

2023 Living to 100

Discussant Comments

Education Influence on Mortality

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## Education Influence on Mortality

Driving Longevity through Educational Attainment—A Literature Review, Robert L. Brown, Ph.D.

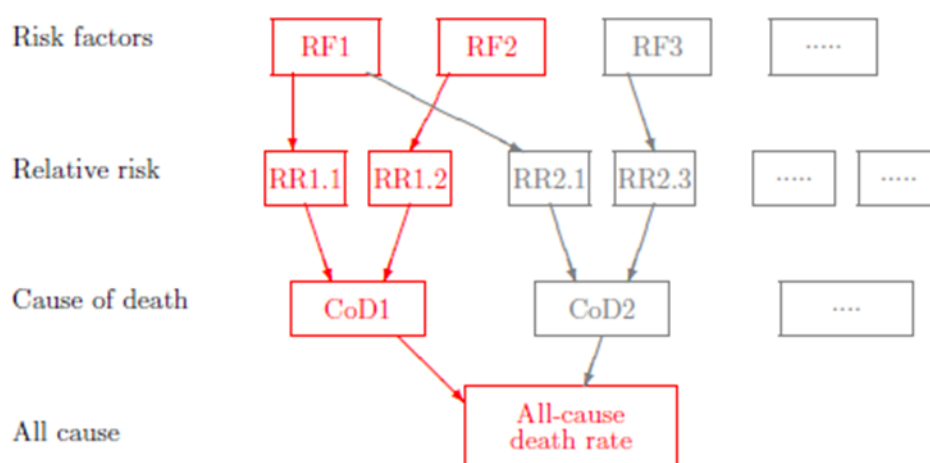
Higher-Age US Mortality by Education and Cause of Death: Trends, Inequality and Controllable Risk Factors, Andrew J. G. Cairns, MPA, Ph.D., and Cristian Redondo Lourès, Ph.D.

These two papers marshal overwhelming evidence for the linkage between educational attainment and life expectancy. Brown’s paper is a thorough and accessible literature review covering research around the world. He concludes that “educational attainment is the number one driver of longevity.” The Cairns paper presents an empirical analysis of US mortality data, using various graphical visualizations to illustrate several important observations about variation in mortality improvement rates by cause of death, the impact of controllable risk factors on mortality inequality by education level, and the increasing level of inequality over time.

Both papers agree that education affects longevity through various mechanisms. Higher levels of education are clearly linked to more remunerative employment opportunities, producing higher income, wealth, socioeconomic status and greater access to health care. Brown especially emphasizes that many studies have shown education to drive differences in life expectancy even when controlling for wealth and that education is, in fact, a driver of both.

Brown notes that education also impacts mortality by influencing healthy behaviors, consistent with the finding that it appears to have a particular effect on causes of death with a behavioral component. Cairns makes a similar observation, noting that mortality inequality by education level is especially pronounced with respect to causes of death associated with controllable risk factors, such as the effect of smoking on lung cancer.

Cairns presents a useful framework for thinking about how risk factors combine with relative risks (the ratio of the death rate for individuals with a risk factor to the death rate where the risk factor is absent) to drive death rates from specific causes and ultimately all-cause death rates, as illustrated in the figure below.



He uses this framework to investigate trends in mortality inequality from the full range of causes of death. He explains that high levels of cause-specific mortality inequality are likely due to a combination of significant

controllable risk factors, significant differences in prevalence of the risk factors based on educational attainment, and high levels of relative risk for the risk factors.

Cairns finds that almost all causes of death show significant levels of inequality with respect to educational attainment, even those with no significant controllable risk factors, such as breast cancer and prostate cancer. In addition to the advantage of better access to high-quality medical care that comes with greater wealth, he posits conscientiousness as an explanation of this phenomenon. He classifies this “big 5” personality trait as a nonpreventable risk factor (i.e., one that is not easily controlled or prevented), along with certain racial and genetic characteristics. High levels of conscientiousness would be expected to drive earlier diagnoses and more diligent follow-through with treatment.

Cairns notes a significant correlation between measured conscientiousness and educational attainment and that this might be an important explanation for higher death rates among lower-educated groups. That is, the same personality trait that drives some to greater educational attainment might also lead to more diligence in addressing health challenges.

This perspective that underlying personality or cognitive traits might be drivers of both educational attainment and health has implications for Brown’s paper. Brown does a valuable service in summarizing the results of 42 papers dealing with the relationship between educational attainment and longevity. His paper concludes with a section on public policy indications effectively advocating greater public spending on education and encouraging more people to stay in school, earn degrees and pursue advanced professional degrees. An item of consideration on this point is the question whether education is causative of improved longevity or whether the innate personality and cognitive characteristics that lead some people to attain more education would be associated with greater economic success and healthier lifestyle choices regardless of formal education. Specific areas of inquiry here may include the following:

- Is it possible that a substantial subset of the population doesn’t have the combination of personality traits (like conscientiousness), cognitive skills or academic interest to pursue a meaningful academic degree? Can public policy alter these characteristics through early childhood intervention, greater spending on education etc.? Or is the distribution of traits across a population the result of human diversity?
- To the extent that education is reflective of a college degree, a higher proportion of people obtaining a college degree may lead to a dilution of the value of the college degree because the value as a signal to employers may be diminished. If this were to lead to a dilution of availability of highly remunerated jobs, is it possible that a consequence could, eventually, be diminishing returns on longevity? Of course, more education could also mean more investment in apprenticeships and potentially new forms of learning that could have a positive impact.

Related to Cairn’s approach to the analysis of causes of death, a potential use may be with refining mortality predictions. For actuaries, connecting medical advances or changes in behavior (nutrition, exercise etc.) to causes of death may be a basis to refine mortality forecasts. For public policy discussion, the broad connection of medical advances and changes in behavior to causes of death may present a consideration for public spending (that is, broadening the perspective from spending on education).

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