

## Sampling bias in transgender studies

Stefan Baral and colleagues<sup>1</sup> reported an international meta-analysis of HIV seroprevalence among transgender women. This work shares a common methodological weakness with past meta-analyses on this topic, one that unfortunately Baral and colleagues are unable to remedy. Sampling bias is common in studies of transgender women, in which convenience samples are primarily drawn from urban sites over-representing street-active women, including HIV testing sites. Although such studies are important in reporting HIV vulnerabilities experienced by segments of the transgender population, we caution against broadly extrapolating to transgender women.

Evidence for greater heterogeneity has emerged in new population studies with large samples and self-reported data. In North America, three studies<sup>2-4</sup> have observed self-reported HIV prevalences in transgender women of between 2.2% and 3.8%. These results contrast by a factor of four with the summary statistic of 11.8% from Herbst's meta-analysis of US studies with self-report measures,<sup>5</sup> studies that were similar in design to those used by Baral and colleagues. The consistency of results across larger, more representative samples contrasts with the consistently higher prevalences observed in urban convenience and clinic samples, suggesting that sampling bias has a potentially large role in shaping these results. We suspect that when new studies are able to provide seroprevalence estimates for broad population samples of transgender women, the results will probably challenge the "remarkable" consistency observed by Baral and colleagues.

Moreover, contrary to Baral and colleagues' assertion that transgender women "have been consistently identified as engaging in receptive anal sex with men",<sup>1</sup> data for sexual

behaviour reported for one of the broader population studies showed that about half of transgender women have no past-year sex partners, and most reported no anal sex.<sup>2</sup> Thus, urban and clinic samples might not represent the sex lives of transgender women in less urban areas, of higher economic positions, or those who are not primarily sexually attracted to men.

Although high HIV prevalences can serve as an advocacy instrument in drawing attention to the health of transgender women, labelling a group that experiences stereotypes of hypersexuality as a high risk group for HIV has the potential to add to stigma. We support Baral and colleagues' arguments for greater inclusion of transgender women in HIV surveillance, research, and interventions, and for structural changes to increase social inclusion. However, we caution that the consistency that they observe might be, at least in part, a function of consistent sampling bias.

We declare that we have no conflicts of interest.

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## Authors' reply

We thank Greta Bauer and Ayden Scheim for highlighting concerns about selection bias in studies of transgender women and the generalisability of estimates of HIV burden in these women. As described in our study,<sup>1</sup> the sampling strategies that are most pragmatic in most settings tend to oversample higher risk transgender women, which could overestimate the actual burden of HIV in all transgender women in a city, country, or region. This is a challenge for studies in any populations in which denominators are scarce and population-based sampling is problematic. Our study called for improved sampling frames of transgender women through inclusion of transgender identities in government censuses or formal recognition of transgender people in the context of government documentation.

Given these realities, however, we do not agree with Bauer and Scheim's assessments. Our study specifically excluded self-reported HIV prevalence data because of the well known limitations of self reports of HIV status. Bauer and Scheim quoted three studies in which self-reported HIV prevalence ranged from 2.2 to 3.8% in transgender populations;<sup>2-4</sup> however, these studies also had remarkably high numbers of transgender women who had not been tested recently or had never been tested. In the study from Ontario,<sup>2</sup> only 27% of transgender women had been tested for HIV in the previous year, and 42% had never been tested for HIV. Moreover, although 3% reported living with HIV, 25% reported being unsure of their status. The highest self reported HIV prevalence of 17% (+24% unsure) was in Aboriginal populations who also reported the highest testing rates.<sup>2</sup> In the National Transgender Discrimination survey,<sup>3</sup> 2.6% of all participants (4.3% in transgender women) reported living with HIV, but more than three-times as many reported being unsure of their status and coverage of HIV testing was not assessed. Additionally, in the online