Did the Great Recession affect mortality rates in the metropolitan United States? Effects on mortality by age, gender and cause of death

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Abstract

Objectives: Mortality rates generally decline during economic recessions in high-income countries, however gaps remain in our understanding of the underlying mechanisms. This study estimates the impacts of increases in unemployment rates on both all-cause and cause-specific mortality across U.S. metropolitan regions during the Great Recession.

Methods: We estimate the effects of economic conditions during the recent and severe recessionary period on mortality, including differences by age and gender subgroups, using fixed effects regression models. We identify a plausibly causal effect by isolating the impacts of within-metropolitan area changes in unemployment rates and controlling for common temporal trends. We aggregated vital statistics, population, and unemployment data at the area-month-year-age-gender-race level, yielding 527,040 observations across 366 metropolitan areas, 2005–2010.

Results: We estimate that a one percentage point increase in the metropolitan area unemployment rate was associated with a decrease in all-cause mortality of 3.95 deaths per 100,000 person years (95% CI 6.80 to −1.10), or 0.5%. Estimated reductions in cardiovascular disease mortality contributed 60% of the overall effect and were more pronounced among women. Motor vehicle accident mortality declined with unemployment increases, especially for men and those under age 65, as did legal intervention and homicide mortality, particularly for men and adults ages 25–64. We find suggestive evidence that increases in metropolitan area unemployment increased accidental drug poisoning deaths for both men and women ages 25–64.

Conclusions: Our finding that all-cause mortality decreased during the Great Recession is consistent with previous studies. Some categories of cause-specific mortality, notably cardiovascular disease, also follow this pattern, and are more pronounced for certain gender and age groups. Our study also suggests that the recent recession contributed to the growth in deaths from overdoses of prescription drugs in working-age adults in metropolitan areas. Additional research investigating the mechanisms underlying the health consequences of macroeconomic conditions is warranted.

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macroeconomic conditions and overall mortality to remain procyclical in some countries (Lindo, 2015; C. J. Ruhm, 2015), but also evidence of a shift towards acyclicity in recent years due to counter-cyclical upsurges in cancer and accidental poisoning deaths (C. J. Ruhm, 2015).

This study contributes to the existing literature on economic conditions and health by examining the impacts of economic conditions during the recent and relatively severe Great Recession (Business Cycle Dating Committee, Sept 20 2010). Specifically, we estimate the effects of changes in unemployment within metropolitan statistical areas (MSAs) on both all-cause and cause-specific mortality from 2005 to 2010. MSAs are population centers and their adjacent communities with a high degree of social and economic integration, and therefore reflect local labor markets. Approximately 84% of the US population lives in MSAs (U.S. Census Bureau, 2012). Given recent counter-cyclical findings for accidental poisoning (C. J. Ruhm, 2015) and epidemiological data on prescription drug overdose deaths, (U.S. Centers for Disease Control and Prevention, 2012) we investigated accidental drug poisoning specifically. Further examine age- and gender-specific effects by cause of death in order to better understand the mechanisms at work. Some of the most widely-cited studies that examine the impacts of the recent recession on mortality do not convincingly identify causal relationships (Stuckler et al., 2011). We therefore contribute further to this literature by using more rigorous methods (C. J. Ruhm, 2000) to plausibly identify the effects of the Great Recession on mortality.

2. Methods

2.1. Data and sample

We calculated mortality rates based on data from the Centers for Disease Control and Prevention’s National Vital Statistics System (U.S. Department of Health and Human Services et al., 1980–2010). Underlying causes of death were designated through International Classification of Diseases (ICD) codes version 10 (ICD-10). We used auxiliary information available on the state and county of residence of the decedent, and their age, sex, race, and time of death, to generate month-MSA-subgroup-specific mortality rates. Within each MSA we stratified monthly mortality totals by age (0–15, 15 to 24, 25 to 44, 45 to 64, and 65 years old), sex, and race (white, non-white), using county of residence to map to MSAs. We used 366 MSAs, geographic areas made up of counties with at least one urbanized core (population \(\geq 50,000\)) and integrated adjacent areas (Office of Management and Budget, 2000) corresponding to the November 2008 update of area definitions (Office of Management and Budget, 2008). Annual midyear population denominators were obtained from the Surveillance Epidemiology and End Results (SEER) U.S. population database (Surveillance Epidemiology and End Results, 2005–2010) between 2004 and 2011 for counties and demographic groups, aggregated to MSAs, and used to estimate monthly counts in population strata by linear interpolation. The final data set consisted of 527,040 observations at the MSA-month-year-age-gender-race level, from 366 MSAs over the period 2005–2010.

2.2. Exposure and outcome measures

Our primary exposure variable, the seasonally-adjusted MSA-level unemployment rate, was collected from the Bureau of Labor Statistics’ (BLS) Local Area Unemployment Statistics database (U.S. Bureau of Labor Statistics, 2005–2010). Given the unavailability of seasonally adjusted estimates for New England MSAs, these rates were computed from county level data and were not seasonally interpolated. The final data set consisted of 527,040 observations at the MSA-month-year-age-gender-race level, from 366 MSAs over the period 2005–2010.
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