NATIONAL CENTER FOR HIV, VIRAL HEPATITIS, STD, AND TB PREVENTION

Using the ICE Method to Examine Income/Racial Segregation and HIV Outcomes —US, 2021

Zanetta Gant Sumner, André Dailey, Xiaohong Hu, Shacara Johnson Lyons, Anna Satcher Johnson
Centers for Disease Control and Prevention, Atlanta, Georgia, USA



BACKGROUND

Assessing the role of structural racism on poor health outcomes among persons in the United States can inform interventions aimed at increasing health equity. We examined associations between HIV outcomes (diagnoses, linkage to HIV care, and viral suppression) and Index of Concentration at the Extremes (ICE) measures for economic/racial segregation (proxy for structural racism) in the United States in 2021.

METHODS

Census tract-level data on HIV diagnoses, linkage to HIV medical care within 1 month of diagnosis (linkage to care), and viral suppression within 6 months of diagnosis (viral suppression) were obtained from CDC's National HIV Surveillance System for adults aged ≥18 years with HIV diagnosed during 2021.

- Three ICE measures were obtained from the U.S. Census Bureau's American Community Survey:

ICE Formula $ICE_i = \frac{A_i - P_i}{T_i}$

  - A_i = No. of privileged persons in census tract *i* (i.e., most privileged communities)
  - P_i = No. of deprived persons in census tract *i* (i.e., most deprived communities)
  - T_i = Total population with known information in census tract *i*
    → ICE ranges from -1 (indicating 100% of the population is concentrated in the most deprived group) to 1 (indicating that 100% of the population is concentrated into the most privileged group)
  - *ICE income* (income segregation) = (No. of persons ≥$100k − No. of persons <$25k) / total population
  - *ICE race* (Black-White racial segregation) = (No. of White persons − No. of Black persons) / total population
  - *ICE income and race* (Black-White racialized economic segregation) = (No. of White persons ≥$100k − No. of Black persons <$25k) / total population
- Rate ratios (RRs) for diagnoses and prevalence ratios (PRs) for linkage to care and viral suppression estimated with 95% confidence intervals (CIs)
- Differences across ICE quintiles examined using the most privileged communities (Quintile 5, Q5) as the reference group. Rates and percentages considered significantly different if 95% CIs of the RRs or PRs excluded 1.0.

We quantify the negative effects that structural racism has on HIV outcomes in the presence of greater Black-White racial and/or economic segregation.

Understanding the impacts of structural racism on HIV diagnosis and care disparities can aid HIV prevention efforts, guide public health strategies, and inform equitable and greater access to resource to provide better HIV care.

Discontinuing policies that promote and sustain structural racism will contribute to reducing HIV transmission and to achieving health equity in the United States.

RESULTS

Among 32,529 adults who received an HIV diagnosis in 2021,

- Diagnosis rates were highest in Q1 for all ICE measures: ICEincome = 23.9; ICErace = 29.7; ICEincome+race = 29.6.
- For linkage to care, the lowest percentages were in Q1 for all ICE measures: ICEincome = 80.4%; ICErace = 81.5%; ICEincome+race = 80.9%.
- For viral suppression, the lowest percentages were in Q1 for all ICE measures: ICEincome = 66.2%; ICErace = 68.0%; ICEincome+race = 67.2%.

Among all 3 ICE measures where statistically significant differences were found,

- Residing in the most deprived communities compared to most privileged communities increased the likelihood of receiving an HIV diagnosis (Figure 1).
- Residing in the most deprived communities compared to most privileged communities decreased the likelihood of being linked to care or to have viral suppression (Figures 2 & 3).

CONCLUSION

- One of the first large-scale analysis to use ICE to evaluate associations of racial and economic segregation with HIV outcomes.
- Provides evidence that the worst HIV outcomes occur in the most racialized/economically-deprived communities.
- Persons with HIV living in highly segregated and deprived communities experience higher rates of diagnoses and lower percentages of linkage to care and viral suppression
- Expanded efforts are needed to address the social/economic barriers that impede access to HIV care.
- Increased partnerships between government agencies and private sector are needed to change policies that promote and sustain segregation.

ACKNOWLEDGEMENTS

The Public Health Disparities Geocoding Project Training 2.0 team, based at the Harvard T.H. Chan School of Public Health (Boston, MA): Nancy Krieger (Principal Investigator), Jarvis Chen, Pam Waterman, Christian Testa, Dena Javadi, Enjoli Hall, Justin Morgan, Tamara Rushovich, Sudipta Saha.

HIV surveillance staff at state and local health departments.

Figure 1. HIV diagnosis rate ratios (RRs) among adults by ICE

- More likely to receive an HIV diagnosis if residing in Q1 through Q4 compared to Q5.
- Greatest RR for HIV diagnosis was observed for ICE_{race}.

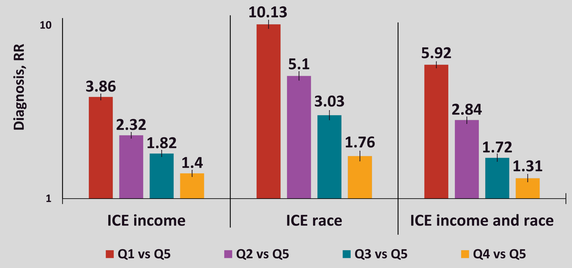


Figure 2. Linkage to care prevalence ratios (PRs) among adults by ICE

- Less likely to be linked to care if residing in Q1 through Q4 compared to Q5.
- Smallest PRs for linkage were observed for ICE_{income} and $ICE_{income+race}$.

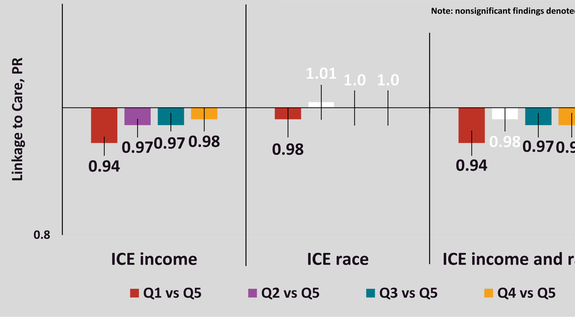
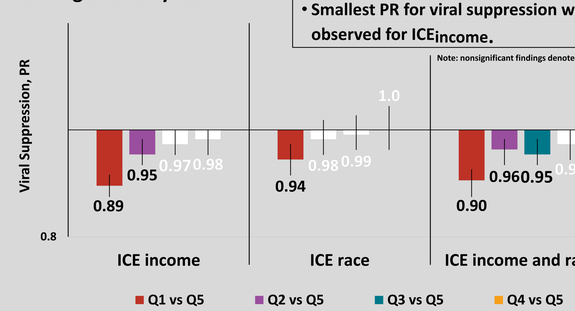


Figure 3. Viral Suppression to care prevalence ratios (PRs) among adults by ICE

- Less likely to have viral suppression if residing in Q1 through Q4 compared to Q5.
- Smallest PR for viral suppression was observed for ICE_{income}.



CONTACT INFO

Zanetta Gant Sumner
uwf5@cdc.gov