

Urban and rural divergence in mortality trends: A comment on Case and Deaton

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In table 1 of Case and Deaton's paper, "Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st Century" (1), the authors show a much larger rise in mortality for those with a high school education or less (+134.4 deaths per 100,000) over the study interval (1999–2013) compared with those with a Bachelor's degree or more (–57.0). The authors also find a fairly uniform pattern for changes in mortality because of their two largest suspect causes—poisoning and suicide—across different census regions, identifying a national rather than regional pattern. However, Case and Deaton do not report on variations in mortality trends by finer geographical units.

The CDC Wonder data analysis tool (2) allows investigators to largely reproduce Case and Deaton's (1) mortality results, and also allows partition of those results into six levels by urban/rural status (2013 categorization). All-cause mortality decreases in the study population over the study interval for the most urban category (–7.6) and rises steadily as we move from urban to rural over the next four categories (+6.3, +42.4, +58.3, +70.8). The most rural category shows a mortality rate increase of +76.0.

Although education levels vary by urban/rural status (3), the impacts would not seem large enough to account for this gradient. It will take time and additional research to disentangle the effects of geography and education. However, as Case and Deaton note (1), the rise in all external causes of death accounts for only half the mortality rate rise in their least-educated group (table 1, row 4 in ref. 1). We generate compatible results when we compare the two largest causes of mortality (cancer and heart disease) between the most urban and most rural categories. The most urban group shows reduced mortality rates for these major causes (–44.4), whereas the most rural group shows a small rise (+5.4). In 1999, mortality differences across the six rural/urban categories differed by 52.8, with the lowest mortality rate in the second category and the highest in the most rural. The same two categories are lowest and highest in 2013, but the gap is now 122.8. Urban America, whatever its problems with external causes, seems to share in the international decline in mortality (Figure 1 in ref. 1) in a way rural America does not.

- 1 Case A, Deaton A (2015) Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century. *Proc Natl Acad Sci USA* 112(49):15078–15083.
- 2 Centers for Disease Control and Prevention (2015) National Center for Health Statistics: Underlying cause of death 1999–2013 on CDC Wonder online database, released. Available at wonder.cdc.gov/ucd-icd10.html. Accessed November 22, 2015.
- 3 Provasnik S, et al. (2007) *Status of Education in Rural America (NCES 2007-040)*. (National Center for Education Statistics, Institute of Education Sciences, US Department of Education, Washington, DC).

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