

Constructing the index of concentration at the extremes for Chicago

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Introduction

In a recent article in the *American Journal of Public Health*, Krieger et al argued for the use of the Index of Concentration at the Extremes (ICE) as a public health monitoring metric. They argued that the ICE may hold particularly important methodological advantages over other more commonly used measures of a community's socio-economic condition. The ICE quantifies the extent to which a community's residents are concentrated in the extremes of distributions.

- The measure can take a value of -1 to + 1; a value of -1 indicates that all of that community's population is concentrated in the 'most deprived' group, while a value of +1 indicates that all of that community's population is concentrated in the most privileged group. The ICE can be modified to account for distributions of other community characteristics, including educational attainment, and race/ethnic composition.

Methods

We sought to create ICE estimates for the 77 communities in Chicago, and then explore the association between ICE values and the hardship index.

Data were obtained from the American Community Survey (2012 – 5 year estimates). 804 Census tracts were aggregated to the 77 Chicago community areas based on the census tract boundaries of the Chicago Data Portal.

Results

Table 1: Summary Statistics for ICE values, Chicago Community Areas

Index	Formula	Mean (Standard deviation)	Minimum	Maximum
ICE _{income}	(# of people with income ≥ \$100,000 - # of people with income < \$25,000)/ total	-0.14 (0.24)	-0.68	0.32
ICE _{race}	(# of non-Hispanic White people - # of non-Hispanic Black people)/total	0.02 (0.70)	-0.99	0.96
ICE _{combined}	(# of non-Hispanic White people with income ≥ \$100,000 / # of non-Hispanic Black people with income < \$25,000)/total	-0.08 (0.28)	-0.68	0.39

Table 2: Bivariate correlations among ICE measures and the Hardship Index (r values)

	ICE _{income}	ICE _{race}	ICE _{combined}	Hardship
ICE _{income}	1.00			
ICE _{race}	0.72 (<0.001)	1.00		
ICE _{combined}	0.91 (<0.001)	0.93 (<0.001)	1.00	
Hardship	-0.88 (<0.001)	-0.56 (<0.001)	-0.75 (<0.001)	1.00

Note: N = 77 Chicago communities.

Conclusions

- There is substantial heterogeneity among Chicago communities in ICE values, particularly ICE(race). More research is needed to explore how the index categories predominantly Latino communities.
- All 3 ICE measures are correlated in the expected direction with the hardship index. The correlations are not perfect, suggesting that the ICE may be measuring community characteristics that are not picked up by the hardship index.

Figure 1: Boxplot of the 3 ICE measures for Chicago communities

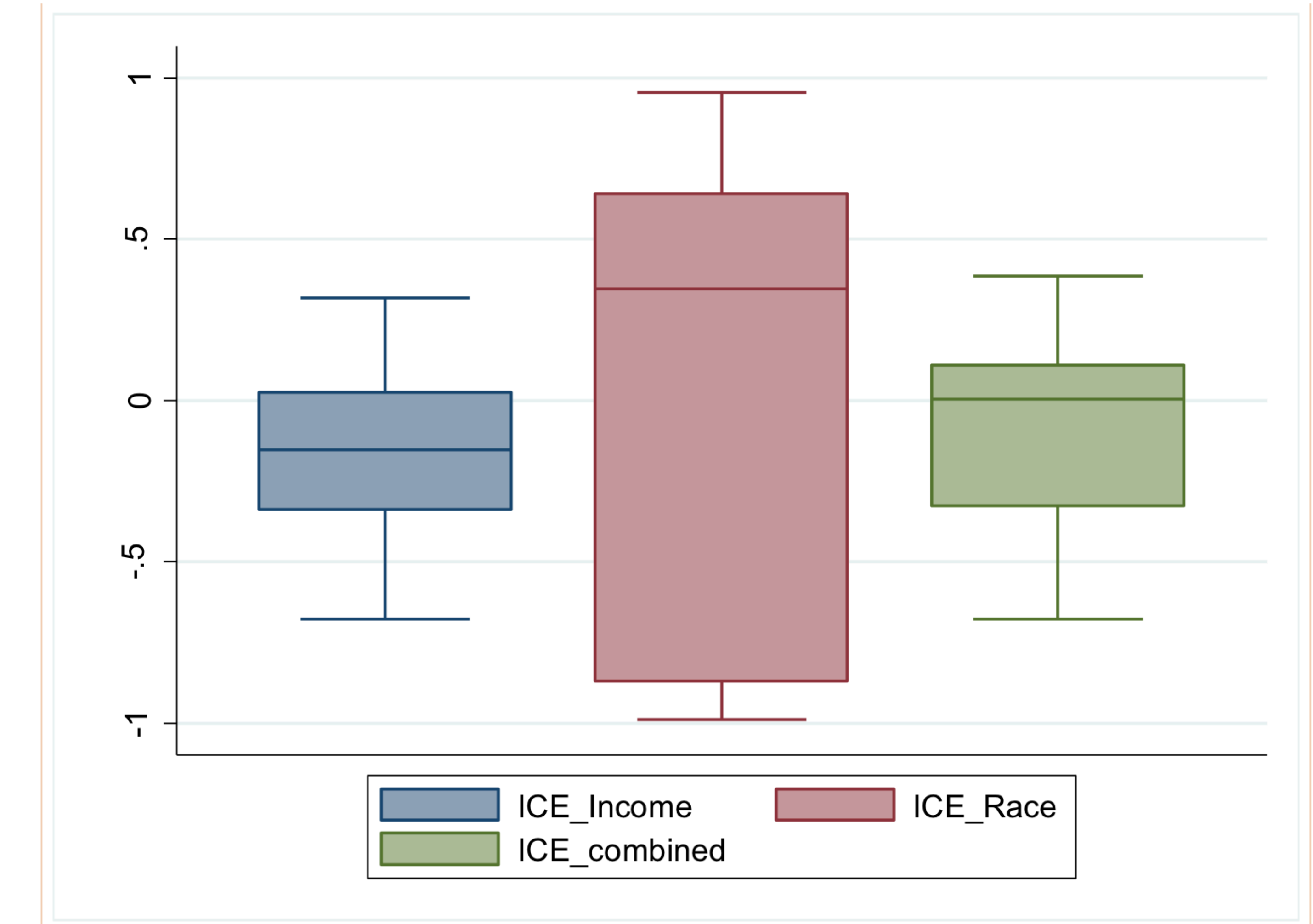


Figure 2: Scatterplot of ICE_{combined} and Community-Level Hardship

