Appendix

1. Estimates of the number of deaths attributable to poverty and low levels of education were based on the work of Galea and colleagues (2011). In their paper in the American Journal of Public Health they describe the process of arriving at estimates of relative risk for various social factors by completing a meta-analysis that included 24 studies on the association of low levels of education (defined as less than high school) and all-cause mortality and 14 studies on the association of poverty (defined as below the federal poverty line) and all-cause mortality. Data were extracted for two broad age groups for each of these social factors: 25 to 64 years and 65 years or older. The authors then calculated the population-attributable fraction (PAF) for each social factor using the formula:

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PAF = \frac{p(RR-1)}{p(RR-1)+1}
\]

where RR is the summary relative risk estimate for mortality derived from the meta-analyses and p is the prevalence of the social factor in the US population in 2000. According to Galea et al. (2011), the population-attributable fraction “represents the proportion of all deaths that can be attributed to the social factor (i.e., the proportion of all deaths that would not have occurred in the absence of the social factors)” (p. 1461).

For the current analysis, mortality, poverty, and educational attainment data were obtained for residents of St. Louis City and St. Louis County identifying as Black or African American alone according to conventions of the US Census and non-Hispanic Black/African American according to State of Missouri data collection conventions. Mortality data were drawn from the Missouri Department of Health and Senior Services’ Missouri Information for Community Assessment (MICA), Death MICA module for 2011. Poverty and education data are from the American Community Survey (3-year estimates, 2009-2011).

There were 3,101 deaths from all causes among non-Hispanic Black/African American residents of St. Louis City and St. Louis County older than 25 years in 2011. There were 1,244 deaths among those ages 25-64 years and 1,857 deaths among those ages 65 years and older. The Black/African American alone rate of poverty was 21.8% for those 25-64 and 16.5% for those 65+ in the City and County combined. Using the relative risk (RR) estimate of 1.75 for poverty among those 25-64 and 1.40 for those 65+, the PAF was calculated using the same formula as Galea et al. The result was 175 deaths attributable to poverty in the 25-64 age group and 105 in the 65+ age group. The Black/African American alone rate of low education was 14.0% for those 25-64 and 34.5% for those 65+. With RR estimates of 1.81 for the 25-64 age group and 1.23 for the 65+ age group, the resulting number of attributable deaths were 127 and 110 respectively.

There are several limitations to these estimates that should be noted. First, the underlying studies for the meta-analysis upon which the relative risk estimates are based included racial and ethnic groups other than non-Hispanic Blacks/African Americans (usually Whites) and represented different geographical areas (often nationally representative samples or other geographically specific subsamples). These samples may not be representative of African Americans in the St. Louis region. In addition, the association of poverty and education with all-cause mortality was not directly estimated using local data in this analysis. Estimates of relative risk could be different in this specific geographic region, but the rigor with which the estimates of relative risk were obtained by Galea et al. make them preferable as reasonably reliable approximations of the true association between social factors and mortality. Another limitation, however, is the timeframe during which most of the studies in question were conducted. The meta-analysis included studies that were conducted as early as 1980. Most of the studies were conducted in the 1980s and 1990s, and the assumption is that the association between these social factors and mortality still held in 2011. Finally, it should be noted that poverty and low levels of education are highly correlated with one another, and as Galea et al. note, “deaths attributed to each factor are not necessarily mutually exclusive” (p. 1463). Despite these limitations, these estimates provide a useful approximation of the contribution that poverty and low levels of education make to all-cause mortality for African Americans in St. Louis City and St. Louis County.

2. The estimate of the cost of premature deaths reflects the “social value” of life, which is the same measure used across disciplinary fields and in benefit-cost analysis of regulatory impacts in public policy. We estimated the share of value of a statistical life (VSL) in terms of lost potential life years relative to average life expectancy (adjusted for race, ethnicity, and age) and discounted the result by 3%. The VSL concept of value is appropriate here because it reflects the willingness of society to pay for reductions in mortality risks. For further information and examples, see http://yosemite.epa.gov/ee/epa/eed.nsf/pages/MortalityRiskValuation.html.