

Economic Hardship Index as a state indicator of social and economic disadvantage

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Background

The economic hardship index (EHI) was developed in 1976 to quantify the distribution of financial strain within the metropolitan areas of America's central cities. EHI measures economic quality of life beyond monetary poverty, and shows distribution of hardship relative to other geographies. EHI is typically applied at a city, neighborhood, or county level. We explore the addition of EHI to a comprehensive state-level health scorecard and compare it with years of potential life lost (YPLL-75), a measure of premature death that is strongly correlated with state health rankings

Methods

EHI was calculated using six variables from 2019 American Community Survey data: percent of occupied housing units with more than one person per room, percent of population younger than 18 and older than 64 years, percent of unemployed civilian labor force, percent of population aged 25 and older without a high school diploma, per capita income, and percent of family households living below the federal poverty level. YPLL-75 was calculated using 2018 CDC WONDER mortality data. Years of life lost were calculated by age groups (ages <1 and ten year age increments up to age 75) and adjusted to the U.S. population. Spearman's rank-order correlation coefficient was calculated to assess correlation between state ranks on EHI and YPLL-75 as well as EHI components and YPLL-75.

EHI Component	Spearman's Rank Correlation
Per Capita Income	0.768
Poverty	0.734
Education	0.464
Unemployment	0.456
Dependent	0.370
Crowded Housing	-0.245

Fig 1. Correlation between EHI and Premature Death State Rank

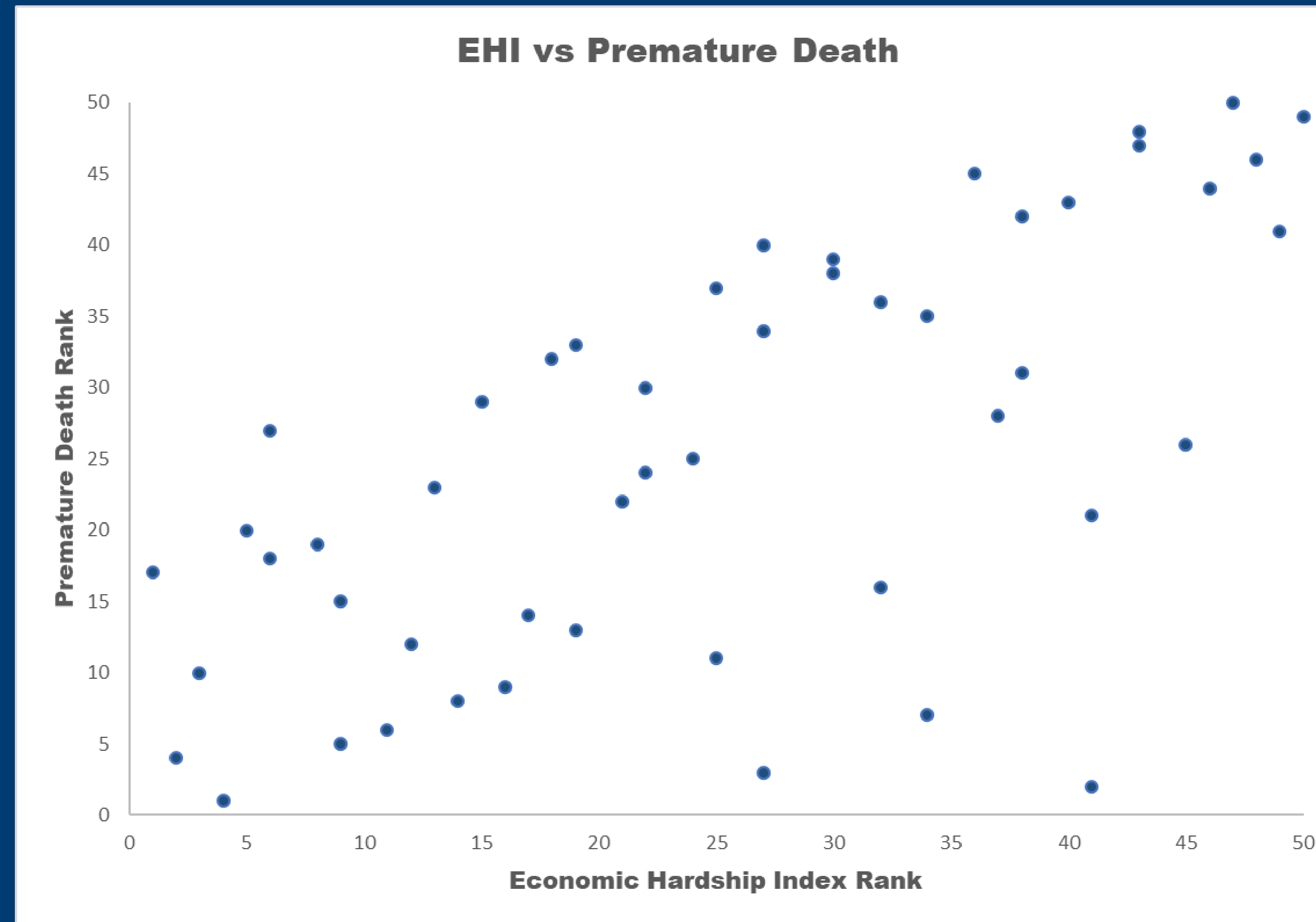
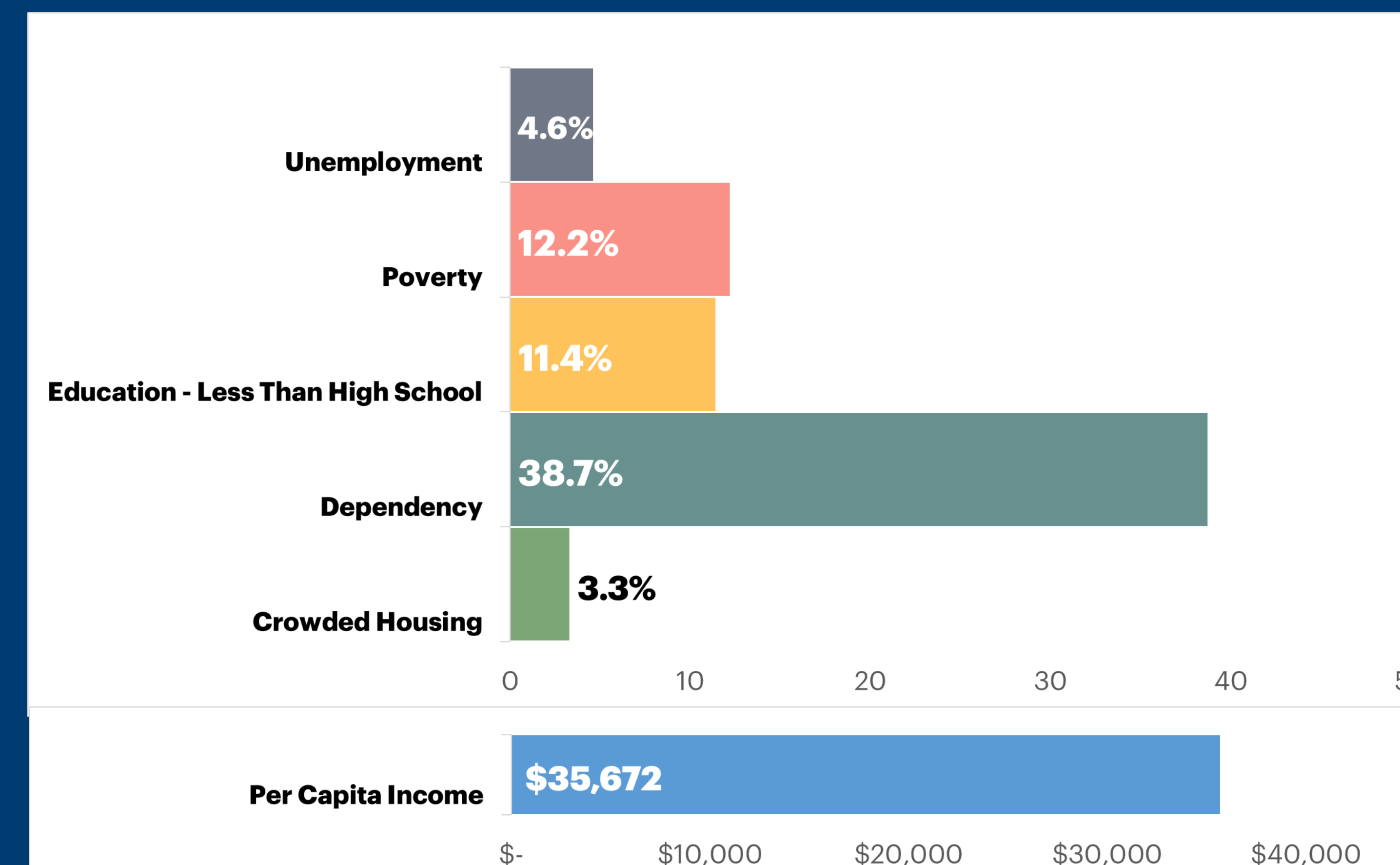


Fig 2. Prevalence of EHI components in the U.S.



Findings

The five states with the lowest economic hardship were New Hampshire, Massachusetts, Colorado, Minnesota, and North Dakota; of those, only Minnesota and Massachusetts were in the top five states with the lowest YPLL-75 rate. New Hampshire ranked first for EHI and was 17th for YPLL-75. The five states with the highest economic hardship were Arkansas, West Virginia, Louisiana, New Mexico, and Mississippi. Four of these states were also in the bottom five for YPLL-75. **Spearman's rank coefficient was $\rho=0.656$** , suggesting YPLL-75 and EHI are moderately positively correlated.

Discussion

EHI offers a comprehensive, validated index of social and economic disadvantage that could support broader representation of hardship in a state scorecard, and offer insight to states on specific factors driving their hardship score. Correlation with premature death, likely driven by strong correlations with the income and poverty components, suggest the measure is related with mortality health outcomes. It provides a more complete picture of the economic difficulties faced in a community than a single measure could provide. However, concerns exist about interpretability, adjusting for cost of living, and inclusion of population age distribution in the EHI. Addressing the components within EHI at the state-level could help reduce racial health disparities as American Indian/Alaska Native, Black and Hispanic adults are disproportionately affected by economic hardship, which is associated with lower life expectancy.

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