"The Poor and the Dead: Socioeconomic Status and Mortality in the U.S., 1850-1860"

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December 19, 2000

ABSTRACT

Despite the significant research on aggregate trends in mortality and physical stature in the middle of the nineteenth century, little evidence on the individual-level characteristics associated with premature mortality has been presented. This essay describes a new project that links individuals from the Mortality Schedules to the Population Schedules of the 1850 and 1860 federal population censuses. This makes it possible to assess the link between individual and household characteristics and the probability of dying. The results reveal a strong and negative relationship between household wealth and mortality in 1860 and a somewhat weaker negative relationship between occupational status and mortality in 1850. The findings suggest that even when the U.S. population was largely rural and agricultural, changes in the distribution of income and wealth would have had a large impact on mortality rates and life expectancies.

Introduction

Research on the possibly deleterious impact of economic growth on nineteenth century U.S. living standards was prompted by a simple observation: though economic growth was strong and per capita incomes were rising before the Civil War, two indicators of living standards — average height and life expectation at age 10 (e_{10}) — were declining. (Fogel, 1986) Attention then turned to examination of the factors that influenced physical stature at the individual level in cross section, in order to understand how changes over time in urbanization, industrialization, and nutrition could explain the change in stature. But the second aspect of what has come to be

known as the “antebellum paradox,” falling life expectation, has received considerably less attention at the micro level.

This study introduces new evidence on the correlates of individual-level mortality, particularly socioeconomic status (SES) measured by occupation and household wealth, created by linking the Mortality and Population Schedules of the 1850 and 1860 federal population censuses. This makes it possible to calculate mortality rates by occupation, by household wealth, and by cause of death, and thereby uncover in two cross sections some of the factors underlying the changes in life expectation observed over the decades before the U.S. Civil War.

Research on the link between SES and mortality in the late twentieth century U.S. has uncovered a substantial gap between high and low status individuals, a gap that is apparent in other health outcomes as well. (Williams, 1998; Lantz *et al.*, 1998) Though a great deal of attention has now been devoted to explaining why those lower in SES have worse outcomes, as well as the possibility that there is some reverse causation involved (with poor health leading to low SES), these investigations lack an historical perspective. (Smith, 1999) For example, though wide disparities in mortality rates by SES were described in the early 1970s (Kitagawa and Hauser, 1973), we simply do not know whether the disparities observed over the last 25 years are large or small by historical standards. It is entirely possible that disparate health outcomes by SES are a product of developments in medicine and technology in the late twentieth century that give an advantage to those with the resources to purchase them. This casts in an altogether different light the disparities that are observed today, compared to how they would be seen if they were merely the continuation of a persistent pattern of poor outcomes for poor people that generations have failed to erase.

The following section describes some previous efforts to assess the link between SES and mortality in the nineteenth century. Section II describes the creation of the data. Section III looks at the link between occupation and mortality for adult males in 50 counties in 1850 and examines mortality by household wealth for men, women, adults, and children in five counties in 1860. The final section offers some conclusions and describes avenues for further research that are underway.

I. What We Know About 19th Century SES & Mortality

There is a consensus that low SES is associated with increased risk for a variety of diseases, as well as a substantially increased risk of premature mortality. Attention has now largely turned to discovering the mechanisms that produce these disparate outcomes. An understanding of the long-run progress made in narrowing disparities in health outcomes by SES, however, has been more difficult to attain. There are few sources of data on mortality with information on SES available before the Second World War. In fact, no nationally-uniform system of reporting deaths was in place until the completion of the Death Registration Area in 1933. Before that time, those interested in the link between SES and mortality were forced to rely on data less representative of the national experience. Only three published studies and one on-going research project that have attempted to assess the link between SES and mortality for the second half of the nineteenth century.

The first of these studies estimated crude death rates in 1865 Providence, Rhode Island, with a comparison of the rates for taxpayers and non-taxpayers (Chapin, 1924). The annual crude death rate for taxpayers was 11 per thousand, while the corresponding rate for non-taxpayers was

25 per thousand. Though this suggests a substantial gap in crude death rates by SES, it is less than satisfying in a number of respects. The first is the year examined: 1865 was the last year of the U.S. Civil War. Given the disruptions to commerce, industry, and agriculture, as well as the large number of Rhode Island's inhabitants who enlisted, this is unlikely to have been a year representative of the mid-nineteenth century mortality experience. The second difficulty is the narrow geographic coverage of the study: it examines a significant urban center, but in 1860 only 21 percent of the U.S. population resided in places of 2,500 or more inhabitants. An additional shortcoming is that the study is unable to distinguish among different causes of death, though we know today that not all causes are equally susceptible to the influence of SES. Finally, the experience of a single city for a single year tells us little about trends in the link between SES and mortality over the late nineteenth century; data from several years are necessary to establish a pattern of increase or decline in the relationship between SES and mortality.

The second study to examine the relationship between SES and mortality for the late nineteenth century used data from the 1900 U.S. Census of Population, which for only the second time contained a question on "children ever born." (Preston and Haines, 1991). The authors used this information, together with the composition of the household actually observed in the 1900 population schedules, to infer infant and child mortality for each household. There was no significant relationship between higher SES and lower infant and child mortality, when SES was measured by the occupation of the household head (Preston and Haines, 1991, pp. 156-56). Though there was higher mortality among those in households headed by unskilled laborers than among those in households headed by other workers, there were no substantial differences in mortality by occupation among households headed by non-laborers. Though this study is useful

for its broad geographic coverage and the representativeness of the population it examines, it also has some important limitations. The first is the inability to say anything about the mortality experience of adults: because mortality was inferred from the question on "children ever born" and the observed household composition in 1900, it was not possible to say whether individuals at older ages who were absent from the household where their mother was enumerated had died or simply moved out. This study is also somewhat limited in the components of SES that it can examine: though the household head's occupation was recorded, there was no information collected in the 1900 census on the value of the household's wealth. Such information was included in the 1850-70 population censuses, and can thus be used in the sample that will be constructed in the present project. The second difficulty with the Preston and Haines study is that, like the 1865 Providence, Rhode Island study, it provides information at only one date (1900). Though deaths that occurred prior to 1900 can be inferred, it is impossible to say much about deaths that occurred much prior to 1885, nor to say with much precision when the deaths than can be inferred actually occurred. This may substantially attenuate any underlying link between observed household SES (measured in 1900) and the household's infant and child mortality experience over the preceding years. It is also impossible with these data to examine causes of death and uncover links between SES and specific mortality risks.

Finally, one study has examined the link between SES and mortality with a sample that covers the entire U.S. and includes the information on wealth provided in the 1850 and 1860 federal population censuses (Steckel, 1988). This project used 1,600 households linked from the 1850 census population schedules to the 1860 population schedules. Mortality within the household was inferred by comparing the household's composition in 1850 and in 1860. Like the

Preston and Haines study, this study found no statistically significant relationship between SES (measured by wealth, literacy, and father's occupation) and infant and child mortality. Like the other studies described above, however, this project was unable to disaggregate by cause of death and provides information on SES and mortality at but a single point in time.

The Early Indicators Project currently underway at the University of Chicago's Center for Population Economics, under the direction of Robert Fogel, is using information from Civil War military pension records to assess the link between SES (among other factors) and later disability and premature mortality. Though this work is able to provide tremendously detailed information on diseases and causes of death as documented by health science professionals, it covers a relatively narrow population: veterans of the Union Army who survived late enough into the nineteenth century to obtain a federal pension. It says nothing about mortality among infants, children, women, or younger men. Further, it is limited to the northern population. The present study complements this work: though the data on causes of death is less precise (see "Mortality Schedules" below), it covers the populations and regions missed in the Civil War veterans project.

A recent unpublished study (Haines, Craig, and Weiss, 2000) examined county-level crude death rates for 1850 (calculated from the Mortality Schedules used here) and found that wealthier counties actually had higher crude death rates. The authors conclude that this surprising finding "is consistent with the view that wealthier areas were those with more urbanization and greater levels of commercialization and better transport connections." (Haines, Weiss, and Craig, 2000, p. 8) Though their methodology makes it possible to say how aggregate wealth in a county affected aggregate mortality levels, their findings cannot tell us how SES at the individual level

affected individual level mortality. And it is at the individual level that the link between SES and mortality is probably strongest if it exists.

II. The Data

This project links decedents from the Mortality Schedules of the 1850 and 1860 federal Censuses of Population to the Population Schedules of those censuses. This provides information on roughly 1,500 individuals who died in the year preceding each of these censuses, and roughly 150,000 individuals who survived the same period. The information on all households will include the age, sex, birthplace, literacy, occupation, wealth, and location of each household member; for households that experienced a death, information on the decedent (age, sex, birthplace, occupation, date of death, and cause of death) is included as well. The following sub-sections describe the mortality schedules and the linkage procedure.

A. The Mortality Schedules

As part of the regular decennial federal censuses in the years 1850 through 1880, enumerators collected information from each household on individuals from that household who had died in the twelve months prior to the date of the census. Though published totals from these inquiries were included in the 1850 through 1880 census volumes and these figures form the basis for many estimates of mid-nineteenth century U.S. life tables (Haines, 1994), these data have never been examined at the individual level. Several difficulties with the data have prevented their full exploitation.[1]

[1] These difficulties are summarized in Condran and Crimmins (1979).

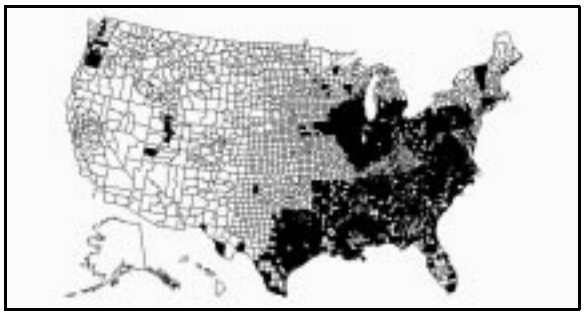

Figure 1 Counties for which 1850 Mortality Schedules Have Been Transcribed.

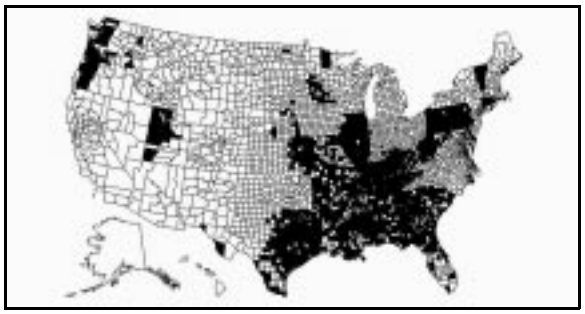

Figure 2 Counties for which 1860 Mortality Schedules Have Been Transcribed.

The greatest difficulty is the inaccessibility of the original manuscript schedules. After the census office's tabulations were completed, the schedules were returned to archives in the states where the data had been gathered. Records from some states have not survived, some have not been microfilmed, and none had been available in machine-readable form until recently. Since the late 1980s, just over 400,000 decedents from the 1850 through 1880 Mortality Schedules have been transcribed and computerized. These are computerized transcriptions of the mortality schedules, containing all of the information as it appeared on the forms submitted to the census office by census marshals.

Figures 1 and 2 show the counties for which the mortality schedules have been transcribed. For 1850 and 1860, the mortality schedules cover a significant fraction of the total U.S. Table 1 shows several records from the 1850 Mortality Schedules from Washington, D.C. to illustrate the range of information available from this source. There are four significant sources of bias in these data. The first is that, based on model life tables and the published totals, it appears that mortality at very young and very old ages is under-reported.

Name	Age	Occupation	Sex	Month of Death	Cause of Death	Birthplace
Altamus, Thomas	1	None	M	Feb	whooping cough	DC
Anderson, Lewis	50	Laborer	M	Jan	smallpox	DC
Augustus, Milly	27	Slave	F	Mar	scarlet fever	MD
Duvall, Thomas	31	Coachman	M	Feb	pneumonia	MD

Table **1**: Sample Records from Mortality Schedules (1850) for Washington, D.C.

The second source of bias is that surviving households are probably more likely to report deaths that occurred closer in time to the date of the census enumeration. The third source of bias is the under-enumeration of deaths in households where all members died and thus left no survivors to report their deaths to the census enumerator. The final source of bias results from the reporting of the cause of death by household members rather than by health care professionals. This no doubt leads to common mistakes (like reporting “typhus” when the cause of death was “typhoid”), but can be remedied to some extent by grouping diseases into several broad categories, reflecting either easily identified physical symptoms or the likely susceptibility to the influence of SES. For the present study, which will examine mortality rates by comparing the mortality schedules to the population schedules for a set of identical counties, these biases are problems only if the extent of under-reporting or mis-reporting varies by SES differently in the mortality and population schedules.

The advantages of using these individual-level observations from the mortality schedules more than outweigh these shortcomings. For example, when combined with the information on household SES in the population schedules, the mortality schedules provide the best and most broadly representative view we are likely to get of the socio-economic correlates of mortality by

cause of death. The range of places covered in the mortality schedules makes it possible to assess the impact of a variety of environmental forces (such as climate and the presence of sanitation and public health systems) on the relationship between SES and mortality.

B. Linking the Mortality & Population Schedules

By themselves, the data in the mortality schedules are an extremely valuable and heretofore unexploited source of information on the health of the nineteenth century U.S. population. As Table 1 shows, the mortality schedules themselves contain some information on SES — each decedent's occupation at the time of death was reported. But a great deal more can be done after linking the mortality schedules to the population schedules collected at the same time. Table 2 shows the information relating to SES than can be obtained from the 1850-60 population schedules. Each piece of information is reported for each surviving member of the household.

1850	1860
occupation	occupation
real estate wealth	real estate wealth
	personal wealth
literacy	literacy
school attendance	school attendance
pauper	pauper
criminal	criminal

Table **2**: Variables in Population Schedules Related to SES.

The linkage process was guided by three considerations:

1. The census marshals collected the mortality information from households in the same order as that in which they collected the population information; comparing the mortality records sorted by order of visitation with similarly sorted population records makes it possible to link even individuals with the most common names.

2. The 1860 census has a more comprehensive measure of SES (total wealth) than the real estate wealth reported in 1850.

3. In order to calculate mortality rates or perform multivariate analysis on the correlates of mortality, it is necessary to have either a reliable sample or a complete enumeration of the entire population of a county to which the mortality data can be linked.

The first consideration meant that the linkage of individual decedents to their surviving households could be done easily only where a source allowed the computerized mortality records to be sorted by order of visitation. Published transcriptions of the 1860 Illinois and Alabama mortality schedules were used for this purpose and allowed 1860 decedents in these states to be linked back to their actual households. The second consideration confirmed the need to focus on 1860 for this aspect of the analysis. The third consideration further limited the analysis to those counties in Illinois and Alabama for which the 1860 population schedules have been entirely transcribed. The five counties meeting these criteria are shown in Figures 3 and 4.

For 1850, the lack of a source revealing the order of visitation on the mortality schedules prevented such individual-level matching. Instead, individual decedents whose occupations were reported in the mortality schedules were compared with individual survivors whose occupations were reported in the population schedules from the same counties. Fifty counties were selected for which the 1850 population schedules have been entirely transcribed and for which decedents

were included in the computerized mortality database. These counties are shown in Figures 5 through 15.

For 1860, the linked data contains all the information for each decedent in the mortality schedules if the household experienced a death in the year preceding the census, as well as the following information for all surviving members of their household and all members of households that did not experience a death (in addition to the SES-related information shown in Table 2): age, sex, race, birthplace, household wealth, and occupation of the household head. The cause of death is also included for decedents.

The overall linkage rate was 85.4%, but a linear probability regression with successful linkage as the dependent variable revealed that a year of age reduced the linkage rate by 0.17 percentage points (p=0.032), males were 4.3 percentage points more likely to be matched (p=0.096), the linkage rate in the three Illinois counties was 7.2 percentage points below that in the two Alabama counties (p=0.009), and those born outside their state of residence at death were 5.9 percentage points more likely to be linked (p=0.118). The linked sample contains 758 decedents and 66,093 survivors.

For 1850, the linkage produced a sample of 810 adult male decedents with reported occupations and 92,755 adult male survivors with reported occupations in the 50 county area. The sample contains each individual's occupation, age, and birthplace, and the reported cause of death for decedents.

In both 1850 and 1860, the counties for which the analysis can be performed were determined largely by where genealogists had transcribed mortality and population schedules. These counties are uniformly rural. In 1850, only 4 places with populations over 3,000 are

included: Mauch Chunk, Pennsylvania, pop. 5,203, Springfield, Illinois, pop. 4,533, Raleigh, North Carolina, pop. 4,518, and Galveston, Texas, pop. 4,177. In 1860, only two places with 2,000 or more inhabitants are included: Tuscaloosa, Alabama, pop. 3,989, and Elwood, Illinois, pop. 2,000. It was not possible to locate any counties in the Middle Atlantic or New England states for which linkage was possible.[2]

III. Analysis of SES and Mortality in 1850 & 1860

The hypothesis to be tested is that in 1850 individuals in higher income occupations had lower mortality rates than individuals in lower income occupations; in 1860, individuals in households with greater wealth had lower mortality rates than individuals in households with less wealth. The exact mechanism through which these relationships operate will not be tested, but it seems reasonable to imagine that higher SES individuals and households may be able to purchase better nutrition (both more calories and a greater variety of calorie sources), and better housing (larger, better ventilated, farther from sanitary hazards, more thoroughly protected against rain and cold). This suggests that the relationship between SES and mortality will not be the same for all causes of death. In particular, it will be strongest for those causes of death most susceptible to living circumstances. Death from tuberculosis (best transmitted among individuals weakened by poor nutrition or exposure to other diseases and living in cramped, poorly ventilated places) will be more strongly associated with low SES than death from drowning.

[2] The 1860 mortality and population schedules for Albany, New York have been linked by David Davenport, and the author has linked most of the 1860 mortality and population schedules for Chicago, but both places presently lack a comparison population of survivors.

	Mortality Rate (per thousand)	Difference (1 vs. 2)	t-statistic	probability
1850				
1. Farmer	8.6			
2. White Collar	7.1	1.5	1.25	0.211
1. Farmer	8.6			
2. Laborer	8.1	0.5	0.64	0.522
1. White Collar	7.1			
2. Laborer	8.1	-1.0	-0.73	0.464
1. Farmer	8.6			
2. Craft	10.1	-1.5	-1.59	0.110
1. White Collar	7.1			
2. Craft	10.1	-3.0	-1.89	0.059
1. Craft	10.1			
2. Laborer	8.1	2.0	1.79	0.074
1860				
1. Total Wealth > 0	9.7			
2. Total Wealth=0	27.5	-17.8	-12.64	0.001
1. Real Wealth >	10.1			
2. Real Wealth=0	13.8	-3.8	-4.36	0.001
1. Personal Wealth > 0	9.5			
2. Personal Wealth=0	26.8	-17.3	-12.97	0.001

Table **3**. Comparisons of Mortality Rates by Occupation (1850) and Wealth (1860).

Though it will be necessary to control for a variety of individual, household, and community characteristics in addition to occupation and wealth, as well as to consider different causes of death separately, it will be useful to calculate some simple mortality rates without these controls as a first step. Table 3 presents *t*-tests on differences in mortality rates by the individual's occupation in 1850 and by whether or not the household possessed any wealth in

1860. Occupations are grouped into 4 broad categories: white collar (professional, managerial, clerical and sales, and government), craft, farmer, and laborer (including operatives and unskilled workers). Farmers and white collar workers had higher incomes than craft workers, who in turn had higher incomes than laborers. No attempt is made here to calculate separate mortality rates by cause of death.

The results provide only weak support for the hypothesis that occupational status (as a proxy for income) is a significant determinant of mortality rates: white collar workers did indeed have lower mortality rates than craft workers, but craft workers had substantially higher mortality rates than common laborers. There is little evidence that farmers had lower mortality rates than any of the other occupational groups. The evidence for the role of wealth (whether measured as total wealth, real estate, or personal estate) is considerable stronger: differences in mortality rates between those with and without wealth were both large in magnitude and statistically significant, with the greatest differences for total and personal wealth.

There are several other likely influences on mortality rates that can be accounted for in order to isolate the role of SES. The most important of these is obviously age. The 1850 and 1860 samples both make it possible to identify individuals born abroad or outside the state in which they resided at the time of the census. Such people may have lower mortality if the process of in-migration selects for the most physically fit, but their introduction to a new disease environment may have a countervailing effect on their mortality. There may also be differences in the physical or economic environment across counties or regions that influence mortality. Haines, Weiss, and Craig (2000) include measures of both population density and the availability of transportation. The multivariate analysis includes both of these county level variables as well

as regional dummies for the west (Indiana, Michigan, Illinois, Iowa, and Texas) and south (North Carolina, Virginia, Alabama, and Kentucky).

The first column of Table 4 presents logistic regressions with death (from any cause) as the dependent variable. As expected, there is a clear age pattern: the risk of death increases slightly from the 15-24 category (the excluded group) to the 25-34 group, then increases by a greater amount in the 45-54 group, then nearly doubles in the age 55 and over group. Death rates were also lower in the south and the west. The occupation categories now reveal a pattern somewhat more consistent with a positive influence of SES on mortality: the largest coefficients are for farmers and white collar workers (though only the former is statistically significant), and craft workers and common laborers are similar in their mortality. The density measure (population per square mile in the county) suggests that more densely populated places actually had lower mortality rates. Though this seems contrary to an impression of nineteenth century urban places as sites of prevalent disease, overcrowding, poor sanitation, and high death rates, keep in mind that the counties included in the analysis are all predominantly rural, while the small number of urban places within in them are quite modest in size. The coefficient on density suggests, then, that within the range of densities found in these rural counties, mortality was lower in counties with more people per square mile (and thus more people living in small towns) than in places more like the frontier with very low densities and few amenities.

It is straightforward to identify two specific causes of death in the mortality schedule: consumption was the most frequently reported cause of death throughout the nineteenth century, while cholera was epidemic throughout the U.S. in 1849 (the second half of which falls within the twelve month window of the question asked by census marshals as they canvassed

	Dependent Variable:		
Variable	Death From Any Cause	Death From Consumption	Death From Cholera
Intercept	-4.1656***	-5.4920***	-6.5409***
Age 25-34	0.0348	0.1552	0.8419***
Age 35-44	0.2483**	-0.1980	0.7404**
Age 45-54	0.6357***	0.2392	0.7914*
Age 55+	1.2579***	1.0370***	1.2508***
White Collar	-0.2309	0.2224	-0.4603
Farmer	-0.2336***	-0.5458**	-0.2338
Laborer	-0.1227	-0.5726*	0.3264
Interstate Mover	-0.1872**	-0.2503	-0.1291
South	-0.5371***	-1.3471***	-1.6742***
West	-0.1665*	-0.7215***	0.3154
Density	-0.0154***	-0.0156	-0.0341**
Transportation Access	0.0245	0.2593	-0.4814*
Likelihood Ratio χ^2	167.5649***	47.5783***	62.5213***
Observations	93,565	92,864	92,730

Note: The figures shown are regression coefficients rather than partial derivatives. The sample consists of males age 15 to 65 who reported occupations in either the mortality or population schedules. For "Consumption" and "Cholera," only deaths from these causes and survivors are included; other deaths are excluded. Omitted categories for the categorical variables are "Age 15-24," "Craftsman," "Living in State of Birth," "North," "East," and "No Access to Rail or Water Transportation." Transportation Access was taken from Craig, Palmquist, and Weiss (1998); the authors graciously provided their data in machine readable format. Probability that the true regression coefficient is zero: *** < 0.001 ** < 0.05 * < 0.10

Table **4**. Logistic Regressions on Mortality, 1850.

households). The second and third columns of Table 4 examine deaths separately from these two causes. For consumption, there are clear differences by occupation, though not the differences we would anticipate if occupation captured only the influence of income and its corresponding access to superior food, shelter, and sanitation. Rather, both farmers and laborers enjoyed lower consumption death rates than white collar and craft workers. This may reflect the importance of the workplace (generally outdoors for farmers and common laborers, most of whom in these

counties would have been farm laborers) and fewer workplace opportunities to come into direct contact with other people for these occupations rather than the role of the home environment in the disease's transmission. The age pattern of mortality was similar in magnitude to that for all causes of death, though statistically significant for consumption only in the oldest age cohort, perhaps as a consequence of the greater susceptibility of those already debilitated in some way. Lower consumption death rates prevailed in the south and the west.

The regression for deaths from cholera reveals no statistically significant relationship to occupation, though the coefficients suggest an ordering of death rates from laborers (highest) to craft workers to farmers to white collar workers (lowest). That this disease is only weakly (if at all) related to occupation as a proxy for material living conditions is not surprising. Cholera is spread by contaminated water supplies (and also the consumption of contaminated shellfish), so it is quite possible for an otherwise well-fed, well-housed, well-clothed individual to contract the disease.

Results from the 1860 sample are shown in Tables 5 (all causes of death) and 6 (deaths from consumption). For all causes of death, the impact of total wealth on mortality is large and statistically significant for all ages up to 44. The coefficient on total wealth in the regression for infants, for example, implies that a change in income from the first quartile of the household distribution of wealth ($250) to the third quartile ($2900) reduces infant mortality from 26.6 per thousand to 19.5 per thousand. Though these figures are well below previous estimates of infant mortality in the mid-nineteenth century U.S., reflecting the under enumeration of infant deaths in the mortality schedules, the difference between the rates for low and high wealth households (a decline of 27% with the change in wealth from the first to the third quartile) is impressive. As

age increases, the partial effect of total wealth on mortality falls initially (from -0.0030 for infants to -0.0009 for age 1 to 4, to -0.0004 for age 5 to 19), then rises (to -0.0013 for age 20-44). The greatest impact, then, is for infants, which is consistent with a substantial role for material resources earliest in life.

Column 1 of Table 6 shows a regression like those estimated separately by age category in Table 5, but with the age categories now combined and terms up to age cubed added to the regression (to facilitate comparisons with the following regression on deaths from consumption, for which cell sizes were too small to estimate separate regressions by age category). The effect of wealth remains when the ages are pooled, and it remains regardless of how wealth is measured: there is a positive and statistically significant relationship between mortality and real

Dependent Variable: Death From Any Cause

Variable	Infants	Age 1-4	Age 5-19	Age 20-44	Age 45-64
Intercept	-2.8896***	-2.3633***	-5.0452***	-5.3154***	-8.1521***
Age		-0.6915***	-0.0020	0.0362***	0.0741***
Male	0.2384	0.3482***	-0.0105	-0.3598***	0.3492
Born In State	0.4549	0.2784	0.7073***	0.5963***	0.7270
Foreign Born	-10.5323	1.7270***	-13.4426	-0.1729	-0.1136
Perry County, IL	0.5451*	0.6609***	-0.3040	-0.2256	0.0408
Shelby County, IL	-0.1313	0.2997	0.3501	0.1494	-0.4037
Vermilion County, IL	0.6203**	0.5774***	0.2052	0.1192	0.1633
St. Clair County, AL	0.2414	0.4183	0.2585	0.2297	0.4082
Log(Total Wealth + $1.00)	-0.1288***	-0.1330***	-0.1727***	-0.1317***	-0.0409
Likelihood Ratio χ^2	31.3749***	159.5286***	40.8739***	44.4384***	23.5083***
Observations	2,531	9,290	26,194	22,258	5,500

Note: The figures shown are regression coefficients rather than partial derivatives. The sample consists of all individuals in the population schedules and all individuals in the mortality schedules who were linked to households in the population schedules. Total Wealth is measured at the household level. Omitted categories for the categorical variables are "Female," "Born Outside State of Residence," and "Tuscaloosa County, AL."
Probability that the true regression coefficient is zero: *** < 0.001 ** < 0.05 * < 0.10

Table **5**. Logistic Regressions on Mortality, 1860.

	Dependent Variable:			
Variable	Death From Any Cause			Death From Consumption
Intercept	-3.2481***	-3.7404***	-3.2282***	-10.8683***
Age	-0.2159***	-0.2160***	-0.2165***	0.2454***
Age^2	0.0063***	0.0063***	0.00635***	-0.00391***
$Age^3 \times 10^{-2}$	-0.0040***	-0.0040***	-0.004 ***	0.0019
Male	0.1037	0.0954	0.1023	-0.3556
Born In State	0.5878***	0.5747***	0.5769***	0.6000*
Foreign Born	-0.1928	-0.0985	-0.2012	-14.0634
Perry County, IL	0.2134*	0.1937	0.2132*	0.0277
Shelby County, IL	0.1355	0.0270	0.1373	0.9309**
Vermilion County, IL	0.3590***	0.2623**	0.3363***	1.2010***
St. Clair, AL	0.3607***	0.2625**	0.4037***	0.5205
Log(Total Wealth+$1.00)	-0.1320***			-0.0927**
Log(Real Wealth+$1.00)		-0.0505***		
Log(Personal Wealth+$1.00)			-0.1524***	
Likelihood Ratio χ^2	659.2109***	581.3489***	668.8916***	76.1813***
Observations	66,851	66,851	66,851	66,150

Note: The figures shown are regression coefficients rather than partial derivatives. The sample consists of all individuals in the population schedules and all individuals in the mortality schedules who were linked to households in the population schedules. For "Consumption," only deaths from this cause and survivors are included; other deaths are excluded. Wealth is measured at the household level. Omitted categories for the categorical variables are "Female," "Born Outside State of Residence," and "Tuscaloosa County, AL."
Probability that the true regression coefficient is zero: *** < 0.001 ** < 0.05 * < 0.10

Table **6**. Logistic Regressions on Mortality, 1860.

wealth and personal wealth shown in the second and third columns of Table 6, though the effect from personal wealth is clearly greater than the effect for either total or real wealth. When deaths from consumption are considered separately in the last column of Table 6, the relationship between wealth and mortality is evident again.

Conclusions and Extensions

The results for both 1850 and 1860 support the view that socioeconomic status was an important force shaping the mortality rates experienced by Americans in the middle of the nineteenth century, at least in the sample of rural counties examined here. The results for wealth (1860) are much stronger than those for occupation (1850) as a proxy for SES and are quite large in magnitude, with a change in wealth from the first to the third quartile of the household wealth distribution leading to a dramatic 27% drop in infant mortality. These findings suggest that when Americans moved into cities and towns and factories as the first half of the nineteenth century closed, they had already experienced substantial disparities in health outcomes in the rural, agricultural settings they left behind. Though these disparities may have widened with this movement, the mortality experience and its relationship to socioeconomic status after 1860 were different only in degree and not in kind from that seen here. Even on farms and in small towns, the more affluent experienced longer lives than their poorer neighbors.

The analysis presented here suffers from two principal shortcomings. The first is the inability to say anything about the experience of urban dwellers. Data for Chicago and Albany will be added as the project progresses, but more information from the cities of the northeast, inundated with immigrants and beset with crowding, poor sanitation, and substandard housing, will be essential to understand the full scope of mid-century America's mortality record. The second shortcoming is the only brief attention given to causes of death and their likely different relationships to SES. The analysis needs to be expanded to take explicit account of the competing risks faced by these households. The reported causes of death may yield greater insights when

they have been coded in ways that reflect their probable relationship to the material circumstances in which Americans found themselves at mid-century.

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Figure 3. Alabama counties in 1860 analysis: (1) Tuscaloosa, (2) St. Clair.

Figure 4. Illinois counties in 1860 analysis: (1) Vermilion, (2) Shelby, (3) Perry.

Figure 5. Alabama counties in 1850 analysis: (1) Madison, (2) Jackson, (3) Blount, (4) Jefferson, (5) Shelby, (6) Marengo, (7) Lowndes, (8) Wilcox, (9) Monroe, (10) Conecuh, (11) Washington, (12) Baldwin, (13) Henry.

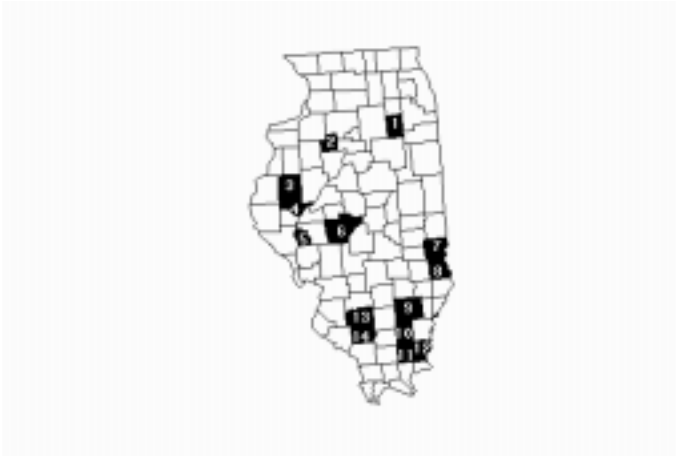

Figure 6. Illinois counties in 1850 analysis: (1) Grundy, (2) Stark, (3) McDonough, (4) Schuyler, (5) Scott, (6) Sangamon, (7) Clark, (8) Crawford, (9) Wayne, (10) Hamilton, (11) Saline, (12) Gallatin, (13) Washington, (14) Perry.

Figure 7. Indiana counties in 1850 analysis: (1) Kosciusko, (2) White, (3) Boone, (4) Fayette.

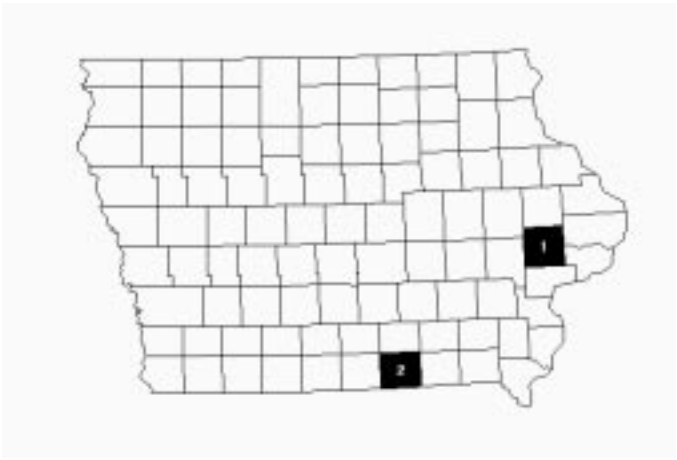

Figure 8. Iowa counties in 1850 analysis: (1) Cedar, (2) Appanoose.

Figure 9. Kentucky counties in 1850 analysis: (1) Spencer, (2) Simpson.

Figure 10. Michigan counties in 1850 analysis: (1) Lapeer, (2) Ionia.

Figure 11. North Carolina counties in 1850 analysis: (1) Northampton, (2) Wake.

Figure 12. Ohio counties in 1850 analysis: (1) Williams, (2) Henry, (3) Sandusky, (4) Pike.

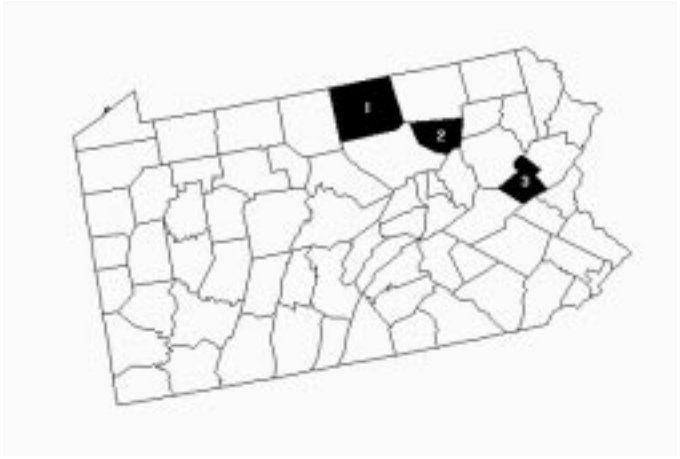

Figure 13. Pennsylvania counties in 1850 analysis: (1) Tioga, (2) Sullivan, (3) Carbon.

Figure 14. Texas counties in 1850 analysis: (1) Galveston.

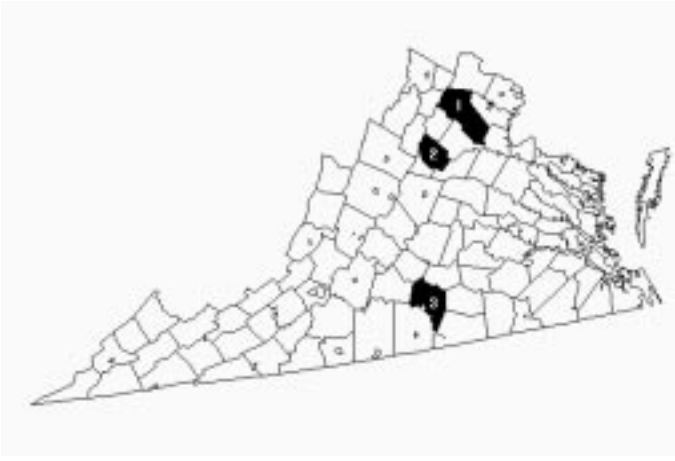

Figure 15. Virginia counties in 1850 analysis: (1) Fauquier, (2) Madison, (3) Charlotte.