

## Background

Gay-identifying, bisexual-identifying (GB) and other men who have sex with men (MSM), both an identity- and behaviourally-based community, account for approximately half of new HIV diagnoses in Canada, despite representing only 3-4% of the adult male population.<sup>1</sup> Reliable population size estimates of this community are necessary to allocate resources to meet prevention needs and for modelling the HIV epidemic.<sup>2</sup>

A nuanced understanding of the epidemic among gay, bisexual and other men who have sex with men has been limited by the challenges estimating this population size: lack of population sample frame,<sup>3</sup> small sample size, stigma surrounding sexual orientation disclosure,<sup>4</sup> and inconsistent measurement of sexual orientation.<sup>5</sup> Previous Canadian estimates were solely identity-based, which did not account for gay/bisexual-identifying men not willing to reveal sexual orientation on a government survey or non-identifying men who also engaging in sex with other men.

## Objective

Building off methods previously developed,<sup>6,7</sup> our objective was to calculate national population size estimates of gay, bisexual and other men who have sex with men in Canada for the following groups:

- “Identity-Behaviour”: Gay or bisexual-identifying men + men who didn’t identify as gay or bisexual but reported any sex with a man in the past 5 years,
- “Behaviour”: Gay or bisexual (-identifying) men who reported anal sex with a man in the past 6/12 months + men who didn’t identify as gay or bisexual but reported anal sex with a man in the past 6/12 months

## Methods

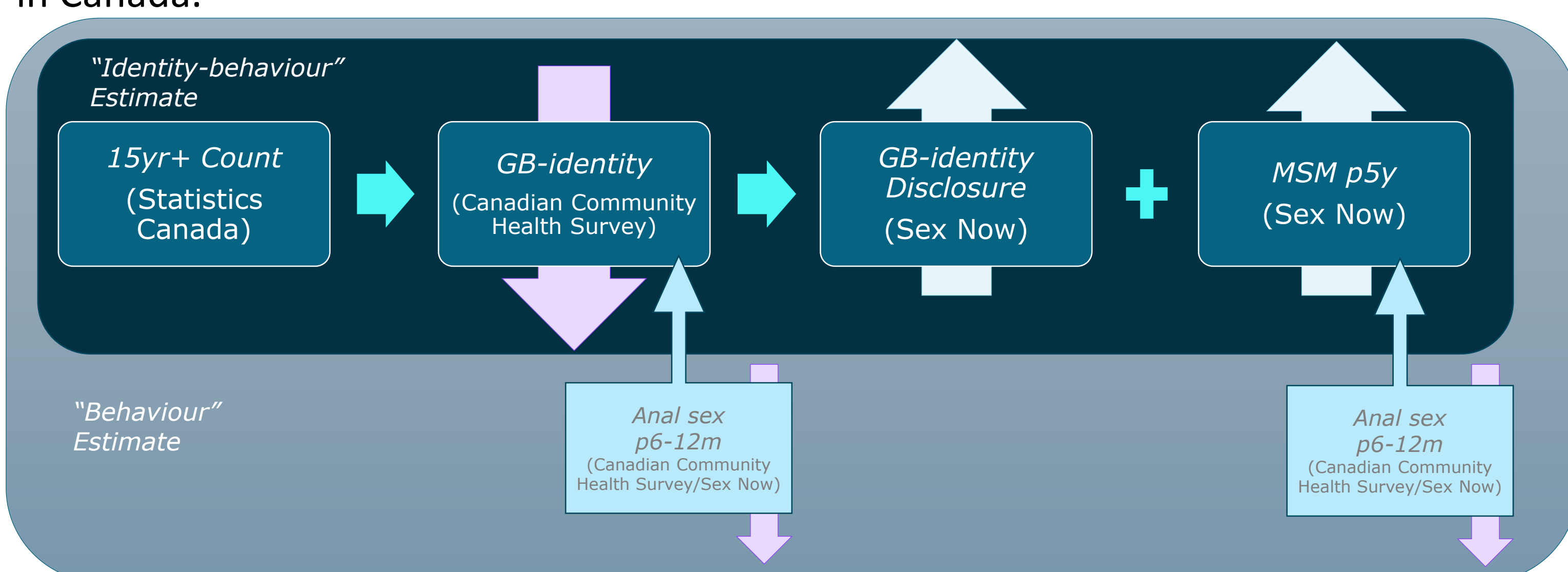
### Data Sources and Measures:

1. Statistics Canada, Population estimates,<sup>8</sup> 2020
  - Postcensal estimate accounting for census undercoverage
  - 15yr+ males (assigned male at birth), urbanity (rural [ $<1,000$  residents]/urban [ $\geq 1,000$  residents])
2. Statistics Canada, Canadian Community Health Survey (CCHS),<sup>9</sup> 2020
  - Cross-sectional, stratified sample, nationally representative survey
  - Sexual identity, urbanity, p12m anal sex with a man
3. Sex Now Survey (a national GBT2Q men’s health survey),<sup>10</sup> 2019
  - Anonymous, self-administered online survey
  - Sexual orientation, age, ethnicity, Indigenous identity, Immigration experience, urbanity, willingness to disclose gay/bisexual sexual orientation on a government survey, p6m anal sex with a man

### Analysis:

Using Sex Now, we explored the willingness of gay/bisexual-identifying respondents to report their sexual orientation on a government survey (likely/unlikely) by age group, ethnicity, Indigeneity, Immigration experience, and urbanity (rural/urban).

Beginning with the 15yr+ age male population count, we applied proportional estimates of gay/bisexual-identity, unlikeliness to disclose gay/bisexual-identity, and non-gay/bisexual-identifying men who had sex with men in the past 5 years. This estimate comprised the “Identity-Behaviour” group. We then restricted this estimate to those reporting recent anal sex with a man (p6m Sex Now/p12m CCHS) to produce our “Behaviour” estimate. This estimation model is presented graphically in **Figure 1**. The gay/bisexual-identity estimate is adjusted upward to correct for unwillingness to disclose, and an estimate of p5y men who have sex with men is included. Based on recent sexual behaviour, downward adjustments are made to arrive at sexually active gay, bisexual and other men who have sex with men. All population size estimation analyses were stratified by urbanity, and CCHS data were analyzed using weighted counts. Point estimates were derived as the midpoints between CCHS- and Sex Now-based estimates. Results are presented as counts (range) and % (range) of 15yr+ males in Canada.



**Figure 1.** Estimation model of gay, bisexual, and other men who have sex with men in Canada, 2020.

## Results

Overall, we found 13.5% of gay/bisexual-identifying Sex Now respondents were not likely to reveal their sexual orientation on a government survey. Several correlates, including urbanity, were associated with gay/bisexual orientation disclosure on a government survey. Urban residence was strongly associated with willingness to disclose (88.4% urban, 80.2% rural, odds ratio 1.88 [95%CI: 1.45-2.43]). We therefore stratified population size estimation by urbanity (other associations not shown).

We estimate that 3.5% of the 15yr+ male population identify as gay or bisexual and were willing to disclose, and 0.2% of 15yr+ males were not gay/bisexual-identifying and reported sex with a man in the past 5 years. The national *Identity-Behaviour* gay, bisexual and other men who have sex with men population size in 2020 is estimated at 640,785 (617,263-664,307), 4.1% (3.9%-4.2%) of the Canadian male 15yr+ population. Among this estimate, 4.6% did not identify as gay/bisexual but reported p5y sex with a man. An estimated 560,575 (4.2%) *Identity-Behaviour* gay, bisexual and other men who have sex with men 15yr+ were in urban areas, and 80,210 (3.1%) were in rural areas. The estimate of gay, bisexual and other men who have sex with men reporting past-year anal sex, our *Behaviour*-based estimate, was 432,267 (361,984-502,549), representing 2.7% (2.2%-3.2%) of the male 15yr+ population (**Table 1**).

**Table 1.** Gay, bisexual, and other men who have sex with men population size estimates by urbanity, 15yr+, Canada, 2020

	GBMSM ( <i>Identity-Behaviour</i> )		GBMSM ( <i>Behaviour</i> )	
	n (range)	% (range)	n (range)	% (range)
National total*	640,785 (617,263-664,396)	4.1 (3.9-4.2)	432,267 (361,984-502,549)	2.7 (2.2-3.2)
Urban area	560,575 (540,570-580,579)	4.2 (4.1-4.4)	382,736 (321,729-443,744)	2.9 (2.4-3.4)
Rural area	80,210 (76,693-83,728)	3.1 (3.0-3.2)	49,530 (40,255-58,806)	1.9 (1.6-2.3)

\*Excludes Canadian territories. At the time of submission data for the territories were not yet available. Efforts are underway to include these regions as data become available

## Conclusions

Using data from multiple sources, these estimates account for gay, bisexual and other men who have sex with men previously unaccounted for in Canada’s estimate, including gay/bisexual-identifying individuals that would not disclose their sexual orientation on a government survey and non-gay/bisexual-identifying men who have sex with men. Stratification of results by urbanity provides additional information to guide health services and promotion. Using more robust estimation methods than previously employed in Canada, a more accurate understanding of the burden of HIV among gay, bisexual and other men who have sex with men may be appreciated. It is our hope that these methods may be adopted by other jurisdictions similarly estimating gay, bisexual and other men who have sex with men population size in efforts towards cross-jurisdictional comparability while accounting for underrepresented subgroups.

### References:

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5. Laumann EO, Gagnon JH, Michael RT, Michaels S. The Social Organization of Sexuality. Chicago, IL: University of Chicago Press; 1994.
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9. Canadian community health survey - annual component (CCHS). (2021). Retrieved from <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3226>
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