The impact of COVID-19 on racial/ethnic and regional disparities in HIV testing: a retrospective analysis using N3C data

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BACKGROUND

- **HIV testing** is crucial for early diagnosis and treatment, but disparities persist, especially among Black and Hispanic/Latino populations.
- **COVID-19 disruptions** reduced HIV testing due to facility closures and resource shifts, but the full extent of impact remains unclear.
- **Research gap:** Prior studies focus on specific states or urban areas, lacking a comprehensive national analysis.
- **Why N3C?** The largest harmonized EHR dataset in the U.S., covering 71 clinical sites across all Census regions, allowing for a broad, longitudinal assessment.
- **Objective:** Evaluate pandemic-related changes in HIV testing by race/ethnicity and region to guide public health interventions.

METHODS

- **Data Source:** Electronic health records from N3C (2018–2022), covering 12.1 million patients across 71 U.S. clinical sites.
- **Study Design:** Interrupted time-series (ITS) analysis using segmented linear regression.
- **Outcome Measure:** Monthly HIV testing rates (tests per 10,000 people).
- **Study Periods:** Pre-Pandemic (Jan 2018–Feb 2020), Early Pandemic (Mar–Aug 2020), and Late Pandemic (Sep 2020–Dec 2022).
- **Analysis:** Estimated slope and level changes to evaluate the pandemic's impact on HIV testing rates, stratified by region and racial/ethnic groups.

RESULTS

- Before the COVID-19 pandemic, HIV testing rates remained stable across all regions and racial/ethnic groups, though some disparities were present. The Black population had the highest pre-pandemic testing rates, while the Northeast exhibited the highest regional rates overall.
- During the early phase of the pandemic (March–August 2020), HIV testing rates plummeted nationwide, with particularly sharp declines among marginalized populations. The Black population in the Northeast experienced the most severe drop, with a decline of 50.34 tests per 10,000 persons (95% CI: -67.84 to -32.85). In contrast, the White population in the Midwest saw a comparatively modest decrease of 8.19 tests per 10,000 persons (95% CI: -11.55 to -4.84). The South exhibited a smaller but still notable decline.

A significant decline in HIV testing rates across the U.S. occurred with COVID-19, with most pronounced declines among *Black and Hispanic/Latino communities.* Regionally, the *West* experienced the most pronounced disruption, as it was on a strong upward trajectory before the pandemic, and this growth was significantly curtailed across all racial/ethnic groups.

- Testing rates fluctuated in the early pandemic phase before beginning a slow and uneven recovery during the later period (September 2020–December 2022). While some regions, such as the Northeast, saw partial rebounds, others, particularly the Midwest and West, lagged behind. The Black population in the Midwest, despite higher pre-pandemic testing rates, continued to experience significant disparities in recovery.

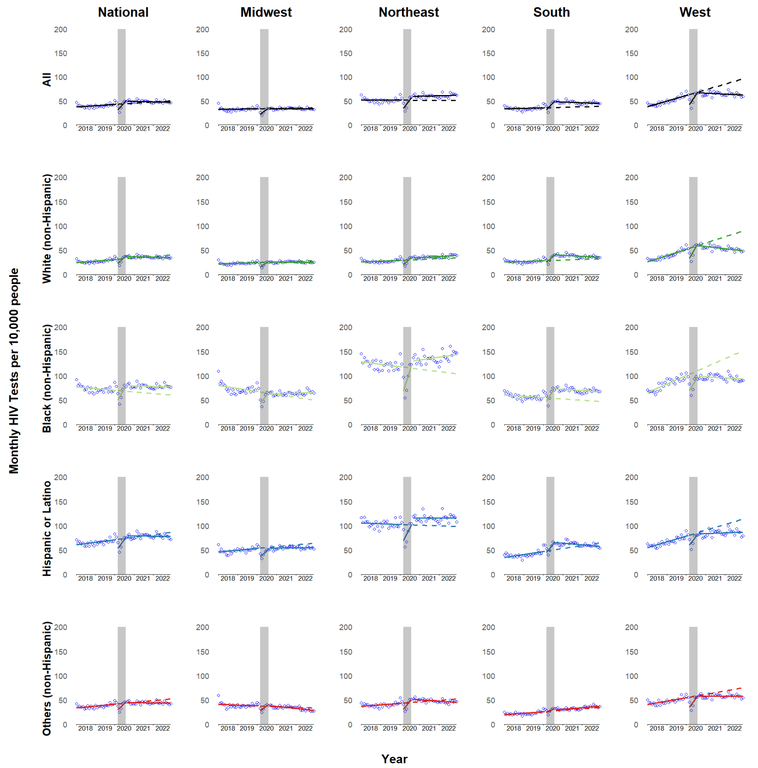
ADDITIONAL KEY INFORMATION

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N3C Website: https://covid.cd2h.org/

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Figure I: Interrupted Time Series Analysis on HIV Testing Rates by Region and Race/Ethnicity (2018-2022)



--Dotted line represents the expected HIV testing rate levels in the absence of the pandemic
Grey vertical bar represents the Early Pandemic Period (Mar–Aug 2020)

CONCLUSION

- These findings underscore the disproportionate impact of the pandemic on HIV testing among racial/ethnic minority groups and in certain regions, exacerbating pre-existing healthcare inequities.
- Despite recovery in the late pandemic phase, testing rates had still not fully recovered to pre-pandemic levels, and persistent racial/ethnic gaps highlight the need for targeted interventions to ensure equitable healthcare access.
- Strengthening healthcare infrastructure, addressing socioeconomic disparities, and implementing effective public health strategies are crucial to mitigating the impact of future pandemics and improving HIV care for all populations.