

# The impacts of social determinants of health on new HIV diagnosis vary over geography and race/ethnicity: a Bayesian multivariate spatial analysis of cities prioritized by EHE

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In the United States, the burden of HIV infections disproportionately affects states in the South as well as Black and Hispanic populations. Whether and how the impacts of social determinants of health (SDOH) on new HIV diagnosis vary over geography and race/ethnicity have been underexplored at small-area levels such as zip code tabulation areas (ZCTA). This study applies a Bayesian multivariate spatial model to investigate race-stratified new HIV diagnoses across 14 different U.S. cities that are prioritized by the Ending the HIV Epidemic in the U.S. (EHE) initiative. Five different SDOH variables are examined, including socioeconomic deprivation, income inequality, % of the uninsured population, racial segregation, and spatial accessibility to pre-exposure prophylaxis (PrEP). Results indicate that socioeconomic deprivation, income inequality, and % of uninsured population are positively associated with new HIV diagnosis only among Black and Hispanic populations and only in a few cities, but without obvious geographical patterns. The % of Black population is positively associated with new HIV diagnosis, but only among White and Hispanic populations and most prevalent in the South. ZCTAs with higher new HIV diagnosis are more likely to have better PrEP accessibility among all races/ethnicities in cities except NYC, Bridgeport-Hartford-New Haven, and Detroit. Magnitude differences in the positive association between new HIV diagnosis and spatial accessibility to PrEP, however, are also observed across geography and race/ethnicity. These findings suggest that geographically and racially tailored interventions should be developed to reduce HIV incidence in the U.S.

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