

US Metropolitan Areas 2000 - Poverty Disparity and Income Inequality Measures Methods

Russ Lopez, MCRP, DSc

Department of Environmental Health
Boston University School of Public Health
715 Albany St., Talbot 2E
Boston, MA 02118

Rptlopez@bu.edu
(617) 414-1439 phone
(617) 638-4857 fax

Acknowledgements: The author wishes to thank Leslie Boden, H. Patricia Hynes, Richard Clapp and Rachel Morello-Frosch for their comments. This publication was made possible by grant number 5 F31 ES11219-02 from the National Institute of Environmental Health Sciences (NIEHS). Its contents are solely the responsibility of the author and do not necessarily represent the official views of the NIEHS, NIH

The GINI Index

The formula for the GINI index is:

$$\sum_{i=1}^N 2(X_i - Y_i)\Delta X_i$$

Where $X_i = 1/n$, $Y_i =$ cumulative % of income by unit, $\Delta X_i = X_i - X_{i-1}$, and N is the number of income categories.

The range of potential values of GINI is 0 (complete equality), to 100 (complete inequality).

Robin Hood Index

The Robin Hood Index is based on the difference between the actual cumulative distribution function of income and a situation of perfect equality. It is equal to the greatest distance between the two lines. As inequality increases, the Robin Hood Index approaches 1, as it decreases, it approaches 0.

20/80 Poverty Ratio

This measure is calculated by taking the percentage of total income received by the poorest 20% of the population and dividing it by the percentage received by the wealthiest 20% of the population. At perfect equality, the value is 1, as income inequality increases, the ratio approaches 0.

P* Poverty Isolation Index – All Persons

P* Poverty Isolation Index – Non-Hispanic Whites

$$\sum_{i=1}^n \left(\frac{x_i}{X} \right) \left(\frac{x_i}{t_i} \right)$$

Where x is the number of low income people in census tract i , X is the total number of low income people in a metropolitan area and t is the total number of people in census tract i .

P* Isolation Index reflect the average percent of poor people in the census tract of each poor person in a metropolitan area. As the isolation of poor people increases, it approaches 1, as isolation decreases, it approaches 0.

Black-White Poverty Ratio
Asian-White Poverty Ratio
Hispanic-White Poverty Ratio

As a measure of the relative income level between different groups, the ratio of people living in poverty was calculated. The Census does not report this number separately for all non-Hispanic groups. While it reports numbers for non-Hispanic Whites, it does not report separate numbers for non-Hispanic Blacks and non-Hispanic Asians. Therefore, the poverty ratio numbers include Hispanic Blacks (2.84% of all Blacks) and Hispanic Asians (2.68% of all Asians). The ratio (using the Black-White Poverty Ratio as an example) is:

Percentage of Blacks living in households with total income below the poverty line / Percentage of Whites living in households with total income below the poverty line

Potential values range from approaching 0 (all Whites live in poverty but no Blacks live in poverty) to approaching infinity (all Blacks live in poverty but no Whites live in poverty).