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Street-based female sex workers of all ages in SA at sustained high risk of acquiring HIV

Street-based female sex workers in South Africa have extraordinarily high HIV incidence, emphasising the need to sustain and strengthen efforts to mitigate risk and provide adequate care. This is according to a paper published today in the [Lancet HIV journal](#).

A consortium of researchers spread across six institutions; the University of Cape Town (UCT) University of the Witwatersrand, African Potential Consulting, Stellenbosch University, the South African Medical Research Council and the National Institute of Communicable Diseases has published a new analysis of data obtained from the first national survey of female sex workers in South Africa accessible through sex worker programmes.

The analysis aims to understand not just what proportion of surveyed respondents were living with HIV at the time of sampling (HIV *prevalence*: 62%), but also to shed light on the rate of occurrence of new HIV infections in this population (HIV *incidence*). Estimating infection rates is famously difficult, having been called the 'Holy Grail' of epidemiology, to suggest both its value and elusiveness.

Dr Reshma Kassanjee of UCT's Centre for Infectious Diseases Epidemiology and Research (CIDER), chief analyst and lead author of the paper, commented: "Ideally, to measure infection rates, one would recruit people who are initially not infected, and then test them repeatedly and note how rapidly infections occur in this cohort. One indirect way of extracting the same information at a single time would be to find out when people most recently tested negative for HIV, and then see which, and how many, of these people now test positive.

Interestingly, the estimate we obtained using this approach was *much* higher than the three mutually overlapping estimates we obtained from the three other methods of estimation we used. This inflation in the estimate is consistent with a possible social desirability bias in the reporting of recent previous negative tests."

Dr Jenny Coetzee, Principal investigator of the female sex worker study, at the Perinatal HIV Research Unit, University of the Witwatersrand and African Potential Consulting, explained: "Our survey had numerous aims, and we have previously written about designing the study of female sex workers, HIV prevalence and the HIV cascade of care, experience of violence, mental health and access to health care – particularly treatment for HIV and pre-exposure

prophylaxis services. This additional analysis grapples with the question of estimating HIV incidence, for which there is no obvious straightforward approach in such a setting.”

Professor Alex Welte of the Department of Science and Innovation – National Research Foundation Centre of Excellence in Epidemiological Modelling and Analysis (SACEMA) has developed methods for estimating HIV incidence from survey data and supported the study. “We noted four logically different ways in which *infection rates* (incidence) influence a data set of this kind. Then we essentially asked – under various circumstances, what would the incidence have had to be for these various features of the data to arise. This gave us four logically independent estimates of the infection rate, which we then compared.”

Kassanje summarises the findings: “Considering the range of estimates from our different approaches, we can conclude that among 100 initially uninfected female sex workers, we expect between 4 and 7 to become infected over the course of a year, with uncertainty around these estimates and a clear need to continue and strengthen epidemiological surveillance in this group to support future incidence estimations.”

Welte further explains: “While this certainly is a very high infection rate, it bears pointing out that before anti-retroviral treatment was widely available, and hence a large proportion of infected individuals were highly infectious, some studies found such high infection rates among young women in community settings, without focusing on sex workers specifically.

However, this was only in some areas with the highest levels of transmission, and then only among women of age around 20 years. In community settings, incidence varies a great deal by age, but we found that we were unable to clearly distinguish incidence by age among sex workers, which leads to an enormous cumulative risk of becoming infected in a lifetime. “While a dataset of this kind has inherent limitations in terms of allowing us to see differences between subgroups within the total sample of participants – if there were sufficiently large difference in incidence between locales, or different ages, we would expect to have been able to see that.”

Coetzee concludes on implications: “This level of risk is despite broad gains in HIV programmes targeting the population and offering access to pre-exposure prophylaxis and rapid antiretroviral therapy initiation, emphasising the need to strengthen efforts, across age groups. Clients of sex workers not only present the primary risk of infection to female sex workers but also bridge to the general population, and no programmes exist to target this key population in South Africa.”

[Access the full paper.](#)

Notes to editors:

- Analysis is based on the first national survey of female sex workers in South Africa accessible through sex worker programmes. Other analyses based on this extensive dataset have been published, notably describing the study design, demographic structure, HIV status and cascade of care, exposure to violence and mental health.
- Estimation the rate of occurrence of new infections (disease ‘incidence’) as opposed to the current proportion of people infected (‘prevalence’) is notoriously difficult. This analysis explores, refines, and demonstrates several logically distinct methods for achieving this.
- The core result is that the rate of acquiring HIV infection (among the approximately 40 percent who are not already living with HIV) is estimated to be in the range of 4-7

percent per year. See the primary article for details including uncertainty ranges, sensitivity analysis, and consistency of estimates across methods.

- For context, such high rates of acquiring infection have previously been observed in some communities other than sex workers, but only among young women which has long been the group experiencing the highest rates of infection, and at a time when antiretroviral treatment (which not only treats infection, but also greatly reduces transmission) was not as widely available or used as present.

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