Large decline in HIV prevalence and incidence among female sex workers in Zimbabwe, 2011-2023

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BACKGROUND

- HIV incidence among women in sub-Saharan Africa has declined steadily but little is known about HIV trends among female sex workers (FSW).
- We analysed data from a national-scale collaboration to explore trends in HIV prevalence and HIV incidence among FSW in Zimbabwe between 2011 and 2023, complemented by mathematical modelling.

METHODS

- Between 2011-2023 we collected data on HIV infection from 13,918 women aged 18-39 in multiple respondent-driven sampling surveys (RDS) in Zimbabwe.
- In 13 towns RDS surveys were repeated in 2017 and 2021, and in 2 large cities RDS surveys were repeated in 2017 and 2023.
- In 2021, we analysed 306 dried blood spot samples with a recent infection algorithm (LAg avidity + viral load).
- We explored HIV prevalence trends using RDS-II weighting.
- Since patterns were similar across years, we estimated HIV incidence pooled for 2011-2017 and for 2021-2023, based on HIV prevalence rises with age ("prevalence to incidence method").
- In 2021, we also estimated HIV incidence using recent infections ("RITA method", MDRI=130 days, false recency rate=0.2%).
- The HIV synthesis model was calibrated to data from Zimbabwe to further estimate HIV incidence.

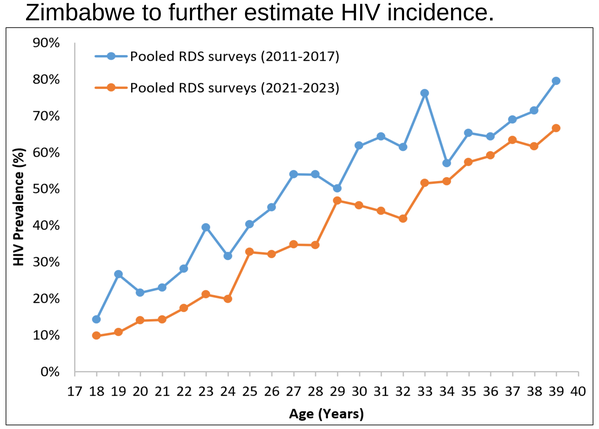


Figure 1. HIV prevalence among FSW aged 18-39 by age for pooled RDS surveys in 2011-2017 and 2021-2023

HIV prevalence in 2021-2023 pooled RDS surveys was 17% lower than in 2011-2017 (37.3% vs 54.2%, p<0.001).

Modelled HIV incidence fell from 10.1/100 person-years in 2012 to 4.0/100 person-years in 2022 for FSW attending a sex worker programme.

RESULTS

- HIV prevalence in 2021-2023 was 17% lower than in 2011-2017 (37.3%, n=2220/5954 vs 54.2%, n=4314/7964; p<0.001) (Figure 1).
- HIV prevalence fell in 11/13 towns and in both large cities with repeated surveys, between 2017 and 2021/2023, by an average of 9% (Figure 2).
- HIV incidence ("prevalence to incidence method") was similar in both 2011-2017 and 2021-2023, estimated at 4.4/100 person-years.
- HIV incidence in 2021 ("RITA method") was estimated at 1.9/100 person-years (17 recent infections, 1396 long term positive, 2107 HIV negative samples).
- Modelled HIV incidence was higher in earlier years than the empirical estimates but fell from 10.1/100 person-years in 2012 to 4.0/100 person-years in 2022 among FSW attending a sex worker programme (Figure 3).

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CONCLUSIONS

- Using population-based sampling we show a large reduction in HIV prevalence over time among FSW in Zimbabwe.
- Trends in incidence are harder to estimate, but incidence appears to be declining, possibly due to increases in ART coverage in men. ZIMPHIA data suggest that the proportion of males aged 15-49 living with HIV who had suppressed viral load increased from 48.9% (2015/16) to 68.1% (2020).
- Despite these declines, HIV incidence remains unacceptably high among FSW. Persistence and innovation in HIV prevention for FSW are needed.

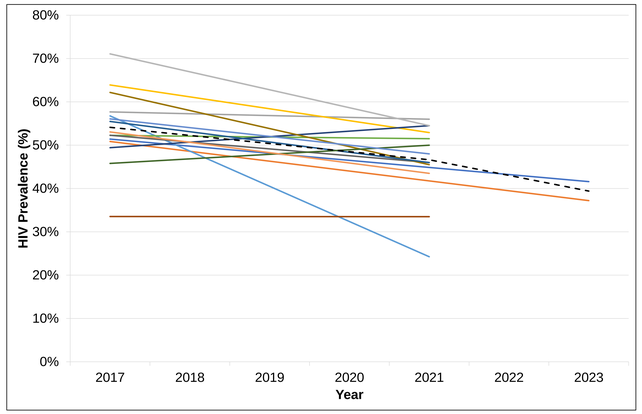


Figure 2. HIV prevalence among FSW aged 18-39 by year in 13 towns and 2 large cities with repeated RDS surveys

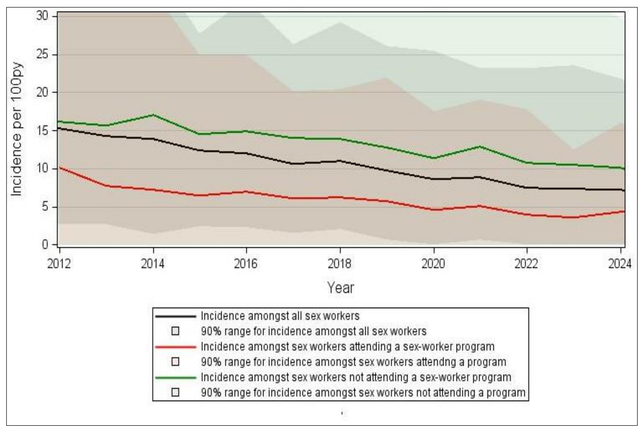


Figure 3. Modelled HIV incidence among FSW aged 18-39