Trajectory in Syphilis Infection and Reinfection among People Living with HIV, 2021-2024

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BACKGROUND

Syphilis remains a major global public health challenge. In 2022, an estimated 8 million cases were reported worldwide, with the Region of the Americas accounting for approximately 42% of new infections. People living with HIV (PLWH) are at particularly high risk of both syphilis infection and reinfection. In Mexico, national surveillance data indicate an increasing burden of syphilis following declines in HIV and STI testing during 2020, probably related to the COVID-19 pandemic and a subsequent expansion of screening efforts. At our institution, a previous longitudinal analysis conducted between 2001 and 2017 documented a sustained increase in syphilis prevalence and a growing burden of reinfections among PLWH.

This study describes the trajectory of syphilis infection and reinfection by year in a Mexican cohort of PLWH from 2021 to 2024.

METHODS

We conducted a retrospective observational study at the HIV Clinic (VIHVA) - INCMNSZ from March 2021 to November 2024. The active population was defined as PLWH who had at least one clinical interaction in a calendar year. We annually assessed the size of the active population, VDRL screening coverage -proportion of individuals with at least one VDRL test per year-, and test positivity rates.

Syphilis episodes were classified as:

1. Primary infection: the first documented episode of Treponema pallidum infection in individuals without prior reactive serology.

2. Reinfection: new episode in previously treated individuals with documented serologic response followed by a ≥4-fold increase in non-treponemal titers, a new diagnosis ≥6 months after treatment, or ≥2 registered episodes.

Trends in annual syphilis prevalence and reinfection rates were analyzed using Poisson regression models adjusted for annual VDRL testing volume.

Expanded ***syphilis*** screening revealed a peak in 2022, followed by sustained declines in primary infections and reinfections. This highlights improved detection and follow-up in a PLWH cohort.

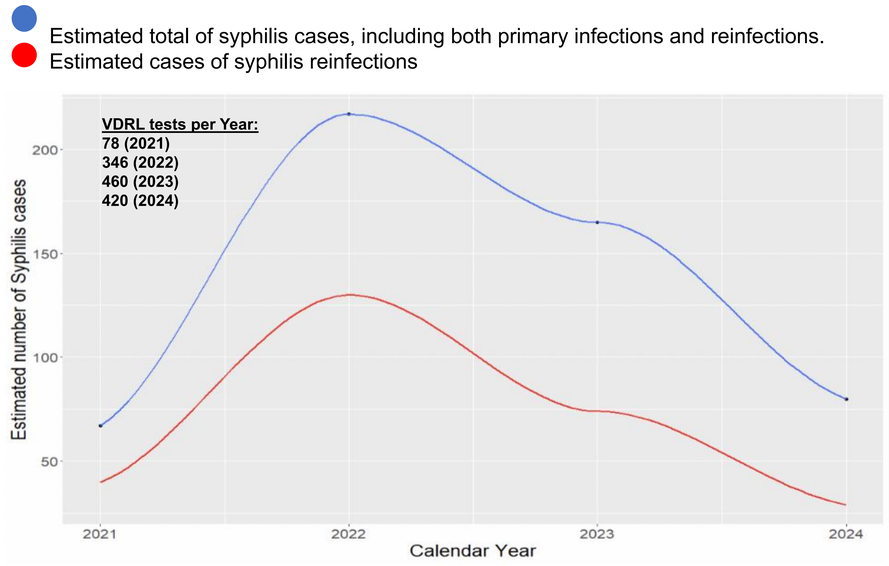


Figure 1. Estimated annual number of syphilis and reinfection cases in Mexico City cohort, 2021–2024

Table 1. Annual syphilis testing and infection episodes among PLWH, 2021–2024

Year	Active population	VDRL tests n (%)	Syphilis cases n (%)	Primary infection n (%)	Reinfection n (%)
2021	1,917	78 (**4%**)	67 (**86%**)	27 (**40**%)	40 (**60**%)
2022	1,682	346 (**21%**)	217 (**63%**)	87 (**40**%)	130 (**60**%)
2023	1,756	460 (**26%**)	165 (**36%**)	91 (**55**%)	74 (**45**%)
2024	1,770	420 (**24%**)	80 (**19%**)	51 (**64**%)	29 (**36**%)

RESULTS

The active population was 1,917 in 2021, 1,682 in 2022, 1,756 in 2023, and 1,770 in 2024. The coverage of VDRL screening was 4% in 2021, 21% in 2022, 26% in 2023, and then 19% in 2024.

Syphilis prevalence based on the active population was 4% in 2021, peaked at 13% in 2022, and subsequently declined to 9% in 2023 and 5% in 2024. Among individuals who underwent VDRL testing, positivity decreased from 86% in 2021 to 63% in 2022, 36% in 2023, and 19% in 2024. **Figure 1**

A total of 529 syphilis episodes occurred in 356 individuals, 256 (48%) were primary infections, and 273 (52%) were reinfections. Reinfections accounted for a higher proportion of episodes in 2021-2022 (60%) and declined in 2023-2024 (36-45%). **Table 1**

Regression models confirmed a peak in 2022, followed by a sustained decline, driven primarily by a marked reduction in reinfections.

CONCLUSIONS

Syphilis prevalence peaked in 2022 and declined thereafter. The increase in detected cases in 2022 occurred alongside a rise in VDRL testing among the active population, while positivity rates decreased in subsequent years. Adjusted models confirmed a decline in both infections and reinfections following the expansion of testing.

These findings highlight the ***importance of screening coverage*** for interpreting syphilis trends in HIV care settings and suggest that recurrent syphilis at the population level may represent an opportunity to evaluate additional prevention strategies, such as doxycycline post-exposure prophylaxis (***DoxyPEP***), as part of routine HIV care at the HIV Clinic (VIHVA) - INCMNSZ.

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