

# Quality Assurance of the Ogun Measure: Enhancing the Accuracy of Structural Racism Indicators in Health Outcomes Research

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## BACKGROUND

- Older adults racialized as Black experience 1.5-1.9 times higher incidence of Alzheimer's disease and related dementias compared to older adults racialized as White (Adkins-Jackson et al., 2024).
- Disparities in dementia risk can be linked to lifetime exposure to structural racism.
- Structural racism influences the wellbeing of marginalized groups and exposes them to stressors that can cause cognitive decline.
- Measuring the impact of structural racism is challenging, but the Ogun Measure systematically captures anti-Black racism across some key domains—property ownership, environmental pollution, occupational segregation, policing, and income disparities—over three historical periods.
- The facets are assessed across two paths: Structural Violence and Limited and Restricted Access
- By quantifying these factors, the Ogun Measure hopes to highlight how structural racism shapes dementia risk, providing a framework for targeted public health interventions.

## PROJECT DESCRIPTION

- This project ensured the accuracy and reliability of the Ogun Measure, which evaluates structural racism through quality assurance of the following aspects:
  - Property Ownership:** Assessed access restrictions prior to the 1968 Civil Rights Act.
  - Environmental Pollution:** Measured structural violence through HAP emissions.
  - Occupational Segregation and Unemployment:** Analyzed unemployment disparities between Black and White communities during Desegregation.
  - Policing and Incarceration:** Examined the disproportionate incarceration rates of Black individuals.
  - Income and Poverty:** Evaluated income inequality and poverty disparities between Black and White communities.

## METHODS

- Facets and Operationalization**
  - Property Ownership (PO.LRA1):**
    - Dataset:** IPUMS NHGIS (1930).
    - Operationalization:** Proportion of full-time and part-time Black and White farm owners.
      - 1:** Black farm owners below national average or White farm owners above their national proportion.
      - 0:** Black farm owners above national average or White farm owners below national average.
  - Environmental Pollution (EP.SV3):**
    - Dataset:** EPA National Emissions Inventory (NEI) and Census.gov (2022).
    - Operationalization:** Average annual Hazardous Air Pollutant (HAP) emissions for target and non-target counties.
      - 1:** HAP emissions  $\geq$  mean of non-target counties.
      - 0:** HAP emissions  $<$  mean of non-target counties.
  - Occupational Segregation and Unemployment (OSU.LRA2):**
    - Dataset:** IPUMS USA (1980).
    - Operationalization:** County-level unemployment rates.
      - 1:** Black unemployment  $\geq$  1.5 times White unemployment.
      - 0:** Black unemployment  $<$  1.5 times White unemployment.
  - Policing and Incarceration (PL.LRA2):**
    - Dataset:** Vera Institute for Justice and US Department of Justice (1988-1999).
    - Operationalization:** Proportion of incarcerated individuals racialized as Black.
      - 1:** Proportion of Black incarcerated individuals  $>$  50% in any year from 1988 to 1999.
      - 0:** Proportion consistently  $<$  50%.
  - Income and Poverty (IP.LRA3):**
    - Dataset:** IPUMS USA survey data (2010).
    - Operationalization:** County-level poverty rates based on household income thresholds.
      - 1:** Poverty rate among Black community  $\geq$  2x White community.
      - 0:** Poverty rate among Black community  $<$  2x White community.
- Data Analysis**
  - All data were analyzed using SAS and R, with quality assurance protocols implemented to ensure the accuracy of operational definitions and coding criteria.

## RESULTS

Facet	Sample Size	Percent of U.S. counties flagged as 1 (indication of structural racism)
Property Ownership (PO.LRA1)	Cases N = 1,410 (1 = 841; 0 = 569) Missing N = 1,747	59.65%
Environmental Pollution (EP.SV3)	Cases N = 3,013 (1 = 256; 0 = 2,757) Missing N = 223	8.50%
Occupational Segregation and Unemployment (OSU.LRA2)	Cases N = 339 (1 = 261; 0 = 78) Missing N = 1	76.99%
Policing and Incarceration (PL.LRA2)	Cases N = 1,786 (1 = 742; 0 = 1,044) Missing N = 1,353	41.54%
Income and Poverty (IP.LRA3)	Cases N = 375 (1 = 243; 0 = 132) Missing N = 1	64.80%

- Fifteen U.S. counties were flagged as 1 across the five facets.
  - Calhoun County, AL
  - Jefferson County, AL
  - Mobile County, AL
  - Hillsborough County, FL
  - Orange County, FL
  - Jefferson County, KY
  - Montgomery County, MD
  - Jackson County, MS
  - Forsyth County, NC
  - Guilford County, NC
  - Anderson County, SC
  - Greenville County, SC
  - Davidson County, TN
  - Jefferson County, TX
  - Norfolk City County, VA

## CONCLUSIONS

- Measuring structural racism is inherently challenging due to its complexity, as it permeates multiple societal systems like healthcare, housing, and employment.
- Addressing these deeply embedded inequalities requires an interdisciplinary approach, joining quantitative data with qualitative insights.
- Collaboration across fields like public health, sociology, and economics is crucial for developing comprehensive solutions.
- While this study only identifies fifteen counties significantly impacted across all five facets, these findings reflect only part of a broader issue.
- To effectively combat structural racism, long-term, data-driven, and culturally informed interventions are needed, alongside sustained collaboration between researchers, policymakers, and communities.

## STUDENT CONTRIBUTION

- Ensured quality assurance for five key Ogun measure items: Property Ownership, Environmental Pollution, Policing and Incarceration, Income and Poverty, and Occupational Segregation and Unemployment.
- Applied and tailored complex coding criteria to county-level historical and modern data.
- Resolved discrepancies between quality-assured data and original items, ensuring consistency.
- Updated Ogun Measure manual with feedback to improve accuracy for future use.

## EXAMPLES OF HOW I APPLIED COMPETENCIES

Competency	I applied it by . . .
Application of appropriate epidemiologic and statistical measures to generate, calculate and draw valid inferences from public health data.	Utilizing SAS and R to analyze large datasets, compare my derived results with the item developers', and assess the index's accuracy.
Analysis of public health problems in terms of place and time.	Assessed how historical and contemporary racism might influence health outcomes. With the data collected and U.S. counties flagged for structural racism, this project can advance to determine if structural racism impacts dementia risk in African Americans.