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Correlates and Consequences of American War Casualties in World War I

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1. Introduction

Commemorations of the centenary of World War I have brought renewed attention to the causes of the conflict, and the consequences of global mass warfare for soldiers and civilians (Jones 2013; Keene 2011; Vasquez 2014). Mirroring the conflict itself, the pace of American scholarship prompted by the centenary of the war has lagged that in other combatant countries by several years (Keene 2016; Kinder 2015). But outside of international relations much of the scholarship has come from historians rather than social scientists. Thus, there has been little attention paid to extending our knowledge of the basic demographic facts of American involvement in World War I, and analysis of the social impact of the war on veterans and their communities. After knowing how many Americans died, demographers might ask how did they die, and how did mortality rates differ across different groups? Sociologists might proceed to ask how the society these men came from was affected by their deaths. How did contemporaries react to a significant, yet temporary, rise in mortality for young men in the course of a controversial war?

To answer these questions, we create a new dataset of individual-level data on American casualties in World War I. The dataset contains township of origin (and thus state and county of origin), rank, and cause-of-death, and in conjunction with existing aggregate sources on enlistments and casualties allows us to show significant state-level variation in casualty rates. State casualties from all causes and solely from battlefield causes both

varied more than three-fold across the states. The mortality from World War I was spread widely, but unevenly, across the country. Just 69 of 2,960 counties experienced no casualties. Variation in county-level mortality rates was significantly higher than at the state level. Among counties experiencing a casualty, the mortality rate varied more than 80 times from 5/100,000 to 451/100,000.[1]

Following a literature in sociology and political science, we then examine how variation in casualty rates was associated with electoral results. While the decision to enter the war was a Congressional *and* Presidential one, the war and the difficult peace that followed were strongly associated with Democratic President Woodrow Wilson's administration. Thus, our measure of electoral consequences is the change in the Democratic Party's presidential vote-share between the 1916 and 1920 elections. We find a significant impact of higher casualties on electoral results in 1920, with a standard deviation increase in the World War I casualty rate associated with a one-third of a standard deviation decline in the Democratic Party's presidential vote share in the 1920 election. Lower casualties in World War I would have been unlikely to change the overall result in 1920 of a Republican victory. Higher casualties turned what was likely to have been a Republican victory into a Republican landslide, and thus contributed to the establishment of Republican ascendancy in US politics through the 1920s.

[1] Bennett County, South Dakota, with a population of 96 in the 1910 census suffered four casualties in World War I. The next highest county had a mortality rate of 451. We omit Bennett County as an outlier in our analyses.

2. Background

In this paper we address two primary questions. First, we ask an essentially demographic question. What were the risks of death in World War I for different groups of American men? With the destruction of more than 80% of the records of United States soldiers from the era (Stender and Walker 1974), there is limited microdata from which one might estimate hazards of death, adjusting for individual characteristics. As we document below, there are reasonably comprehensive sources identifying who died. The challenge wrought by the destruction of the military personnel records is that we lack comparable information on survivors. Thus, our assessment of social inequalities in casualties is ecological, examining whether casualty death rates were correlated with county-level measures of socioeconomic status.

Second, we ask a more sociological question about the effects of casualties on the communities from which casualties were drawn. The extent to which public opinion reacted to combat deaths sheds light on the strength of national ties at the local level. Were people willing to retrospectively approve of the local people lost for the pursuit of international political goals? In an era before public opinion polling, election results provide one of the few quantifiable sources for understanding public opinion. The interpretation of election results is frequently over-determined; an individual's single vote reflects her private weighting of the importance of multiple public issues. At an aggregate level, we can recover some of the public, measurable influences on collective decisions with an ecological assessment of how the characteristics of an area affect its voting patterns.

Sociologists have much to gain from renewed attention to America's involvement in World War I. The conjunction within a few years of a mass global war, intense debate over immigration, a major disease pandemic, the admission of women to suffrage, a major recession, and a significant political realignment towards the Republican Party in the 1920 election provide fertile ground for diverse questions about the structure of American society. Scholarship on later twentieth century conflicts and the American Civil War shows that there can be large social consequences of wartime casualties. For example, a series of recent papers (Carson et al 2001; Kriner and Shen 2007, 2010, 2012, 2014; Mayhew 2005) on the effects of wartime casualties on public opinion and political outcomes show that casualties are politically salient, and that even wars with relatively few casualties can cause significant swings in public opinion, and electoral results. How did American react to the 115,000 soldiers who lost their lives in service during World War I?

We demonstrate the importance of World War I mortality by showing that the political re-alignment of the 1920 election was partially caused by differential casualty rates across American states during World War I. The election of 1920 began a sequence of three straight elections in which the Democratic Party incurred major Presidential election losses. Between the 1916 and 1920 elections the Democratic share of the two-party presidential vote dropped 14-15% in the average state. In Congress, the Democratic Party relinquished control of the Senate in the November 1918 elections, and incurred significant losses in the House of Representatives in both the 1918 (21 seats) and 1920 (59 seats) elections. Differences in Great War casualties across the states had a significant impact on

election outcomes because states with higher casualty rates were more politically competitive and important. While the Democratic vote dropped significantly in the South in 1920, their margin was still sufficient to win. High wartime casualty rates in the Midwest and Northeast had a significant effect on the results of the 1918 and 1920 elections.

3. Methods

To answer these questions about the demography and social consequences of American involvement in World War I, we compile a new machine-readable data source of individual American casualties. The data are derived from the publication *Soldiers of the Great War*, which listed in three volumes all Americans reported as having died during service. While privately published, the volumes reproduced all deaths reported in the *Official Bulletin* issued regularly by the United States government during World War I. We are able to disaggregate casualties by state of origin, rank, and broad cause of death (killed in action, died of wounds, accidents, illness). In the course of creating this dataset, it becomes clear that a complete individual listing of Americans who died during World War I service may be impossible to construct, as the personnel files for American servicemen from the era were destroyed in a 1973 National Archives fire. We obtain information on the population and time at risk (our denominators for deaths during the war) from data presented in the *Medical and Casualty Statistics* report by the Surgeon General of the Army in 1925. We add data on the characteristics of each states population, including the male cohort eligible to be enlisted from ICPSR Study 2896.[2]

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[2] Michael R. Haines, Inter-university Consortium for Political and Social Research. 2010. "Historical, Demographic, Economic, and Social Data: The United States, 1790-2002." Ann Arbor: Inter-university Consortium for Political and Social Research.

Our dataset includes nearly the entirety of the population that died in the American Expeditionary Force in Europe, but excludes deaths from disease and accident on American soil. Our data accounts for two-thirds of the generally accepted total number of American army casualties from World War I. Our dataset includes 95% of the battlefield deaths (killed in action and died of wounds), and 60% of deaths by accident, but includes less than one-third of deaths from disease (principally influenza). Soldiers remained at risk for mortality from influenza—and other diseases—and accidents after the conclusion of hostilities in November 1918, yet battle deaths [largely] did not occur after this date. Because our dataset is derived from published official sources, it corresponds with the number of deaths overseas that were being officially reported to Americans at the time. Moreover, deaths that occurred in Europe may have been more politically salient than deaths that occurred in the United States.

The format for *Soldiers of the Great War* allowed straightforward extraction of key data elements (**Figure 1)**. The document is organized into lists of soldiers by state, permitting state death totals to be calculated easily. Within each state, the data was organized hierarchically, grouping men first by the cause of death. Within each cause, men were further separated by rank. An individual entry for a soldier stated their last name (in block capitals), first name, and home town. After reading the data into a text file, we wrote a program to first recognize changes in the cause of death, and within each cause of death,

changes in rank. After separating names and place names within individual entries, we had a dataset that identified an individual's full name, cause of death, state of origin, and hometown.

The township information is critical to further analysis of the social bases of World War I mortality and required extensive post-processing to make the data useable. Although an apparently straightforward question, the social circumstances under which the township information was collected illuminate why some entries could not be easily placed into a county or city. Abstracting from spelling and OCR issues, we encountered a range of issues in identifying a county or city of origin for soldiers. We used the Open Cage geocoder service implemented in Stata with the -opencagegeo- command to assign county codes to town and city data.

County boundary changes: Soldiers identified a township, which can be assigned to a modern county. However, some counties have changed boundaries over time. For example, independent cities in Virginia have separated from their original counties. In the Mountain West states and Florida, many new counties were created in the 1910-20 period.

Name changes and disappearance: Particularly in the Mountain West, mining towns have disappeared, and are no longer recorded in modern GIS systems. These places had to be manually looked up, and assigned to a county. Similarly, some men from rural areas gave their address as a post office, many of which have since closed. Towns and counties that have changed names since the World War I era also required manual resolution.

For the preceding categories, we were able to assign a county manually; choosing to locate the soldier in the county that existed in 1918. This poses some problems for using pre-war 1910 census data as the denominator but appeared the least incorrect assignment. A final category of place names required that the soldier be allocated only to a state, but not to a county in the first round of analysis.

Township and state mismatch: The information in *Soldiers of the Great War* on soldier's hometowns comes from their enlistment papers, which were collected in a great hurry as the United States mobilized four million men for war in 1917 and 1918. Understandably, not all the information on enlistment papers was validated for its consistency or accuracy. Thus, towns listed by soldiers are not consistent with the state of enlistment for various reasons. For example, a man enlisting in Alabama listed his hometown as "Audenreid," which is a known place, but in Pennsylvania. Further investigation revealed the man's sister listed as his next-of-kin lived in Audenreid, Pennsylvania. Similarly, there are other examples of men listed under state X, giving a town clearly from state Y as their hometown. Checking some of these cases in the 1910 census showed that the man often had ties to both states. Finally, we encountered several examples of people listing a better known location across a state border as their hometown. For example, the town of Port Jervis is in New York state, but borders Pennsylvania and New Jersey, and the areas across the border from New York are populated. Men from both Pennsylvania and New Jersey listed "Port Jervis" as their hometown. In situations like this, we assigned men to the border county

nearest the listed town, in the state for which their data had been printed in *Soldiers of the Great War*.

We were able to assign county codes to 71,698 men from the 72,122 (99.4%) unique names listed in *Soldiers of the Great War*. Our county-level analyses at this point omit cases not yet assigned a county code. We plan to impute these cases to counties for future analyses. We merge our county- and state-level summaries of mortality with information from the 1910 and 1920 censuses on state and county characteristics from ICPSR (Haines and Inter-university Consortium for Political and Social Research 2010). We calculate the size of the birth cohort likely to serve from the complete-count 1910 census available from IPUMS (Ruggles et al 2017). In particular, we use this data to obtain total populations for each state and county, and measures of the share of the adult population who were of German birth or descent, African American, or working in agriculture. We expect these factors to affect enlistment, and therefore the male population from each area at risk of death during the war (Shenk 2009).

Specifically, we expect that areas with more German born or descended people will see increased patriotism and higher enlistment, either as a response to the German population in the area, or through German descended men themselves serving in large numbers. While African American men were allowed to serve, their capacity to do so was restricted, and we expect that in areas with higher African American populations fewer men of military age will serve, reducing the chance of men from the area ultimately dying in service. Finally, we expect that areas with a higher share of the population in agriculture will also

see reduced numbers serving, as local military service authorities would be more sympathetic to the needs of farmers for labor to produce food for the war effort.

We also use county-level data to measure social inequality in the level of casualties. Recent work by Kriner and Shen (2010) shows that military casualties disproportionately come from poorer areas, echoing the findings of Mayer and Hoult (1955) on casualties in World War II. Taking a long-term perspective World War II, Kriner and Shen suggest that casualties have become more unequal over time. Working with more recent county-level census data, Kriner and Shen use county income as a measure of socioeconomic status of counties. Income information is not available in the 1910 or 1920 census, and so we follow other authors in using the occupational income score (OCCSCORE) from IPUMS as our measure of county resources (See for example Goldstein and Stecklov 2016). The occupational income score measures the median income of a given occupation in 1950 dollars at the 1950 census. We calculate the mean, 25th percentile, and 75th percentile occupational scores for men aged 18-64 in each county, using the complete enumeration of the 1910 census. As an additional measure of socioeconomic status, we use the fraction of people aged 10 and over who are illiterate.

4. Results

The United States joined World War I in April 1917, and the first American combat deaths did not occur until May 1918. However, American troops had been in Europe since October 1917. In the broadest sense American troops were exposed to the risk of death in Europe for just over a year. Thus, we can interpret the mortality ratios as being nearly

equivalent to annual rates. The total official death toll for the American forces is known, losing 52,000 men in battle and 63,000 to disease or accidents, accounting for deaths in both Europe and the United States.

Even adjusted for time at risk the overall mortality rate for the United States during World War I was lower than for other Allied Powers. The United States lost 0.13% of its pre-war population between entry into the war in April 1917 and the return of troops from foreign service in mid-1919, with this 2-year timeframe accounting for deaths from disease, or approximately 0.06% of pre-war population per year. By comparison the next lowest mortality rate among comparable non-European Allied Powers was from Newfoundland which lost 0.10% of pre-war population per year. Canada (0.15%), Australia (0.25%) and New Zealand (0.30%) lost considerably more of their pre-war population for each year of war.

We focus our analysis on the deaths which occurred in Europe, documented in the *Official Bulletin*, and reprinted in *Soldiers of the Great War.* However, one third of the deaths in the U.S. forces in World War I occurred in the United States (Figure 2). This appears to have been a higher proportion of domestic deaths than other Allied nations which did not fight on their own soil. The influenza epidemic consumed a larger fraction of the US forces time in service, because of the later entry into the war and many of these deaths took place in camps during 1918 and 1919. Deaths from disease in camps in the United States are included in the death registration statistics. Moreover, they are extensively documented in

the *Medical and Casualty Statistics* report by the Surgeon General of the Army in 1925 with a focus on variation across different camp locations.

Our database from *Soldiers of the Great War* includes a total of 72,122 unique individual deaths, compared to a documented total of 76,699 (Figure 2) deaths in the American Expeditionary Force in Europe. Thus, we have individual-level records for 94% of the official death toll while serving abroad. Previous disaggregation of American casualties in the 1925 report *Medical and Casualty Statistics* focused on the causes, dates, and domestic camps in which deaths occurred, with some additional tabulations of the race of casualties. Thus, we have no official benchmark for our statistics on the domestic geographic origin of deaths in Europe. However, with records for 94% of the total number of deaths, it is unlikely that imbalances across counties or states will be significant.

We organize our discussion of results around i) estimates of the mortality ratio for states and counties, ii) county-level inequality, and iii) the effect of state casualties on the 1920 presidential election. We present our estimates without adjustment for the 6% shortfall in total casualties.

Mortality totals and ratios for counties and states

With a disaggregation of deaths into states and counties, we are able to calculate more specific mortality totals and ratios for areas across the United States. However, a key question in doing so is the choice of denominator. Kriner and Shen (2010) use *total state or county populations* as a measure of casualty burden. This is problematic for calculating

the risk of death in a demographic sense, as the entire population is not exposed to the risk of military service. However, total state populations are a useful basis for adding deaths in Europe in military service to mortality rates for the death registration states. It appears that the published death rates and totals for the death registration states in 1917 and 1918 included domestic deaths in military service (largely influenza mortality), but omitted deaths in Europe.[3] Total populations are also an appropriate metric for measuring the social impact of the war in a community.

The relationship between various denominators can be seen by decomposing deaths relative to the total population of an area (state or county) into its component fractions, in Equation 1 below.

$$\frac{\text{deaths}}{\text{total area population}} = \frac{\text{deaths}}{\text{enlisted men}} \times \frac{\text{enlisted men}}{\text{eligible cohort}} \times \frac{\text{eligible cohort}}{\text{total area population}} \quad (1)$$

Equation 1 shows that the death rate relative to the total population of an area is composed of three terms, all of which can be measured at the state level. The number of enlisted men for each county is not available. Deaths relative to total population reflects first of all the mortality hazard in service of men from the area. This will be affected most obviously by

[3] Whether and how to include overseas World War I mortality in death totals was not a challenge unique to the United States. Reports of the Australian and New Zealand civil registration offices of the time show there was a debate about the correct procedure from a legal and statistical standpoint. The deaths occurred overseas, but under the control of government authorities, so legally it was thought appropriate for the deaths to be registered. However statistically it was a significant departure from previous practice to include deaths of citizens abroad.

the share of men from an area who reached Europe and then the front. These measures cannot be recovered owing to the destruction of personnel files which might show who departed for Europe. It is important to note that even in countries that have extensive personnel records from the era, it is sometimes difficult to tell precisely whether or when a given individual was on the front lines, and thus exposed to risk. Military personnel files generally document promotions and transfers between units, and do not list periods of exposure to combat. The second term in the equation reflects the propensity of men in a given area to enlist. As we show below this varied significantly across states with measurable demographic factors. Finally, within an area the cohort size eligible for enlistment will reflect age structure. We might expect that "frontier" and mining areas to have a higher share of age- and sex- eligible people.

At the other extreme, the most precise and thus perhaps most demographic, denominator would be the number of men from a particular area who served abroad in Europe. Unfortunately, the destruction of records in the National Personnel Records Center fire precludes the construction of such a variable. Moreover, while the Army did produce statistics on the numbers of men who served in Europe and the number who remained stateside, these figures do not provide any detail on men's domestic origins. What is readily available is the number of men enlisting in a particular state (Ayres 1919). As this information is derived from the same source—enlistment papers—used to produce reports on deaths, it provides a denominator consistent with the deaths.

In between these extremes lies a less precise, but also meaningful, denominator of men eligible for military service. We can view dying in service as the end result of a series of hazards. First, men had to be eligible to serve, so the population should reflect the total eligible population. Enlistment might vary between states, but eligibility was constant across them. As we outlined earlier, a range of social factors was likely to have affected men's willingness to serve, and the chance they were accepted into the United States' forces.

The Selective Service Act of 1917 established the parameters of eligibility for military service. At first, from June 1917 to September 1918 it required men aged 21-30 to register. Men could volunteer outside these age ranges. After September 1918, 18-45 year olds were required to register. The question of which birth cohorts actually enlisted is empirical. While we lack evidence from contemporary reports on the age of enlisted men, the 1930 census veteran questionnaire allows us to measure which birth cohorts served (Figure 3). 95% of the World War I veterans in the 1930 census were born between 1880 and 1901 (inclusive). Thus, we use the size of this birth cohort at the 1910 census within each state and county as our denominator of the male population at risk of enlistment, acceptance, deployment, and ultimately death.

Within the United States enlistment rates varied considerably across states (Figure 4). Enlistment was lower in the South, where the eligible cohort was more heavily African American. Enlistment rates—either voluntary or through conscription—tended to be higher in states with a higher German born. or descended population. For every one

percentage point increase in a state's German born population there was a rise of 0.6 percentage points in the share of the birth cohort that enlisted (beta coefficient: 0.30). Thus, the share of a state's population at risk during World War I varied with identifiable demographic characteristics (Figure 5).

The 1880-1901 birth cohort denominator aggregates the risk of entering service, with the risk of mortality for the smaller population who actually served. A concern for our analysis would be if there was significant correlation between the share of men who served, and the mortality rate once in service. However, we find that there was a weak negative relationship between these variables (r= - 0.31). Thus, for example Montana which had the nation's highest enlistment share had an average casualty rate; while Kansas which had the nation's highest casualty rate had an essentially average enlistment rate. Thus, state mortality rates from World War I were largely a function of the exogenous risk of death in combat, and not strongly related to the propensity of the state's men to serve (Figure 6).

While there was variation across states in enlistment rates, it bears emphasizing that, as is common in demography, places with more people had more demographic events. Thus, it is unsurprising that New York, Pennsylvania and Illinois had the three highest totals of deaths in Europe, while Arizona, Delaware, and Nevada bring up the rear (Figure 7). Mortality ratios do not follow this pattern, with important variation across states. For comparability with Kriner and Shen's work, we report mortality ratios standardized per million people.

Relative to total population, the highest rates were observed in Kansas and Montana (Figure 8), and other Western and Midwestern states. The geographic pattern of casualties is clear, with the northern tier of states except Maine and Washington tending to have higher casualty rates (Figure 9). The same pattern is largely true when we change the denominator to the number of men enlisting from a particular state (Figure 10). Montana, which had very high enlistment rates, now appears more normal, as death rates for Montana men once in service were not abnormally high.

At the county level there was significantly greater variation in mortality rates than among states. The larger size of state populations absorbs variation. Significantly we find that only 69 counties out of nearly 3,000 had no casualties in World War I. In itself this result shows the widespread impact of the war across the United States, and a broad participation in fighting (Figure 11). The distribution of county-level mortality ratios was skewed, and appears log normal.

We examine inequality among counties by regressing county mortality ratios (for the total population) on a range of social indicators, letting coefficients vary in the North and South (Figure 12). Mortality at the county level was associated with a range of social characteristics of counties. In the North, counties that were less urban or had more farming households had higher casualties. This result is consistent with qualitative research on who American soldiers were, that they were drawn disproportionately from rural areas and small towns (Keene 2011). Similarly in the North, mortality ratios were higher in areas with a

greater fraction of the population who was illiterate, consistent with greater service among the less well edcuated. However, in the South these relationships were reversed, counties that were more urban had higher casualties. In both the North and South, the proportion of African American men in the adult population had little effect on mortality ratios.

We find a strong effect of German populations on mortality ratios. The German born or descended population was positively associated with mortality ratios in the North, where the German population was larger. German descent is measured one generation back, if either parent was German. In the South with few German immigrants the relationship was insignificant.The interpretation of these results bears further investigation. The German born and descended share of the population ranged from near zero in many Southern counties to around 30% in some counties in the Midwest, with the highest values occurring in Wisconsin. Population shares in this range leave open the possibility that it was the Germans themselves who enlisted, or their non-German neighbors. Linking individual names from the mortality data to the 1910 census has the potential to show more clearly the origins of casualties, and shed further light on this question. Whether it was the Germans or their neighbors, or both together, this result shows the differential reach of the war into American communities. Taken together, the results of these regressions suggest that war mortality was not equally distributed across American counties. Moreover, the social bases of participation in the war appeared to vary regionally.

Finally, we find that the political consequences of differential state mortality rates were significant. States with higher mortality rates swung significantly against the Democratic

party in World War I (Figure 13). Our results are robust to restricting the casualty set to battlefield deaths or enlisted men. A one-standard deviation rise in the statewide casualty rate from WWI is associated with a one-third of a standard deviation decline in the Democratic Party vote share between the 1916 and 1920 election. For each additional thousand casualties per million men of military age the Democratic Party vote dropped approximately 2.5%. Our findings are significant, because although American war casualties were small in international comparison the political ramifications were substantial. Americans reacted intensely to the loss of these men.

Conclusions

In this paper we document for the first time, a disaggregation of American mortality from World War I deaths in Europe. We find significant variation across states and counties in the level of casualties, with a distinctive geographic pattern. Casualties were higher in the Northern states, particularly in the Midwest and Mid-Atlantic. Initial analyses suggest that similarly to recent conflicts the presence of social inequalities in military sacrifice. These results are significant as they may provide the basis for the strong reaction against the Democratic party in the 1920 election. Many states that had been competitive in the 1916 election suffered high casualties in the war, and swung strongly against the Democratic party. The size of this effect is testament to the political salience of mortality from avoidable causes.

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Figure 1. Sample page from *Soldiers of the Great War*

MINNESOTA

KILLED IN ACTION

Captain

DOUGHERTY, Francis E., Glenwood.

Lieutenants

BALLENTINE, James J., Minneapolis.
BRADFORD, Alford J., Duluth.
COOK, Richard E., Minneapolis.
GAYLORD, Arthur R., Minneapolis.
GRACIE, Ralph D., Bemidji.
HANSCOM, Austin F., Willmar.
HARTWIG, Gerhard F., Wadena.
HOBBS, Harold J., Mankato.
JOHNSON, Conrad G., Duluth.
McGUIGGAN, Robert F., Winnebago.
MILLER, Melvin A., Wykoff.
MOE, Henry O., Minneapolis.
PRENTICE, Lee C., Albert Lea.
ROTH, Irving J., Minneapolis.
SHELLEY, Phillip M., South Minneapolis.
WOLD, Ernest G., Minneapolis.

Sergeants

ADAMS, Benjamin J., North St. Cloud.
BOHLS, John F., Shakopee.
BRIESE, Hasso Adolph, Rice.
BUTLER, Charles, Virginia.
FRYDELUND, John O., Albert Lea.
GAMMELL, Warren S., Madison.
GORGOSCHILITZ, Jacob J., St. Paul.
HASSELL, Zola G., Renville.
KEATING, Edward J., Minneapolis.
KIMBEL, Ray J., Round Lake.
KLINDT, Julius, Sherburn.
KYLE, Cecil F., Minneapolis.
LECK, Laurie William, Minneapolis.
McLEAN, Douglas, Duluth.
MATTSON, James, Winthrop.
NELSON, Arthur Everett, Hopkins.
PECK, William R., Minneapolis.
PETERSON, Erdroy A., Ashby.
PETERSON, Thorwald, Robbinsdale.
PETRIMEAN, George, Minneapolis.
PURTON, John Lawrence, Minneapolis.
RATHERT, Henry A., Mora.
SHERMAN, Stephen Geo., Minneapolis.
WARRAS, Caismer, Delano.

Corporals

ADAMS, James W., Waubun.
AHL, Max Henry, St. Paul.
ANDERSON, Carl L., Cloquet.
ANDREWS, Robert, Minneapolis.
ASHLEY, William H., Northfield.
BAILEY, Harold N., Chatfield.
BAWKS, Norman K., Stevenson.
BENSON, Walt F., Annandale.
BJORMHANG, Herman, Tofte.
CLARK, Dean C., St. Paul.
CROWE, Thomas F., Minneapolis.
ELLIOTT, Harry W., Minneapolis.

Corporals—Continued

MEIDINGER, Alphonse J., St. Paul.
NEARY, David W., St. Paul.
NIKOLOFF, Steve, Walnut Grove.
PATTON, William H., Fort Ripley.
PAUL, Edward J., Dassell.
REESE, Herbert R., Storden.
SABOE, Colben J., Belgrade.
SANDMAN, Carl, Brown Valley.
SCHERF, William H., Minneapolis.
SHOCKEY, Rudolph R., North St. Paul.
SMITH, Harvey, Spring Valley.
SOBANIA, Norbert, Holdingford.
SPLETT, Bennie, Lamberton.
STARKEY, Fred S. or H., Clitheral.
TOMALA, John, Pierz.
WEIER, Henry A., Winona.
WRIGHT, Orville E., Trosky.
YORK, Gay E., Minneapolis.

Buglers

MADSON, Oscar J., Dalton.
TUNELL, Earl L., Minneapolis.

Cooks

COLEMAN, Frank, Caribou.
KUBITZA, Vincent B., Philbrook.

Master Engineer

NUTTER, George L., Minneapolis.

Mechanics

ALLEN, Howard, Sauk Center.
CRESTOFFERS, Herman, Lamberton.
GEIS, Alfred J., Lanesville.

Horseshoers

MICHELSON, Helmer Arthur, South Virginia.
MOOK, Peter, Breckenridge.

Wagoner

VIALL, Frank C., Preston.

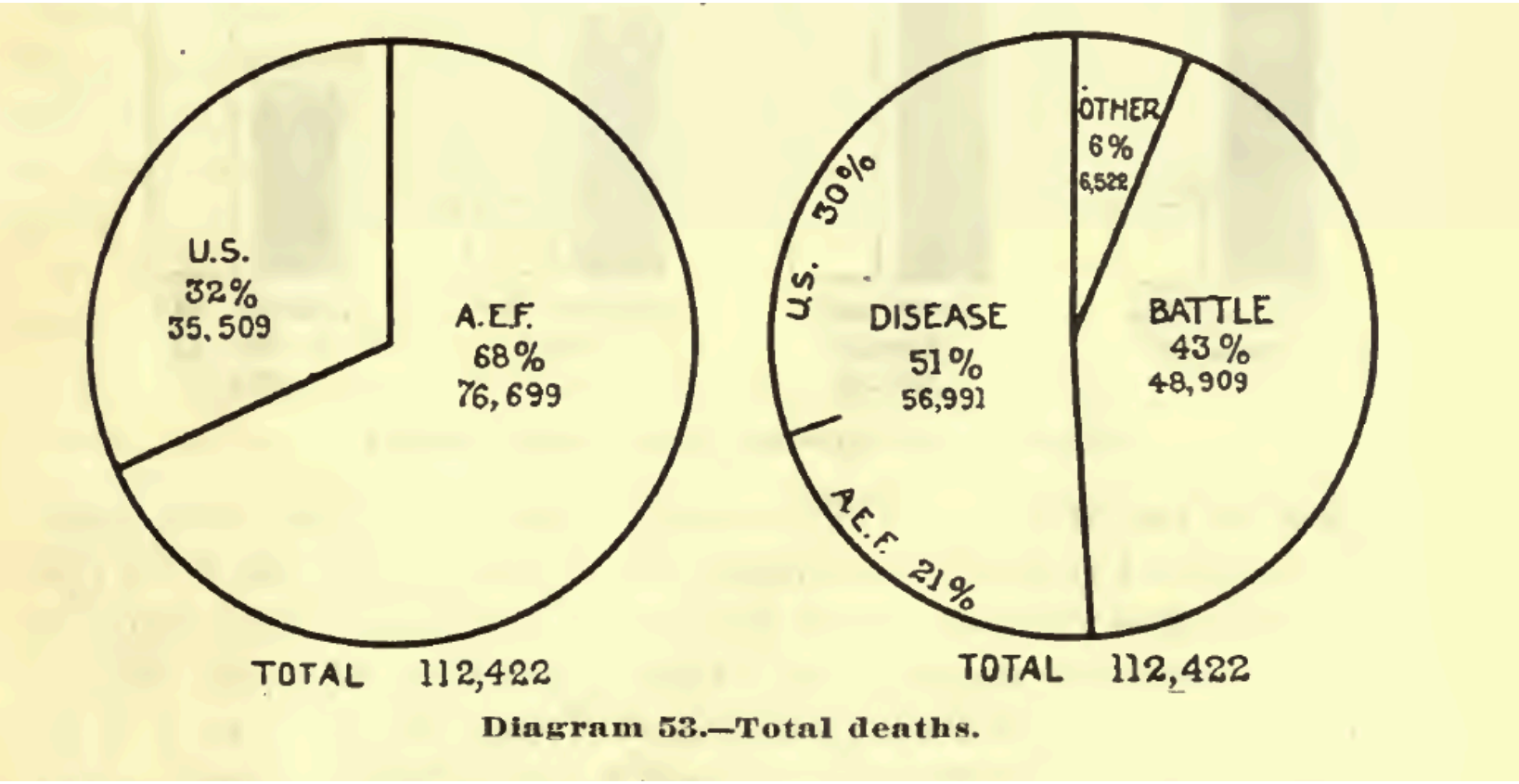
Privates

AASGAARD, Almer M., Twin Valley.
ABDALLA, George, St. Paul.
ABOOD, Steve, Minneapolis.
ABRAMHAMSON, Frank O., Duluth.
ACKERMAN, Louis, St. Paul.
ADAMS, Carl A., Minneapolis.
ADAMS, William H., Ogilvie.
ADWELL, Palmer A., Renville.
AHERN, Arthur E., Minneapolis.
AHL, Gust Edwin, Minneapolis.
ALBERTSON, Carol O., Duluth.
ALDRICH, Grover C., Richville.
ALLEN, William Lorenzo, Plainview.
ALTIZER, Oren S., Minneapolis.
ALTO, Hjalmar, Cromwell.
ANDERSON, Albert, Wheaton.
ANDERSON, Alfred A., Findlayson.
ANDERSON, Alfred W., St. Paul.

Privates—Continued)

BARROWS, Ezra Chandler.
BARSTAD, John M., Grygla.
BARTEL, Otto G. A., Fairhaven.
BARTSCH, Herman O., Good Thunder.
BAUER, George J., Mankato.
BAUMANN, Walter, Le Sueur.
BEACK, Albert, Hector.
BEAUDINE, Chester C., Kent.
BEAUVAIS, Wilfred Earle, Hugo.
BECK, Otto, Finlayson.
BECKER, Edward, Ghent.
BELDEN, Harry O., Rush City.
BELLAND, John, St. Paul.
BENSON, Leonard G., Minneapolis.
BENSON, Ole K., Clarkfield.
BENTHAGEN, George M., Borup.
BERG, William E., Duluth.
BERGEM, George, Underwood.
BERGLIN, John E., South Minneapolis.
BERGQUIST, Olaf A., Lancaster.
BERGSTROM, Sidney H., Clinton.
BERRY, William, Red Lake Falls.
BERTELSON, Peter, Minneapolis.
BESEMAN, Albert J., Albany.
BESKE, Arthur A., Hector.
BEVIER, James J., Minneapolis.
BIEN, Howard L., Wabasha.
BJERKEN, Helmer L., Germantown.
BJORBECK, Lars, Clearbrook.
BLACIK, Thomas L., St. Paul.
BLACKSTAD, Hans S., St. James.
BLASCHKA, Albert J., St. Paul.
BLETHON, Edgar A., Minneapolis.
BOCKENHAUER, Benjamin F., Grand Marais.
BOEKENOOGEN, J. L., Aitkin.
BOLGREN, Albert John, Barnesville.
BOMMGARDEN, Kelly, Steen.
BOOR, William F., Minneapolis.
BORENSON, Carl B., St. James.
BORGIE, Axel, St. Hilaire.
BORN, Edward, Norwood.
BORNES, Olof, Hendricks.
BORTLE, Oscar R., Minneapolis.
BOVYN, Camiel, Marshall.
BRANDENBURG, Henry W., Waconia.
BRATSCH, Paul E., Lesueur.
BREDEHOFT, Carl F., Erhardt.
BRENDEN, Thorvald, Kerkhoven.
BRENNAN, Carl O., Plummer.
BRIGHT, Virgil, Kellogg.
BROWN, Frank H., Rothsay.
BROWN, Jimmie L., Princeton.
BROWN, Walter B., Brainerd.
BRUNKOW, William F., Chokio.
BRUSH, Wesley, Brushvale.
BRYANT, Otto, Garden City.
DUBERGE, Frederick C., St. Paul.
BUDAHL, Peter G., Mildred.
BUEHLER, Charles, Fairfax.
BUESCHER, Chester P., Norwood.
BURELBACK, Nicholas J., Perham.

Figure 2. Distribution of deaths in US forces



Source: Ayres, *The War With Germany,* p.123.

Figure 3. Age distribution of World War I veterans in the 1930 census

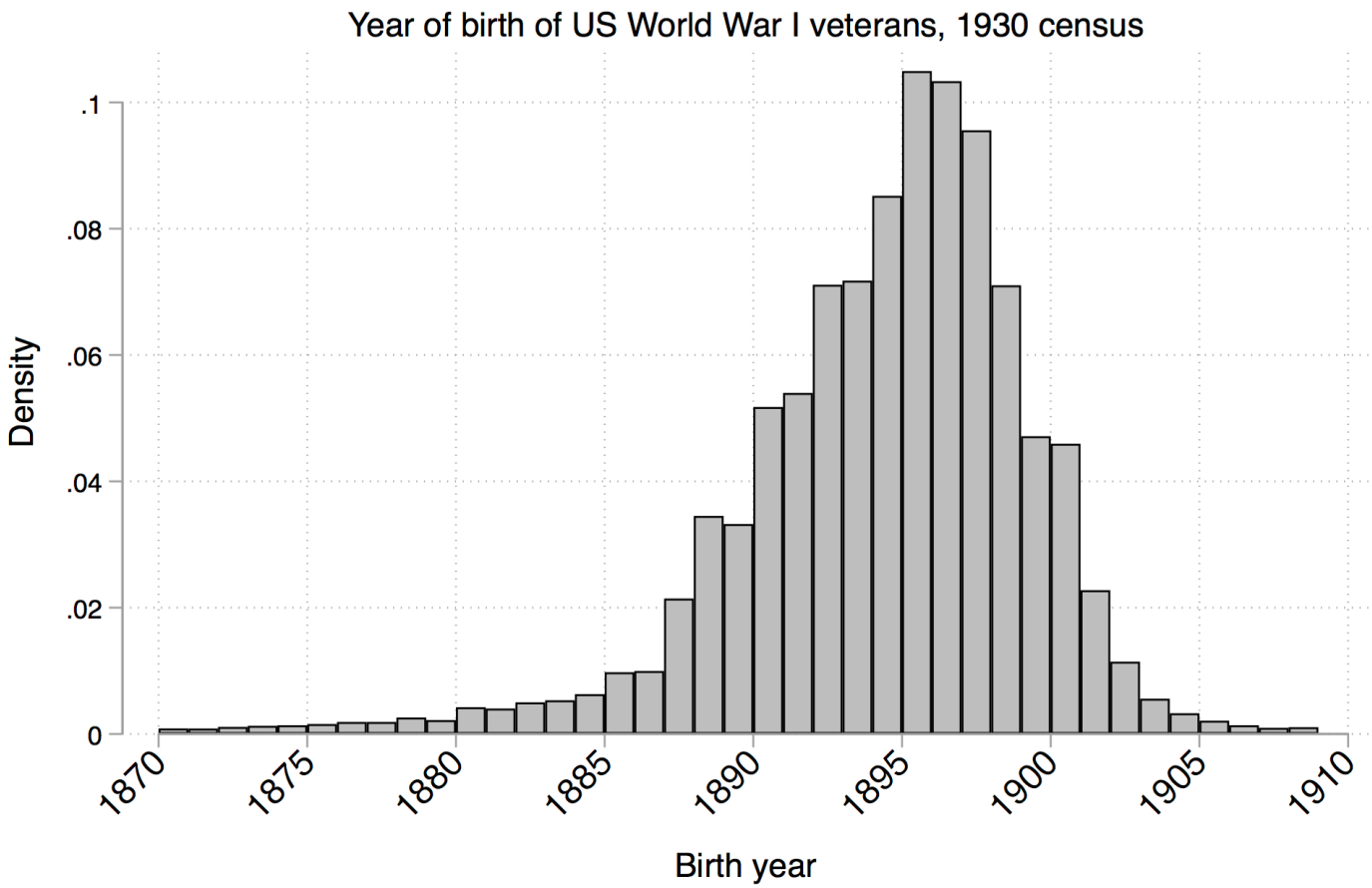
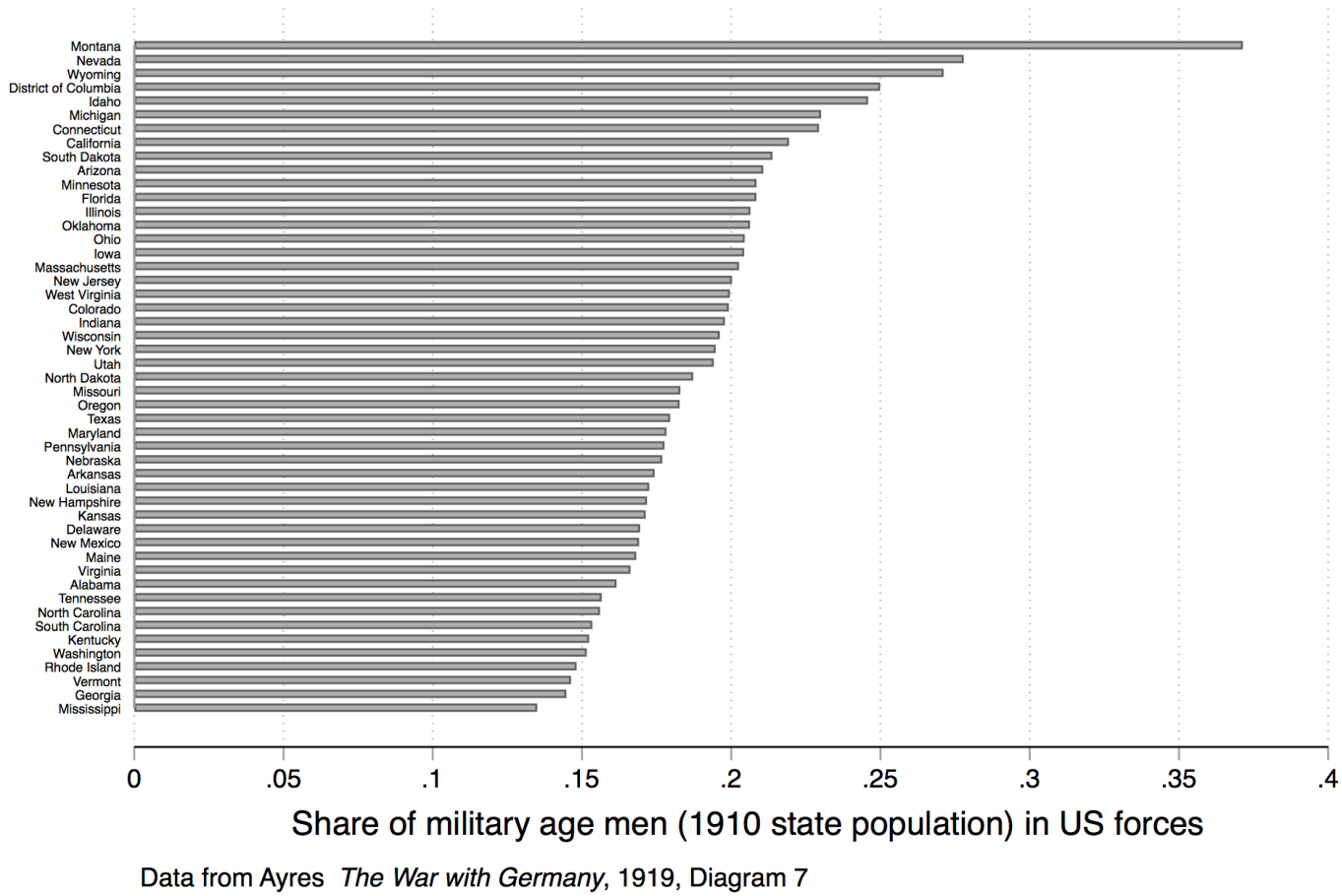


Figure 4. State variation in enlistment shares relative to 1880-1901 birth cohort



Data from Ayres *The War with Germany*, 1919, Diagram 7

Figure 5. German descended population and enlistment shares

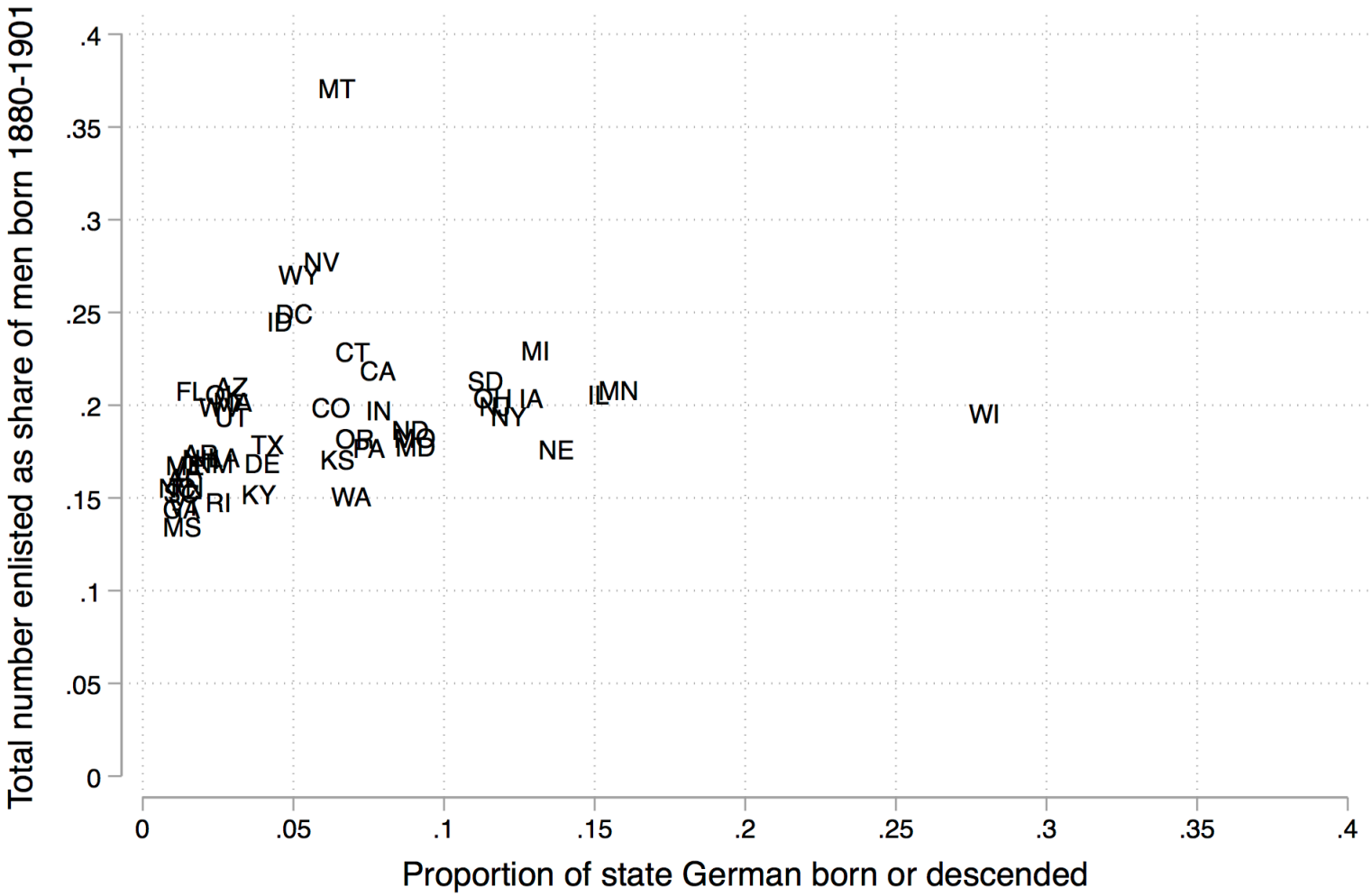


Figure 6. Enlistment shares and battle death rates

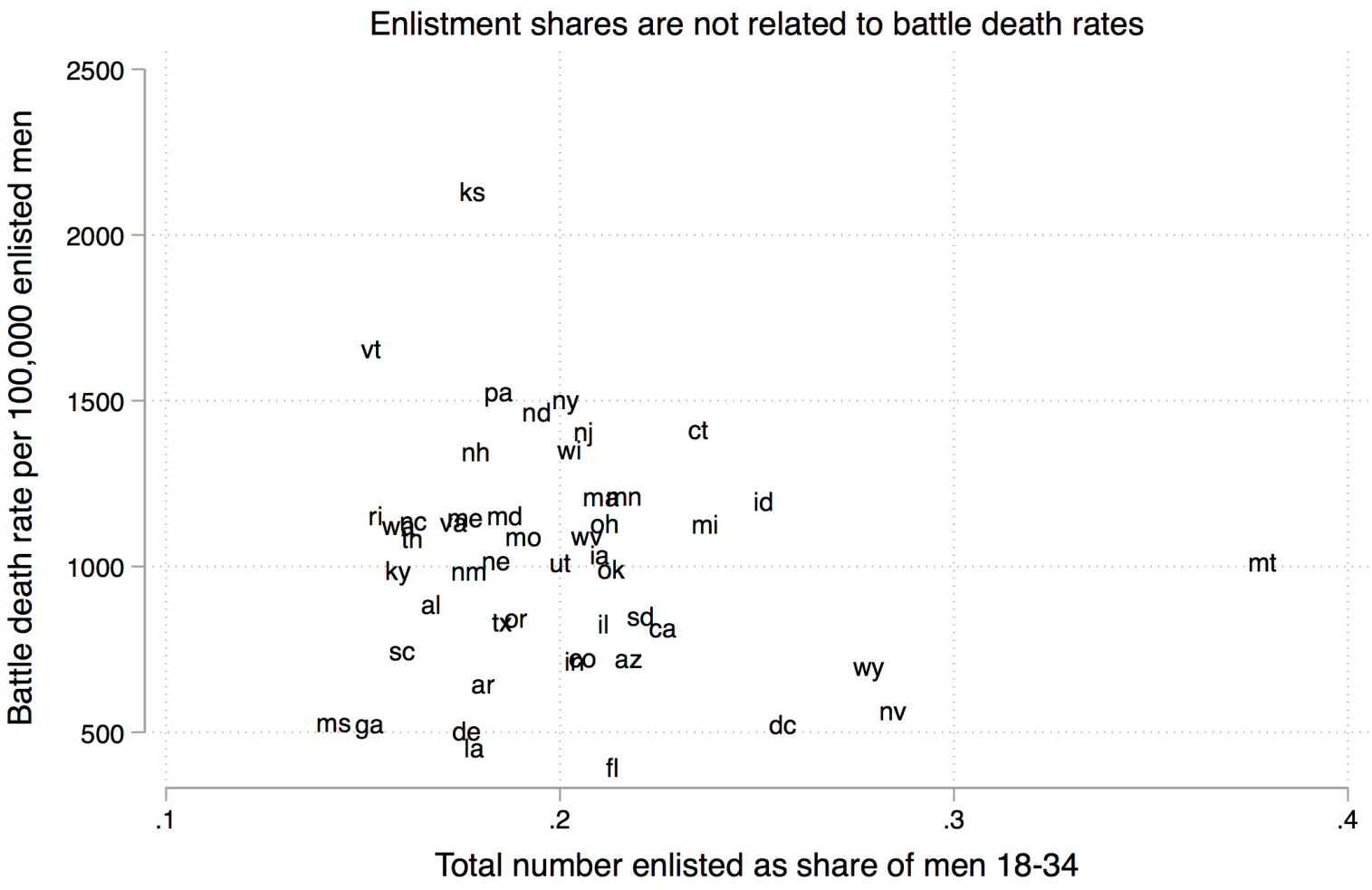


Figure 7. Total number of casualties from each state

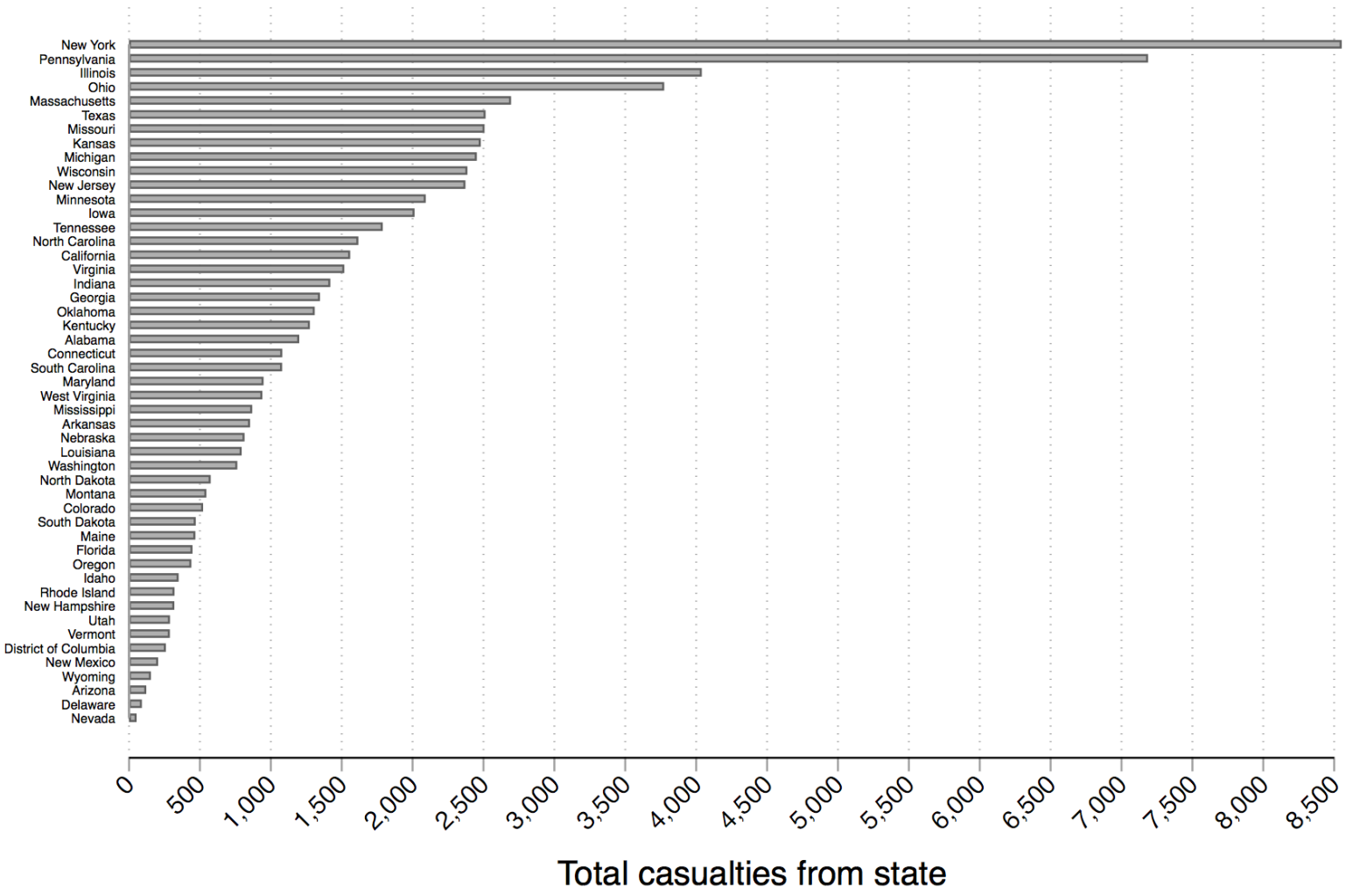


Figure 8. State casualty rates relative to total population at the 1910 census

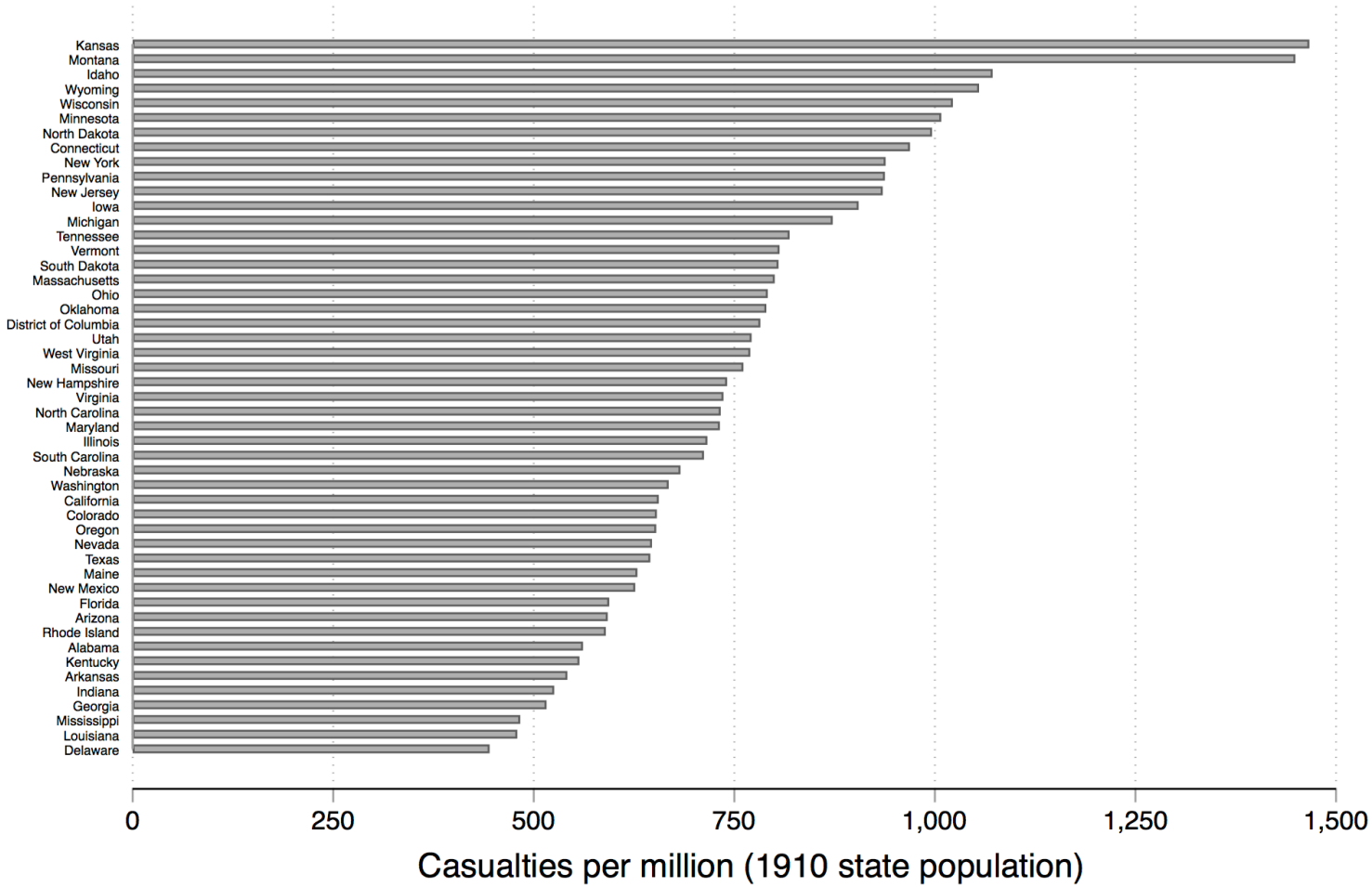

Kansas
Montana
Idaho
Wyoming
Wisconsin
Minnesota
North Dakota
Connecticut
New York
Pennsylvania
New Jersey
Iowa
Michigan
Tennessee
Vermont
South Dakota
Massachusetts
Ohio
Oklahoma
District of Columbia
Utah
West Virginia
Missouri
New Hampshire
Virginia
North Carolina
Maryland
Illinois
South Carolina
Nebraska
Washington
California
Colorado
Oregon
Nevada
Texas
Maine
New Mexico
Florida
Arizona
Rhode Island
Alabama
Kentucky
Arkansas
Indiana
Georgia
Mississippi
Louisiana
Delaware
0
250
500
750
1,000
1,250
1,500
Casualties per million (1910 state population)

Figure 9. State casualty rates relative to total population at the 1910 census

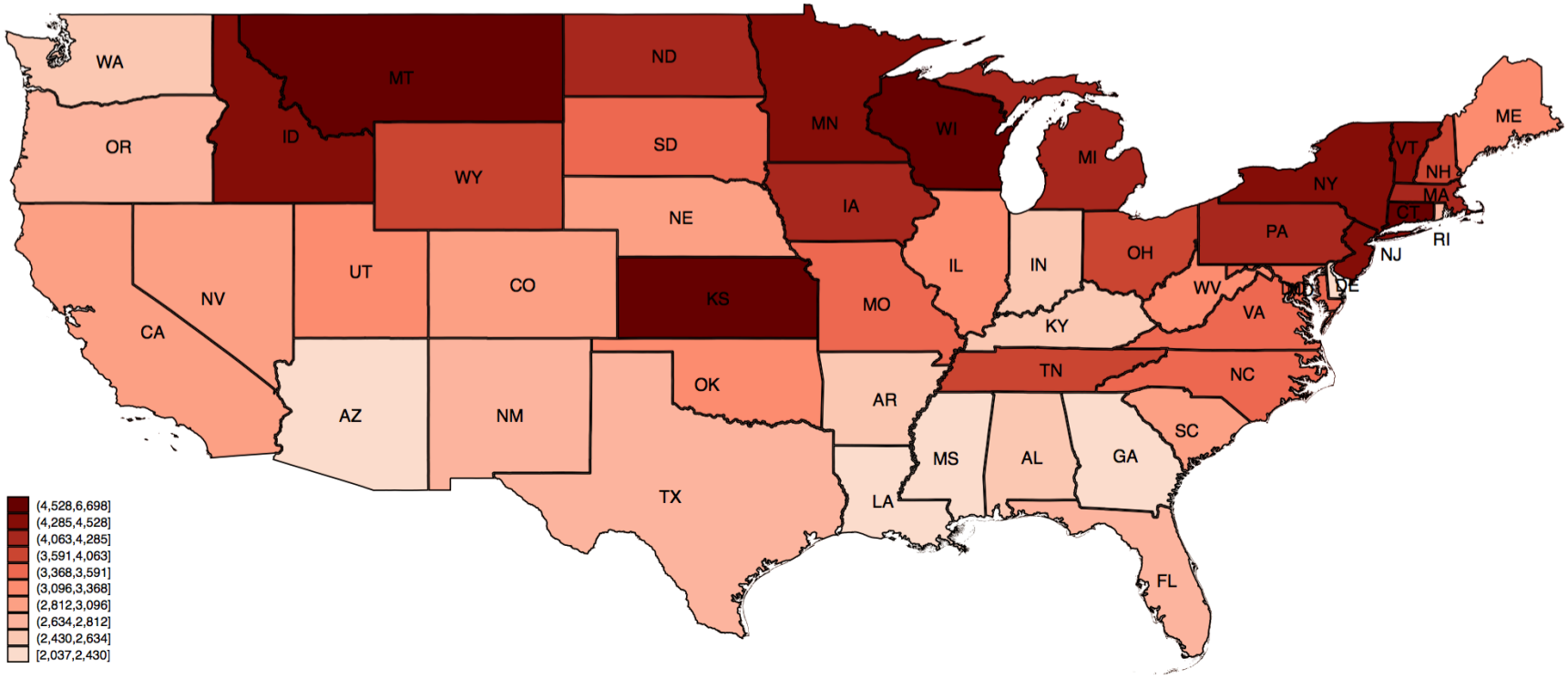


Figure 10. State casualty rates relative to men enlisting from each state

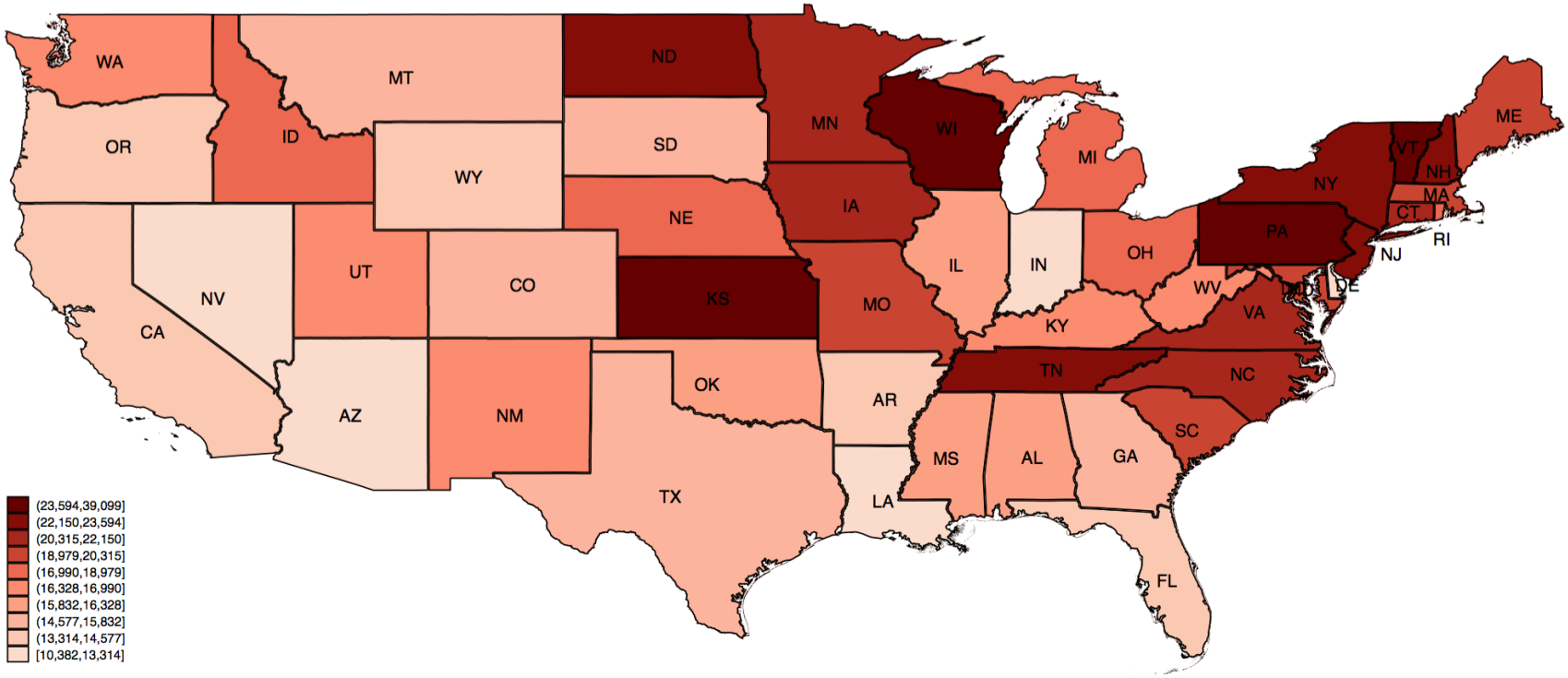


Figure 11. Distribution of county mortality ratios

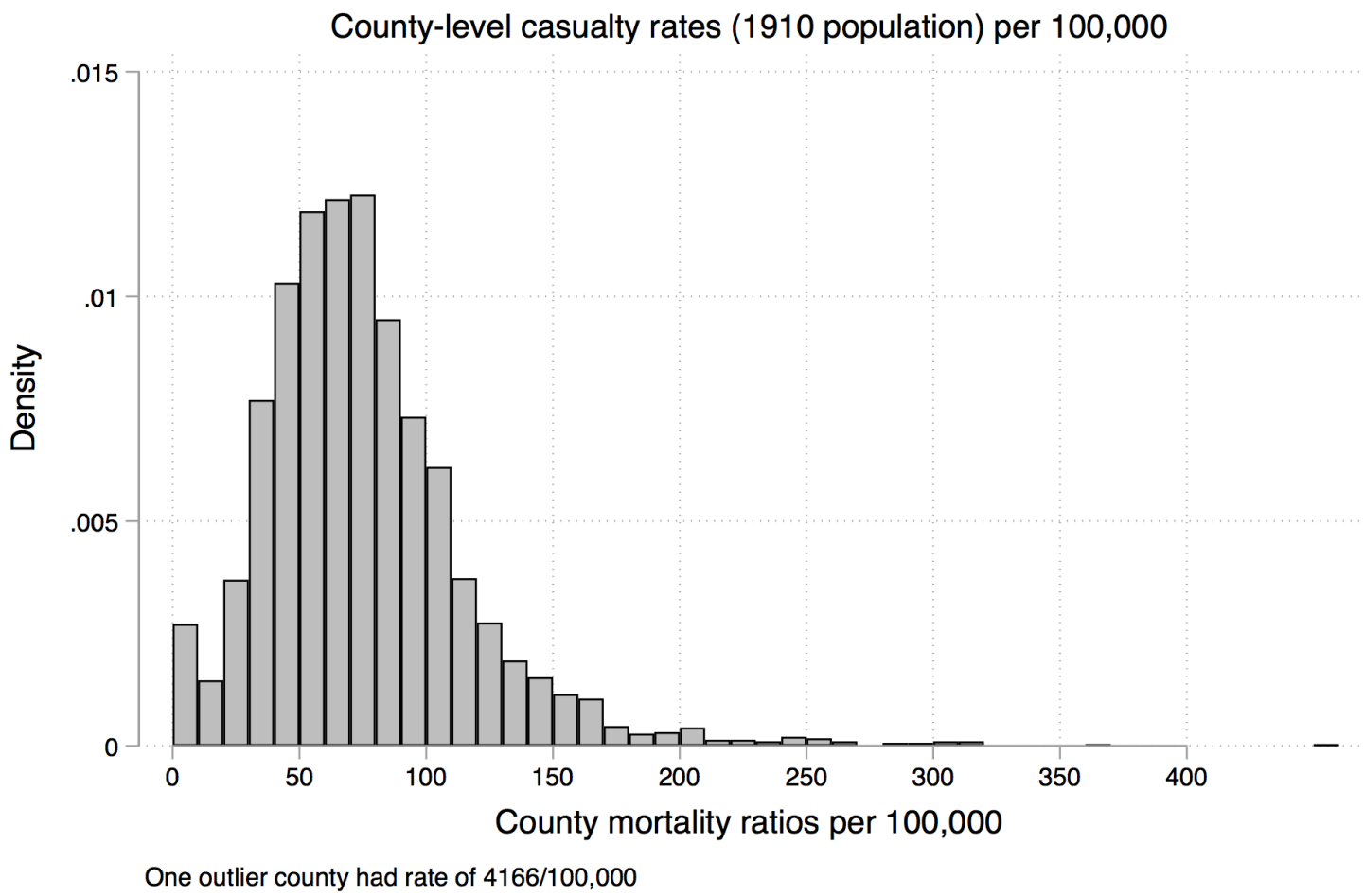


Figure 12. Social influences on county level mortality ratios

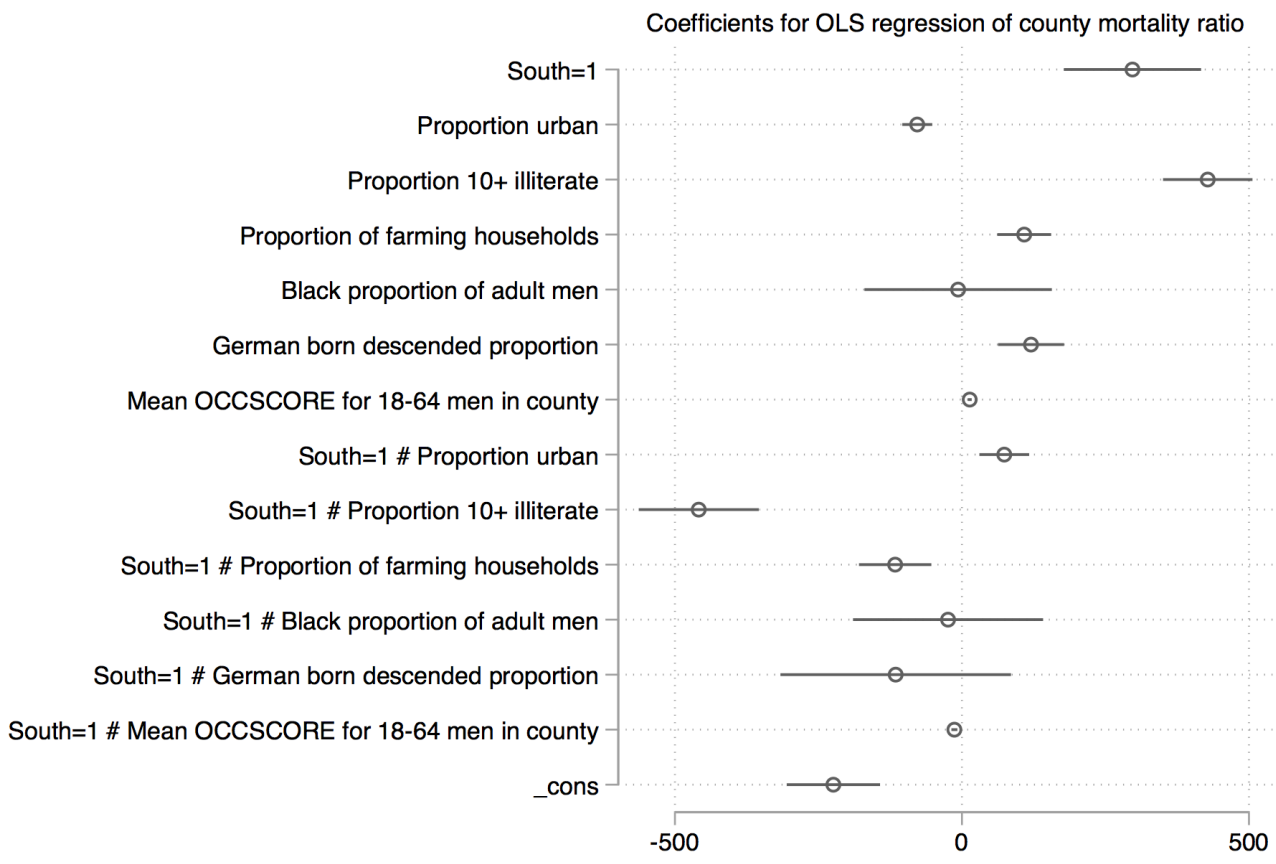

Coefficients for OLS regression of county mortality ratio
South=1
Proportion urban
Proportion 10+ illiterate
Proportion of farming households
Black proportion of adult men
German born descended proportion
Mean OCCSCORE for 18-64 men in county
South=1 # Proportion urban
South=1 # Proportion 10+ illiterate
South=1 # Proportion of farming households
South=1 # Black proportion of adult men
South=1 # German born descended proportion
South=1 # Mean OCCSCORE for 18-64 men in county
_cons
-500
0
500

Figure 13. State presidential vote change and casualty rates