Abstract draft

7-10-2025

Title: Modeling State-Level Aging Patterns Among PLWH in the United States

Background: Aging of the population of those living with HIV in the United States will require adaptation by local healthcare systems to support a change in age-related comorbidities. *It is unknown how these demographic trends will continue into the future, and whether they differ by state.*

Material and Methods: We use the Johns Hopkins Epidemiologic and Economic Model (JHEEM), a dynamic transmission model of HIV, to simulate HIV epidemics in 11 states that currently comprise 63% of diagnosed prevalence in the United States. The model has been previously calibrated at the state level and is fitted to local epidemiologic targets such as new diagnoses and diagnosed prevalence by age group at the state level.

Results: The model projected the proportion of PLWH aged 55+ to rise by 11% (CI: 8 to 14%) across the region between 2025 and 2040, reflecting an increase of 93,971 prevalent cases (CI: 75,052 to 113,903) in that age group. By 2040, the projected median age of PLWH rose by 10 years (CI: 7 to 12). While most states projected aging populations, there was significant variation. California, which currently has the highest number of diagnosed cases within the eleven states, aged the most, with the proportion of PLWH age 55+ rising by 17 percentage points (CI: 11 to 24) and median age shifting 13 years older (CI: 11 to 16). By contrast, Alabama and Wisconsin’s populations of PLWH were not projected to age, with the proportion aged 55+ staying nearly constant (AL changing by -1%, CI -6 to 10%; WI changing by -1%, CI -6 to 7%) and median age decreasing by a few years (AL: -3, CI -5 to 1; WI: -7; CI -10 to 10). Among several candidate variables, a metric of urbanicity was the best predictor of a state’s change in proportion of PLWH aged 55+, with a correlation of +0.72 (p=0.01). Transmission rate was also somewhat predictive, with a correlation of -0.49 (p=0.13).

Conclusions: While the population of those living with HIV in the United States is projected to age significantly by 2040, these patterns are not consistent across states. Urban states are projected to age by more than rural states, where rates of new diagnosis remain higher. It will be important to commit funding, resources, and training to help healthcare systems adapt to changing demographic patterns while recognizing that the types of need may vary locally.