

Past and Present Rural-Urban Mortality Transitions

Russell Sage Foundation: Listening to Rural America

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The Urban Mortality Penalty

- For most of human history, cities have been dangerous for health.
- Location typically mattered more than income.
- Clean water and adequate sanitation played a key role in reducing mortality in urban areas.



Haines 1991, Johansson 1999, Cutler and Miller 2004. Cartoon by Pinwell (1866)

Mid-century equivalence in USA

- Rural mortality rates on par with urbanized areas
- Whole population experiencing epidemic of heart disease.

TABLE F.—RESIDENT AND RECORDED DEATHS, AND DEATH RATES, BY POPULATION-SIZE GROUPS: UNITED STATES, 1940

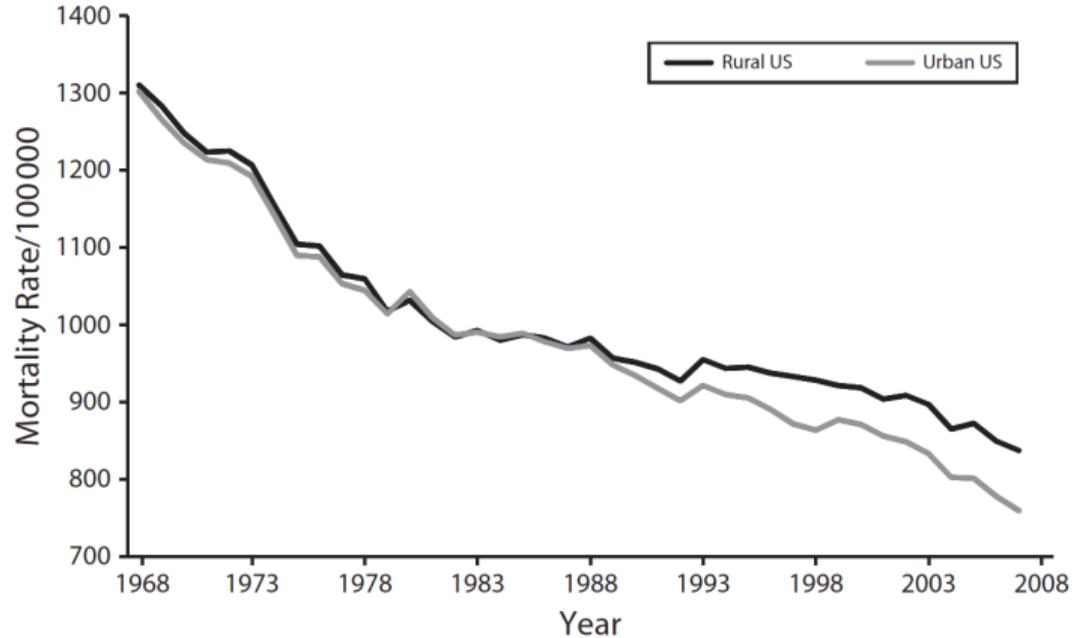
(Exclusive of stillbirths)

POPULATION-SIZE GROUP	TOTAL DEATHS OF RESIDENTS		TOTAL DEATHS IN AREA	
	Number	Rate per 1,000 population	Number	Rate per 1,000 population
UNITED STATES-----	1,417,269	10.8	1,417,269	10.8
Cities of 100,000 or more-----	427,633	11.3	449,271	11.8
Cities of 25,000 to 100,000-----	168,876	11.4	189,311	12.8
Cities of 10,000 to 25,000-----	112,820	11.3	126,498	12.7
Cities of 2,500 to 10,000-----	145,481	12.4	152,608	13.0
Rural-----	562,459	9.8	499,591	8.7

Source: Vital Statistics of the United States, 1940

Post-war divergence

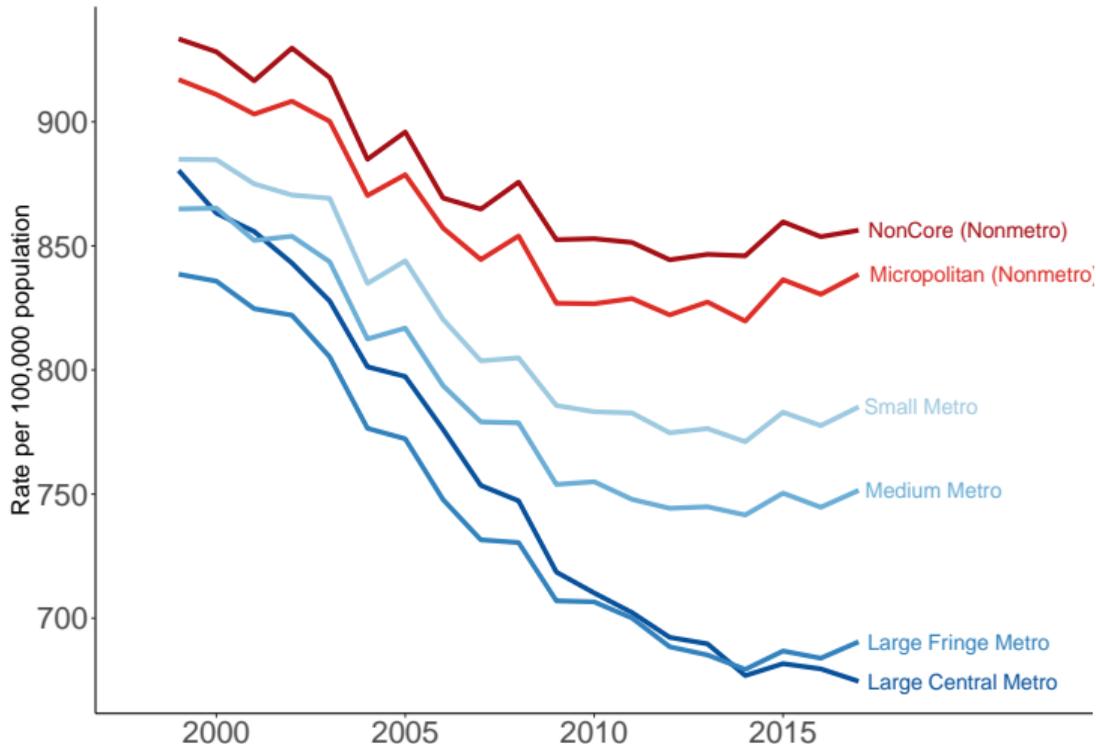
- Divergence with decline in CVD and cancer mortality.
- Increasing rural-urban divergence over time.



Source: James 2014

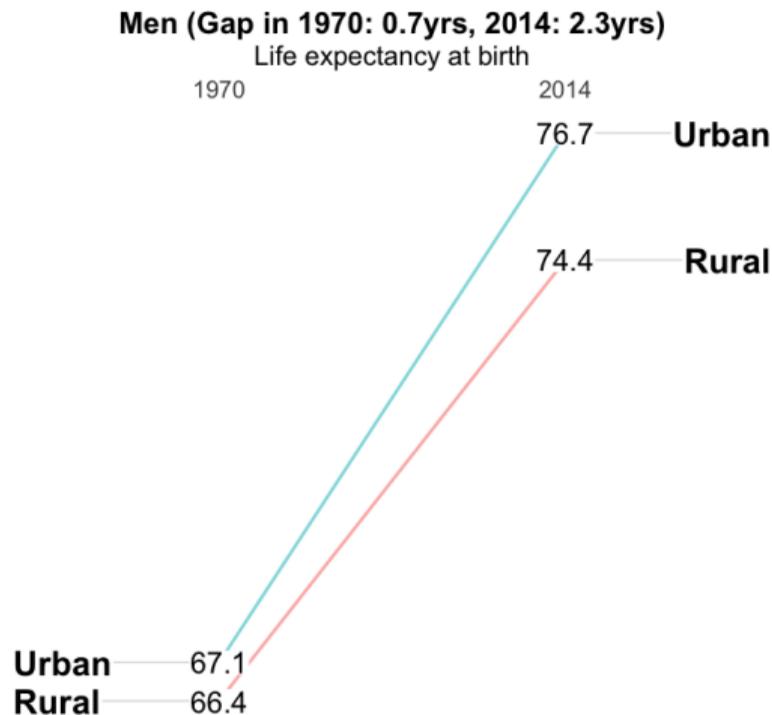
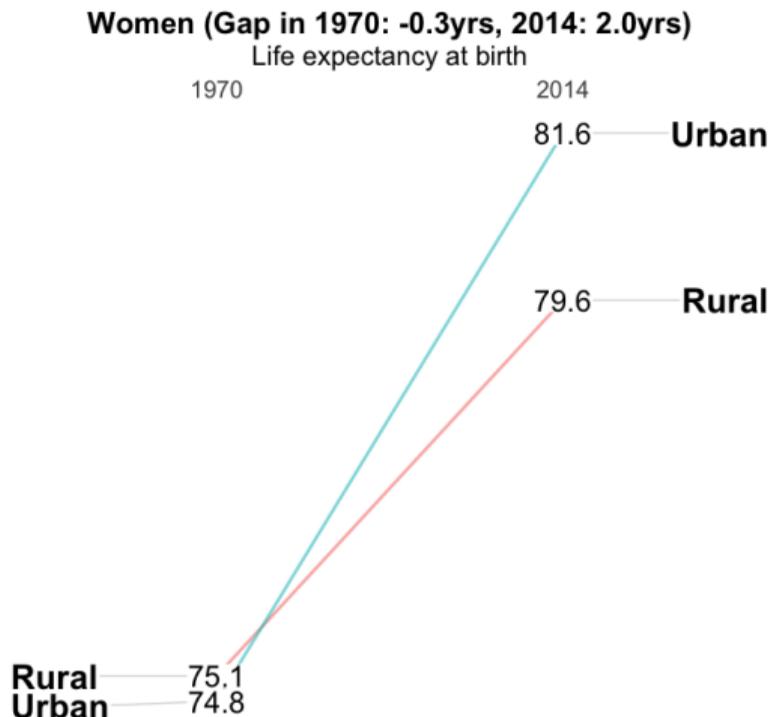
Recent Mortality Trends (age-adjusted)

- Mortality slowdown almost everywhere.
- **Rural areas** still show excess mortality.
- Rural-urban mortality gap has widened.



Source: Author's tabulations by 2013 Rural-Urban continuum code from CDC WONDER

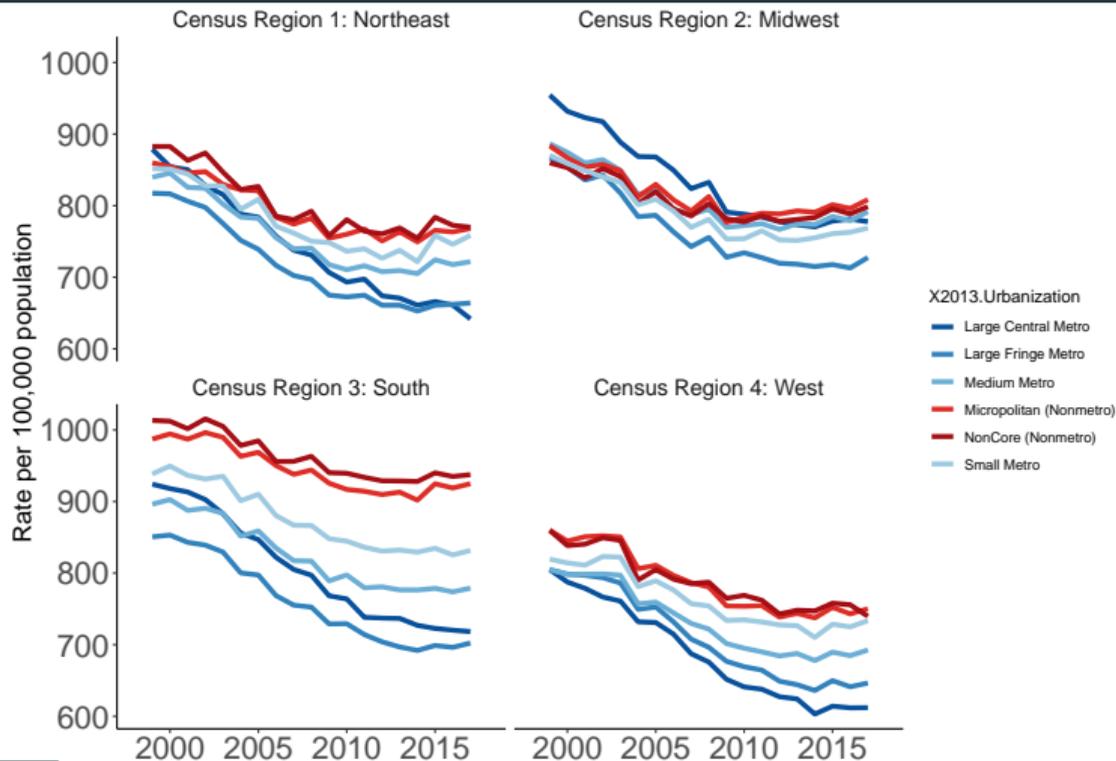
Increasing gap in life expectancy at birth since the 1970s



Source: Author's calculations.

Variation by Census Region

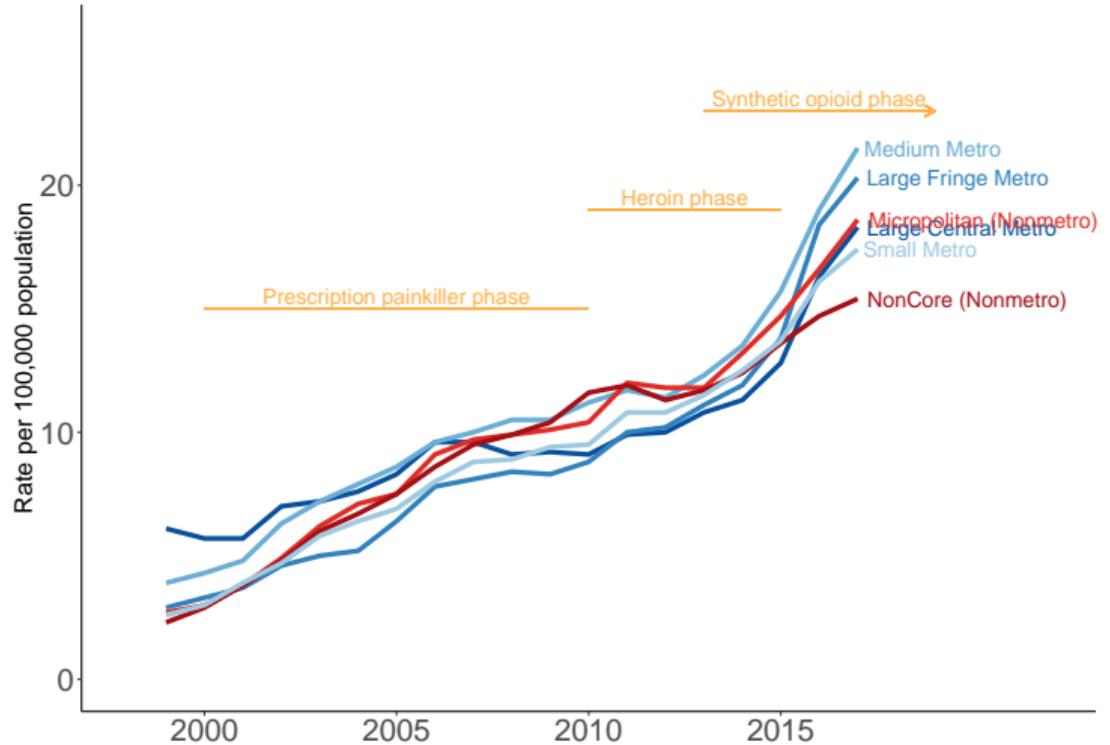
- Rural disadvantage everywhere at present.
- Notably larger gap in US South.
- Recent trends also bad in Midwest.



Source: Author's tabulations from CDC WONDER

Trends in Unintentional Drug Poisoning Mortality (age-adjusted)

- Population-wide increases.
- **Rural areas** were more affected by prescription painkillers.
- Lowest rates in the most rural counties.

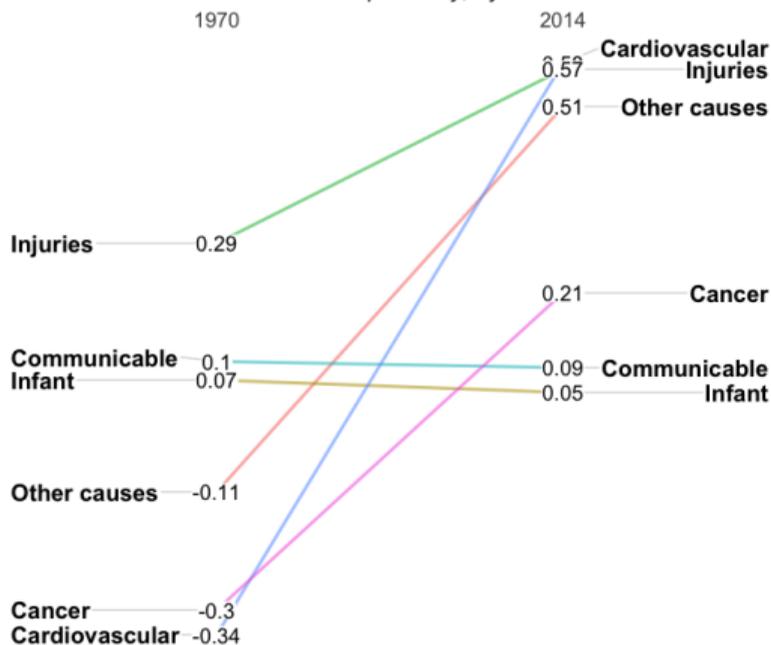


Source: Author's tabulations from CDC WONDER, Kiang et al. 2019

Increasing contribution of chronic diseases to rural gap in life expectancy

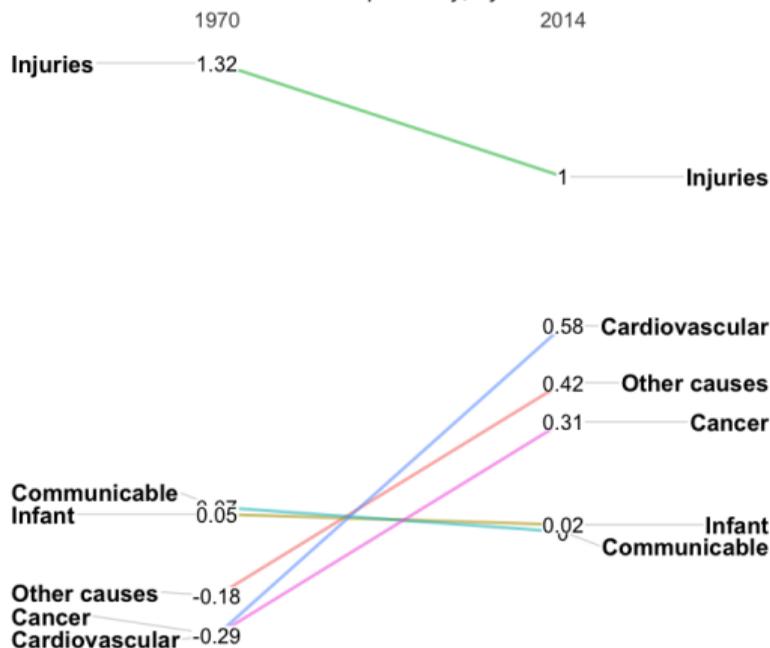
Women (1970: -0.3yrs, 2014: 2.0yrs)

Years of life expectancy, by cause



Men (1970: 0.7yrs, 2014: 2.3yrs)

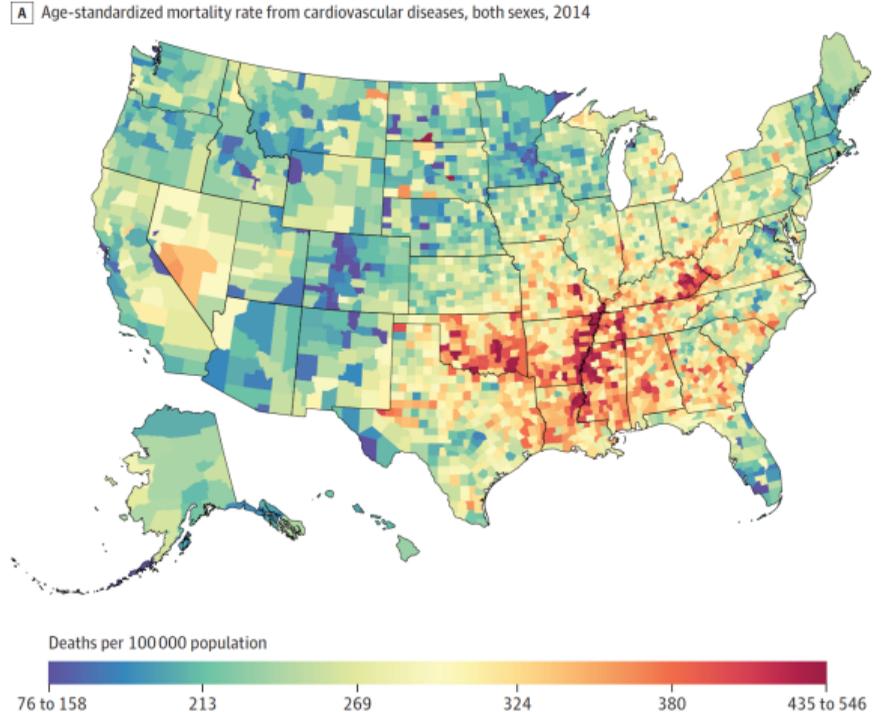
Years of life expectancy, by cause



Source: Author's calculations.

County-level age-adjusted cardiovascular mortality, 2014

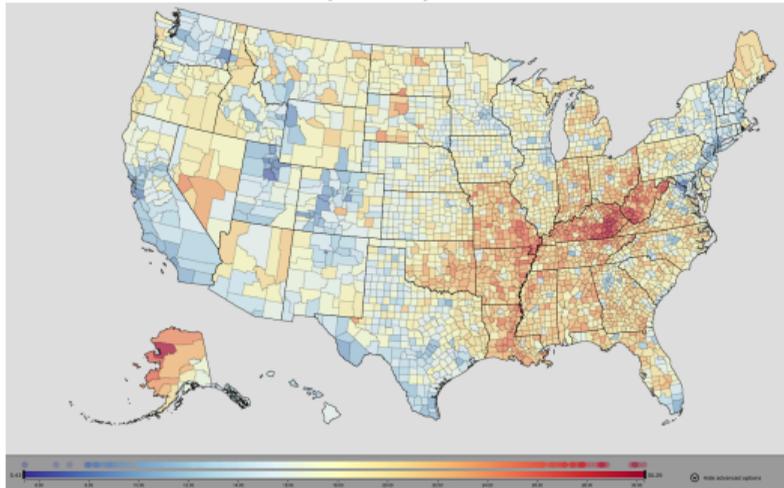
- Excess deaths from CVD in East and West South Central regions.
- Rural areas still show excess mortality, but regional heterogeneity.



Source: Dwyer et al. 2016

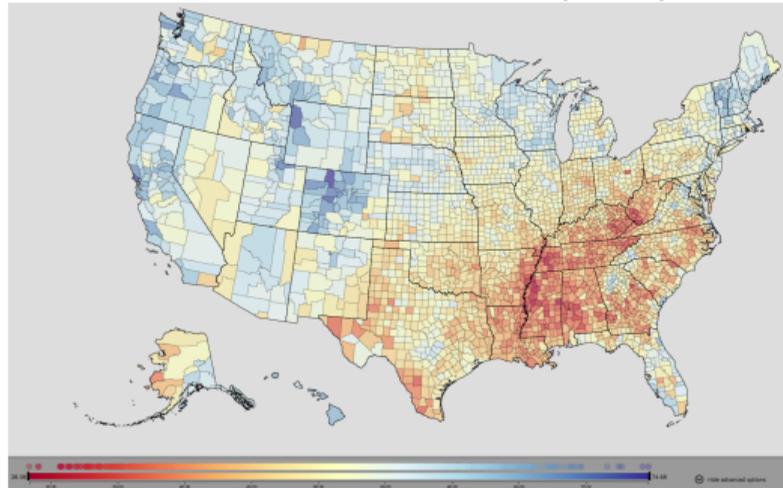
Rural disadvantage for important chronic disease risk factors

Smoking in men (2012)



■ Lower → ■ Higher prevalence

Low physical activity, women (2011)

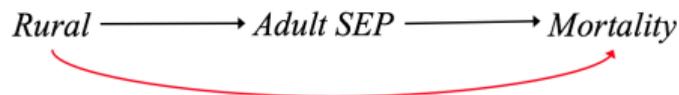


■ Lower → ■ Higher prevalence

Source: Institute for Health Metrics & Evaluation (<https://vizhub.healthdata.org/subnational/usa>)

Potential life-long influence of early life rural residence?

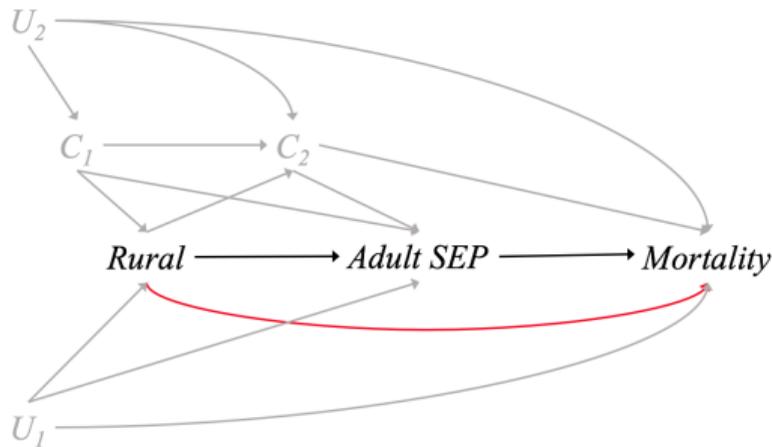
- Farm and rural residence in childhood increased probability of survival to old age among blacks.
- Childhood rural residence associated with reduced mortality in NLS.
- Residence in "Stroke Belt" in childhood associated with excess risk of stroke in adulthood.



Preston et al. 1998, Hayward et al. 2004, Glymour et al. 2008

Difficult methodological challenges to isolate mechanisms

- Need modern methods for mediation analysis.
- Hard to account for unmeasured confounders (U s).
- Time-varying confounding by measured C s.



Points for discussion

- The rural-urban mortality gap is widening.
- Largely due to non-communicable, chronic diseases.
- Important heterogeneity by gender and region.
- Potential for lifecourse impacts.



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