



Drug use among transgender people in Ontario, Canada: Disparities and associations with social exclusion



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A B S T R A C T

Introduction: We identified the prevalence and correlates of past-year illicit drug use among transgender people in Ontario, Canada, and disparities with the age-standardized non-transgender population.

Methods: Data on transgender persons aged 16+ ($n = 406$) were obtained from Trans PULSE, a respondent-driven sampling (RDS) survey (2009–2010). Overall and sex-specific estimates of past-year drug use (cocaine and amphetamines, based on data availability) in the reference population were obtained from Ontario residents aged 16+ ($n = 39,980$) in the Canadian Community Health Survey (2009–2010), and standardized to the overall and gender-specific transgender age distributions. For regression analyses with Trans PULSE data, past-year drug use included drug types associated with high risk of physical, psychological, and social harm to the user, and RDS-II weights were applied to frequencies and prevalence ratios (PR) derived from blockwise logistic regression models.

Results: An estimated 12.3% (95% CI: 7.7, 17.0) of transgender Ontarians had used at least one of the specified drugs in the past year, with no significant difference by gender identity. Transgender Ontarians were more likely to use both cocaine (standardized prevalence difference; SPD = 6.8%; 95% CI = 1.6, 10.9) and amphetamines (SPD = 1.3%, 95% CI = 0.2, 3.1) as compared to the age-standardized non-transgender population. History of transphobic assault, homelessness or underhousing, and sex work were associated with greater drug use among transgender persons.

Conclusions: The prevalence of cocaine and amphetamine use among transgender people in Ontario, Canada was higher than in the age-standardized reference population. Social exclusion predicted within-group variation in drug use among transgender persons.

1. Introduction

Transgender (trans) persons are those with a gender identity that differs from their birth-assigned sex, including individuals who are transfeminine (male birth-assigned sex with female or non-binary gender identity) or transmasculine (female birth-assigned sex with male or non-binary identity). While population size estimates are not available for Canada, data from the United States indicate that trans persons constitute an estimated 0.6% of the adult population (Flores, Herman, Gates, & Brown, 2016).

Trans people continue to experience profound social stigma and exclusion, which contribute to discrimination, violence, internalized stigma, and limited health care access (Bauer et al., 2009; Bockting, Miner, Swinburne Romine, Hamilton, & Coleman, 2013; Marcellin, Bauer, & Scheim, 2013; White Hughto, Reisner, & Pachankis, 2015). Little substance use research has explicitly included trans persons

(Flentje, Bacca, & Cochran, 2015), and quantitative data on substance use among trans persons in Canada have been unavailable. However, limited existing evidence and the theory of minority stress (Hendricks & Testa, 2012; Meyer, 1995; Reisner, Greytak, Parsons, & Ybarra, 2015; Testa, Habarth, Peta, Balsam, & Bockting, 2015) suggest that trans populations experience disparities in drug use related to social stigma and exclusion. Disparities in drug use may also be related to gender dysphoria, or psychological distress caused by lack of alignment between one's sex characteristics and gender identity.

Research to date on substance use in trans populations has primarily focused on urban transfeminine persons living with or at high risk of acquiring HIV, finding high levels of cocaine and methamphetamine use (Nuttbrock et al., 2014; Reback & Fletcher, 2014; Santos et al., 2014). However, samples from HIV prevention studies are not representative of the broader transfeminine population in Ontario, Canada, among whom HIV risk is low overall (Bauer & Hammond, 2015).

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Moreover, drug use is an important outcome in its own right, irrespective of its association with sexually-transmitted HIV, given substantial impacts on morbidity and mortality (Deegenhardt et al., 2013). Also, a respondent-driven sampling survey ($n = 433$) in Ontario found that transmasculine persons had a higher prevalence of binge drinking than their transfeminine counterparts (Scheim, Bauer, & Shokoohi, 2016). These facts underscore the need to examine substance use in broader trans populations, inclusive of multiple gender identities.

Data from mixed-gender convenience samples of trans adults indicate that drug use in these samples is lower than in HIV prevention research settings but potentially higher than in the broader population. For example, one in five participants in a Massachusetts trans survey reported any past-year non-cannabis illicit drug use (Keuroghlian, Reisner, White, & Weiss, 2015), while one in ten participants to an online survey of trans people in the United States reported such use in the past three months (Horvath, Iantaffi, Romine, & Bockting, 2014). In comparison, non-cannabis illicit drug use was reported by approximately 2% of all Canadians aged 15+ over the previous year (Health Canada, 2015) and 3% of all Americans aged 12+ over the previous month (Substance Abuse and Mental Health Services Administration, 2014) in 2013. Few data on substance use in trans populations are available from high-income country settings outside the United States. In a report from an Australian trans convenience sample, 29% reported past-year illicit drug use (including cannabis) (Hyde et al., 2014).

Social stigma and exclusion have been associated with substance use among trans persons, and may partially account for the higher levels of use observed. For example, studies in the United States found that reported anti-transgender discrimination (Reisner, Gamarel, & Nemoto, 2014; Rowe, Santos, McFarland, & Wilson, 2015) and violence (Nuttbrock et al., 2014; Testa et al., 2012) predicted increased drug use among transfeminine adults. Depression consequent to stigma exposure may mediate the association (Nuttbrock et al., 2014). Socio-economic marginalization (e.g., unemployment, poverty), which is common in trans populations (Bauer, Travers, Scanlon, & Coleman, 2012; James et al., 2016), is associated with drug use in the broader population (Merline, O'Malley, Schulenberg, Bachman, & Johnston, 2004; Peck & Plant, 1986). In a context of barriers to formal employment, trans people report high levels of sex work involvement (Hoffman, 2014), and sex work predicts greater drug use in trans samples (Keuroghlian et al., 2015; Nuttbrock et al., 2014). Conversely, social inclusion may be protective against substance use within trans populations. For instance, family support is associated with lower substance use among trans and sexual minority individuals (Benotsch et al., 2016; Newcomb, Heinz, & Mustanski, 2012).

In addition to social stigma and exclusion, gender dysphoria may potentiate substance use as a coping strategy. By alleviating gender dysphoria, medical gender transition through hormones and/or surgery may contribute to improved mental health (Bauer, Scheim, Pyne, Travers, & Hammond, 2015) and reduced substance use. However, gender transition may also increase exposure to minority stressors. Findings on the association between medical transition and substance use have been mixed, with one study of trans women in San Francisco finding lower drug use among those who have taken hormones or had surgery (Wilson, Chen, Arayasirikul, Wenzel, & Raymond, 2015), and another in New York finding the opposite (Nuttbrock et al., 2014).

1.1. The present study

The present study draws on data from a respondent-driven sampling survey of 433 trans people in Ontario, Canada's most populous province, and from the Canadian Community Health Survey. We sought to compare past-year use of select substances (cocaine or crack and amphetamines, based on data availability) to the age-standardized cisgender male and female population of Ontario, hypothesizing that past-year prevalence would be higher among trans persons overall.

Considering that drug use may be impacted both by biological sex and social gender, we did not have a priori hypotheses regarding transgender-cisgender disparities by gender identity.

Next, we built exploratory blockwise regression models to evaluate the impacts of socio-demographic characteristics, gender transition, and social stigma or exclusion factors on past-year use of drugs associated with high risk of physical, psychological, and social harm to users. Considering potential inter-relationships between social stigma and exclusion and both sex work and depression, these were included as covariates. We hypothesized that indicators of social stigma and exclusion (transphobia, transphobic violence, lower social support, lack of parental support for gender, lack of employment, low income, and underhousing or homelessness), sex work, and depressive symptoms would be associated with higher prevalence of drug use.

2. Methods

2.1. Transgender study population

The Trans PULSE community-based participatory research project recruited 433 trans Ontarians via respondent-driven sampling (RDS) in 2009–2010, including 406 who completed substance use measures. Eligible participants needed to be 16 years of age or older; live, work, or receive health care in Ontario; and consider themselves trans, based on self-identification. Participants were not required to have undergone any social or medical gender transition. RDS is a network-based chain-referral sampling and analysis method developed for stigmatized populations lacking appropriate sampling frames (Heckathorn, 1997). Using analytic methods that account for unequal recruitment probabilities, RDS has been shown to produce unbiased estimates when assumptions are met (Wejnert, 2009) and is frequently used for prevalence estimation in hidden populations (Sabin & Johnston, 2014).

Recruitment began with 16 seed participants selected for demographic diversity. Each respondent was provided with three tracked coupons for recruiting their peers. Twenty-two additional seeds were added after 4–5 waves of recruitment, and data collection continued until a maximum of 10 recruitment waves were obtained. Respondents completed the 60–90-min questionnaire online or by visually identical paper copy. They were compensated with a \$20 gift card or could opt to donate the honorarium to a trans-related charity. Secondary incentives for recruitment of peers (\$5 gift cards) were only offered in the final months of the study and had no detectable impact on recruitment rates. The study received approval from Research Ethics Boards at The University of Western Ontario and Wilfrid Laurier University. Additional information about the Trans PULSE study has been published previously (Bauer et al., 2012).

2.2. Cisgender study population

Data on the prevalence of past-year cocaine or amphetamine use among Ontarians aged 16 and above ($n = 39,980$) were obtained from the 2009–2010 data cycles of the Canadian Community Health Survey (CCHS). Data on Trans PULSE-comparable items regarding the use of other drugs (e.g., heroin) were not made available by Statistics Canada due to small cell sizes. CCHS is an annual multi-stage, stratified, cluster sampling cross-sectional survey of Canadians aged 12 and above employing computer-assisted personal and telephone interviews. CCHS covers over 97% of the Canadian population, excluding institutionalized persons and those living on First Nations reserves. Additional information about CCHS methodology has been previously published online (Statistics Canada, 2010). Measures to identify trans respondents are not currently included in CCHS, and therefore we have assumed respondents to be cisgender. Applying national U.S. estimates (Flores et al., 2016), we would expect approximately 0.6% of this cisgender comparison group to be misclassified, with no anticipated substantive impact on results.

2.3. Measures

2.3.1. Past-year cocaine and amphetamine use

Separate CCHS items asked about use of “cocaine or crack” or “speed (amphetamines)” over the past year. Trans PULSE participants were provided with a list of illicit substances and asked to indicate which they had used in the past year. Amphetamines were defined differently in the two surveys: in Trans PULSE use of crystal methamphetamine and “other amphetamines” were queried separately, while CCHS participants were only asked to report use of “speed (amphetamines)”. To be conservative (as CCHS respondents may not have reported crystal methamphetamine use when asked about “speed”), only reported use of “other amphetamines” in Trans PULSE data was compared to reported amphetamine use in CCHS data, excluding crystal methamphetamine.

2.3.2. Past-year higher-risk drug use

A binary variable indicating any past-year drug use was created for regression analyses with Trans PULSE data. Given that an indicator of frequency or severity of use was not available, we limited attention to drugs posing a significant risk of physical, psychological, and social harm to the user, based on Nutt et al.’s multi-criteria decision analysis (Nutt, King, & Phillips, 2010). Evaluation criteria for their ranking of user-side harms included drug-specific and drug-related mortality, morbidity, and mental impairment; risk of dependence; loss of tangibles (including criminal justice involvement); and loss of relationships. While not included in the ranking by Nutt et al., non-medical use of prescription opioids is a source of considerable drug-related morbidity and mortality in Canada (e.g., related to overdose) (Fischer, Gooch, Goldman, Kurdyak, & Rehm, 2014). Therefore, respondents were coded as engaging in higher-risk drug use if they reported any past year use of heroin, cocaine (crack or powder), crystal methamphetamine, other amphetamines, GHB, ketamine, or prescription narcotics not prescribed by a physician. Drug types queried in our survey but excluded from this outcome definition were cannabis, poppers (alkyl nitrites), hallucinogens, and ecstasy/MDMA.

2.3.3. Personal network size

For RDS weighting, Trans PULSE participants were asked “How many other people do you personally know who could answer yes to all three eligibility questions?” These questions were the eligibility criteria listed above.

2.3.4. Covariates

Socio-demographic and background characteristics included age, gender identity (transfeminine or transmasculine), ethno-racial group (Indigenous, white, or person of color), residence in Toronto (Ontario’s capital and major urban center), report of childhood physical or sexual abuse, educational attainment (dichotomized as high school completion or less, versus any post-secondary education), and sexual minority identity. Gender transition variables were social transition (living in felt gender full-time, versus part-time or less) and medical transition. The latter was self-reported as complete; in process; planning but not begun; or not planning, unsure, or not applicable.

Social stigma and exclusion factors included transphobia, operationalized with an 11-item scale of enacted and internalized transphobia (anti-transgender stigma; Cronbach’s $\alpha = 0.81$) (Marcellin et al., 2013) and an indicator of experiencing transphobic physical or sexual violence, both over the lifetime. Social support was measured with the Medical Outcomes Study scale (Sherbourne & Stewart, 1991) (Cronbach’s α in our data = 0.97). Participants reported whether a range of people in their lives were supportive of their gender identity or expression, or anticipated to be supportive if disclosure had not taken place. Given evidence for a unique impact of strong parental support (Bauer et al., 2015), we included a dichotomous indicator of strong (versus moderate or weak) parental support. Other factors indicating

social exclusion were current employment status, low-income status (below the Statistics Canada low-income cut-off (Statistics Canada, 2009)), and homelessness or underhousing (defined as living in temporary or substandard housing, or having low income in combination with trouble meeting housing costs). Current sex work was self-reported in response to a question about current sources of paid work. Finally, past-week depressive symptoms were measured with the Center for Epidemiological Studies scale (Radloff, 1977) (Cronbach’s α in our data = 0.93).

2.4. Statistical analysis

To adjust for unequal recruitment probabilities, Trans PULSE data were analyzed with RDS II weights, which are estimated as the inverse of network size (Volz & Heckathorn, 2008). Estimates are thus for the networked trans population in Ontario (those who know at least one other trans Ontarian aged 16+). Weighted frequencies and their 95% confidence intervals were calculated in SAS version 9.3 (SAS Institute Inc., 2012), employing Taylor series linearization and adjusting variances for clustering by shared recruiter (Szwarcwald, de Souza Júnior, Damacena, Junior, & Kendall, 2011). Comparisons with CCHS data on the prevalence of past-year cocaine and amphetamine use were made by directly standardizing overall and sex-specific weighted estimates for Ontarians aged 16+ to the overall and gender-identity-specific age distributions of trans Ontarians. Six age categories were employed: 16–24, 25–34, 35–44, 45–54, 55–64, and 65+. Comparisons were made by both birth-assigned sex and current gender identity (i.e., between both gender identity groups and both males and females in the broader Ontario population).

This method has been used and described previously to compare the prevalence of heavy episodic drinking among transgender versus cisgender Ontarians (Scheim et al., 2016), while accounting for the substantially younger age distribution of the transgender population. Standardized prevalence differences (SPDs) were estimated by subtracting the age-standardized CCHS prevalence from observed prevalence in the trans population. This can be interpreted as the excess prevalence in the trans population as compared to what would be expected of the cisgender population, if the populations had the same age distribution. Confidence intervals around the SPD were constructed using the Method of Variance Estimates Recovery (Zou & Donner, 2008) to allow for comparison given the different structures of the two data sources. Differences in proportions are significant at $p < 0.05$ where the CI around the SPD excludes 0.

Predictors of higher-risk drug use were examined using Trans PULSE data. Prevalence ratios were estimated using average marginal predictions (Bieler, Brown, Williams, & Brogan, 2010) from weighted logistic regression models in SAS-callable SUDAAN (RTI International, 2013). Bivariate associations were estimated for all covariates. Next, adjusted prevalence ratios (APRs) were estimated for socio-demographic and background factors. Finally, a series of blockwise multivariable models were fit, with variables entered in the following order: (1) gender transition, (2) social stigma and exclusion, (3) sex work, and (4) depressive symptoms. This exploratory modeling approach was intended to account for temporal ordering to the extent possible with cross-sectional data, and to assess the impacts of social exclusion factors while adjusting for gender transition.

Each model was adjusted for age and for socio-demographic or background factors independently associated with the outcome at $p < 0.10$ in the initial multivariable sociodemographic model (ethno-racial group, Toronto residence, and childhood abuse). For each block, all variables were entered simultaneously. Variables were excluded from the following modeling step only if their p -value (for a Wald test in the multivariable model) was > 0.25 . Results of analyses stratified by gender identity did not substantively differ, and thus only analyses for the full sample are reported.

All available outcome data ($n = 406$) were used to generate

Table 1
Past-year drug use among transgender Ontarians, by gender identity (n = 406).

	All Trans People		Transmasculine ^a		Transfeminine ^a	
	%	95% CI	%	95% CI	%	95% CI
Crack cocaine	2.4	(0.0, 4.9)	0.7*	(0.0, 1.5)	4.5*	(0.0, 9.7)
Powder cocaine	7.3	(3.3, 11.4)	9.4	(3.3, 15.5)	5.0	(0.0, 10.2)
Crystal methamphetamine	0.4	(0.0, 0.7)	0.4	(0.0, 0.9)	0.4	(0.0, 0.9)
Other amphetamine	1.6	(0.5, 2.7)	1.4	(0.0, 3.1)	1.9	(0.5, 3.4)
Ketamine	2.6	(1.1, 4.2)	2.9	(0.6, 5.3)	2.3	(0.3, 4.3)
Gamma Hydroxybutyrate (GHB)	0.6	(0.0, 1.4)	0.8	(0.0, 2.1)	0.4	(0.0, 1.0)
Heroin	0.6	(0.0, 1.4)	0.8	(0.0, 2.2)	0.4	(0.0, 1.2)
Non-medical use of prescription narcotics	6.2	(2.9, 9.6)	7.5	(2.6, 12.5)	4.7	(0.0, 9.6)
At least one of above	12.3	(7.7, 17.0)	13.2	(7.7, 17.0)	13.2	(6.7, 19.7)
More than one class of drug ^b	4.1	(1.7, 6.5)	5.2	(1.1, 9.4)	2.8	(0.8, 4.8)

^a Transmasculine = assigned female at birth and identifies as male or masculine; transfeminine = assigned male at birth and identifies as female or feminine.

^b Classes were defined as: cocaine (powder or crack), amphetamines, “club drugs” (Ketamine and GHB), and opiates (heroin, prescription narcotics).

* p < 0.05 for difference between transmasculine and transfeminine persons.

prevalence estimates in Table 1. For regression analyses, respondents were excluded if they were missing data on > 20% of covariates (n = 7), resulting in an analytic sample of 399.

3. Results

3.1. Drug use frequencies in the transgender population

As shown in Table 1, an estimated 12.3% (95% CI: 7.7, 17.0) of trans Ontarians had used at least one higher-risk drug in the past year, with no significant difference detected by gender identity. Powder cocaine was the most frequently reported drug (7.3%; 95% CI: 3.3, 11.4), and crystal methamphetamine least common (0.4%, 95% CI: 0.0, 0.7). Only use of crack cocaine varied significantly by gender identity, with transfeminine persons being more likely to report use (4.5%, 95% CI: 0.0, 9.7 versus 0.7%, 95% CI: 0.0, 1.5).

3.2. Drug use frequencies in comparison to Ontarians overall

Comparisons to the reference population data from CCHS are displayed in Figs. 1 and 2. Compared to the age-standardized cisgender population, transgender Ontarians were more likely than expected to

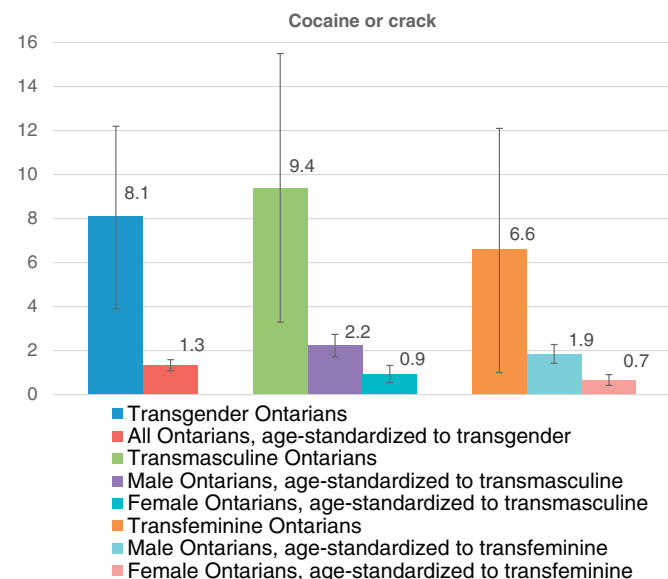


Fig. 1. Past-year cocaine or crack use among transgender Ontarians and the age-standardized Ontario population, 2009–2010. Note: Error bars indicate 95% confidence intervals.

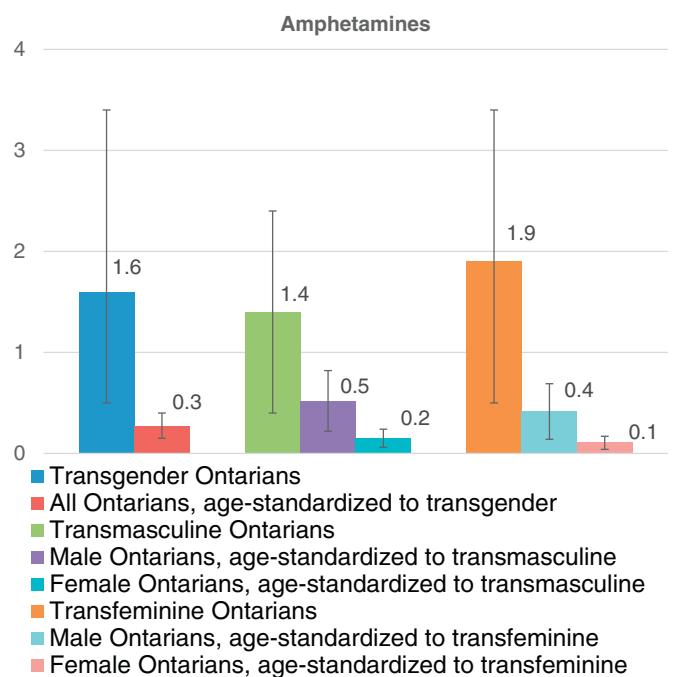


Fig. 2. Past-year amphetamine use among transgender Ontarians and the age-standardized Ontario population, 2009–2010. Note: Error bars indicate 95% confidence intervals.

use both cocaine (powder or crack) and amphetamines. Specifically, the estimated prevalence of past-year cocaine use was 6.8% (95% CI for standardized prevalence difference; SPD = 1.6, 10.9) greater among trans persons, while estimated amphetamine use was 1.6% (95% CI: 0.5, 2.7) greater. Put differently, there were an estimated 68 excess prevalent cases of past-year cocaine use per 1000 trans people, and 16 excess prevalent cases of amphetamine use, compared to what would be expected for the age-standardized reference population.

Next, analyses were stratified by gender identity, with data from cisgender males and females age-standardized to the relevant transgender age distribution (e.g., for comparisons with transmasculine persons, both cisgender males and females were age-standardized to the transmasculine age distribution). Transmasculine persons were significantly more likely to use cocaine than the cisgender reference populations, but not amphetamines. Transmasculine persons had a higher past-year prevalence of cocaine use as compared to both Ontario males (SPD = 7.2%, 95% CI: 1.0, 13.3) and females (SPD = 8.5%, 95% CI: 2.3, 14.6). In contrast, transfeminine persons were more likely to use amphetamines than both cisgender males (SPD = 1.5%, 95% CI: 0.1, 3.0) and females (SPD = 1.8%, 95% CI: 0.4, 3.3). However, their

Table 2

Weighted socio-demographic and background characteristics of transgender people in Ontario, Canada and associations with past-year drug use (n = 399).

	Weighted frequencies		Prevalence ratio (bivariate)		Adjusted prevalence ratio ^a	
	%	(95% CI)	PR	(95% CI)	PR	(95% CI)
Age (years) ^b						
Median, IQR	28.7	22.1–38.7	–	–	–	–
30 versus 20	–	–	0.81	(0.62, 1.07)	0.81	(0.59, 1.12)
40 versus 20	–	–	0.65	(0.37, 1.15)	0.66	(0.33, 1.29)
Gender identity						
Transmasculine	55.6	(47.7, 63.4)	1.31	(0.57, 2.97)	1.09	(0.49, 2.43)
Transfeminine	44.4	(36.6, 52.3)	1.00		1.00	
Toronto residence	38.8	(31.0, 46.7)	2.67***	(1.13, 6.30)	3.15****	(1.42, 6.99)
Race/ethnicity						
White	77.6	(71.5, 83.8)	1.00****		1.00****	
Indigenous	6.5	(3.2, 9.8)	0.79	(0.28, 2.23)	0.63	(0.15, 2.62)
Person of color	15.8	(10.5, 21.2)	0.29	(0.10, 0.79)	0.24	(0.08, 0.65)
Childhood abuse	69.5	(62.4, 76.6)	3.08****	(1.29, 7.33)	2.80****	(1.18, 6.63)
High school education or less	27.5	(20.1, 34.9)	0.55	(0.25, 1.20)	0.51	(0.20, 2.19)
Sexual minority	64.3	(56.6, 72.1)	1.35	(0.59, 3.10)	0.95	(0.42, 2.19)

* $p < 0.10$.** $p < 0.05$.*** $p \leq 0.001$.^a Nagelkerke $R^2 = 0.18$.^b Modeled as continuous in logistic regression, reference levels required for presentation of prevalence ratios.

prevalence of cocaine use varied only in comparison to cisgender females (SPD = 5.9%, 95% CI: 0.3, 11.4).

3.3. Trans population characteristics and associations with drug use

Weighted frequencies of socio-demographic characteristics and their associations with past-year drug use within the transgender population are shown in Table 2. In both crude and adjusted analyses, childhood physical or sexual abuse (APR = 2.80, 95% CI: 1.18, 6.63) and Toronto residence (APR = 3.15, 95% CI: 1.42, 6.99) were associated with higher prevalence of drug use, while people of color had a lower prevalence than whites (APR = 0.24, 95% CI: 0.08, 0.65).

3.4. Predictors of drug use

Results of blockwise logistic regression models predicting drug use are presented in Table 3, alongside bivariate prevalence ratios and weighted frequencies for each covariate. Experiences of transphobia, transphobic physical or sexual assault, homelessness or underhousing, and sex work were crudely associated with drug use. Multivariable models were adjusted for age, race/ethnicity, Toronto residence, and childhood abuse. In model 1, where transition status variables were added, neither social nor medical gender transition was significantly associated with drug use (results not shown). In model 2, including social stigma/exclusion variables, transphobic physical or sexual assault (APR = 2.11, 95% CI: 1.07, 4.17), greater social support (APR = 1.61, 95% CI: 1.11, 2.33), and being underhoused or homeless (APR = 2.34, 95% CI: 1.02, 5.38) were positively associated with drug use. In model 3, adding current sex work to retained social stigma and exclusion variables, sex work was associated with greater drug use (APR = 3.82, 95% CI: 1.22, 11.94). Social support remained positively correlated with drug use, while associations with transphobic assault and homelessness or underhousing were attenuated and lost statistical significance. In model 4, depressive symptoms were not associated with past-year drug use.

4. Discussion

4.1. Key findings

Drawing on data from a province-wide respondent-driven sampling

survey, we found that an estimated 12.3% of trans Ontarians reported past-year use of illicit drugs associated with a high risk of harm to the user, most commonly cocaine or non-prescribed opioids. In comparison to the reference (cisgender) population in the same period, directly standardized to reflect the younger transgender age distribution, trans persons were five to six times more likely to report cocaine and amphetamine use. While data on non-medical prescription opioid use (NMPOU) in the cisgender population were not available for standardized comparisons, an estimated 2.0% of Ontario adults reported NMPOU in 2008–9 (Shield, Ialomiteanu, Fischer, Mann, & Rehm, 2011), as compared to the 6.2% we have estimated for the Ontario trans population. Drug use within the trans population was associated with socio-demographic and background characteristics (white race, major urban residence, and childhood abuse), transphobic violence, homelessness or underhousing, and sex work.

4.2. Strengths and limitations

This is the first study to estimate the prevalence of drug use among trans Canadians and draws on respondent-driven sampling data, which are, in theory, generalizable to the networked transgender population of Ontario (i.e., those knowing at least one other trans person). However, while RDS II weights adjust for unequal recruitment probabilities due to network size, other sampling biases may remain (McCreesh et al., 2012). For instance, subgroups may be consistently under- or over-recruited, or be more likely to decline participation even if recruited. Ultimately, inclusion of measures to identify trans respondents in Canadian population health surveys will be critical to advancing understanding of health disparities. Comparison to CCHS was based on the availability of data for the same categories of drugs as included in Trans PULSE. To be conservative, we compared reported use of “speed (amphetamines)” in CCHS to “other amphetamines” in Trans PULSE. This may underestimate the disparity in use to the extent that crystal methamphetamine users responded affirmatively to the CCHS question.

The Trans PULSE survey did not collect data on the frequency of drug use in the past year. Reported use may have been intermittent, or even a single event, and is not indicative of problematic use or dependence. To mitigate the limitations of the available outcome data, we restricted attention to drugs posing a higher risk of harms to users. Nevertheless, respondents may have experienced high risk related to

Table 3
Blockwise logistic regression predicting past-year drug use among transgender people in Ontario, Canada (n = 399), controlling for socio-demographic and background characteristics.

	Weighted frequencies		Prevalence ratio (bivariate)		Adjusted prevalence ratios ^a					
	% or median	(95% CI) or IQR	PR	(95% CI)	Model 2 ^b		Model 3		Model 4	
					PR	(95% CI)	PR	(95% CI)	PR	(95% CI)
Living full-time in felt gender	52	(43.6, 60.4)	1.6	(0.68, 3.79)	—	—	—	—	—	—
Medical transition status										
Complete	27.1	(20.4, 33.8)	1							
In process	24.3	(18.2, 30.5)	0.64	(0.29, 1.38)	—	—	—	—	—	—
Planning but not begun	28.4	(21.1, 35.8)	0.42	(0.11, 1.57)						
Not planning, unsure, N/A	20.1	(13.1, 27.2)	0.83	(0.31, 2.22)						
Transphobia										
Median, IQR	12.8	9.0–18.2								
75th versus 25th percentile	—	—	1.69*	(1.10, 2.60)	1.08 [†]	(0.71, 1.67)	—	—	—	—
Transphobic assault	20.3	(14.4, 26.1)	3.09**	(1.47, 6.47)	2.11*	(1.07, 4.17)	1.84	(0.94, 3.57)	1.82	(0.92, 3.61)
Social support										
Median, IQR	3.6	2.8–4.3								
75th versus 25th percentile	—	—	1.37	(1.00, 1.90)	1.61*	(1.11, 2.33)	1.59**	(1.15, 2.19)	1.61**	(1.14, 2.27)
Strong parental support for gender	24.7	(18.5, 30.9)	0.49	(0.23, 1.05)	0.52	(0.25, 1.07)	0.55	(0.28, 1.07)	0.55	(0.29, 1.06)
Below low income cut-off	43.8	(35.8, 51.8)	1.69	(0.78, 3.69)	0.95 [†]	(0.47, 1.92)	—	—	—	—
Employment status										
Full or part-time	50.5	(42.9, 58.1)	1		1.00 [†]		—	—	—	—
Student	27.5	(20.5, 34.5)	1.16	(0.48, 2.81)	1.01	(0.44, 2.31)				
Other	22	(15.3, 28.8)	0.79	(0.31, 2.03)	0.78	(0.34, 1.80)				
Underhoused/homeless	17.6	(11.7, 23.5)	2.74*	(1.23, 6.08)	2.34*	(1.02, 5.38)	1.83	(0.75, 4.44)	1.84	(0.77, 4.40)
Current sex work	2.2	(0.0, 4.6)	7.48**	(3.97, 14.08)		3.82*	11.94	(1.22, 3.82*)	11.99	(1.22, 11.94)
Depressive symptoms			1.06	(0.67, 1.68)			1.05	(0.67, 1.63)		
Median, IQR	22.5	10.7–32.8								
75th versus 25th percentile	—	—								

^a All models control for age, ethnracial group, Toronto residence, and childhood sexual or physical abuse.

^b Model 1 (transition status variables) not displayed; p-values for all variables were > 0.25.

[†] p > 0.25, not included in subsequent models.

* p < 0.05.

** p ≤ 0.001.

problematic use of other drugs. Self-reporting of drug use is also subject to social desirability bias. While Trans PULSE was self-administered (with the option to retain anonymity), the CCHS was interviewer-administered, and therefore reporting bias may contribute to over-estimation of prevalence differences. Also, the data are cross-sectional and thus causality cannot be inferred. Further, some exposures were measured over the same time frame as drug use (e.g., sex work), and are potential effects of drug use.

4.3. Implications

Consistent with prior research, indicators of social stigma and exclusion were associated with drug use within the trans population (Hyde et al., 2014; Reisner et al., 2014; Substance Abuse and Mental Health Services Administration, 2014). The addition of sex work to regression models attenuated the estimated prevalence ratios for transphobic assault and underhousing, suggesting that sex work may mediate or confound associations between these factors and drug use. A previous study in New York found that sex work was prospectively associated with transphobic violence, and in turn, with depressive symptoms and substance use (Nuttbrock et al., 2014). Longitudinal research including larger numbers of transgender sex workers is required to elucidate the relationships between these factors over time and across geographic contexts.

Greater social support was consistently positively associated with drug use. This unexpected finding warrants future investigation. As we examined any past-year drug use, much of which would be occasional recreational use, it is plausible that individuals engaging in such use are more socially well-connected.

Gender identity was not associated with drug use among trans

persons. Few studies have directly compared substance use by gender identity, and those studies have had conflicting findings (Horvath et al., 2014; Keuroghlian et al., 2015). In this same study population, transmasculine gender was robustly associated with heavy episodic drinking, while social exclusion variables—with the exception of sex work—were unassociated (Scheim et al., 2016). However, there was no gender identity difference in the prevalence of very frequent (weekly or more) binge drinking. Taken together, these findings suggest that the impact of gender norms on transgender substance use behavior may be stronger for more socially normative use (e.g., occasional heavy drinking), with social marginalization more salient for predicting higher-risk substance use or dependence.

Social and medical gender transition statuses were also not significantly associated with drug use, suggesting that factors other than gender dysphoria may account for the high prevalence of drug use in this population. Indeed, results indicate that drug use is particularly elevated among trans Ontarians who have experienced victimization (childhood abuse, transphobic assault), homelessness or underhousing, and sex work. Culturally competent substance use prevention and treatment services that consider the impact of these experiences are warranted.

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Contributors

GRB planned and carried out the survey. AIS and GRB conceptualized the paper and designed the analyses. AIS conducted the analyses and drafted the manuscript. All authors contributed to interpreting the results, edited the manuscript, and approved the final version.

Conflict of interest

No conflict declared

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