Social Determinants of Health and PrEP use in the US: Repeated Measures Correlational Study

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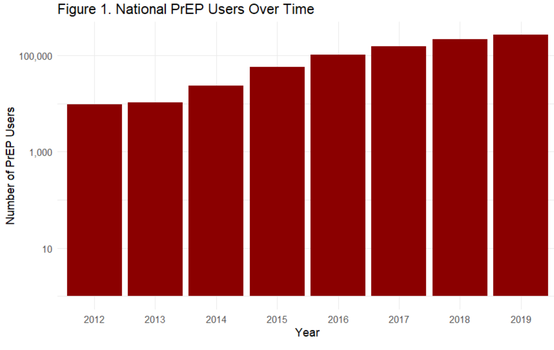
BACKGROUND

HIV pre-exposure prophylaxis (PrEP) is key to the United States' (US) Ending the HIV Epidemic plan. This research aims to 1) evaluate PrEP utilization in high burden jurisdictions with the highest rates of HIV new diagnosis, 2) determine correlation between PrEP use and new HIV diagnoses, mean income, regional political factors, race and geospatial factors. Historical trends of PrEP Users in the United States during the years 2012-2019 are depicted in Figure 1.

METHODS

PrEP data from AIDSVu for the years 2012 – 2019 were abstracted and combined with US Census Bureau and 2020 presidential election data. Linear mixed methods modeling was used to correlate County and State level rates of PrEP use (expressed as PrEP use per 100,000 persons) with year, new HIV diagnoses, mean income, insurance coverage, proportion of Democratic votes, race, and geographic location.

Figure 1. National PrEP Users Over Time



Rates of **PrEP use** are *correlated* with **demographic factors** including income, voting preferences, race, and HIV diagnosis rates.

RESULTS

County Level:

- Figure 2 - relative importance of county model coefficients, scaled to mean of 0 and standard deviation of 1.
- PrEP use increased at County level over time by 7.22/100,000 per year from 2012-2019, in high burden jurisdictions (95%CI 2.87 to 11.8, p<0.001).
- For every $10,000 increase in mean income, PrEP use increased by 65.7/100,000 (95%CI 47.7 to 83.3, p<0.001).
- Regional political affiliation was associated with an increase PrEP use by 633/100,000 persons per percentile increase in votes for the Democratic candidate (95%CI 314 to 999, p<0.001).
- Counties with a higher proportion of Asian persons had decreased PrEP use by -1991/100,000 for each percentile point increase (95%CI -3360 to -632, p=0.004).
- Higher HIV diagnosis rates were associated with decreased PrEP use by -1.9/100,000 per new diagnosis per 100,000 in the population (95%CI -2.79 to -0.93, p<0.001).

State Level:

- Figure 3 -relative importance of state model coefficients, scaled to mean of 0 and standard deviation of 1.
- For every $10,000 increase in mean income, there was increased PrEP use by 45.9/100,000 persons (95%CI 23.9 to 67.8, p<0.001).
- The proportion of persons voting for the Democratic candidate was associated with a decrease in PrEP by -126/100,000 for each percentile point increase (95%CI -219 to -33.1, p=0.009).
- States with a higher proportion of Asian persons had decreased PrEP use by -3079/100,000 for each percentile point increase in population proportion (95%CI -4534.64 to -1623.26, p<0.001).
- High burden state level jurisdictions were only located in the Midwest and South regions, states in the Midwest had higher PrEP rates by 18.5/100,000 compared to the South (95%CI 8.52 to 28.4, p=0.001).
- Higher insurance coverage was associated with decreased PrEP use by -0.54/100,000 per new diagnosis per 100,000 in the population (95%CI- -0.99 to -0.08, p=0.022).

CONCLUSIONS

- Socioeconomic disparities are associated with PrEP usage, notably linked to income levels.
- Unseen costs like travel and childcare may affect PrEP access, further studies to address secondary fiscal barriers are recommended.
- Regions with more Asians show lower PrEP use, possibly due to prioritization of other at risk groups.
- Policies may affect PrEP access, influenced by voter preference within geographic areas.
- Inadequate access to PrEP correlates with higher HIV diagnosis rates displaying a potential lack in PrEP acces
- Varied PrEP use among states in the Midwest compared to the South suggests barriers like transportation and PrEP deserts.
- Insurance coverage is associated with increased PrEP access.

Figure 2. Factors Influencing County PrEP Usage

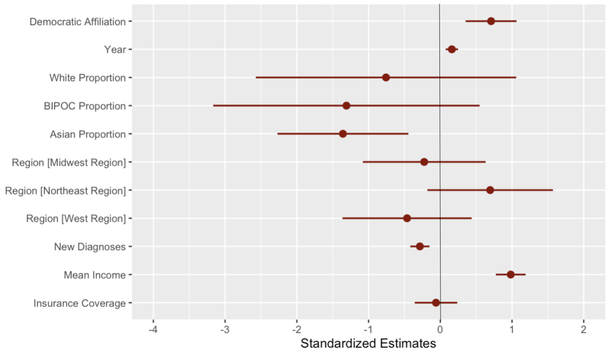
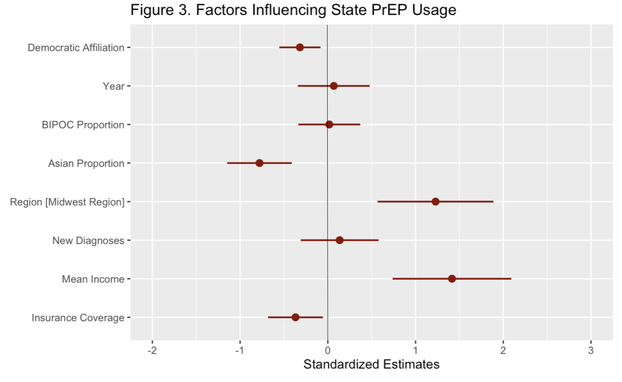


Figure 3. Factors Influencing State PrEP Usage



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