking a button stating ''I consent'' after reading the letter of information (online version). Additional information about study procedures has been published previously.[10]

Recruitment began with 16 diverse initial participants (seeds) from the study's Community Engagement Team, and 22 seeds were added after 4–5 waves of recruitment (i.e., 4–5 referral cycles out from the seed participants) were completed. Ten waves of recruitment were ultimately obtained. Each participant was given three coupons for onward recruitment. These coupons (e-mail or paper) included information about the study's purpose, eligibility criteria, and ways to participate, as well as a unique code for both accessing a survey and tracking referral patterns. The survey was developed over the course of a year, with extensive community consultation and input. It included 243 questions (due to extensive skip logic, most participants completed fewer questions) and was 87 pages long (this includes comics and biographies of the community engagement team members intended to provide breaks from questioning).

There were three potential response modes: online using a web-based survey tool, by paper copy, and by telephone with language interpretation (in 77 languages). The online survey was designed to be visually identical to the paper version. Coupons included a link to the online questionnaire, while those who wished to complete a paper copy or who required language interpretation needed to call a toll-free number to obtain a mailed copy (to a name and address of the participant's choosing). Both the online and paper surveys were pretested for clarity and technical issues. Nevertheless, technical issues did arise for some (e.g., some Macintosh users in particular encountered glitches with the fillable form tool), so paper copies were made available in some community organizations through trusted survey team members, to be provided to recruited participants who encountered technical difficulties.

Upon survey completion, participants could opt to receive a $20 gift card or to donate the value of their honorarium to a trans-related charity.

Measures

Participants reported their age, educational attainment, employment status, social transition status (i.e., living in felt gender full-time, part-time, or not at all), and number of potentially eligible persons known (collected for RDS estimation). Gender spectrum was coded as transmasculine (i.e., female-to-male spectrum) or transfeminine (i.e., male-to-female spectrum) based on assigned sex at birth. Medical transition status was self-defined as complete, in process, planning but not begun, not planning, unsure, or not applicable and referred to whatever combination of hormones and surgery a participant deemed necessary. The ethnoracial group was categorized as Aboriginal, non-Aboriginal persons of color, or non-Aboriginal white based on responses to a series of check-all-that apply items and indication of whether they were perceived by others as a person of color.

Residence in metropolitan Toronto was coded using the first letter of the participant's postal code. Statistics Canada's low-income cutoff[11] was applied to the midpoint of reported household income categories, divided by the number of individuals supported by that income, to classify respondents as above or below this indicator of poverty. Underhousing was defined as meeting at least one of the following criteria: being homeless, living in temporary housing (e.g., motel, couch-surfing, squatting, rehabilitation facility), or reporting difficulty meeting monthly housing costs while living below the low-income cutoff. If engaged in paid labor, participants selected their type of employment from a list provided; those who indicated ''sex work'' or ''escort'' were coded as current sex workers.

Statistical analysis

Unweighted frequencies were calculated in SAS 9.3 (SAS Institute, Inc., Cary, NC, 2012), stratified by the response mode. Statistical significance of differences between groups

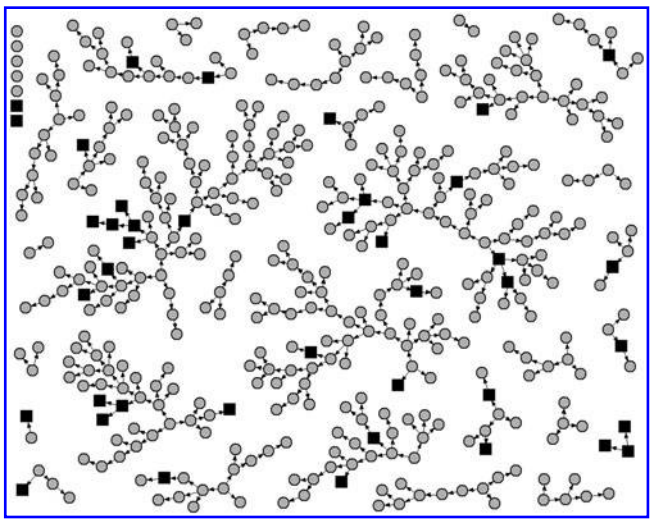

FIG. 1. Recruitment networks for Trans PULSE survey participants in Ontario, Canada ($n=433$). *Grey circles*, online respondents; *Black squares*, paper respondents.

was assessed with chi-square tests or Fisher's exact test (where expected counts were <5 for >20% of cells) for categorical variables and *t*-tests for continuous variables. Missingness was compared by mode for all variables included in this analysis, as well as for two variables from later survey sections with high potential for missingness (childhood sexual abuse and lifetime consideration of suicide).

Results

Of 433 survey respondents, 392 (90.5%) participated online, while 41 (9.5%) filled out the paper version. A network diagram showing the recruitment structure of the respondent-driven sample, coded for survey mode, can be found as Figure 1. No participants used the telephone option with language interpretation. Response rates cannot be calculated since participants were recruited by other participants rather than the research team. Forty-nine copies were mailed out by the research team, and 12 were not returned (24.5%). However, six of the nonreturners eventually completed the online survey, suggesting that they had requested copies due to technical difficulties only, or had changed their minds. Four additional paper surveys were completed by individuals who did not request mailed copies through our toll-free phone line, but instead used their coupons to access a paper copy from a community organization.

Sociodemographic characteristics of online versus paper respondents are shown in Table 1. Those who responded by paper copy were statistically significantly more likely to be Aboriginal or persons of color (35.0% vs. 21.3%, $P=0.048$), underhoused (31.7% vs. 16.9%, $P=0.020$), and current sex workers (13.5% vs. 2.8%, $P=0.008$). Employment status varied between the two groups ($P=0.018$); paper respondents were about half as likely to be employed full-time (18.9% vs. 39.5%), and were more frequently unemployed or receiving disability support payments (27.0% vs. 15.3%). Paper

Table 1. Unweighted Demographic Characteristics of Trans PULSE Respondents Who Participated Online ($n=392$) Versus by Paper Copy ($n=41$)

	Online % or $\bar{x}$ (SD)	n	*Paper % or $\bar{x}$ (SD)*	n	P
Age	33.7 (12.7)	390	37.4 (14.5)	40	0.091
Gender spectrum					0.403
Transmasculine	53.2	208	46.3	19	
Transfeminine	46.8	183	53.7	22	
Living in felt gender					0.465
Full-time	62.9	244	72.5	29	
Part-time	25.3	98	20.0	8	
Not at all	11.9	46	7.5	3	
Medical transition status					0.962
Complete	35.8	140	39.0	16	
In process	26.9	105	26.8	11	
Planning but not begun	17.1	67	17.1	7	
Not planning, unsure, not applicable	20.2	79	17.1	7	
Ethnoracial group					**0.048**
Aboriginal or person of color	21.3	83	35.0	14	
White	78.7	307	65.0	26	
Toronto residence					0.512
Lives in metropolitan Toronto	47.1	177	52.9	18	
Outside metropolitan Toronto	52.9	199	47.1	16	
Low income					0.062
Below low-income cut-off (LICO)	36.9	125	52.8	19	
Above LICO	63.1	214	47.2	17	
Housing status					**0.020**
Underhoused	16.9	62	31.7	13	
Adequately housed	83.1	305	68.3	28	
Education					**0.030**
Postsecondary degree	51.9	202	34.2	14	
Some postsecondary or less	48.1	187	65.9	27	
Employment status					**0.018**
Full-time	39.5	145	18.9	7	
Part-time	14.2	52	27.0	10	
Student or retired	30.3	111	24.3	9	
On leave	0.82	3	2.7	1	
Unemployed/On disability	15.3	56	27.0	10	
Current sex worker					**0.008**[a]
Yes	2.8	10	13.5	5	
No	97.2	347	86.5	32	
Number of eligible individuals known	16.4 (33.5)	392	23.6 (63.5)	41	0.246

Bold values indicate results statistically significant at $P<0.05$.
[a]*P* value from Fisher's exact test, as >20% of expected cell counts were <5.
SD, standard deviation.

respondents also appeared more likely to have household incomes below the low-income cut-off, but this difference failed to reach significance (52.8% vs. 36.9%, $P = 0.062$).

Paper participants were more likely to be missing Toronto residence (i.e., to not have reported the first three digits of the postal code), with 17.1% missing versus 4.1% for online respondents ($P < 0.001$). Paper participants were no more or less likely to be missing any of the other variables assessed, including those with higher proportions missing (e.g., 16.6% overall for childhood sexual abuse, 13.4% overall for low-income cut-off).

Discussion

We found that while only 1 in 10 respondents chose to participate in the Trans PULSE survey via paper copy, they were disproportionately Aboriginal or persons of color, and socially marginalized with respect to employment and housing. No respondents elected to participate by telephone with language interpretation. Anecdotally, this mirrors the experiences of other LGBT health studies in Ontario that have attempted to offer multilingual participation options, but have found poor uptake. Of Trans PULSE participants, 11.2% did not speak English as a first language, and 5.3% most commonly spoke another language at home at the time of participation.

There was little evidence of greater missingness among paper respondents, with the exception of missing postal code data, which may be related to the higher prevalence of underhousing in this group. This may be a function of the higher degree of motivation required to participate via paper copy since, in most cases, such copies had to be requested by phone. It may also reflect the potentially lower likelihood of returning an incomplete paper survey by mail, versus clicking to submit an incomplete online survey. We acknowledge that the questionnaire was unusually long, in consideration of community-identified research priorities and high participant motivation. While this did not appear to differentially impact paper versus online completion rates, it may have led to lower overall participation among those who received recruitment coupons. However, data about nonparticipant recruits are unavailable.

Conclusion

Paper and online respondents differed on characteristics (e.g., race/ethnicity, socioeconomic status) that are robustly associated with health disparities. These findings suggest that a single-mode online survey would have resulted in smaller numbers of participants from multiply marginalized groups of trans people, potentially contributing to bias in estimates. RDS analysis procedures adjust for recruitment probability (i.e., number of eligible persons known) and, when using RDS 1 estimators, for differential recruitment across groups.[12,13] However, estimates cannot be generated for any subgroups entirely excluded from the sample, and RDS does not adjust for other biases related to chain-referral sampling, including differential participation among those who receive recruitment coupons.[14,15]

Thus, for RDS surveys as well as those using convenience sampling, offering paper and/or in-person surveys remains important for obtaining sociodemographically diverse trans samples in Canada, and likely in comparable developed countries (e.g., in Western Europe, Australia). On the other hand, surveys relying solely on paper or in-person data collection and/or RDS coupon distribution may over-represent trans individuals with greater connectedness to community organizations and offline transgender networks by virtue of their social marginalization. For example, while we caution that trans population demographics cannot be assumed to mirror those of the broader population, it is notable that one such RDS study of trans women in San Francisco[16] appeared to underrepresent Asian Pacific Islander and white trans women while over-representing Black trans women, in comparison to the demographic make-up of San Francisco residents. In contrast, while our multi-mode RDS study found that trans Ontarians were younger on average and reported lower incomes, other estimated demographic characteristics (e.g., race/ethnicity) were similar to those of Ontarians overall.[10]

Additional research is required on the implications of survey mode on trans sample representativeness, particularly in the context of RDS. However, we conclude that, for the time being, single-mode surveys are of questionable generalizability to broader trans populations, even if collected using probability-based sampling methods.

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Author Disclosure Statement

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