Abstract draft

7-10-2025

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

Background: Aging of the population of people 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: The Johns Hopkins Epidemiologic and Economic Model (JHEEM), a dynamic transmission model of HIV, is calibrated to local epidemiologic targets such as new diagnoses and diagnosed prevalence by age group at the state level. We projected HIV epidemics out to 2040 in 11 states, which currently comprise 63% of diagnosed prevalence in the United States and estimated the proportion of people with HIV over 55 years old as well as the median age of people with HIV. 1000 simulations were used to calculate results and confidence intervals.

Results: The model projected the proportion of PLWH aged 55+ to rise from 46% (CI: 45 to 47%) to 57% (CI: 54 to 60%) across the 11-state region between 2025 and 2040. This reflected an increase in prevalent cases within that age group from 308,028 (CI: 301,733 to 314,764) cases in 2025 to 401,820 (CI: 379,206 to 425,756) cases by 2040. During this period, 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 was projected to age the most, with the proportion of PLWH age 55+ rising from 50% (CI: 47 to 53%) to 67% (CI: 59 to 75%) and the 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 their proportions aged 55+ staying nearly constant and median ages shifting slightly younger. AL’s proportion aged 55+ shifted from 34% (CI: 30 to 37%) to 33% (CI: 25 to 47%) and WI’s proportion shifted from 44% (41 to 47%) to 43% (37 to 53%). AL’s median age decreased by 3 years (CI: -5 to 1) and WI’s median age decreased by 7 years (CI: -10 to 10). Among several candidate variables, a metric of urbanicity was the most correlated with a state’s change in proportion of PLWH aged 55+, with a correlation of +0.72 (p=0.01). Transmission rate was also somewhat correlated, 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.