



FIGURE. Lorenz curve for risk predictiveness of esophageal adenocarcinoma based on a Swedish case-control study.

be greater in men ages 50 years or older who contribute approximately 75% of all cases in the total population and thus represent a high-yield target for screening.

These results highlight the significant concentration of risks of esophageal adenocarcinoma in the population and the usefulness of risk prediction models in identifying high-risk individuals for targeted early detection and prevention strategies. However, there remains possible overestimation of the risk concentration, given that we used the same dataset to assess the model as that from which the Lorenz curve was developed. Using an external independent dataset would be preferable. Furthermore, needed cut-off points of estimated risk for clinical and public health use need to be carefully determined, and related costs, potential benefits and risks for patients, and the absolute risk in the population should be taken into account.

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Economic Mobility and the Mortality Crisis Among US Middle-aged Whites

To the Editor:

Recent studies demonstrate an alarming rise in mortality rates among middle-aged white Americans in recent decades.^{1–4} These studies hypothesize that an underlying cause of this phenomenon is the growing realization among some members of this age group that they will not achieve a better standard of living than their parents, leading to destructive health behaviors. Put differently, this hypothesis ties the prospects of upward mobility to health outcomes in white middle-aged Americans. While conceptually attractive, this link has not been explicitly studied. Our study addressed this gap by examining whether county-level economic opportunity was associated with changes in mortality rates for middle-aged non-Hispanic whites in recent decades.

We calculated mortality rates for non-Hispanic whites ages 45–54 over the 3-year period between 1999 and 2001 and for the 3-year period between 2011 and 2013.⁴ Economic mobility was defined as the county-level correlation of the percentile ranks in the national income distribution for children (based on average incomes between 2010 and 2012 for the 1980–1982 birth cohort) and their parents

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Rourke O'Brien had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. O'Brien and Venkataramani helped in study concept and design; all the authors helped in drafting the manuscript.

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(whose income was measured over 1996–2000).⁵ Higher values reflect less economic mobility. We obtained county-level estimates of poverty, college completion, marriage, unemployment, and per capita personal income for non-Hispanic whites. We also obtained county-level estimates of the total population, population density, and the Gini index of inequality.

We estimated least squares regression models specifying logged mortality rate as the dependent variable. In this model, we included the above covariates, a binary indicator for year (=1 for observations for 2012 and 0 for 2000), and county fixed effects. The year indicator and county fixed effects account for all national trends and time-invariant county attributes, respectively, that may jointly influence the economic measures and outcomes. To model whether mortality increased more in areas characterized by low economic mobility net of other covariates, we included economic mobility in the model interacted with the year indicator. We weighted models by the average number of non-Hispanic whites ages 45–54 at risk for death in the two periods. Standard errors were corrected for clustering at the county level.⁶ Please see eAppendix; <http://links.lww.com/EDE/B138> for more detail on the data and methodological approach.

Our final sample included $N = 2,659$ counties for $T = 2$ time periods, with coverage of more than 98% of the US population in 2000. As shown in the Table, the positive interaction between economic mobility and the year indicator implies that mortality for middle-aged non-Hispanic whites increased more in areas characterized by low economic mobility. Our findings suggest that mortality increased 5.0% more (95% CI 2.4%, 7.6%) in counties in the bottom quartile of mobility (25th percentile of intergenerational income rank correlation = 0.379) compared with those in the top quartile (75th percentile of intergenerational income rank correlation = 0.287).

The proportion of non-Hispanic whites with a college degree was negatively associated with within-county change in mortality across the two time periods; no other covariates were associated with change in mortality. Models examining sex-specific mortality rates revealed

TABLE. Non-Hispanic White Middle-age Mortality and Economic Mobility, Fixed Effects

Economic mobility × year	0.54 (0.26, 0.83)
Gini index	−0.01 (−0.04, 0.01)
Income per capita (log)	−0.00 (−0.06, 0.06)
College graduates	−0.32 (−0.39, −0.25)
Population density (log)	−1.20 (−3.75, 1.34)
Proportion married	−0.02 (−0.05, 0.01)
Unemployment rate	−0.02 (−0.05, 0.01)
Poverty rate	0.02 (−0.01, −0.06)
Population (log)	0.97 (−1.24, 3.19)
Year	0.10 (−0.04, 0.24)
Constant	6.08 (5.70, 6.47)
Observations	5,171
R^2	0.93

95% confidence intervals computed with standard errors corrected for clustering at the county level in brackets.

substantively similar patterns for both men and women in this age group—see eAppendix; <http://links.lww.com/EDE/B138>.

This study provides the first explicit evidence that lack of economic mobility may help explain the recent and striking rise in mortality among middle-aged non-Hispanic white Americans. Our findings are consistent with recent work showing an inverse relationship between lack of economic opportunity and a range of negative health behaviors and health outcomes.⁷ While the aggregate, observational study design precludes causal inference, our findings motivate further inquiry into whether and how future expectations and changes in living standards may create despair and compromise health. Studies using individual level data may help provide higher resolution, causal evidence on the factors, and mechanisms underlying this growing mortality crisis.

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Leukocyte Telomere Length and Cardiovascular Risk Scores for Prediction of Cardiovascular Mortality

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