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Exploring the Power of County-Level Regional Classifications on Predicting Sex-Specific All-Cause Mortality in the United States

Julia Kay Wolf

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Exploring the Power of County-Level Regional Classifications on Predicting Sex-Specific All-Cause Mortality in the United States

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Thesis submitted
to the Eberly College of Arts and Sciences
at West Virginia University

in partial fulfillment of the requirements for the degree of

Master of Arts in
Sociology

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2017

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ABSTRACT

Exploring the Power of Different Regional Classifications on Predicting Sex-Specific All-Cause Mortality in the United States

Julia Kay Wolf

Sex-specific mortality rates have been found to differ across regions of the United States; however, these areas are typically the broad Census Bureau regions (i.e., Midwest, Northeast, South, and West) that do not consider sociological factors known to affect health. By testing the predictive capabilities of theoretically driven regional classifications distinguished at county-level, I explore whether there are more accurate ways of assessing mortality differences across the United States. Specifically, I use the US Census Bureau divisions and regional groupings produced by Joel Garreau (1981) and Colin Woodard (2011) to predict sex-specific, age-adjusted, all-cause mortality for 2008-2012 (centered on 2010). Garreau's *Nine Nations of North America* uses the economic activities and priorities of various regions to divide the US while Woodard's *American Nations: A History of the Eleven Rival Regional Cultures of North America* uses the historical settlement of the US to generate culturally different nations. I examine the mediating effects of several county-level contextual and demographic factors, health behavior characteristics (including smoking), and socioeconomic measures (including labor force participation). Results suggest that Woodard's "American Nations" slightly outperform the other regional classifications, but the differences are negligible once other mediating factors are taken into account. Findings demonstrate that daily smoking behavior is the strongest predictor of county-level mortality variation for males and females. Researchers and policymakers should continue to find ways to reduce smoking, particularly in the south.

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Research has found “persistent clusters” of high and low mortality rates across the United States from 1968 to 2002 (Cossman et al. 2007). Sex-specific mortality rates have been found to differ among US regions as well (Ezzati et al. 2008; Kindig and Cheng 2013; Montez and Berkman 2014); however, these areas are typically colloquially named regions without long-term definitive boundaries (e.g., Appalachia) or are the broad Census Bureau regions (i.e., Midwest, Northeast, South, and West) that did not consider health-related sociological factors when they were created. These broad regional areas are also large and may be missing disparities within or across their borders. One study found “eight Americas,” (as opposed to *four* regions) or districts of the US distinct in several demographic, socioeconomic, and geographic characteristics, that showed differing mortality rates between males and females (Murray et al. 2006). Nevertheless, these areas were generated via empirical data (including homicide rates) without a general theory to deduce their formations.

By testing the predictive capabilities of theoretically driven regional classifications distinguished at county-level, I explore whether there are more accurate ways of assessing mortality differences across the US. Specifically, I will use the regional groupings produced by Joel Garreau and Colin Woodard. Garreau’s *Nine Nations of North America* uses (1981) the economic activities and priorities of various regions to divide the US while Woodard’s *American Nations: A History of the Eleven Rival Regional Cultures of North America* (2011) uses the historical settlement of the US to generate culturally different nations. On the other hand, the Census Bureau’s divisions were created in 1910 based roughly off of the three largest natural draining systems (e.g., the Mississippi River) in America and follow larger state boundaries (US Census Bureau 2015c). The two former classifications provide theories (e.g., economic values, historical settlement) as to why these nations might have noticeable differences in mortality rates, and this study will allow social demographers to see how these contextual variations each affect males and females.

Preliminary testing has found that Woodard’s nations predict 2010 mortality rates better than Garreau’s or the US Census Divisions (Wolf, Cossman, and Myers 2016; Cossman, Wolf, and Myers 2016a; Cossman, Wolf, and Myers 2016b); however, Wolf and colleagues (2016) did not include health indicators such as obesity or physical activity levels, Cossman and colleagues (2016a) did not include these indicators nor was examined by sex, and Cossman and colleagues (2016b) did not include measures of smoking or participation in the labor force—variables

known to greatly affect female mortality rates (Montez and Barnes 2015; Meara, Richards, and Cutler 2008; Montez and Zajacova 2013). In this thesis I plan to build upon previous findings by taking into account these important factors. I also visually demonstrate the spatial layout of the sex-specific, age-adjusted, all-cause 2010 mortality rates via choropleth maps of the US while overlaying these various regional classifications.

REVIEW OF THE LITERATURE

Mortality Disparities: People vs. Place

Mortality disparities across the US have interested researchers from a variety of fields and perspectives. From sociologists measuring income differentials (e.g., Caldwell and Diamond 1979) to those investigating geographical differences in socioeconomic inequalities (e.g., Krieger et al. 2002) to epidemiologists and public health scholars examining cause-specific disease across education levels (e.g., Miech et al. 2009) to those suggesting marketing strategies regarding tobacco use in rural areas (e.g., Roberts et al. 2016), mortality disparities are widely known and investigated.

Although the US has seen mortality rates declining over the past century (Cutler, Deaton, and Lleras-Muney 2006), disparities in all-cause mortality based on educational attainment (Montez et al. 2011; Hayward, Hummer, and Sasson 2015), sex (Kindig and Cheng 2013), socioeconomic status (Nandi, Glymour, and Subramanian 2014), rurality in association with population size and adjacency to urban areas (James and Cossman 2016), and race/ethnicity (Satcher et al. 2005) have been increasing or remained stagnant in recent years. A recent report by the National Center for Health Statistics shows that life expectancy for both males and females has decreased from 2014 to 2015 (Xu et al. 2016). Case and Deaton (2015) have also shown an increase in all-cause mortality rates of middle-aged white non-Hispanics over a fourteen year period (1999-2013) that was propelled by those with lower levels of education; however, a response by Snyder (2016) indicates that geographical distinctions may play a larger role in the mortality increase and deserves further research.

Emerging as the study “relating environment and community characteristics to health and disease,” public health later reshaped its focus to individual-level factors’ roles in transmitting diseases; this transition was due in part to the introduction of germ theory and the increase in the chronic diseases (Diez-Roux 1998). However, the tides have been changing yet again as epidemiologists, sociologists, and demographers call for a return to an emphasis on contextual

(e.g., economic, geographic) influences on health outcomes rather than on mainly individual behaviors and characteristics (Diez-Roux 1998; Myers 2008; Myers 2010; Montez and Berkman 2014). Indeed Kindig and Cheng (2013) found socioeconomic factors (e.g., “rate of children living in poverty”)¹ had similar or even stronger associations with mortality rate changes than individual behaviors (e.g., smoking, obesity). Furthermore, another study points out that “individual-level incomes have been significantly associated with mortality since the early twentieth century, significant ecological correlations between income and mortality at the state level are more recent” (Kunitz 2014: 28).

While these individual-level characteristics have been contributing to mortality inequalities, geographical effects on mortality levels have also been highlighted. For example, the built (i.e., human-made) environment one resides in influences the possibility of experiencing health risk factors that can lead to certain types of death (e.g., traffic accidents; Lucy 2003) or disease (e.g., ischemic heart disease; Hankey, Marshall, and Brauer 2015). Neighborhood factors have been found to independently influence mortality risk net of individual socioeconomic characteristics (LeClere, Rogers, and Peters 1997; Huie, Hummer, and Rogers 2002). Singh and his colleagues found disparities in all-cause youth mortality vary by socioeconomic deprivation and geographic distribution (Singh et al. 2012). In another study, Singh and Siahpush (2013) found that even though US mortality rates decreased from 1969 to 2009, rural-urban disparities in all-cause mortality (and a few other major causes of death) grew while poverty levels only partially explained the differences; however, poverty greatly affected mortality in non-metropolitan areas and the largest differences in the rural-urban mortality gap were found in high poverty areas. Additionally, when incorporating race and poverty, the gaps in mortality rates are even more pronounced, and show that “poor blacks in non-metropolitan areas experiencing two to three times higher risks of all-cause and premature mortality than affluent blacks and whites in metropolitan areas” (Singh and Siahpush 2013).

Spatial research has also found that area depravity (Singh 2003) and rurality in association with population size and adjacency to urban areas (James and Cossman 2016) affect disparities in death rates. Disparities between rural-urban (Singh and Siahpush 2013) areas as well as metropolitan-nonmetropolitan counties (Cosby et al. 2008) highlight the need to look

¹ Kindig and Cheng (2013) also used “percentage of a county’s population with a college education” as a contextual socioeconomic measure; however, I use sex-specific percentages of each county’s educational attainment as measure of the characteristics of the “people” in the county rather than of the location (i.e., “place”) of the county.

beyond just personal characteristics. For example, metropolitan areas (e.g., urban areas, cities) had higher rates of mortality in early US history than nonmetropolitan areas, but as sanitation services improved in these densely packed places where contagious diseases could spread readily, the disparity disappeared (Haines 2001). A 2008 article showed that this trend had actually reversed in the mid-1980s with higher mortality rates in nonmetropolitan areas (Cosby et al. 2008). The authors' discussion also poses the question of whether or not the disparity trends are found in particular US regions (Cosby et al. 2008). Additionally, research has shown that "persistent clusters of mortality" (as measured by groups of counties) have remained strong over a 35 year span in the US; even through changes in policies and medical advances, certain counties maintain higher or lower mortality rates (Cossman et al. 2007). Personal characteristics and contextual factors both play roles in influencing longevity.

Sex-Specific Disparities in Mortality

Large regional patterns in mortality have been considered, particularly comparing male and female death rates. Kindig and Cheng (2013) examined changes in county-level male and female mortality rates and found that a county's contextual region affected how mortality rates increased, decreased, or remained the same over time, especially for females. For instance, while counties in the West had a 3% higher increase in male mortality than Northeast counties, counties in the South and West had up to a 6% higher increase in female mortality compared those in the Northeast (Kindig and Cheng 2013). Moreover, they found a startling disparity in the increase of mortality rates for men and women across the US; men experienced an increase in mortality rates in 3.4% of counties while women experienced an increase in 42.8% of the counties (Kindig and Cheng 2013). Montez and Berkman (2014) found slight regional mortality disparities for males and females by educational attainment. For example, similar trends of increasing mortality for less educated women and decreasing mortality for highly educated women were seen in most regions, but there were no decreases in mortality for women at any education level in the South and there were no significant increases in mortality for low-educated women in the Northeast (Montez and Berkman 2014). As for the men, the gap between mortality rates in the highly educated and the less educated changed little over time compared to the growing gaps in female mortality by education level (Montez and Berkman 2014). Additionally, patterns in the mortality gradient by education level differed more by gender than

by race (Montez and Berkman 2014). Thus, regional differences appear to be influencing male and female mortality rates differently, potentially more so for females than males.

The reviewed literature has only considered four broadly determined regions (i.e., Northeast, Midwest, West, and South), created without any theoretical consideration, thus leaving explanations for these variations unanswered. Are there local economic or health policies influencing the health behaviors or outcomes of certain groups in that area? Are there different cultural trends across regions affecting men and women's health unequally? American citizens' local residences typically share common cultural norms or values which may affect health behaviors or access to facilities regarding food and physical activity (Papas et al. 2007). This idea warrants further scrutiny at more local levels.

Others have taken up the challenge and examined what could be driving sex-specific mortality disparities at the county-level. Murray and colleagues (2006) generated "eight Americas" that divide the US into similar groups of counties by race, location, population density, particular measures of income, and homicide rates. Examining changes between 1982 and 2001, they demonstrated large mortality disparities across the groups for males and females, particularly due to chronic diseases, injuries, and other elements (Murray et al. 2006). HIV and homicide rates influenced widening gaps between Americas for males in the late 1980s to the early 1990s, and mortality rates for low-income females were seen to increase in areas like Appalachia and the Mississippi Valley over the time period studied (Murray et al. 2006).

However, Murray and his colleagues' (2006) nations were created via the empirical data instead of by a theoretical framework. In other words, they grouped together similar people and mortality rates by their numbers—leaving one to then rely on inductive reasoning to explain why these populations might be similar—rather than working from a theoretical perspective and examining if predicted distinct regions actually do share similar mortality outcomes. Here, I compare two theoretically generated regional classifications of the US to an administrative classification that does not propose meaningful cultural distinctions. It is these conceived cultural similarities that may explain differences in regional mortality rates. While Woodard (2011) touches on historical differences between the sexes and Garreau (1981) briefly mentions any, there are clearly differences in mortality patterns for males and females; therefore, it is germane to consider if and how these historical, cultural, and economic variations are working distinctively for males and females.

Measuring Mortality Disparities

For both men and women, “healthy and unhealthy places,” or “persistent clusters of mortality,” with similar historical features can be found in various areas across the US (Cossman et al. 2004; Cossman et al. 2007). Large groupings of counties appeared to have central counties that had multiple time periods of high levels of mortality (i.e., one standard deviation above the national mean of mortality rates) with surrounding counties that had fewer time periods of high levels of mortality and counties surrounding those with fewer time periods yet (Cossman et al. 2004). In a way, there were pockets of high levels of mortality rates, particularly in “The South,” that lessened as one traveled away from the center of the concentration. However, this study had not taken into account whether or not the mortality rate trends were themselves increasing or decreasing, so such an observation is made cautiously (Cossman et al. 2004).

Nevertheless, and more pertinent to this present research, the authors noted that these zones of low and high levels of mortality traversed state lines (Cossman et al. 2004). By focusing on the county-level, trends that transcend state lines can be observed—a prominent feature that using US Census Bureau regions does not afford. Cossman et al.’s (2004) study illustrated the importance of taking space (and time) into account when analyzing mortality rates and hinted at the potential significance of colloquially defined regions (i.e., “The South”) compared to the administrative regions created by the US Census Bureau. A theoretical framework that operationalizes commonly referred to regions, such as “The South,” could allow us to test their ability to predict mortality rates and give us a foundation for figuring out which geographically similar characteristics influence residents’ health.

Studying mortality differences by US Census Bureau regions may show spatial patterns, but does indicate cultural or economic factors influencing any disparities in those areas. The arguments put forth by Garreau (1981) and Woodard (2011) contend that cultures and economic values cross the state lines used by the US Census Bureau classifications. Therefore, continuing to use the regional definitions of the US Census Bureau may be missing important social factors—which can be considered “fundamental causes of health inequalities”—that can help explain mortality or other health disparities by location (Link and Phelan 2005). Using an economic or cultural lens could then provide a way of approaching segments of America with different mortality rates while providing a theoretical framework for the disparities.

Since data is not collected on US residents based on Garreau or Woodard's regions, I found and used data measured consistently over time in relatively homogeneous units that are comparable across all three regional definitions (Batagelj et al. 2014: 357). US counties fulfill this need as small geographic areas with stable borders from which data has regularly been collected (Batagelj et al. 2014). Using counties is also necessary (versus states) because, while the US Census Bureau regions are grouped by states, Garreau and Woodard's nations transcend state lines. While neighborhoods may have provided a more nuanced glimpse into Garreau and Woodard's regions, these geographic levels are relatively unstable over time and data has not been consistently collected from them nationally (Batagelj et al. 2014).

The US Census Bureau collects data for a variety of reasons. Its primary concern is collecting a comprehensive population count to apportion seats in the House of Representatives; however, over time data has been collected for other legal, social, economic, and financial purposes (Geography 2015b). These demands have forced the US Census Bureau to “recognize many kinds of geographic areas—legal, administrative, and statistical—as the framework for the tabulation and presentation of data from its decennial, economic, agriculture, and governments censuses, as well as its periodic sample surveys and estimates programs” (Geography 2015b). Understanding these geographic levels helps the field of public health as well.

The US is broken down into several geographic entities: four regions, nine divisions, 57 states or statistically equivalent entities, 3,248 counties and statistically equivalent entities, and several other groupings (Geography 2015b).² Although multiple geographic areas are defined by the US Census Bureau, they can be divided into two main categories: 1) legal and administrative entities and 2) statistical entities (Geography 2015b). Legal (e.g., states, *counties*, and their statistically equivalent entities³) and administrative (e.g., ZIP codes) entities are geographic groupings created by “legal actions, treaties, statutes, ordinances, resolutions, court decisions, and the like” (Geography 2015b: 2-2). Legal and administrative entities can be used by local officials to oversee various programs or regulate elections (Geography 2015b). The US Census Bureau's four regions and nine divisions (described in the next section), and several other groupings are considered *statistical entities* that have been established “where the geographic coverage of the legal areas is incomplete, inadequate, or inconsistent over time, or is

² See the Geographic Areas Reference Manual for more information and an illustration of their geographic hierarchy (Geography 2015b).

³ ‘Statistically equivalent entities’ are different from ‘statistical entities.’

nonexistent” (Geography 2015b: 2-2). Statistical entities do not have official legal boundaries (i.e., they are not run by some type of a government), but rather evolved from tradition and are used for data presentation purposes (Geography 2015b). Thus, these regions/divisions are commonly used in previous research, but their boundaries do not indicate unique political areas.

Garreau and Woodard are not the first to have tried to organize the US into regions other than those put forth by the US Census Bureau. According to Lieske, arranging the US into different regions to elucidate various political and institutional policies was brought to the forefront of research in 1984 by Elazar (Lieske 1993). To create his subcultural regions, Elazar classified parts of the nation into one or more of three political subcultures coined individualistic, moralistic, or traditionalistic (Elazar 1984). Like Woodard (2011), Elazar's (1984) classifications stem from the historical settlement of areas by diverse groups. He created a continuum of eight categories that indicate various combinations of his subcultures and placed each state along it while also referencing nine regions they fit in that are similar to the census divisions (Elazar 1984). Elazar's innovative typology sparked a myriad of cultural mappings; however, few of them rely on “replicable, statistical procedures,” including Garreau's (Lieske 1993: 889). Additionally, Lieske includes a criticism of Elazar's state-level and “large substate regions” classifications, suggesting a distinction of subcultures at the county-level (Lieske 1993: 889). The grouping of the US Census divisions by state may also miss cultural distinctions at the county-level; however, Garreau and Woodard's classifications by counties allow for a more nuanced creation of large regional boundaries that supposedly include culturally similar people.

The US Census Bureau's divisions are statistical entities commonly used as geographical indicators for research in mortality disparities, but they may be failing to account for cultures that transcend states lines. By using Woodard (2011) and Garreau's (1981) refined regional classifications, I plan to compare their empirical capability of predicting sex-specific mortality rates in the US to the US Census Bureau's nine divisions.

Regional Definitions

US Census Bureau Divisions

While the US had distinguished geographic regions since its conception, these classifications were not initially used in concurrence with census data (US Census Bureau 2015c). The US Census Office (now the US Census Bureau) did not include regional divisions until 1853 when journalist and statistician James D. B. DeBow became the director of the census

(US Census Bureau 2015c). His census publication *Statistical View of the United States* (also known as the *Compendium*) of the 1850 census data was also the first to include a map (US Census Bureau 2015b). Until this time, “the perception [had been] that the human and physical geographies of the United States were relatively uncomplicated,” but with the addition of more land, it was deemed intricate enough to need a visual aid (Dahmann 2015). Although his census reports examined socioeconomic information within five regions (New England, Middle, Southern, Northwestern, and Southwestern), the map was divided into four regions (Mississippi Valley, Pacific Slope, Gulf Slope, and Atlantic Slope) based on major draining systems (US Census Bureau 2015c).

This initial map did not rely on state boundaries to define regions, but DeBow reclassified them using only the three largest draining systems as the East, West, and Interior. He then separated those regions by northern and southern subsections contouring state and territory lines. Different regional classifications were used in assorted publications of 1850 and 1860 census data, including “Great Natural Divisions” (Northeastern States, Lowlands of the Atlantic Coast, Intermediate Region, Allegheny Region, Lower Mississippi Valley, Northwestern States, and Pacific Coast) for reporting mortality statistics based on groups of states or counties (US Census Bureau 2015c). However, maps were not published consistently along with data until the 1870 census when Francis A. Walker created the *Statistical Atlas* (Dahmann 2015). The US census had changed from a means of merely measuring the need of state Congressional representation to “a quantitative scientific accounting of numerous aspects of the nation’s many human geographies”(Dahmann 2015).

Henry Gannett, geographer of the 1880-1900 US censuses, created new regional classifications for the 1880 census. However, these definitions were not conducive to comparing various censuses, so he modified the regions to divide along county lines (US Census Bureau 2015c). The maps produced during Gannett’s leadership were the first to correlate with data results from the census (Bower 2010). Since 1910, the US census has used the same nine divisions (described below) with the addition of Hawaii and Alaska in the 1960 census (US Census Bureau 2015c).

The US Census Bureau’s current regional definitions have been in use since 1910. There are four Census Regions split into nine Census Divisions (Geography 2015a; see Figure 1). The four regions are 1) Northeast, 2) Midwest, 3) South, and 4) West. The Northeast is divided into

New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) and the Mid-Atlantic (New Jersey, New York, and Pennsylvania). The Midwest (before June 1984 this was known as the North Central Region) is divided into East North Central (Illinois, Indiana, Michigan, Ohio, and Wisconsin) and West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota). The South is divided into the South Atlantic (Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, Washington D.C., and West Virginia), East South Central (Alabama, Kentucky, Mississippi, and Tennessee), and West South Central (Arkansas, Louisiana, Oklahoma, and Texas). The West is divided into the Mountain (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming) and the Pacific (Alaska, California, Hawaii, Oregon, and Washington).

It is important to note that the US Census Bureau regions lie along state borders, thus including entire states into their respective divisions. Moreover, since the regions are used for the US census, they only consist of the 50 states of America and do not include Puerto Rico, other US territories, Canada, or Mexico.

Woodard: American Nations: A History of the Eleven Rival Regional Cultures of North America

Colin Woodard is a journalist and author who published *American Nations: A History of the Eleven Rival Regional Cultures of North America* in 2011. Woodard's theoretical distinctions of the US are based on the historical pattern of settlement by different cultural groups as they arrived and spread across North America (see Figure 2). For example, he describes the "Deep South" as the "center of the states' rights movement, racial segregation, and labor and environmental deregulation" that was settled by Barbados slave lords as an area spanning the eastern part of Texas eastward to the southern half of North Carolina and reaching south about three fourths of the state of Florida (Woodard 2011). Although Lieske (1993) points out that environmental conditions helped mold the establishment of regions as settlers had to adapt to their new surroundings and an article in the Washington Post by MacGillis (2011) agrees that Woodard (2011) also argued this point quite persuasively, one study has found Woodard's eleven nations do not seem to be quite distinct, at least by the cultural index of Hofstede (Mazanec et al. 2015). However, his focus on the cultural and historical backgrounds of these areas help may shed light on the mortality patterns of their residents today.

Woodard's eleven nations include: 1) Yankeedom, 2) New Netherland, 3) The Midlands, 4) Tidewater, 5) Greater Appalachia, 6) Deep South, 7) El Norte, 8) The Left Coast, 9) The Far West, 10) New France, and 11) First Nation. Below is a brief summary of each nation along with a description on the Spanish Caribbean:

Yankeedom

Spanning the far eastern borders of the Dakotas, encompassing Minnesota, Wisconsin, and Michigan, past Lake Erie to New York through Maine and catching the tops of Illinois, Indiana, Ohio, and Pennsylvania, Yankeedom is an area of 441 counties that were originally settled by radical Calvinists. First settled by a few hundred Pilgrims in the 1620s, Yankeedom was soon controlled by the Puritans who arrived in the 1630s. These later founders attempted to create the ideal society through self-denial in order to serve the common good (5). They had a strong emphasis on education, community strength, and citizen participation in government in order to protect themselves against controlling outside powers along with strict religious rules that subjected offenders to severe punishments (5, 57-58).

New Netherland

A small area of only 24 counties that covers the northern half of New Jersey and the southern-most tip of New York and southwestern Connecticut, New Netherland encourages diversity and free trading. Settled by the Dutch in 1624, the values of the area are quite influential in the US's "media, publishing, fashion and intellectual and economic life" as Woodard points out that they greatly contributed to the liveliness, colorfulness, and strength of New York City (6, 65).

The Midlands

Settled by English Quakers in 1680s, these 465 counties found at the corners of Iowa, Nebraska, Kansas, and Missouri span in thin lines north to North Dakota, east to southern New Jersey, and southwest to the tip of Texas and lonely northeast corner of New Mexico (92). Residents are primarily and ethnic and ideologically diverse middle-class with contempt for government involvement and moderate to indifferent political views (6).

Tidewater

One hundred and forty-nine counties along the Eastern Seaboard in North Carolina, Virginia, Maryland, Delaware, and Washington D.C. make up Tidewater. This nation, settled naively by young English gentry and an assortment of vagabonds in 1607, is highly conservative

with a strong “respect for authority and tradition,” particularly in politics (7, 44). They are intolerant of equality and have been declining in their national influence, cultural unity, and land to the Midlands (8).

Greater Appalachia

As the largest of these nations with 922 counties, Greater Appalachia was founded by “bellicose settlers from the war-ravaged borderlands of Northern Ireland, northern England, and the Scottish lowlands” in the mid-1700s (8, 102). Filled with a “warrior ethic and deep commitment to individual liberty and personal sovereignty,” these residents now find themselves stereotyped as “rednecks” or “hillbillies” (8). This nation consists of the heart of Texas and travels east to West Virginia, Virginia, and North Carolina while encompassing the area between the Midlands and the Deep South. It includes the whole of Kentucky and all but two counties of West Virginia along with large chunks of Tennessee and Oklahoma, the southern halves of Illinois, Indiana, and Ohio, and the northern tips of Mississippi, Alabama, Georgia, and South Carolina.

Deep South

These 501 counties were settled in 1670-1671 by Barbados slave lords and span the eastern part of Texas eastward to the southern half of North Carolina and reaching south about three fourths of the state of Florida (82). Woodard describes it as the “bastion of white supremacy, aristocratic privilege, and a version of classical Republicanism modeled on the slave states of the ancient world” (9). The Deep South was created as a replica of the horrific and brutal slave state that the founders came from due to its profitability (82, 83).

El Norte

El Norte’s 87 counties include the southern-most counties of the US that border Mexico from Southern California to southeast Texas. They also have a brief jut northwards in New Mexico to central, southern Colorado. This mainly Hispanic nation is the “oldest of the Euro-American nations” as a “hybrid between Anglo- and Spanish America (10). It has the oldest European cultural influence as Spain discovered the Americas in 1492 and moved north (23-24). Spanish Americans have inhabited parts of El Norte, like northern New Mexico and southern Colorado, since 1595, and they vigilantly distinguish between their culture and that of the Mexican Americans who arrived in the 1800-1900s (24). It also sinks into Mexico, and is

therefore divided in two by the growing military border between the countries (10). As such, residents would rather create a third nation on their own (10).

The Left Coast

The 54 counties of the Left Coast were settled in the late 1820s by New Englanders and a short while later were joined by those from Greater Appalachia—thus holding similar views on ideals and intelligence (11, 217-218). Spanning the west coast of Washington, Oregon, and northern California, these residents enjoy self-discovery while supporting the government and social reforms (11).

The Far West

This dry and remote land of 429 counties encompasses several large western states including Idaho, Nevada, Utah, Wyoming, and Montana while reaching into the centers of the states surrounding them. The vast amount of land needed transportation and other industrial resources, thus the government or other companies managed their construction from distant cities (12). However, many of the residents did not like the government interference (12).

New France

This small nation of 25 counties exclusively in Louisiana is a cultural blend of “northern French peasantry” and “northeastern North America” (9, 34). First settled as a nation exclusively in Canada in 1604, the founders created friendly relationships with the land’s Native American nations, and later their Cajun descendants blended their Christian heritage with the Native Americans’ religion in Louisiana (35, 39). They are motivated by the common good and are the most liberal people of North America (9).

First Nation

The First Nation is exclusively in Canada; therefore, it is not included in this proposal.

Spanish Caribbean

These 12 counties are exclusively in the southern tip of Florida. Similar to El Norte, this area was also mapped by the early Spanish settlers (23).

Garreau: The Nine Nations of North America

Joel Garreau,⁴ another journalist and scholar, published the book *The Nine Nations of North America* in 1981. He created these distinct nations based on the economic and political priorities and popular cultural values of the regions’ inhabitants. According to Lieske (1993), he

⁴ For more information, his personal website: <http://www.garreau.com/index.cfm>

and Garreau conceived their regional nations in an attempt to eventually explain social behavior. Much like Murray's formulation of Eight Americas for grouping mortality trends, Garreau's regional classifications inspired a study where the authors created their own eight regions with similar economic backgrounds to better understand real estate portfolio efficiency (Hartzell, Shulman, and Wurtzebach 1987). They too found the previous literature's focus on four regions (i.e., Northeast, Midwest, West, and South) to be vague and ineffective (Hartzell, Shulman, and Wurtzebach 1987). However, Kahle (1986) found Garreau's Nine Nations were not significantly related to the cultural values of a probability sample of Americans. In fact, in this study the US Census Bureau's regions *and* divisions were better associated with their values (Kahle 1986). Additionally, Garreau's nations were created thirty years prior to the mortality data I will be examining; thus, putting the generality of his regional distinctions over time to the test.

Garreau's nine nations include: 1) New England, 2) The Foundry, 3) Dixie, 4) The Islands, 5) MexAmerica, 6) Ecotopia, 7) The Empty Quarter, 8) The Breadbasket, and 9) Quebec. He also includes a tenth chapter entitled "Aberrations," that includes Alaska, Hawaii, New York City, and Washington D.C. Garreau singled them out because they had conflicting characteristics that could fit them into several of the nations, but in our past analyses and this thesis New York City and Washington D.C. are included in the respective nations around them. Below is a brief summary of each nation:

New England

Garreau's version of New England is the same 66 counties as the US Census Bureau's New England with the exception of excluding Fairfield County, Connecticut. It includes all of Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont along with the rest of Connecticut. He paints this nation as being highly educated, claiming to be the only civilized region in the US, but he points out that it is also the poorest (16). The residents have a strong commitment to self-discipline and conservation as they have few natural resources, but this is balanced with a strong public transportation system (9).

The Foundry

This nation consists of 426 counties that include all of New York, Delaware, Pennsylvania, New Jersey, Washington D.C., and Ohio along with large portions of Michigan, Indiana, and Maryland. It also extends shortly into Wisconsin, Virginia, and West Virginia. In the past, The Foundry was an important contributor to the industrialization of the US due to its

wide array of waterways and ports; however, it has since decreased in its power (2, 58, 60). Filled mainly with cities, its population values work as an “essential part of life” (75).

Dixie

Dixie has the most counties at 1,219, though its overall size is comparable to The Empty Quarter and The Breadbasket. This nation includes all of Arkansas, Louisiana, Kentucky, Tennessee, Mississippi, Alabama, Georgia, and the Carolinas with most of Virginia, West Virginia, Missouri, and Florida along with parts of west Texas, Oklahoma, Illinois, Indiana, and Maryland. It is also quite similar to the US Census Bureau’s South region. Garreau emphasizes this nation’s “unquestioning commitment to growth” as it is double the national average growth rate (9, 141). He notes this is a diverse hodgepodge of an area, but that it is a place of change (130-131). The residents appreciate getting to know one’s neighbors (146).

The Islands

These seven southernmost counties in Florida are composed of mainly Cuban residents and are part of one of the world’s largest trade industries with Latin America and other regions (176). However, Garreau notes that “drug-smuggling is South Florida’s number one industry – ahead of tourism” (169).

MexAmerica

MexAmerica, similar to Woodard’s El Norte, consist of 141 counties bordering Mexico from Texas to Southern California with a short uptick in New Mexico to central Colorado. Similar to Dixie, MexAmerica is exhibiting a large amount of growth, both in people (mainly Hispanic) and wealth (211, 218). He thinks that it may supersede The Foundry in this respect as the “dominant region” (218). The nation is filled with important resources such as “water, power, and even breathable air” (4).

Ecotopia

This nation of 61 counties is found along the west coast of Washington, Oregon, and California, much like Woodard’s Left Coast. It is filled with renewable-energy resources and residents who care about the environment and enjoying simple lives close to nature (9, 275). This nation is known for being open-minded and appreciating education (261).

The Empty Quarter

The 236 counties of this vast nation encompass Idaho, Nevada, and Utah with the majority of Oregon, Washington, Montana, and Wyoming as well as parts of California,

Colorado, New Mexico, and Arizona. Even though it makes up about a quarter of the US, it only has less than one-twenty-fifth of the continent's population (301). It has an abundance of minerals and coal deposits, and is the only area with places containing Quality One air (3, 302). The Empty Quarter is nearly identical to the US Census Bureau's West region, but is slightly smaller as its borders are enclosed by MexAmerica on the south, Ecotopia on the west, and the Breadbasket on the east.

The Breadbasket

This nation contains 953 counties that span the heart of the US completely including the Dakotas, Nebraska, Kansas, Minnesota, and Iowa as well as most of Oklahoma, Texas, Illinois, and Wisconsin. Garreau found this to be a nation that has a team mentality, perhaps because of its lack of diversity, but that it was a socially "calm" (334) area (339, 350). Though it has quite the successful agricultural economy (331), outsiders find its residents are "behind the times and, for that matter, not too smart" (337).

Quebec

This nation is exclusively in Canada; therefore, it will be excluded from my analyses.

Aberrations

Garreau found that Alaska, Hawaii, New York City, and Washington D.C. had characteristics that would allow them to easily fit within several nations; therefore, he created this separate category. For this proposal, New York City and Washington D.C. will be located in the spatial nations within which they are embedded while Alaska and Hawaii will not be included.

APPLYING REGIONAL CLASSIFICATIONS TO SEX-SPECIFIC MORTALITY DISPARITIES

Preliminary Findings

Previous research using census regions and divisions have produced mixed results. Kindig and Cheng (2013) found that female mortality rates were more affected by location using the four Census regions than male mortality rates; however, Wang and colleagues (2013) criticized their study and instead found that life expectancy improvements were similar by sex and location. Both studies recommended more nuanced approaches for examining the areas.

Preliminary findings suggest that Woodard's "American Nations" model predicts slightly more variation in county-level age-adjusted all-cause mortality for both 2007 (Myers et al. 2015) and 2010 (Cossman, Wolf, and Myers 2016a), including 2010 sex-specific rates (Wolf,

Cossman, and Myers 2016; Cossman, Wolf, and Myers 2016b), than Garreau's nations or the US Census Bureau divisions when comparing base models without controls (see Table 1). For 2007 mortality, Woodard's classification had a greater adjusted R^2 value (0.25) than the US Census Bureau (0.21) and Garreau (0.21), indicating his "American Nations" had the best statistical fit (Myers et al., 2015). For 2010 mortality for the whole population, the adjusted R^2 values were even higher across all classifications and Woodard's still remained the highest (Cossman, Wolf, and Myers 2016a). Model fits were marginally weaker with the division into sex-specific mortality for 2010, but again Woodard's were the best fit for both males and females. Woodard's "American Nations" were also found to outperform the other two classifications on predictions of sex-specific life expectancy for 2010 (Wolf, Cossman, and Myers 2016).

These preliminary analyses also took into account several mediator variables. The most recent and comparable of the previous studies included variables accounting for rurality, county dependency for production, hospital and doctor rates of availability, lack of health insurance, race, and sex-specific measures of education and indicators of obesity and physical activity (Cossman, Wolf, and Myers 2016b). Even with the inclusion of these other factors, Woodard's regional model remains supreme; albeit, only slightly so. For male mortality the adjusted R^2 's were: 0.60 for Woodard; 0.59 for the US Census Bureau; 0.60 for Garreau; and for female mortality they were: 0.57 for Woodard; 0.54 for the US Census Bureau; 0.56 for Garreau (Cossman, Wolf, and Myers 2016b). Our most recent results also found that rurality via the Rural-Urban Continuum Codes (RUCCs) did not increase the models' explanatory power greatly (Cossman, Wolf, and Myers 2016b). What has continued to stand out across the sex-specific mortality studies has not been the relatively negligible difference among the regional classifications, but rather, the larger difference between male and female mortality predictions once mediating factors are considered. In other words, none of the models including additional variables work as well for females as they do for males.

This disparity between model fit for male and female mortality is what drove the decision to include health behavior elements here. A measure of tobacco use is crucial in understanding mortality, especially since cigarette smoking is the most preventable cause of death in the US and has been for decades (U.S. Department of Health and Human Services 2014). Even when accounting for confounding factors, the relationship between smoking and mortality is strong (Rogers et al. 2005). Montez and Zajacova (2013) also highlight the negative effects of smoking

for women's mortality, particularly for those with less education, and recommend boosting work-family policies for women due to the large role employment plays in the mortality gap between high- and low-educated women. Adding these measures may augment the explanatory power of each of the models for female mortality.

Hypotheses

Based on preliminary findings, I generated four hypotheses. First, I hypothesize that Woodard's "American Nations" will continue to explain more variance in these new models predicting sex-specific mortality rates than the US Census Bureau's or Garreau's classifications; and the US Census Bureau's classifications will explain more variance than Garreau's⁵ classifications. Second, with the addition of the measures on smoking and labor force participation that the new models will predict female and male mortality more equally (rather than as previously fitting better for males than females). Third, I compare the effects of the "people" (i.e., percent no health insurance, educational attainment, race, physical activity, obesity levels, smoking, and labor force participation) and "place" (i.e., regional classifications, RUCCs, typology, active MDs, hospital beds, Gini) predictors within models. While both play a role in mortality disparities, the literature has found that context (i.e., place) may explain more of these differences than individual behaviors (e.g., Kindig and Cheng 2013; Montez, Zajacova, and Hayward 2016). Therefore, I hypothesize that the "place" models will explain more variance in mortality than the "people" models. Finally, I expect Woodard's nations to better capture spatial variations in mortality than the other regional categorizations. The regions may be capturing the same mortality hot and cold spots of "healthy and unhealthy places," but due to Woodard's boundaries transcending state lines, his regions may be capturing slightly more of certain "clusters."

METHODS

Data

All data was downloaded at the county-level since Woodard and Garreau's regional classifications are delineated at this level. The US Census Bureau divisions can be examined at this level as well due to their state borders. The various sources that were used to collect the assortment of variables for these analyses are described below.

⁵ Another study has found Garreau's "Nine Nations" theory to perform less favorably against the US Census Bureau divisions in finding values (e.g., self-respect) related to those regions (Kahle 1986).

Dependent variables

Mortality data from the CDC Wonder (Centers for Disease Control and Prevention 2016) database was used to explore how well these regions explain sex-specific differences in age-adjusted all-cause mortality rates centered on 2010. Calculating a five-year rate centered on 2010 reduces the possibility of an unusually high number of deaths in a county (e.g., from a large accident) skewing the calculation. I requested age-adjusted mortality rates per 100,000 for males and females from CDC Wonder. Mortality rates for counties with less than 10 deaths were marked by CDC Wonder as unreliable along with those where the numerator was 20 or less; any county with data marked as unreliable was dropped (along with those in Alaska and Hawaii) leaving a total of 3,076 counties.

Mediators

Mediator data was from 2000 or 2001 in order to account for lag time between factors and their potential effects on mortality. I used data gathered from the Area Health Resource File (AHRF 2012); it includes each county's 2003 RUCC (ranging from 1 to 9)⁶ ("USDA ERS - Rural-Urban Continuum Codes" 2016) and 2004 typology (i.e., farming, mining, manufacturing, government, or service dependent; reference is nonspecialized-dependent) ("USDA ERS - County Typology Codes" 2017). Similarly to Kindig and Cheng (2013), I used the AHRF's rates of active MDs and hospital beds per county along with the percents of those with no health insurance, as well as the AHRF's sex-specific racial composition of the county (i.e., white, black, other) from the year 2000. The US Census Bureau (2016a) has data providing the 2000 Gini coefficient for each county, used as a measure of income inequality similar to Ezzati and colleagues (2008).

Independent variables also included the rates of sex-specific educational attainment (US Census Bureau 2016a) and sex-specific percents of obesity and physical activity per county (Institute for Health Metrics and Evaluation n.d.). Dwyer-Lindgren and colleagues (2013) noted that both obesity and physical inactivity are associated with premature death, and their study

⁶ Rural-Urban Continuum Code descriptions: (1) county in metro area with 1 million population or more; (2) county in metro area of 250,000 to 1 million population; (3) county in metro area of fewer than 250,000 population; (4) nonmetro county with urban population of 20,000 or more, adjacent to a metro area; (5) nonmetro county with urban population of 20,000 or more, not adjacent to a metro area; (6) nonmetro county with urban population of 2,500-19,999, adjacent to a metro area; (7) nonmetro county with urban population of 2,500-19,999, not adjacent to a metro area; (8) nonmetro county completely rural or less than 2,500 urban population, adjacent to metro area; (9) nonmetro county completely rural or less than 2,500 urban population, not adjacent to metro area ("USDA ERS - Rural-Urban Continuum Codes" 2016).

found that county-level measures of both are not highly correlated with one another. I used these measures to capture more individualistic components of the population as opposed to the contextual components of rurality or hospital doctor/bed availability. Data on educational attainment from the US Census Bureau (2016) was available for those over the age of 25 for a variety of levels, from no schooling to the doctorate level; I combined them into three categories: (1) less than high school, including no schooling; (2) high school graduate (includes equivalent) to associate degree; (3) bachelors degree to doctoral degree.

The data on obesity and physical activity levels was from 2001. Dwyer-Lindgren and colleagues (2013) explain how they used body mass index (BMI) reports of respondents from the Behavioral Risk Factor Surveillance System (BRFSS) and modified the responses by taking into account self-reported bias via the National Health and Nutrition Examination Survey (NHANES) to calculate county-level measurements of obesity (i.e., $BMI \geq 30$) with “validated small area estimation methods” (1). Similarly, self-reported BRFSS data was used to calculate the prevalence of sufficient⁷ levels of physical activity with the small area estimation methods (Dwyer-Lindgren et al. 2013).

Additionally, I downloaded county-level, sex-specific smoking behavior data from the Institute for Health Metrics and Evaluation (Institute for Health Metrics and Evaluation 2016). They used BRFSS data to calculate rates for counties and county equivalents⁸ (Dwyer-Lindgren et al. 2014). The data spans from 1996 to 2012; I used the 2000 data to be consistent with the other mediator variables. This data indicated the percent of people who currently smoke daily per county. Labor force participation data from the 2000 US Census (US Census Bureau 2016b) measures by sex the number of individuals over the age 16 in the labor force (i.e., employed, unemployed, Armed Forces) or not in the labor force per county. I created unemployment rates as the proportion of those who are unemployed divided by those in the labor force times 1,000. After removing counties that were missing any of the mediator variables, the final sample consisted of 3,070 counties.

⁷ “Sufficient physical activity is defined as reporting 150 total minutes of moderate activity per week, the equivalent in vigorous activity, or combination of moderate and vigorous activity (1 minute vigorous activity = 2 minutes moderate activity)” (Dwyer-Lindgren et al. 2013).

⁸ For males and females, the researchers had combined the daily smoking means of the following counties: Adams, CO; Boulder, CO; Broomfield, CO (not included in analyses); Jefferson, CO; and Weld CO; for my analyses I used the same daily mean value for each county individually. The same approach was taken with the combined Southampton, VA and Franklin City, VA along with Prince William, VA and Manassas Park City, VA.

Regional Classifications

The main variable of interest is the regional classification in each model. I compared the US Census Bureau Divisions, Woodard's "American Nations" (2011), and Garreau's "Nine Nations" (1981). The US Census Bureau Divisions consist of: 1) New England (ref); 2) Mid Atlantic; 3) East North Central; 4) West North Central; 5) South Atlantic; 6) East South Central; 7) West South Central; 8) Mountain; and 9) Pacific. Woodard's "American Nations" (2011) consist of: 1) Yankeedom (ref); 2) Deep South; 3) El Norte; 4) Far West; 5) Greater Appalachia; 6) Left Coast; 7) Midlands; 8) New France; 9) New Netherlands; 10) Spanish Caribbean; and 11) Tidewater. Garreau's "Nine Nations" (1981) consist of: 1) New England (ref); 2) The Empty Quarter; 3) Ecotopia; 4) The Breadbasket; 5) MexAmerica; 6) The Foundry; 7) Dixie; and 8) The Islands.

Analyses

Descriptive tables detailing the individual divisions and nations for each classification scheme and the appropriate measure of each control variable (e.g., see sample Table 2) provide a clear summary of the characteristics of each division and nation. Standardized ordinary least squares (OLS) regressions of the sex-specific, age-adjusted, all-cause 2010 mortality rates on the mediators and each of the three regional classifications are presented across five models. First, base models analyze the effect of each classification on the mortality rates. A second set of models include the regional classifications along with the county mediators that indicate the "place" of the county (i.e., RUCCs, typology, active MDs, hospital beds, Gini). A third set of models include the "people" characteristics of the counties (i.e., percent no health insurance, educational attainment, race, physical activity, obesity levels, smoking, and labor force participation). These two models will be compared via adjusted R^2 's, AICs, and BICs to answer the third hypothesis regarding the explanatory power of "people" versus "place" variables. A fourth set of models include all the variables from the second and third set of models (i.e., regional classifications, "place," and "people"), with the exception of the smoking and labor force participation variables, serving as the comparison for the new (fifth) full set of models. A fifth set of models include the variables in the fourth set of models *and* the newly acquired data on smoking and labor force participation, used to answer two hypotheses: 1) whether or not Woodard's classification models are the best fit; 2) whether or not the explanatory power for female mortality is more equitable to that of the male mortality. These final models also are a

combination of models two and three, allowing me to compare the relative strength of each “people” and “place” indicator via their standardized beta values to further address the third hypothesis.

Standardized coefficients permit comparison of the relative effect each control variable has on mortality rates; adjusted R^2 's will allow me to compare model fits across classifications. Data management (i.e., merging data sets) was conducted in SPSS 23 and 24 while data analyses were performed in Stata 13.

Maps

I created visual representations of the sex-specific mortality rates across the country using ArcMap 10.4, specifically choropleth maps illustrate the three regional classifications and the mortality rates in each county. Choropleth maps will be used since the data is at the county-level and they are favorable for visually demonstrating various levels of mortality. Lighter counties represent lower death rates and darker counties represent higher death rates.

First, I created three maps—one for each regional classification; then I created six maps—three for male mortality and three for female mortality, each outlining one of the three regional classifications. Two final maps—one for male mortality and one for female mortality—outline all three of the regional classifications, to show if common hot or cold spots of high or low mortality (i.e., “healthy and unhealthy places”) are present fully in individual regions. In other words, this map will answer the fourth hypothesis by showing if the similarities in previous models (Cossman, Wolf, and Myers 2016b; Cossman, Wolf, and Myers 2016a; Wolf, Cossman, and Myers 2016) are due to overlapping of regions on the same clusters of low or high mortality while also covering different average areas of mortality.

RESULTS

Descriptives

Tables 3a-3c illustrate the descriptive statistics for the US Census Bureau's divisions (henceforth, census divisions). New England has the lowest average female mortality rate and the second lowest male mortality rate. Expectedly, it consistently demonstrates a high ranking compared to other divisions in factors considered to lower mortality risk while also ranking low in factors considered to increase one's risk of mortality. For example, New England counties have some of the highest average percent of residents with a bachelor's degree or higher, of those who reach sufficient physical activity levels, of active MDs, and of white residents, while

also containing the lowest unemployment rates for males and females, obesity levels, residents who smoke daily, and uninsured residents. New England does have some of the fewest hospital beds per 1,000 residents while having one of the largest populations. Additionally, New England is mainly urban and has the highest average number of service-dependent counties. The Pacific division has the lowest average mortality rates for males and the second lowest for females. It ranks lower than most other divisions in its average percent of obese males, percent of daily smokers, percent black residents, and in hospital bed rates while ranking among the highest in residents with a bachelor's degree or higher, sufficient physical activity levels, and overall population size. However, it falls in between the other nations regarding active MDs, Gini, percent white residents, and has relatively high levels of uninsured residents and female unemployment.

East South Central has the highest average mortality levels for both sexes followed by West South Central and South Atlantic. All three of them rank high for percent of residents who are obese and low in sufficient physical activity levels. East South Central and South Atlantic both rank high in their percent of black residents and percent of residents who smoke daily while ranking low in percent of white residents. East South Central and West South Central both rank high in unemployment rates for females and Gini and low in active MD rates. East South Central also ranks high with percent of residents with less than a high school degree, unemployment rates for males, and manufacturing-dependent counties while having one of the lowest overall populations. West South Central also ranks highly in the percent of uninsured residents. While most divisions were consistent for both sexes on each factor, unemployment rates tended to differ more depending on sex and division.

Tables 4a-4c illustrate the descriptive statistics for Woodard's "American Nations" (henceforth, Woodard's nations). New Netherlands has the lowest average mortality rates followed by the Spanish Caribbean and the Left Coast. Expectedly, New Netherlands consistently demonstrates a high ranking compared to other divisions in factors considered to lower mortality risk while also ranking low in factors that are considered to increase one's risk of mortality. For example, New Netherlands counties have some of the highest average percent of residents with a bachelor's degree or higher, of active MDs, and of service-dependent counties while also containing the lowest obesity levels, residents who smoke daily, and uninsured residents. However, New Netherlands does have one of the highest Gini scores and one of the

largest populations. Oddly, the Spanish Caribbean only ranks high amongst the nations in obesity and Gini, despite having the second lowest average mortality rates. Similarly, the Left Coast has a high unemployment rate for males and the lowest hospital bed rates, but has an incredibly low Gini score, higher levels of physical activity, and is mainly urban. Yankeedom, the reference category in the models below, has the fourth lowest mortality rates along with the lowest average percent of residents who are uninsured per county, one of the highest percentage of white residents, and is mainly manufacturing-dependent.

The Deep South, New France, and Greater Appalachia have the highest average mortality levels, respectively; they also rank highest among the nations with residents who smoke daily. The Deep South ranks high among the nations with its average percent of uninsured, obese, and black residents along with a high average Gini score. It ranks amongst the lowest with white residents and those who reach sufficient physical activity levels. New France also ranks high with obesity levels and Gini, but has the second highest level of female unemployment as well. New France also ranks low in sufficient physical activity and is a mainly mining- and nonspecialized-dependent nation.

Tables 5a-5c illustrate the descriptive statistics for Garreau's "Nine Nations" (henceforth, Garreau's nations). The Islands nation has the lowest mortality rates. For males, Ecotopia and New England had the next lowest rates; for females, New England and MexAmerica did. The Islands ranks higher in both percent of residents with less than a high school education and of those with greater than a bachelor's degree, has the highest Gini score and population while being mainly service-dependent. New England is a mainly urban nation that has the highest average percent of residents with a bachelor's degree or higher, active MDs, and residents who are white while ranking low among those who are uninsured and obese. Ecotopia is also mainly urban and nonspecialized-dependent while having both the highest average unemployment rate for males and percent of residents attaining sufficient physical activity. MexAmerica has a high average percent of less than high school educated residents, unemployed females, and uninsured residents while also ranking low on hospital bed rates and residents who smoke daily.

Dixie has the highest mortality levels for males and females. It also has the highest average obesity levels, percent of residents who smoke daily, percent of black residents, and percent of residents with less than a high school education, and the lowest average percent of

percent of white residents and residents who reach sufficient physical activity levels. Dixie also ranks high on unemployment rates for both sexes.

Model 1a and 1b: Male and Female Mortality without Mediators

In the first set of models, I regress male and female mortality on the three regional classifications. Model 1a (Table 6) shows the results for male mortality and Model 1b (Table 7) shows the results for female mortality. Both models reveal that Woodard's nations are the best fit as indicated by the highest adjusted R^2 (male: 0.3256; female: 0.3300) and lowest AIC (male: 39,063; female: 36,874) and BIC (male: 39,129; female: 36,940) scores. The two models also show that Garreau's nations is the worst fitting classification as indicated by the lowest adjusted R^2 (male: 0.2954; female: 0.2686) and highest AIC (male: 39,194; female: 37,140) and BIC (male: 39,242; female: 37,189) scores—as such, the following results and discussion will focus mainly on Woodard's nations and the census divisions. The census divisions predict 2.23% less of male mortality and 3.58% less of female mortality than Woodard's nations.

Seven of Woodard's nations predict significantly different male mortality levels from the reference group of Yankeedom ($p < 0.01$); five of them predict higher levels while the Left Coast and New Netherlands predict lower levels. Seven of Woodard's nations predict significantly different female levels of mortality from Yankeedom as well; however, in this case Far West is a significantly higher predictor while the Left Coast is not significant. El Norte and the Spanish Caribbean are not significantly different from Yankeedom for either sex. For males and females, Greater Appalachia (male: $\beta = 0.524$; female: $\beta = 0.562$) and Deep South (male: $\beta = 0.517$; female: $\beta = 0.506$) are the strongest relative predictors—both indicating much higher levels of mortality than Yankeedom.

Six of the census divisions predict significantly different male mortality levels from the reference group of New England ($p < 0.001$); all of them predict higher levels. Each of those census divisions also predicts significantly higher levels of female mortality from New England with the addition of the Mountain division as well. The Pacific division is not significantly different from New England for either sex. For males and females, East South Central (male: $\beta = 0.602$; female: $\beta = 0.589$), West South Central (male: $\beta = 0.409$; female: $\beta = 0.453$), and South Atlantic (male: $\beta = 0.403$; female: $\beta = 0.416$) are the strongest relative predictors—all indicating much higher levels of mortality than New England. These three divisions overlap considerably with Greater Appalachia and the Deep South except for the southern halves of

several northeastern states and the inclusion of several full eastern states.

Four of Garreau's nations predict significantly different male mortality levels from the reference group of New England ($p < 0.01$); three of them predict higher levels while The Islands predicts lower levels. The same four predict significantly different female levels of mortality from New England as well; however, in this case The Empty Quarter is also a significantly higher predictor. Ecotopia and MexAmerica are not significantly different from New England for either sex. For males and females, Dixie (male: $\beta = 0.684$; female: $\beta = 0.689$), the Breadbasket (male: $\beta = 0.188$; female: $\beta = 0.198$), and The Foundry (male: $\beta = 0.160$; female: $\beta = 0.186$) are the strongest relative predictors—each indicating higher levels of mortality than New England.

Model 2a and 2b: Male and Female Mortality with “Place” Mediators

Male Model 2a (Table 8) and female Model 2b (Table 9) show the results of regressing mortality rates on the three regional classifications and several “place” mediator variables. These “place” variables include RUCCs, economic typology, two medical care factors (i.e., active MD and hospital bed rates), and the Gini inequality index. The final column shows the model without a regional classification, but with all the “place” mediators.

The male models (Model 2a) show that Garreau's nations is the best fit as indicated by the highest adjusted R^2 (0.4474) and lowest AIC (38,464) and BIC (38,609) scores; however, it predicts less than 0.5% more than Woodard's nations' model. Of the three models including regional classifications, the census divisions provide the worst fitting model as indicated by the lowest adjusted R^2 (0.4305) and highest AIC (38,557) and BIC (38,708) scores. However, the model without a regional classification has a much lower score in fit as it explains only 31% of male mortality rates. This finding indicates that regions are important factors in predicting male mortality when also considering “place” factors.

Gini was one of the strongest predictors in Model 2a. For the census divisions, as counties' Gini index increases, mortality rates significantly increase ($p < 0.001$); Gini ($\beta = 0.287$) is the second strongest predictor in the model behind being a county in East South Central ($\beta = 0.390$). In Woodard's model, Greater Appalachia ($\beta = 0.377$) and the Deep South ($\beta = 0.345$) are the strongest predictors while Gini is the third strongest ($\beta = 0.294$). Dixie ($\beta = 0.399$) is Garreau's strongest predictor, followed by Gini ($\beta = 0.317$).

The female mortality models (Model 2b) show that Woodard's nations is the best fit as indicated by the highest adjusted R^2 (0.305) and lowest AIC (36,391) and BIC (36,554) scores; Woodard predicts 2.1% more than Garreau and 3.1% more than the census divisions. Of the three models including regional classifications, the census divisions provide the worst fitting model as indicated by the lowest adjusted R^2 (0.3996) and highest AIC (36,552) and BIC (36,702) scores. However, the model without a regional classification again has a much lower score in fit as it explains only 28.3% of female mortality rates. This finding indicates that regions are also important factors in predicting female mortality.

The census divisions Model 2b is similar in significance, direction, and strength as census divisions Model 2a with the main exceptions being that South Atlantic ($\beta=0.269$) and West South Central ($\beta=0.250$) are also stronger predictors of female mortality than Gini ($\beta=0.232$) instead of just East South Central ($\beta=0.398$); Model 2a for census divisions explained 43.1% of male mortality, but its Model 2b only explains 40.0% of female mortality. Woodard's Model 2b shares the same strongest predictors as Model 2a. Overall, Woodard's Model 2b explains 1.3% less than his Model 2a, but it is the best fit of the Model 2b models. Garreau's model explains 2.1% less than Woodard's in Model 2b, but explained the most variation by 0.4% more than Woodard in Model 2a.

Model 3a and 3b: Male and Female Mortality with "People" Mediators

Male Model 3a (Table 10) and female Model 3b (Table 11) regress mortality rates on the three regional classifications and several "people" mediator variables. These "people" variables include one medical care factor (i.e., percent without health insurance), and several sex-specific factors including measures on education, racial composition, three health indicators (i.e., obesity, physical activity, and smoking), and unemployment rates of those applicable to participate in the labor force. The final column shows the model run without a regional classification, but with all the "people" mediators.

The male models (Model 3a) show that Woodard's nations is the best fit as indicated by the highest adjusted R^2 (0.6335) and lowest AIC (37,200) and BIC (37,320) scores; however, it predicts less than 0.7% more than the census divisions' model. Of the three models including regional classifications, Garreau's nations provide the worst fitting model as indicated by the lowest adjusted R^2 (0.6210) and highest AIC (37,299) and BIC (37,402) scores. However, the model without a regional classification is roughly equivalent in fit as it explains 61% of male

mortality rates. This finding indicates that regions are not quite as important factors in predicting male mortality when other “people” indicators are accounted for in the model, or that these “people” factors are mediating the relationship between regions and mortality. In the regional models, obesity ($p<0.01$) and smoking ($p<0.001$) both significantly and strongly predict higher levels of mortality with smoking as the highest predictor in each model.

The model without regions, but with the “people” mediators, found that the percent of those without health insurance ($\text{beta}=0.172$; $p<0.001$) and unemployment rates ($\text{beta}=0.106$; $p<0.001$) are positive significant predictors of male mortality rates and are both relatively strong predictors. Increases in the percent of those in the county having either high school/some college ($\text{beta}=0.094$; $p<0.001$) or four or more years of college ($\text{beta}=0.123$; $p<0.001$) both indicate significantly higher levels of mortality than the reference group of less than a high school education. As the percent of those who are white in the county increases, mortality rates significantly decrease compared to the percent of “other” races ($\text{beta}= -0.136$; $p<0.001$); however, this model is only on in Model 3a where the percent of black residents is significant—it indicates higher mortality levels than “other” races ($\text{beta}= 0.084$; $p<0.05$). An increase in sufficient physical activity predicts lower levels of mortality as the second strongest predictor in this model of Model 3a ($\text{beta}= -0.201$; $p<0.001$). Obesity ($\text{beta}=0.086$; $p<0.001$) and smoking ($\text{beta}=0.507$; $p<0.001$) both significantly predict higher levels of mortality; smoking is the highest predictor in the model.

Compared to the model with place mediators but no regions (Model 2a), the model people controls and no regions (Model 3a) explains 29.7% more of the male mortality rates. This indicates that the “people” mediators predict more of the variation in male mortality rates than the “place” mediators; this holds for models including any regional classification in Model 2a as well. Garreau’s model was the best fit in Model 2a; however, the model with no regions in Model 3a explains 16.0% more of the male mortality rates than the “place” indicators plus Garreau’s nations.

Similar to the male models, the female models (Model 3b) show that Woodard’s nations is the best fit as indicated by the highest adjusted R^2 (0.6094) and lowest AIC (35,227) and BIC (35,347) scores; however, it predicts about 0.3% more than the census divisions’ model. Of the three models including regional classifications, Garreau’s nations provide the worst fitting model as indicated by the lowest adjusted R^2 (0.5913) and highest AIC (35,363) and BIC (35,465).

scores. However, the model without a regional classification is roughly equivalent in fit as it explains 58.0% of female mortality rates. As with the male models, regions are not quite as important factors in predicting female mortality when other “people” indicators are accounted for in the model. Again, obesity ($p<0.05$) and smoking ($p<0.001$) both significantly and strongly (though obesity is not as strong in Garreau’s model) predict higher levels of mortality with smoking as the highest predictor in each model.

The “people” model without regions found that the percent of those without health insurance ($\text{beta}=0.104$; $p<0.001$) and unemployment rates ($\text{beta}=0.103$; $p<0.001$) are positive significant predictors of female mortality rates and are both relatively strong predictors, though lack of health insurance is stronger here than in the census divisions’ Model 3b. Neither measure of education is significantly different than the reference group of less than a high school education. As the percent of those who are white in the county increases, mortality rates significantly decrease compared to the percent of “other” races ($\text{beta}= -0.235$; $p<0.001$); however, this model is only one in Model 3b where the percent of black residents is not significant—this is the opposite of the pattern in Model 3a where only the ‘no regions’ model had significance for the percent of black residents per county on mortality. An increase in sufficient physical activity predicts lower levels of mortality as the second strongest predictor in this model of Model 3b ($\text{beta}= -0.281$; $p<0.001$). This is the only model in Model 3a or 3b where obesity is not a significant predictor of mortality. Smoking significantly predicts higher levels of mortality, as the strongest predictor in the model ($\text{beta}=0.436$; $p<0.001$).

As with the male models, compared to the model with no regions in Model 2b, the model with no regions in Model 3b explains 29.7% more of the female mortality rates. This indicates that the “people” mediators predict more of the variation in female mortality rates than the “place” mediators; this holds for models including any regional classification in Model 2b as well. Woodard’s model was the best fit in Model 2b; however, the model with no regions in Model 3b explains 14.9% more of the male mortality rates than the “place” indicators plus Woodard’s nations.

Model 4a and 4b: Male and Female Mortality with Mediators (except Smoking and Labor Force Participation)

Male Model 4a (Table 12) and female Model 4b (Table 13) regress mortality rates on the three regional classifications, the “place” mediators, and several “people” mediator variables.

These “people” variables include one medical care factor (i.e., percent without health insurance), and several sex-specific factors including measures on education, racial composition, and two health indicators (i.e., obesity and physical activity). Smoking and labor force participation were withheld from these models to mimic previous findings with a slight change with new data (i.e., the inclusion of sex-specific racial composition rather than a non-sex-specific variable). The final column shows the model without a regional classification, but with the same mediators.

The male models (Model 4a) show that Woodard’s nations is the best fit as indicated by the highest adjusted R^2 (0.6103) and lowest AIC (37,401) and BIC (37,606) scores; however, it predicts less than 0.4% more than the Garreau’s nations’ model—in fact, according to the BIC, Woodard’s model fit is not more appropriate and parsimonious than Garreau’s. The census divisions provide the worst fitting model, barely, as indicated by the lowest adjusted R^2 (0.6022) and highest AIC (37,463) and BIC (37,656) scores. However, each of these models show lower fit than their counterparts in Model 3a, indicating that smoking and/or labor force participation are important omitted variables from these models since models that include them are better at explaining variation in male mortality.

Across the models, as the percent of those who are white ($p < 0.001$) or black ($p < 0.001$) in the county increases, mortality rates significantly decrease compared to the percent of “other” races; these represent two of the strongest predictors in each model. For the census divisions, an increase in sufficient physical activity significantly predicts lower levels of mortality as the second strongest predictor in the census Model 4a (beta = -0.239; $p < 0.001$). Woodard’s Greater Appalachia (beta = 0.251; $p < 0.001$) and Deep South (beta = 0.145; $p < 0.001$) are two of the strongest predictors in its model. An increase in sufficient physical activity significantly predicts lower levels of mortality as the third strongest predictor in Woodard’s nations’ Model 4a (beta = -0.246; $p < 0.001$). For Garreau, Dixie was the strongest predictor of male mortality in Model 1a and Model 2a, but loses its significance in Model 4a. An increase in sufficient physical activity predicts lower levels of mortality as the strongest predictor in Garreau’s nations’ Model 4a (beta = -0.285; $p < 0.001$).

Similar to the male models, the female models (Model 4b) show that Woodard’s nations is the best fit as indicated by the highest adjusted R^2 (0.5848) and lowest AIC (35,428) and BIC (35,633) scores; however, it predicts only about 0.9% more than Garreau’s nations’ model. The census divisions provide the worst fitting model as indicated by the lowest adjusted R^2 (0.5653)

and highest AIC (35,567) and BIC (35,760) scores. However, as with the male models, each of these models shows lower fit than their counterparts in Model 3b. This finding indicates that smoking and/or labor force participation are important omitted variables from these models since models that include them are better at explaining variation in female mortality as well.

Within each model again, as the percent of those who are white ($p<0.001$) or black ($p<0.001$) in the county increases, mortality rates significantly decrease compared to the percent of “other” races; these represent two of the second strongest predictors in each model. An increase in sufficient physical activity significantly predicts lower levels of mortality as one of the strongest predictors in each model as well ($p<0.001$). In the census model, South Atlantic and West South Central are no longer significant, despite being two of the strongest predictors of female mortality in Models 1b, 2b, and 3b. Woodard’s New France also loses significance despite being a relatively strong predictor in Model 1b. Greater Appalachia (beta=0.226; $p<0.001$) and the Deep South (beta=0.168; $p<0.001$) remain two of the strongest predictors in the model. In Garreau’s model, Dixie is no longer significant despite having been the strongest regional predictor of female mortality in Model 1b, Model 2b, and Model 3b.

Woodard and Garreau’s nations explain roughly the same amount of variation in male mortality (Model 4a), both more so than the census divisions, while Woodard’s is the best fit of the three regional classifications for female mortality (Model 4B). However, even with more mediators than Models 3a and 3b, these models that omit smoking behaviors and labor force participation do not explain as much variation in mortality for either sex. This finding indicates the importance of these two variables; but, as will be described in the following sections, smoking behavior is most likely the factor driving these higher model fits.

Model 5a and 5b: Male and Female Mortality with All Mediators

Male (Model 5a, Table 14) and female (Model 5b Table 15) mortality rates are regressed on the three regional classifications, along with the “place” and *all* “people” mediator variables. Smoking and labor force participation were added to the previous models to create these full models for this study. Woodard’s nations is the best fit for male mortality (Model 5a) as indicated by the highest adjusted R^2 (0.6487) and lowest AIC (37,085) and BIC (37,302) scores; however, it predicts only about 0.5% more than the census divisions’ model and 0.8% more than Garreau’s nations’ model. Garreau’s nations provide the worst fitting model, but not by much, as indicated by the lowest adjusted R^2 (0.6410) and highest AIC (37,149) and BIC (37,348).

scores. Each of these models only have slightly higher fits than their counterparts in Model 3a; Woodard's fits only 1.5% better, the census is 1.7% better, and Garreau's is 2.0% better. This finding indicates that adding "place" variables to Model 3a does not change the fit of the model by much. The addition of Woodard's nations and the other "place" variables only improve upon the model in Model 3a with no regions by 4.1%. Looking at this impact another way, by adding all of the "people" variables to Model 2a, each regional classification explains approximately 20% more variance in male mortality than with the "place" mediators alone (improvements: 21.3% for census, 20.5% for Woodard, 19.4% for Garreau).

Similar to Model 3a, smoking is the strongest predictor of male mortality within each model ($p < 0.001$). An increase in the percent of those without health insurance is one of the strongest predictors of an increase in mortality (particularly for Garreau) while an increase in the percent of those who are white or who reach sufficient physical activity levels strongly predicts a decrease in mortality ($p < 0.001$). The percent of black residents in the county is not a significant predictor for any of the regional models; this is interesting as this mediator was one of the strongest predictors in Model 4a. Gini and the percent of those with a high school degree or some college (compared to less than a high school degree) are two relatively strong positive predictors of mortality ($p < 0.001$).

In the census model, West North Central is the strongest regional predictor of mortality (beta = -0.141; $p < 0.001$). Greater Appalachia (beta = 0.197; $p < 0.001$) and the Deep South (beta = 0.148; $p < 0.001$) remain two of the strongest predictors in the model for Woodard's nations. For Garreau, Dixie is again no longer significant. As with Model 3a and Model 4a, the Breadbasket (beta = -0.141; $p < 0.001$), MexAmerica (beta = -0.121; $p < 0.001$), and the Empty Quarter (beta = -0.104; $p < 0.001$) are the strongest regional predictors in the model.

Similar to the male models, the female models (Model 5b) show that Woodard's nations is the best fit as indicated by the highest adjusted R^2 (0.6229) and lowest AIC (35,134) and BIC (35,351) scores; however, it predicts only about 0.6% more than the census divisions' model. Garreau's nations provide the worst fitting model as indicated by the lowest adjusted R^2 (0.6089) and highest AIC (35,243) and BIC (35,442) scores. As with the male models, each of these models only have slightly higher fits than their counterparts in Model 3b, indicating that adding "place" variables to Model 3b does not change the fit of the model by much. The addition of Woodard's nations and the other "place" variables only improve upon the model in Model 3b

with no regions by 4.3%. In other words, by adding all of the “people” variables to Model 2b, each regional classification explains approximately 20% more variance in male mortality than with the “place” mediators alone (improvements: 21.8% for census, 19.2% for Woodard, 19.9% for Garreau).

Similar to Model 3a, smoking is the strongest predictor of female mortality within each model ($p < 0.001$). An increase in the percent of those without health insurance is only a particularly strong predictor of an increase in mortality for Garreau while an increase in the percent of those who are white or who reach sufficient physical activity levels strongly predicts a decrease in mortality for each model ($p < 0.001$). Unlike Model 5a, the percent of black residents in the county is a strong significant predictor of lower mortality rates for each of the regional models. Also unlike Model 5a, Gini and the percent of those with a high school degree or some college (compared to less than a high school degree) are two relatively *weaker* positive predictors of mortality ($p < 0.001$)⁹; rather, obesity is a relatively strong positive predictor for census divisions and Woodard ($p < 0.001$), but less so for Garreau ($p < 0.01$).

In the census model, West South Central and East South Central are the strongest regional predictors of higher mortality ($p < 0.001$). Greater Appalachia (beta=0.207; $p < 0.001$) and the Deep South (beta=0.180; $p < 0.001$) remain two of the strongest predictors in the model for Woodard’s nations. For Garreau, Dixie is again no longer significant. MexAmerica (beta=-0.108; $p < 0.001$) is the strongest regional predictor in the model.

Model 5a and 5b indicate that Woodard’s nations explain more variation in male and female mortality than the other two regional classifications, though the difference is slight. Woodard explains less than 1.0% more variation in mortality than the census divisions for either sex. Overall, these full models have the best fit, but they only outperform their respective “people” models by 2.0% or less. In fact, these models outperform their respective “people” models with *no* regional classifications by less than 4.5%. For both male and female mortality rates, “people” mediators are more important for predicting variation in mortality rates than the “place” mediators or regional classifications. The percent of people who smoke daily is a consistently important factor in predicting mortality rates.¹⁰ Racial composition of the county

⁹ High school/some college is not significant for Woodard.

¹⁰ In analyses not shown, separate models were run with each regional classification mediated by smoking and models of sex-specific mortality regressed on smoking behavior alone. Analyses available upon request.

and reaching sufficient levels of physical activity remain strong as well while labor force participation added little to the models.

Comparison of Models for US Census Divisions

Tables 16 and 17 summarize the findings of Models 1-6 using the census divisions for males and females, respectively. Of the six Models examined, the census divisions' model in Model 5a is the best fit for explaining variation in male mortality as evidenced by its highest adjusted R^2 (0.6434) and lowest AIC (37,129) and BIC (37,334) scores; it predicts only about 1.7% more than the census divisions' model in Model 3a with the sex-specific (except for percent without health insurance) "people" mediators, 4.1% more than in Model 4a with all the mediators except smoking behavior and labor force participation, and 21.3% more than in Model 2a with just the "place" mediators. Model 2a is the worst fitting model that included any mediators and even explains 7.9% less than Model 6a including just the census divisions and smoking behavior.¹¹

Declaring a best fitting model for explaining variation in female mortality is slightly more complex. Of the six models examined, the census divisions' model in Model 5b is the best fit for explaining variation in female mortality as evidenced by its highest adjusted R^2 (0.6174) and lowest AIC (35,177); however, it is Model 3b that has the lowest BIC (35,358) score. The adjusted R^2 of Model 2b is 0.6063 and its AIC score is 35,249 while the BIC of Model 3b is 35,382. BIC scores account for the number of parameters in a model, whereas AIC scores do not; thus, since Model 5b has more mediators, the BIC score will penalize Model 5b more so as such a complex model (Smith 2016). BIC scores tend to advocate for more parsimonious models—that is, they prefer using simpler (i.e., fewer variables) explanations that explain the same amount of information. Since Model 3b explained roughly the same amount of variation as Model 5b, but with fewer factors, BIC found Model 3b to be a better fit. According to Raftery (1996), a difference of 10 or more in BIC scores indicates "very strong" evidence for accepting another model with a lower BIC score. Thus, Model 5b may be the better fit model according to its adjusted R^2 and AIC scores, but the BIC suggests that the simpler Model 3b is a better model that explains roughly the same amount of variation with fewer variables. Of the rest of the

¹¹ Analyses were run examining the census divisions with a smoking interaction term in each of the Models that contained both regional classifications and smoking (i.e., Models 3, 5, and 6); although the interaction was significant, it did not change the fit of the model or direction of relationships substantially. Interaction Models are not included in the Appendix or discussed in the Results, but are available upon request.

Models with mediators, Model 2b and its “place” mediators is decidedly the worst fitting model with the lowest adjusted R^2 (0.3996) and highest AIC (36,552) and BIC (36,702) scores. Model 6b, with only census divisions and smoking behavior, explains more variation in female mortality than Model 2b by 8.4%.

Maps

Eleven choropleth maps illustrate: (1) the three regional classifications (Figures 1-3)¹²; (2) female and male mortality rates with an outline of the borders of each regional classification (Figures 4-9)¹³; and (3) female and male mortality rates with overlapping borders of all three regional classifications (Figures 10-11).

Figures 4 and 5 demonstrate the male and female (respectively) age-adjusted, all-cause mortality rates across the US with an outline of the census divisions. For both sexes, East South Central, West South Central, and part of South Atlantic appear to have the most counties with higher rates of mortality while West North Central has some noticeably large counties with higher mortality rates as well. New England, Middle Atlantic, and potentially East North Central appear to be the most homogenous with mainly lower mortality rates. The Mountain and Pacific regions appear to be slightly more heterogeneous, which may explain their typically non-significant results.

Figures 6 and 7 demonstrate the male and female (respectively) age-adjusted, all-cause mortality rates across the US with an outline of Woodard’s nations. The Deep South, Greater Appalachia, and New France appear to have the most counties with higher rates of mortality while the Far West has some noticeably large counties with higher mortality rates as well. Yankeedom, the Spanish Caribbean, and potentially the Midlands and New Netherlands appear to be the most homogenous with mainly lower mortality rates. Tidewater appears to be homogenous with mainly higher mortality rates, though not as high as in the Deep South and Greater Appalachia. The Left Coast and El Norte appear to be slightly more heterogeneous, which may explain their typically non-significant results.

Figures 8 and 9 demonstrates the male and female (respectively) age-adjusted, all-cause mortality rates across the US with an outline of Garreau’s nations. Dixie appears to have the most counties with higher rates of mortality while the Breadbasket and The Empty Quarter have

¹² Colored versions of these maps are available upon request. These maps visually demonstrate the nations and divisions discussed in the Literature Review—they will not be discussed again in the Results.

¹³ Colored versions of these maps are available upon request.

some noticeably large counties with higher mortality rates as well. New England, The Islands, and potentially The Foundry appear to be the most homogenous with mainly lower mortality rates. Ecotopia and MexAmerica appear to be slightly more heterogeneous, which may explain Ecotopia's typically non-significant results and MexAmerica's non-significant results in Model 1a and 1b.

According to Figures 10-11, Woodard's "American Nations" do seem to encapsulate the clusters of unhealthy places in the southwest through three nations (i.e., Greater Appalachia, Deep South, and New France), but include some of the lower mortality rates in mid-Texas and mid-Florida. The census division East South Central, West South Central, and South Atlantic catch higher mortality rates while including many other lower mortality counties—particularly in Texas, southern Florida, Virginia, and North Carolina. Garreau's Dixie covers most of the southwestern high mortality rates, but misses the higher rates in Oklahoma and northern Texas while including lower ones in mid-Florida, North Carolina, and Virginia. Woodard's nations also appear to better encompass the healthy places within Yankeedom, the Spanish Caribbean, New Netherlands, and the Midlands. Of the census divisions, New England, Middle Atlantic, and East North Central appear to encapsulate mainly healthy places, but East North Central has several counties with higher mortality its lower portion. In Garreau's nations, New England and The Foundry appear to capture mainly healthy places, but The Foundry has some counties with higher mortality towards its southern area. Being able to compare the overlapping nation boundaries on top of the sex-specific mortality helps us to visually examine the shortcomings or advantages of each regional classification to help understand the results of the regression analyses (particularly for Models 1a and 1b).

DISCUSSION

Hypothesis One

Hypothesis one¹⁴ posited that Woodard's "American Nations" will continue to explain more variance in the new models (i.e., Models 5a and 5b) predicting sex-specific mortality rates than the US Census Bureau's or Garreau's classifications; and the US Census Bureau's classifications will explain more variance than Garreau's classification. This hypothesis was supported for both sexes as evidenced by Woodard's "American Nations" showing the highest adjusted R^2 values in Models 5a and 5b and the lowest AIC and BIC scores in both Models.

¹⁴ See Table 2 for a summary of hypotheses, whether or not they were supported, and which evidence was used.

However, the differences in adjusted R^2 values between Woodard and the least fit model in Models 5a and 5b (both, Garreau's "Nine Nations") was 1.4% for females and 0.8% for males. Woodard's better fit was only 0.5% and 0.6% for males and females compared to the census divisions in both Models, respectively.

Even though Woodard's "American Nations" does a little better in the base models (Models 1a and 1b) than the census divisions and Garreau's "Nine Nations" than it does in the Models 5a and 5b, the differences are still not that large (less than 3.6%). Woodard's nations may capture more similar cultures within their county-level boundaries that influence some of the "people" mediators used in this study. For example, the Deep South, Greater Appalachia, and New France had some of the highest average percentages of obese residents and those who smoked daily along with the highest average mortality rates for both sexes. While Woodard focuses on the historical settlement of these nations and the shared beliefs and dispositions of the residents, these cultural aspects most likely translate into common actions and behaviors which were deemed mediators in the models. As we see in the models, the inclusion of some of these particular mediators reduces the predictive power of Woodard's nations indicating they were most likely driving Woodard's predictive power in the base models. In other words, the cultural aspects Woodard's nations were based on may have affected these mediators, which in turn affected mortality rates. Models 5a and 5b suggest that Woodard's nations (or any regional classification) do little more to explain differences in mortality than the mediator variables alone. Woodard's nations may capture these common behaviors and factors better than the census divisions do, and through these models, we can tease apart the ones that most contribute to mortality disparities.

Smoking was indeed an important mediator, but labor force participation did little to predict mortality. An increase in the percent of the county population that is white (compared to "other") along with an increase in reaching sufficient physical activity levels were strong predictors of lower mortality rates. As obesity, inequality (evidenced by the Gini index) and the percent of those with no health insurance and a high school degree/some college (compared to less than high school) increased, mortality rates also significantly increased. Farming- and service-dependent counties predicted lower mortality rates while mining-dependent counties predicted higher mortality rates than nonspecialized-dependent counties. These typologies may indicate environmental conditions in these counties as well. Farming-dependent counties most

likely have more open farmland versus mining-dependent counties that may have more factories that contaminate air or water around them. Previous research found similar results regarding county-level agricultural and mining environments (Hendryx, Fedorko, and Halverson 2010) and poor health conditions among local miners (Antao et al. 2005). RUCC codes were not generally significant predictors in Models 5a or 5b, except for Garreau's models predicting female mortality and partially for male mortality.

Woodard's nations' ability to explain slightly more of the mortality variation than the census divisions' models in the base models, but then reach a much closer explanatory power to the census divisions in Models 5a and 5b may indicate that these mediators were some of the main concepts of culture that Woodard had captured better within his regional groupings that the US Census Bureau has not caught within their divisions.

Hypothesis Two

My second hypothesis was that with the addition of the measures on smoking and labor force participation, the new models (Models 5a, and 5b) would predict female and male mortality with less of a discrepancy than the previous models (Models 4a and 4b). This hypothesis was supported for the census division models, but not for Woodard's or Garreau's nations. In Models 4a and 4b: the census divisions and mediator variables explain 3.7% more of male mortality than female mortality; Woodard's nations and the mediator variables explain 2.6% more of male mortality than female mortality; Garreau's nations and the mediator variables explain 3.1% more of male mortality than female mortality. In Models 5a and 5b: the census divisions and mediator variables explain 2.6% more of male mortality than female mortality; Woodard's nations and the mediator variables explain 2.6% more of male mortality than female mortality; Garreau's nations and the mediator variables explain 3.2% more of male mortality than female mortality. The additional factors help lessen the difference in explanatory power for the census divisions, have no effect on the difference for Woodard's models, and negligibly increased the difference for Garreau's models.

In their base models (Models 1a and 1b) the census divisions explain 0.9% more of male mortality than female mortality; Woodard's nations explain 0.4% more of *female* mortality than *male* mortality; Garreau's nations explain 2.7% more of male mortality than female mortality. The census divisions and Woodard's nations roughly explain the same variation in mortality for males and females (as they did for Models 5a and 5b where both had a 2.6% difference), but

once mediators are included, differences emerge in predictive quality (i.e., from less than 1.0% difference between sexes to a 2.6% difference between sexes). This change in differences in sex-specific explanatory power suggests that the census divisions and Woodard's nations are able to capture aspects of their regions that have similar impacts on male and female mortality; however, the mediators applied to these models do not encompass all of those aspects. That is, in holding these mediating factors constant, the remaining variance to be explained determined by regions explains slightly more of the variation of female mortality.

Hypothesis Three

My third hypothesis was that the “place” models would explain more variance in mortality than the “people” models. This hypothesis was not supported for either sex; in fact, the “people” models explain approximately 20% more variation in mortality than the “place” models. Smoking behavior was consistently the strongest predictor in each model it was in except for a couple in Model 6b where one of Woodard's nations (i.e., Deep South) and one of Garreau's nations (i.e., Dixie) were stronger predictors of mortality rates for females. This finding suggests that attributes of these regions still strongly affect female mortality even when controlling for the percent of those who smoke daily by county. Additionally, physical activity, obesity, education, and racial composition, were also consistently strong. Most or all RUCCs lost their significance once “people” mediators were included which is consistent with previous research showing RUCCs accounted for only 4.4% of the explanation of non-sex-specific 2008-2012 age-adjusted, all-cause mortality (Cossman, Wolf, and Myers 2016a). Typology and medical care mediators were moderately strong predictors; however, Gini remained relatively strong across models.

Research has shown smoking has a strong effect on mortality rates, and this study supports those findings (Rogers et al. 2005). Smoking behavior alone counted for 42.2% of the variation in male mortality which was nearly 10% more than any of the regional classifications alone; however, smoking explained roughly the same amount of variation in female mortality as any of the regional classifications (approximately 30%). For males, smoking explained about the same amount of variation in mortality as the regional classification models in Model 2a; though for females it explained roughly 10% less than any of the regional classification models in Model 2b. Nevertheless, smoking grouped with sufficient physical activity levels, racial composition, obesity, and education outperformed the selected “place” variables in explaining mortality.

Exploratory Maps

The maps were used to explore whether the preliminary findings of Woodard's nations only slightly predicting mortality better than the US Census Bureau's divisions or Garreau's nations may be due to how large the regions are within each classification. Although only examined visually, this was seemingly supported as most regional classifications had a similar number of nations or divisions with homogeneous and heterogeneous mortality rates. For example, the US Census Bureau's West North Central, Mountain, and Pacific divisions, Woodard's Far West, El Norte and Left Coast, Garreau's Empty Quarter, Breadbasket, Ecotopia, and MexAmerica all largely encompass areas with a variety of mortality levels. On the other hand, the other regions within each classification largely encompass either mainly healthy places or unhealthy places.

Garreau is the only one to miss a large chunk of the southern high mortalities in a southern nation; instead, the counties with high mortality in Texas and Oklahoma are encapsulated in the Breadbasket along with plenty of lower mortality counties. This finding may be why Garreau's model fit is typically the worst in each Model. Contrarily, Woodard seems to capture the many high mortality counties within his southern nations and more homogenous nations of Yankeedom and the Midlands. The large, block of the Far West and the other heterogeneous nations most likely contribute to a downfall of Woodard's predictive capability. The three southeastern divisions of the US Census Bureau capture the majority of the high mortality counties as well as relatively homogenous northwestern divisions, but the southwestern divisions also include areas of lower mortality in Florida and southeastern Texas. Again, the three large census divisions in the east with heterogeneous mortality levels may contribute to poor predictive ability.

LIMITATIONS

A limitation of this study might be that the "place" mediators that were used did not include measures of the built environment (e.g., parks, sidewalks, land use) or the natural environment (e.g., plant life, air quality, and climate) outside of rurality. The typology mediators may have captured some of these aspects, but did not do so explicitly. Montez, Zajacova, and Hayward (2016) found state-level contextual factors to explain more variation in female mortality than personal characteristics; perhaps including more similar county-level factors would help increase the predictive quality of "place" mediators.

Another limitation of this work was the lack of political or religious potentially mediating factors. Woodard (2011) highlights the typical political and religious ideologies and affiliations found within his nations. For example, he notes the Midlands were settled by Quakers, but were welcoming of others, leading to a pluralistic society with a “moderate, even apathetic” approach to politics, while Yankeedom’s religious beginnings have instilled a Puritan-like moral and social code and strong support of their government (6). Religious involvement has been found to be related to mortality risks (Hummer et al. 2004). Political factors ideologies and policies can be complex as policies (e.g., regarding healthcare) can be enacted at the federal or state level while ideologies can cross these lines, or show differences within states, and potentially affect mortality rates (e.g., Hatzenbuehler 2011).

Other limitations include the use of OLS regression rather than spatial regression, that this was a cross-sectional study that did not look at changes in mortality or other variables over time, and that examination of the maps was only visual rather than using more powerful methods such as cluster analysis.

FUTURE RESEARCH

Future research could include more environmental, economic, political, or religious variables to determine what Woodard’s nations account for that the census divisions do not. This thesis also used OLS regression to examine the predictive power of the regional classifications. Future analyses can use more sophisticated techniques such as spatial regression modeling. Additionally, since this was a cross-sectional study and Woodard’s thesis was published in 2011 (even though it is about the historical settlement of regions, contemporary influences may have been at play), future work can use longitudinal analyses to examine if Woodard’s nations’ hold their predictive capability over time.

Future studies could also examine the predictability of sex-specific mortality with smaller, more homogenous regions. For example, in research not shown, the predictability of either male or female mortality by state is about 10% stronger than any of the three regional classifications.¹⁵ Individual states may show more potential due to laws or policies within each state or because there are fifty of them rather than less than twelve. Research has found strong associations between state-level factors (e.g., public expenditure on education) and state-level all-cause mortality (Dunn, Burgess, and Ross 2005). As previously stated, a more recent study

¹⁵ Analyses available upon request.

found significant disparities between states regarding female mortality levels; though contextual factors, and—to a lesser degree—personal characteristics were found to explain a great deal of the variation in mortality (Montez, Zajacova, and Hayward 2016). While the census divisions are outlined at the state level, perhaps less similar states are grouped together, or more groups could be formed to explain mortality variation.

While the maps provided here allow for a visual examination of the sex-specific mortality rates within or across regions, they do not conclusively say whether or not certain nations or divisions are capturing full or complete clusters. Cluster analyses can be run on the maps used to demonstrate the overlap in regions on whether or not certain areas are indeed capturing clusters of healthy or unhealthy places. These analyses can show where the male and female mortality rates cluster at higher or lower rates, and whether or not they are within certain regional boundaries.

CONCLUSION

Overall, Woodard's "American Nations" do explain greater variance in 2008-2012 age-adjusted, all-cause, female and male mortality in the United States; however, the difference in explanatory power is quite small compared to the nine census divisions. Thus, it would not be imperative to switch to using his classification in the research field. On the other hand, this is a cross-sectional study; if future research found that Woodard's nations were consistently stronger than the census divisions over time and at a greater difference in all-cause mortality, cause-specific mortality, or another health outcome, then perhaps shifts in standard methodology could become advantageous.

These findings suggest that taking into account the historical settlement of areas may help explain some differences in mortality or potentially other health outcomes. Since the census divisions were not developed from any sociological theories, the strength in predicting sex-specific mortality may stem from their use of state borders and the administrative, political, and legal similarities found within states. Further analyses can investigate the affect state laws and policies have on mortality compared to these divisions and cultural/economic nations.

This study also highlights the large effect smoking has on mortality. Congruent with most research on smoking (Rogers et al. 2005), these findings show how harmful smoking is for one's health. Policymakers could benefit from actively pursuing ways to decrease smoking in America with a particular focus on southern and Appalachian areas.

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Appendix

Table 1. Comparison of Model Fit from Preliminary Analyses

Study	Description	Census Adj. R ²		Woodard Adj. R ²		Garreau Adj. R ²	
Myers et al. 2015	Mortality 2007	0.21		0.25		0.21	
Cossman et al. 2016a	Mortality 2010	0.32		0.35		0.30	
		Female	Male	Female	Male	Female	Male
Cossman et al. 2016b Wolf et al. 2016	Sex-specific mortality 2010	0.29	0.30	0.33	0.32	0.27	0.29

Note. Base models without controls.

Table 2. Hypotheses and Results

Hypothesis	Support/Rejected	Evidence
1: Woodard's "American Nations" will continue to explain more variance in the new models (i.e., including smoking and labor force participation) predicting sex-specific mortality rates that the US Census Bureau's or Garreau's classifications; and the US Census Bureau's classifications will explain more variance than Garreau's classification.	Supported, albeit slightly	Model 5a (Table #) Model 5b (Table #)
2: The addition of the measures on smoking and labor force participation, the new models (Models 5a, and 5b) will predict female and male mortality more equally than the previous models (Models 4a and 4b)	Supported for census divisions, not Woodard's or Garreau's nations	Model 4a (Table #) Model 4b (Table #) Model 5a (Table #) Model 5b (Table #)
3: The "place" models would explain more variance in mortality than the "people" models.	Not supported	Model 2a (Table #) Model 3b (Table #) Model 3a (Table #) Model 3b (Table #)
4: Preliminary findings that Woodard's nations only slightly predict mortality better than the US Census Bureau's divisions or Garreau's nations may be due to how large the regions are within each classification	Supported, cautiously	Maps 4-11

Table 3a. Descriptives of US Census Bureau Divisions

Variable	USA	New England	Mid Atlantic	ENC	WNC	South Atlantic	ESC	WSC	Mountain	Pacific
# of counties	3,109	67	150	437	618	589	364	470	281	133
# of counties included in OLS Regressions ^a	3,070	67	150	437	602	584	364	463	271	132
# of RUCCS (%)										
1	411 (13.39)	16 (23.88)	46 (30.67)	69 (15.79)	34 (5.65)	115 (19.69)	43 (11.81)	50 (10.80)	12 (4.43)	26 (19.70)
2	322 (10.49)	11 (16.42)	31 (20.67)	52 (11.90)	28 (4.65)	85 (14.55)	31 (8.52)	45 (9.72)	24 (8.86)	15 (11.36)
3	349 (11.37)	7 (10.45)	12 (8.00)	52 (11.90)	50 (8.31)	87 (14.90)	44 (12.09)	48 (10.37)	25 (9.23)	24 (18.18)
4	217 (7.07)	7 (10.45)	24 (16.00)	49 (11.21)	15 (2.49)	46 (7.88)	17 (4.67)	29 (6.26)	14 (5.17)	16 (12.12)
5	101 (3.29)	2 (2.99)	3 (2.00)	14 (3.20)	31 (5.15)	5 (0.86)	13 (3.57)	14 (3.02)	14 (5.17)	5 (3.79)
6	607 (19.77)	8 (11.94)	23 (15.33)	96 (21.97)	88 (14.62)	128 (21.92)	76 (20.88)	129 (27.86)	38 (14.02)	21 (15.91)
7	440 (14.33)	10 (14.93)	6 (4.00)	57 (13.04)	121 (20.10)	35 (5.99)	57 (15.66)	71 (15.33)	72 (26.57)	11 (8.33)
8	226 (7.36)	4 (5.97)	3 (2.00)	22 (5.03)	53 (8.80)	45 (7.71)	42 (11.54)	28 (6.05)	22 (8.12)	7 (5.30)
9	397 (12.93)	2 (2.99)	2 (1.33)	26 (5.95)	182 (30.23)	38 (6.51)	41 (11.26)	49 (10.58)	50 (18.45)	7 (5.30)
# Typology (%)										
Nonspecialized-dependent	936 (30.49)	17 (25.37)	37 (24.67)	118 (27.00)	229 (38.04)	145 (24.83)	100 (27.47)	163 (35.21)	67 (24.72)	60 (45.45)
Farming	413 (13.45)	0	0	5 (1.14)	192 (31.89)	36 (6.16)	20 (5.49)	86 (18.57)	61 (22.51)	13 (9.85)
Mining	125 (4.07)	0	2 (1.33)	12 (2.75)	5 (0.83)	20 (3.42)	11 (3.02)	42 (9.07)	32 (11.81)	1 (0.76)
Manufacturing	898 (29.25)	16 (23.88)	49 (32.67)	241 (55.15)	109 (18.11)	199 (34.08)	176 (48.35)	86 (18.57)	7 (2.58)	15 (11.36)
Government	367 (11.95)	5 (7.46)	17 (11.33)	31 (7.09)	37 (6.15)	103 (17.64)	34 (9.34)	63 (13.61)	58 (21.40)	19 (14.39)
Service	331 (10.78)	29 (43.28)	45 (30.00)	30 (6.86)	30 (4.98)	81 (13.87)	23 (6.32)	23 (4.97)	46 (16.97)	24 (18.18)
Medical Care										
Active MD rate (SD)	1.20 (1.34)	2.58 (1.75)	2.08 (2.07)	1.17 (1.01)	0.94 (1.33)	1.45 (1.74)	0.98 (0.96)	0.86 (0.82)	1.12 (0.87)	1.61 (0.99)
Hospital Bed rate (SD)	3.89 (5.15)	2.78 (1.65)	3.79 (3.24)	2.89 (2.57)	5.81 (7.06)	3.69 (6.31)	3.39 (3.21)	3.19 (4.06)	4.36 (5.41)	2.81 (2.86)
No Health Insurance (SD)	14.68 (4.93)	9.32 (2.06)	10.83 (2.60)	10.63 (2.35)	12.42 (4.30)	14.95 (3.74)	15.73 (3.80)	19.22 (4.31)	18.89 (4.67)	16.80 (4.13)
Inequality										
Gini (SD)	43.45 (3.85)	42.78 (2.61)	42.58 (3.17)	40.69 (2.76)	41.56 (3.03)	44.52 (3.98)	46.27 (3.83)	45.83 (3.02)	42.59 (3.38)	43.49 (2.74)

Note. ^aAll averages and SD's are of the 3,070 counties included in the OLS Regressions.

(no Alaska or Hawaii; counties/cities missing mortality data were: Alpine, CA, Arthur, NE, Banner, NE, Billings, ND, Blaine, NE, Borden, TX, Camas, ID, Clark, ID, Daggett, UT, Glasscock, TX, Grant, NE, Harding, NM, Hayes, NE, Hinsdale, CO, Jones, SD, Kenedy, TX, Keya Paha, NE, King, TX, Logan, NE, Loupe, NE, Loving, TX, McMullen, TX, McPherson, NE, Mineral, CO, Petroleum, MT, Roberts, TX, San Juan, CO, Sioux, NE, Slope, ND, Sully, SD, Thomas, NE, Treasure, MT, Wheeler, NE; counties missing data on mediators: Bedford City, VA, Broomfield, CO, Clifton Forge City, VA, Fairfax City, VA, Franklin City, VA, Manassas Park City, VA, Waynesboro City, VA)

Table 3b. Descriptives of US Census Bureau Divisions – Male

Variable	USA	New England	Mid Atlantic	ENC	WNC	South Atlantic	ESC	WSC	Mountain	Pacific
# of counties	3,109	67	150	437	618	589	364	470	281	133
# of counties included in OLS Regressions ^a	3,070	67	150	437	602	584	364	463	271	132
Avg. Male Mortality rate (SD)	978.60 (170.41)	848.79 (75.77)	894.39 (96.24)	946.71 (109.42)	908.62 (148.74)	1023.65 (161.48)	1166.22 (146.06)	1043.59 (152.30)	872.16 (156.12)	838.67 (103.89)
Avg. Male Residents (SD) (in 2000)	44,778.7 (145,289.0)	100,791.5 (137,286.8)	127,888.2 (189,083.1)	50,654.58 (151,167.1)	15,728.01 (41,707.7)	43,409.19 (89,807.73)	22,747.38 (41,149.54)	33,634.8 (112,695.8)	33,706.63 (116,041.5)	163,571.8 (466,286.1)
MALE										
% Education										
<HS (SD)	23.72 (9.23)	16.12 (4.57)	19.63 (5.36)	18.95 (5.50)	19.12 (6.24)	27.71 (8.75)	32.83 (8.75)	28.86 (8.49)	18.11 (7.32)	19.67 (7.71)
HS/Some College (SD)	59.31 (7.39)	56.54 (5.88)	59.06 (7.48)	64.67 (5.65)	64.40 (5.34)	55.44 (6.36)	54.57 (5.67)	56.18 (6.45)	60.86 (6.84)	58.30 (7.59)
4yr College+ (SD)	16.97 (8.67)	27.33 (8.60)	21.31 (9.70)	16.38 (7.66)	16.49 (6.46)	16.84 (10.17)	12.70 (6.92)	14.96 (6.58)	21.03 (9.68)	22.03 (9.27)
% Race										
White (SD)	87.61 (15.29)	94.77 (5.29)	90.71 (9.90)	94.12 (7.61)	94.69 (10.99)	76.82 (17.47)	81.64 (20.46)	84.73 (13.51)	92.85 (11.28)	90.08 (7.55)
Black (SD)	9.10 (14.35)	2.51 (4.05)	6.39 (7.74)	3.59 (5.72)	1.42 (3.61)	21.11 (17.39)	17.08 (20.49)	11.36 (13.40)	1.03 (1.84)	2.31 (3.11)
% Health Indicator										
Obesity (SD)	28.77 (3.13)	23.75 (2.42)	27.37 (2.82)	28.36 (1.85)	28.85 (2.30)	29.62 (3.29)	31.11 (2.55)	29.90 (2.15)	25.53 (3.50)	26.48 (2.96)
Physical Activity (SD)	52.92 (7.01)	62.37 (4.33)	56.34 (3.64)	55.83 (4.41)	53.28 (4.52)	51.90 (6.14)	44.20 (6.16)	49.16 (5.01)	59.32 (5.63)	61.57 (5.34)
Smoking (SD)	23.29 (3.87)	20.63 (3.12)	21.71 (2.92)	24.28 (2.99)	22.51 (2.96)	24.17 (3.07)	27.73 (3.80)	23.07 (3.29)	19.39 (3.22)	19.32 (2.53)
Labor Force										
Unemployment rate (SD)	57.43 (29.75)	50.67 (15.25)	63.90 (21.64)	58.51 (25.02)	46.39 (30.67)	53.21 (28.87)	62.95 (29.07)	59.88 (26.87)	62.93 (34.55)	83.89 (32.18)

Note. ^aAll averages and SD's are of the 3,070 counties included in the OLS Regressions.

(no Alaska or Hawaii; counties/cities missing mortality data were: Alpine, CA, Arthur, NE, Banner, NE, Billings, ND, Blaine, NE, Borden, TX, Camas, ID, Clark, ID, Daggett, UT, Glasscock, TX, Grant, NE, Harding, NM, Hayes, NE, Hinsdale, CO, Jones, SD, Kenedy, TX, Keya Paha, NE, King, TX, Logan, NE, Loupe, NE, Loving, TX, McMullen, TX, McPherson, NE, Mineral, CO, Petroleum, MT, Roberts, TX, San Juan, CO, Sioux, NE, Slope, ND, Sully, SD, Thomas, NE, Treasure, MT, Wheeler, NE; counties missing data on mediators: Bedford City, VA, Broomfield, CO, Clifton Forge City, VA, Fairfax City, VA, Franklin City, VA, Manassas Park City, VA, Waynesboro City, VA)

Table 3c. Descriptives of US Census Bureau Divisions – Female

Variable	USA	New England	Mid Atlantic	ENC	WNC	South Atlantic	ESC	WSC	Mountain	Pacific
# of counties	3,109	67	150	437	618	589	364	470	281	133
# of counties included in OLS Regressions ^a	3,070	67	150	437	602	584	364	463	271	132
Avg. Female Mortality rate (SD)	701.45 (119.71)	605.80 (50.62)	641.20 (62.12)	680.99 (79.07)	639.84 (118.58)	732.74 (106.14)	823.96 (96.08)	757.34 (107.28)	642.85 (104.59)	615.13 (80.50)
Avg. Female Residents (SD) (in 2000)	46,508.37 (150,864.3)	107,448.7 (147,391.8)	136,906.1 (208,568.2)	52,839.35 (161,285.9)	16,260.0 (44,133.07)	45,476.9 (95,325.98)	24,101.2 (44,745.75)	34,515.08 (114,504.2)	33,556.97 (115,685.5)	164,853.3 (474,867.3)
FEMALE										
% Education										
<HS (SD)	21.78 (8.41)	14.20 (4.43)	17.76 (4.45)	17.54 (4.53)	17.08 (5.99)	25.24 (7.42)	30.34 (7.27)	27.39 (7.74)	16.50 (6.71)	17.91 (7.00)
HS/Some College (SD)	62.20 (6.87)	59.68 (5.63)	62.63 (6.74)	67.44 (4.57)	66.60 (5.02)	58.80 (5.37)	57.29 (5.17)	58.43 (6.03)	64.46 (7.05)	62.76 (7.46)
4yr College+ (SD)	16.02 (7.13)	26.12 (7.44)	19.61 (7.81)	15.02 (6.18)	16.33 (5.47)	15.95 (7.98)	12.37 (5.27)	14.18 (5.08)	19.04 (8.88)	19.33 (8.03)
% Race										
White (SD)	87.71 (15.97)	94.91 (5.43)	91.63 (10.50)	94.95 (7.55)	94.90 (11.26)	76.26 (13.40)	81.21 (21.42)	85.00 (14.11)	93.00 (11.47)	90.16 (7.89)
Black (SD)	8.93 (15.05)	2.34 (4.28)	5.56 (8.44)	2.74 (5.65)	1.13 (3.64)	21.64 (18.29)	17.51 (21.46)	11.10 (14.05)	0.64 (1.35)	1.78 (2.87)
% Health Indicator										
Obesity (SD)	31.35 (5.05)	25.09 (3.10)	28.99 (3.63)	29.99 (2.62)	29.73 (3.21)	33.62 (5.94)	35.18 (5.27)	33.59 (3.92)	27.16 (4.23)	29.19 (3.83)
Physical Activity (SD)	43.86 (7.98)	53.91 (4.97)	46.98 (3.88)	46.62 (5.23)	46.91 (4.34)	40.20 (6.44)	33.23 (5.14)	39.70 (5.17)	52.56 (5.68)	54.37 (5.62)
Smoking (SD)	19.92 (3.78)	18.35 (2.68)	19.83 (2.99)	21.39 (2.83)	19.26 (3.11)	19.95 (3.30)	22.96 (4.30)	19.62 (3.70)	17.46 (3.80)	16.47 (3.38)
Labor Force										
Unemployment rate (SD)	57.70 (28.10)	44.66 (11.33)	56.16 (19.28)	49.30 (18.09)	40.82 (25.50)	62.21 (28.68)	74.56 (28.26)	65.72 (27.18)	57.64 (28.11)	76.53 (27.05)

Note. ^aAll averages and SD's are of the 3,070 counties included in the OLS Regressions.

(no Alaska or Hawaii; counties/cities missing mortality data were: Alpine, CA, Arthur, NE, Banner, NE, Billings, ND, Blaine, NE, Borden, TX, Camas, ID, Clark, ID, Daggett, UT, Glasscock, TX, Grant, NE, Harding, NM, Hayes, NE, Hinsdale, CO, Jones, SD, Kenedy, TX, Keya Paha, NE, King, TX, Logan, NE, Loupe, NE, Loving, TX, McMullen, TX, McPherson, NE, Mineral, CO, Petroleum, MT, Roberts, TX, San Juan, CO, Sioux, NE, Slope, ND, Sully, SD, Thomas, NE, Treasure, MT, Wheeler, NE; counties missing data on mediators: Bedford City, VA, Broomfield, CO, Clifton Forge City, VA, Fairfax City, VA, Franklin City, VA, Manassas Park City, VA, Waynesboro City, VA)

Table 4a. Descriptives of Woodard's American Nations

Variable	USA	Deep South	El Norte	Far West	Greater Appalachia	Left Coast	Midlands	New France	New Netherlands	Spanish Caribbean	Tide-water	Yankeedom
# of counties	3,109	501	87	429	922	54	465	25	24	12	149	441
# of counties in OLS ^a	3,070	501	85	404	917	54	463	25	24	12	144	441
# RUCCS (%)												
1	411 (13.39)	55 (10.98)	10 (11.76)	14 (3.47)	123 (13.41)	18 (33.33)	47 (10.15)	7 (28.00)	21 (87.50)	4 (33.33)	52 (36.11)	60 (13.61)
2	322 (10.49)	68 (13.57)	11 (12.94)	27 (6.68)	90 (9.81)	7 (12.96)	48 (10.37)	1 (4.00)	3 (12.50)	3 (25.00)	9 (6.25)	55 (12.47)
3	349 (11.37)	71 (14.17)	7 (8.24)	40 (9.90)	103 (11.23)	8 (14.81)	48 (10.37)	6 (24.00)	0	1 (8.33)	20 (13.89)	45 (10.20)
4	217 (7.07)	37 (7.39)	7 (8.24)	18 (4.46)	47 (5.13)	9 (16.67)	39 (8.42)	5 (20.00)	0	1 (8.33)	12 (8.33)	42 (9.52)
5	101 (3.29)	16 (3.19)	4 (4.71)	17 (4.21)	27 (2.94)	3 (5.56)	17 (3.67)	0	0	0	1 (0.69)	16 (3.63)
6	607 (19.77)	134 (26.75)	18 (21.18)	52 (12.87)	224 (24.43)	4 (7.41)	72 (15.55)	6 (24.00)	0	3 (25.00)	20 (13.89)	74 (16.78)
7	440 (14.33)	51 (10.18)	16 (18.82)	90 (22.28)	131 (14.29)	3 (5.56)	70 (15.12)	0	0	0	8 (5.56)	71 (16.10)
8	226 (7.36)	40 (7.98)	2 (2.35)	35 (8.66)	79 (8.62)	1 (1.85)	23 (4.97)	0	0	0	11 (7.64)	35 (7.94)
9	397 (12.93)	29 (5.79)	10 (11.76)	111 (27.48)	93 (10.14)	1 (1.85)	99 (21.38)	0	0	0	11 (7.64)	43 (9.75)
# Typology (%)												
Non-dependent	936 (30.49)	144 (28.74)	31 (36.47)	102 (25.25)	293 (31.95)	26 (48.15)	147 (31.75)	10 (40.00)	3 (12.50)	0	41 (28.47)	139 (31.52)
Farming	413 (13.45)	54 (10.78)	10 (11.76)	131 (32.43)	67 (7.31)	0	114 (24.62)	0	0	1 (8.33)	3 (2.08)	33 (7.48)
Mining	125 (4.07)	6 (1.20)	9 (10.59)	31 (7.67)	66 (7.20)	0	3 (0.65)	6 (24.00)	0	0	1 (0.69)	3 (0.68)
Manufacturing	898 (29.25)	180 (35.93)	0	16 (3.96)	343 (37.40)	9 (16.67)	135 (29.16)	5 (20.00)	1 (4.17)	0	36 (25.00)	173 (39.23)
Government	367 (11.95)	73 (14.57)	26 (30.59)	69 (17.08)	80 (8.72)	9 (16.67)	27 (5.83)	2 (8.00)	1 (4.17)	3 (25.00)	46 (31.94)	31 (7.03)
Service	331 (10.78)	44 (8.78)	9 (10.59)	55 (13.61)	68 (7.42)	10 (18.52)	37 (7.9)	2 (8.00)	19 (79.17)	8 (66.67)	17 (11.81)	62 (14.06)
Medical Care												
Active MD rate (SD)	1.20 (1.34)	1.01 (1.00)	0.95 (0.79)	1.07 (0.86)	0.98 (0.93)	2.02 (1.17)	1.13 (1.59)	1.38 (1.28)	3.62 (2.12)	1.95 (0.96)	2.14 (2.66)	1.53 (1.53)
Hospital Bed rate (SD)	3.89 (5.15)	3.37 (3.67)	2.18 (2.47)	5.34 (6.52)	3.16 (3.71)	2.11 (2.11)	4.76 (5.79)	3.10 (2.56)	3.92 (1.80)	4.05 (2.90)	4.97 (10.71)	3.98 (4.68)

% No Health Insurance (SD)	14.68 (4.93)	17.76 (3.47)	25.18 (5.42)	17.50 (4.36)	14.72 (4.22)	14.31 (2.47)	11.50 (3.64)	16.42 (1.93)	12.67 (4.17)	15.42 (3.89)	13.42 (3.22)	10.27 (2.45)
Inequality												
Gini (SD)	43.45 (3.85)	46.55 (3.88)	46.18 (2.77)	42.55 (3.06)	44.05 (3.44)	13.18 (3.11)	41.02 (3.02)	46.13 (3.37)	46.05 (5.44)	46.87 (3.09)	43.69 (4.33)	41.11 (2.43)

Note. ^aAll averages and SD's are of the 3,070 counties included in the OLS Regressions.

(no Alaska or Hawaii; counties/cities missing mortality data were: Alpine, CA, Arthur, NE, Banner, NE, Billings, ND, Blaine, NE, Borden, TX, Camas, ID, Clark, ID, Daggett, UT, Glasscock, TX, Grant, NE, Harding, NM, Hayes, NE, Hinsdale, CO, Jones, SD, Kenedy, TX, Keya Paha, NE, King, TX, Logan, NE, Loupe, NE, Loving, TX, McMullen, TX, McPherson, NE, Mineral, CO, Petroleum, MT, Roberts, TX, San Juan, CO, Sioux, NE, Slope, ND, Sully, SD, Thomas, NE, Treasure, MT, Wheeler, NE; counties missing data on mediators: Bedford City, VA, Broomfield, CO, Clifton Forge City, VA, Fairfax City, VA, Franklin City, VA, Manassas Park City, VA, Waynesboro City, VA)

Table 4b. Descriptives of Woodard's American Nations – Male

Variable	USA	Deep South	El Norte	Far West	Greater Appalachia	Left Coast	Midlands	New France	New Netherlands	Spanish Caribbean	Tidewater	Yankeedom
# of counties	3,109	501	87	429	922	54	465	25	24	12	149	441
# of counties included in OLS Regressions ^a	3,070	501	85	404	917	54	463	25	24	12	144	441
Avg. Male Mortality rate (SD)	978.60 (170.41)	1,104.78 (162.36)	890.65 (149.37)	878.01 (163.74)	1,061.39 (145.96)	825.90 (111.57)	915.49 (115.73)	1,085.76 (104.52)	777.35 (75.57)	821.78 (124.75)	978.27 (153.00)	866.39 (92.63)
Avg. Male Residents (SD) (in 2000)	44,778.7 (145,289.0)	36,245.2 (96,459.65)	163,014.6 (579,334.5)	28,661.52 (81,648.02)	26,735.55 (62,423.32)	143,189.8 (198,990.1)	33,577.29 (73,262.3)	49,109.68 (57,812.98)	382,955.4 (303,467.6)	252,910.7 (358,757.7)	40,213.32 (72,628)	60,854.37 (159,144.6)
MALE												
% Education												
<HS (SD)	23.72 (9.23)	30.01 (8.19)	31.97 (11.27)	18.23 (7.10)	27.45 (8.72)	16.41 (5.65)	18.43 (5.69)	31.94 (8.34)	17.84 (7.66)	23.15 (9.80)	25.83 (9.47)	17.87 (4.61)
HS/Some College (SD)	59.31 (7.39)	55.82 (5.53)	51.63 (8.32)	60.03 (6.54)	58.23 (6.44)	57.35 (8.66)	64.33 (6.49)	54.96 (5.65)	47.55 (7.21)	53.74 (6.33)	52.88 (8.03)	62.61 (5.69)
4yr College+ (SD)	16.97 (8.67)	14.16 (7.46)	16.39 (7.11)	19.74 (8.77)	14.32 (7.20)	26.24 (10.34)	17.23 (7.39)	13.09 (7.10)	34.61 (9.78)	23.11 (11.53)	21.29 (12.72)	19.52 (8.12)
% Race												
White (SD)	87.61 (15.29)	67.55 (16.89)	93.33 (5.22)	91.96 (13.86)	92.72 (7.56)	88.72 (9.15)	94.81 (8.43)	72.33 (14.29)	78.17 (13.96)	84.43 (9.54)	69.80 (16.44)	94.23 (7.23)
Black (SD)	9.10 (14.35)	30.68 (17.22)	2.76 (3.25)	0.95 (1.94)	4.65 (5.86)	2.47 (3.34)	2.69 (5.17)	25.23 (14.36)	14.09 (11.82)	13.25 (8.86)	27.75 (16.70)	2.66 (4.56)
% Health Indicator												
Obesity (SD)	28.77 (3.13)	31.08 (2.80)	27.33 (3.07)	26.74 (3.56)	29.53 (2.25)	25.26 (3.35)	28.51 (2.20)	30.68 (2.24)	23.30 (2.75)	26.76 (3.36)	29.10 (3.95)	27.55 (2.55)
Physical Activity (SD)	52.92 (7.01)	48.83 (5.71)	52.23 (6.94)	57.96 (5.92)	49.36 (6.55)	65.15 (3.89)	53.52 (4.11)	45.34 (4.56)	54.41 (5.61)	55.21 (6.91)	53.94 (6.33)	58.31 (4.29)
Smoking (SD)	23.29 (3.87)	24.21 (2.52)	18.76 (2.11)	19.87 (2.90)	25.84 (3.92)	19.23 (2.94)	22.97 (2.98)	26.39 (2.30)	17.25 (1.74)	22.17 (3.44)	23.31 (3.39)	21.94 (2.44)
Labor Force												
Unemployment rate (SD)	57.43 (29.75)	62.52 (26.52)	83.22 (35.98)	64.17 (43.48)	55.45 (24.11)	67.23 (22.27)	42.76 (22.22)	66.12 (16.44)	56.78 (27.49)	54.53 (19.68)	51.19 (38.30)	60.49 (24.33)

Note. ^aAll averages and SD's are of the 3,070 counties included in the OLS Regressions.

(no Alaska or Hawaii; counties/cities missing mortality data were: Alpine, CA, Arthur, NE, Banner, NE, Billings, ND, Blaine, NE, Borden, TX, Camas, ID, Clark, ID, Daggett, UT, Glasscock, TX, Grant, NE, Harding, NM, Hayes, NE, Hinsdale, CO, Jones, SD, Kenedy, TX, Keya Paha, NE, King, TX, Logan, NE, Loupe, NE, Loving, TX, McMullen, TX, McPherson, NE, Mineral, CO, Petroleum, MT, Roberts, TX, San Juan, CO, Sioux, NE, Slope, ND, Sully, SD, Thomas, NE, Treasure, MT, Wheeler, NE; counties missing data on mediators: Bedford City, VA, Broomfield, CO, Clifton Forge City, VA, Fairfax City, VA, Franklin City, VA, Manassas Park City, VA, Waynesboro City, VA)

Table 4c. Descriptives of Woodard's American Nations – Female

Variable	USA	Deep South	El Norte	Far West	Greater Appalachia	Left Coast	Midlands	New France	New Netherlands	Spanish Caribbean	Tidewater	Yankeedom
# of counties	3,109	501	87	429	922	54	465	25	24	12	149	441
# of counties included in OLS Regressions ^a	3,070	501	85	404	917	54	463	25	24	12	144	441
Avg. Female Mortality rate (SD)	701.45 (119.71)	782.73 (99.63)	619.58 (99.73)	640.07 (120.78)	765.89 (102.30)	603.47 (82.92)	653.56 (93.70)	776.97 (88.22)	554.76 (46.79)	588.88 (126.34)	692.77 (86.99)	619.00 (70.59)
Avg. Female Residents (SD) (in 2000)	46,508.37 (150,864.3)	37,743.21 (99,048.81)	165,469.8 (590,212.1)	28558.14 (81,629.63)	27687.33 (64,287.49)	144408.9 (200081.4)	35,423.58 (80,085.25)	52,527.76 (64,137.46)	414,478.8 (33,7130.7)	269,257.8 (384,420.8)	42,445.15 (76,870.41)	63,665.68 (169,862.5)
FEMALE												
% Education												
<HS (SD)	21.78 (8.41)	27.98 (6.79)	32.12 (11.79)	16.20 (6.12)	25.59 (7.38)	14.97 (4.33)	16.89 (5.18)	28.85 (6.85)	18.09 (7.77)	20.20 (7.49)	22.55 (7.36)	15.49 (3.62)
HS/Some College (SD)	62.20 (6.87)	58.11 (4.68)	52.70 (8.80)	65.55 (6.26)	60.96 (5.57)	61.80 (8.50)	66.63 (5.68)	58.10 (4.73)	51.73 (6.90)	60.69 (6.26)	57.46 (6.68)	65.97 (5.27)
4yr College+ (SD)	16.02 (7.13)	13.91 (5.58)	15.18 (5.86)	18.25 (7.77)	13.45 (5.59)	23.23 (9.27)	16.48 (6.10)	13.05 (5.11)	30.19 (8.18)	19.11 (9.18)	19.99 (10.06)	18.54 (7.00)
% Race												
White (SD)	87.71 (15.97)	66.45 (17.78)	94.23 (5.15)	92.07 (14.14)	93.21 (7.71)	88.54 (9.75)	95.27 (8.56)	71.65 (14.93)	77.50 (14.64)	85.64 (9.49)	69.01 (16.85)	94.79 (7.24)
Black (SD)	8.93 (15.05)	31.78 (18.12)	1.72 (2.06)	0.58 (1.38)	4.16 (6.03)	2.03 (3.41)	2.22 (5.20)	26.05 (15.00)	15.08 (12.78)	12.17 (8.81)	28.48 (17.09)	2.07 (4.62)
% Health Indicator												
Obesity (SD)	31.35 (5.05)	36.88 (5.49)	33.42 (5.50)	28.08 (4.54)	31.65 (3.04)	28.06 (4.06)	29.71 (2.70)	35.43 (3.95)	24.74 (4.57)	37.31 (4.71)	33.73 (6.74)	28.60 (3.11)
Physical Activity (SD)	43.86 (7.98)	36.90 (5.87)	43.85 (6.96)	52.05 (5.34)	39.53 (6.18)	57.42 (4.44)	46.01 (3.53)	34.21 (4.35)	45.08 (6.04)	45.23 (5.56)	41.56 (7.26)	50.53 (4.26)
Smoking (SD)	19.92 (3.78)	19.38 (2.53)	14.42 (2.89)	17.75 (3.38)	22.66 (3.69)	16.17 (4.07)	19.61 (2.88)	20.93 (2.88)	15.40 (1.94)	18.96 (3.97)	18.57 (3.15)	19.30 (2.65)
Labor Force												
Unemployment rate (SD)	57.70 (28.10)	77.48 (27.45)	82.51 (34.36)	57.44 (34.90)	57.84 (21.72)	62.49 (15.92)	41.17 (19.01)	78.04 (22.16)	59.71 (30.36)	54.19 (20.89)	58.00 (38.62)	45.91 (18.15)

Note. ^aAll averages and SD's are of the 3,070 counties included in the OLS Regressions.

(no Alaska or Hawaii; counties/cities missing mortality data were: Alpine, CA, Arthur, NE, Banner, NE, Billings, ND, Blaine, NE, Borden, TX, Camas, ID, Clark, ID, Daggett, UT, Glasscock, TX, Grant, NE, Harding, NM, Hayes, NE, Hinsdale, CO, Jones, SD, Kenedy, TX, Keya Paha, NE, King, TX, Logan, NE, Loupe, NE, Loving, TX, McMullen, TX, McPherson, NE, Mineral, CO, Petroleum, MT, Roberts, TX, San Juan, CO, Sioux, NE, Slope, ND, Sully, SD, Thomas, NE, Treasure, MT, Wheeler, NE; counties missing data on mediators: Bedford City, VA, Broomfield, CO, Clifton Forge City, VA, Fairfax City, VA, Franklin City, VA, Manassas Park City, VA, Waynesboro City, VA)

Table 5a. Descriptives of Garreau's Nine Nations

Variable	USA	The Empty Quarter	Ecotopia	The Bread-basket	Mex-America	New England	The Foundry	Dixie	The Islands
# of counties	3,109	236	61	953	141	66	426	1,219	7
# of counties included in OLS ^a	3,070	229	61	931	136	66	424	1,216	7
# of RUCCS (%)									
1	411 (13.39)	9 (3.93)	14 (22.95)	65 (6.98)	30 (22.06)	16 (24.24)	108 (25.47)	166 (13.65)	3 (42.86)
2	322 (10.49)	18 (7.86)	7 (11.48)	47 (5.05)	19 (13.97)	10 (15.15)	65 (15.33)	154 (12.66)	2 (28.57)
3	349 (11.37)	25 (10.92)	13 (21.31)	96 (10.31)	12 (8.82)	7 (10.61)	53 (12.50)	143 (11.76)	0
4	217 (7.07)	13 (5.68)	11 (18.03)	34 (3.65)	13 (9.56)	7 (10.61)	57 (13.44)	80 (6.58)	2 (28.57)
5	101 (3.29)	12 (5.24)	3 (4.92)	43 (4.62)	2 (1.47)	2 (3.03)	8 (1.89)	31 (2.55)	0
6	607 (19.77)	39 (17.03)	6 (9.84)	167 (17.94)	28 (20.59)	8 (12.12)	78 (18.40)	281 (23.11)	0
7	440 (14.33)	53 (23.14)	4 (6.56)	172 (18.47)	17 (12.50)	10 (15.15)	35 (8.25)	149 (12.25)	0
8	226 (7.36)	22 (9.61)	2 (3.28)	81 (8.70)	5 (3.68)	4 (6.06)	9 (2.12)	103 (8.47)	0
9	397 (12.93)	38 (16.59)	1 (1.64)	226 (24.27)	10 (7.35)	2 (3.03)	11 (2.59)	109 (8.96)	0
# Typology (%)									
Non-dependent	936 (30.49)	61 (26.64)	29 (47.54)	331 (35.55)	53 (38.97)	17 (25.76)	95 (22.41)	350 (28.78)	0
Farming	413 (13.45)	46 (20.09)	2 (3.28)	272 (29.22)	11 (8.09)	0	0	81 (6.66)	1 (14.29)
Mining	125 (4.07)	28 (12.23)	0	33 (3.54)	7 (5.15)	0	6 (1.42)	51 (4.19)	0
Manufacturing	898 (29.25)	12 (5.24)	8 (13.11)	178 (19.12)	7 (5.15)	16 (24.24)	209 (49.29)	468 (38.49)	0
Government	367 (11.95)	41 (17.90)	10 (16.39)	77 (8.27)	38 (27.94)	5 (7.58)	36 (8.49)	160 (13.16)	0
Service	331 (10.78)	41 (17.90)	12 (19.67)	40 (4.30)	20 (14.71)	28 (42.42)	78 (18.40)	106 (8.72)	6 (85.71)
Medical Care									
Active MD rate (SD)	1.20 (1.34)	1.15 (0.87)	1.89 (1.14)	0.95 (1.18)	1.20 (0.92)	2.57 (1.76)	1.68 (1.74)	1.12 (1.29)	2.17 (0.87)
Hospital Bed rate (SD)	3.89 (5.15)	4.41 (5.13)	2.19 (2.09)	5.19 (6.41)	2.03 (2.16)	2.79 (1.66)	3.34 (4.94)	3.35 (4.35)	3.07 (1.13)
% No Health Insurance (SD)	14.68 (4.93)	17.60 (3.85)	15.31 (3.32)	13.64 (5.17)	22.24 (6.03)	9.31 (2.08)	10.94 (2.41)	15.63 (3.88)	16.7 (4.33)
Inequality									
Gini (SD)	43.45 (3.85)	42.09 (3.10)	43.49 (3.04)	42.00 (3.36)	45.38 (2.93)	42.62 (2.30)	41.71 (3.25)	45.23 (3.86)	48.35 (2.51)

Note. ^aAll averages and SD's are of the 3,070 counties included in the OLS Regressions.

(no Alaska or Hawaii; counties/cities missing mortality data were: Alpine, CA, Arthur, NE, Banner, NE, Billings, ND, Blaine, NE, Borden, TX, Camas, ID, Clark, ID, Daggett, UT, Glasscock, TX, Grant, NE, Harding, NM, Hayes, NE, Hinsdale, CO, Jones, SD, Kenedy, TX, Keya Paha, NE, King, TX, Logan, NE, Loupe, NE, Loving, TX, McMullen, TX, McPherson, NE, Mineral, CO, Petroleum, MT, Roberts, TX, San Juan, CO, Sioux, NE, Slope, ND, Sully, SD, Thomas, NE, Treasure, MT, Wheeler, NE; counties missing data on mediators: Bedford City, VA, Broomfield, CO, Clifton Forge City, VA, Fairfax City, VA, Franklin City, VA, Manassas Park City, VA, Waynesboro City, VA)

Table 5b. Descriptives of Garreau's Nine Nations – Male

Variable	USA	The Empty Quarter	Ecotopia	The Breadbasket	MexAmerica	New England	The Foundry	Dixie	The Islands
# of counties	3,109	236	61	953	141	66	426	1,219	7
# of counties included in OLS Regressions ^a	3,070	229	61	931	136	66	424	1,216	7
Avg. Male Mortality rate (SD)	978.60 (170.41)	859.66 (149.01)	850.26 (113.26)	920.62 (141.49)	865.52 (147.21)	851.12 (73.90)	930.03 (112.80)	1,089.55 (155.77)	765.54 (97.42)
Avg. # Male (SD) (in 2000)	44,778.7 (145,289.0)	26,393.73 (66,565.62)	100,919.9 (139,357.4)	20,088.41 (50,803.79)	164,527.4 (494,438.5)	95,843.48 (132,181.9)	94,445.74 (192,868.6)	28,768.99 (57,887.31)	405,485.9 (415,099.9)
MALE									
% Education									
<HS (SD)	23.72 (9.23)	17.11 (6.87)	17.65 (6.70)	19.98 (6.84)	27.70 (11.47)	16.14 (4.61)	19.22 (5.53)	29.65 (8.55)	24.97 (13.37)
HS/Some College (SD)	59.31 (7.39)	61.64 (6.50)	58.39 (7.84)	63.21 (6.15)	52.80 (8.09)	56.78 (5.60)	61.28 (8.29)	56.16 (5.95)	50.30 (6.85)
4yr College+ (SD)	16.97 (8.67)	21.25 (9.24)	23.95 (10.05)	16.81 (6.37)	19.50 (10.14)	27.09 (8.42)	19.50 (1.60)	14.18 (7.78)	24.73 (8.05)
% Race									
White (SD)	87.61 (15.29)	92.75 (11.87)	89.91 (7.15)	93.80 (10.24)	90.71 (7.99)	94.92 (5.19)	91.67 (9.78)	79.63 (18.19)	84.87 (7.79)
Black (SD)	9.10 (14.35)	0.71 (1.59)	2.02 (2.59)	2.25 (4.13)	4.14 (4.78)	2.40 (3.97)	5.72 (8.31)	18.36 (18.22)	12.75 (7.06)
% Health Indicator									
Obesity (SD)	28.77 (3.13)	26.02 (3.46)	25.79 (3.18)	28.67 (2.17)	26.71 (3.41)	23.77 (2.43)	27.82 (2.68)	30.37 (2.76)	25.43 (2.50)
Physical Activity (SD)	52.92 (7.01)	60.49 (5.20)	63.90 (5.07)	53.50 (4.79)	54.55 (6.99)	62.44 (4.33)	56.25 (4.19)	48.62 (6.55)	55.87 (5.85)
Smoking (SD)	23.29 (3.87)	19.40 (3.28)	19.63 (2.70)	22.11 (2.55)	18.78 (2.37)	20.71 (3.08)	23.41 (3.57)	25.72 (3.41)	21.26 (2.50)
Labor Force									
Unemployment rate (SD)	57.43 (29.75)	71.01 (38.00)	75.54 (27.74)	48.30 (28.63)	75.25 (35.53)	50.72 (15.36)	58.83 (25.12)	58.89 (27.72)	49.66 (15.99)

Note. ^aAll averages and SD's are of the 3,070 counties included in the OLS Regressions.

(no Alaska or Hawaii; counties/cities missing mortality data were: Alpine, CA, Arthur, NE, Banner, NE, Billings, ND, Blaine, NE, Borden, TX, Camas, ID, Clark, ID, Daggett, UT, Glasscock, TX, Grant, NE, Harding, NM, Hayes, NE, Hinsdale, CO, Jones, SD, Kenedy, TX, Keya Paha, NE, King, TX, Logan, NE, Loupe, NE, Loving, TX, McMullen, TX, McPherson, NE, Mineral, CO, Petroleum, MT, Roberts, TX, San Juan, CO, Sioux, NE, Slope, ND, Sully, SD, Thomas, NE, Treasure, MT, Wheeler, NE; counties missing data on mediators: Bedford City, VA, Broomfield, CO, Clifton Forge City, VA, Fairfax City, VA, Franklin City, VA, Manassas Park City, VA, Waynesboro City, VA)

Table 5c. Descriptives of Garreau's Nine Nations – Female

Variable	USA	The Empty Quarter (1)	Ecotopia (2)	The Breadbasket (3)	MexAmerica (4)	New England (5)	The Foundry (6)	Dixie (7)	The Islands (8)
# of counties	3,109	236	61	953	141	66	426	1,219	7
# of counties included in OLS Regressions ^a	3,070	229	61	931	136	66	424	1,216	7
Avg. Female Mortality rate (SD)	701.45 (119.71)	637.85 (103.69)	623.50 (82.34)	658.88 (115.88)	616.31 (95.00)	607.19 (49.71)	971.82 (76.62)	775.91 (102.86)	525.99 (72.13)
Avg. # Female (SD) (in 2000)	46,508.37 (150,864.3)	26,124.28 (65,380.89)	101,651 (140,159.8)	20,602.58 (52,765.26)	166,340.2 (502,878.4)	102,148.4 (141,941.5)	100,246 (208,554.8)	30,050.86 (60,293.97)	429,470.7 (447,252.3)
FEMALE									
% Education									
<HS (SD)	21.78 (8.41)	15.40 (5.78)	16.08 (5.52)	18.08 (6.42)	27.30 (11.93)	14.17 (4.46)	17.73 (4.74)	27.31 (7.17)	21.63 (9.45)
HS/Some College (SD)	62.20 (6.87)	65.71 (6.43)	62.73 (7.61)	65.64 (5.68)	54.95 (8.47)	59.87 (5.46)	64.64 (7.11)	58.98 (5.13)	58.16 (5.77)
4yr College+ (SD)	16.02 (7.13)	18.89 (8.57)	21.19 (9.15)	16.27 (5.27)	17.75 (8.63)	25.96 (7.39)	17.63 (8.66)	13.71 (6.05)	20.21 (5.62)
% Race									
White (SD)	87.71 (15.97)	92.74 (12.00)	89.89 (7.62)	94.32 (10.33)	91.16 (8.51)	95.07 (5.30)	92.27 (10.29)	79.25 (19.08)	84.49 (8.00)
Black (SD)	8.93 (15.05)	0.43 (1.10)	1.52 (2.41)	1.68 (3.82)	3.49 (4.96)	2.21 (4.16)	5.15 (8.91)	18.73 (19.12)	13.11 (7.38)
% Health Indicator									
Obesity (SD)	31.35 (5.05)	27.24 (4.11)	28.53 (3.98)	29.91 (3.19)	31.73 (5.65)	25.15 (3.08)	29.62 (3.44)	34.29 (5.22)	26.39 (5.16)
Physical Activity (SD)	43.86 (7.98)	54.00 (4.83)	56.73 (4.95)	46.49 (5.00)	46.14 (7.34)	53.93 (5.01)	46.58 (4.50)	37.54 (6.30)	43.77 (6.61)
Smoking (SD)	19.92 (3.78)	17.58 (3.89)	16.88 (3.68)	19.06 (2.72)	14.84 (2.92)	18.40 (2.68)	20.85 (3.44)	21.50 (3.68)	17.34 (2.78)
Labor Force									
Unemployment rate (SD)	57.70 (28.10)	61.11 (27.37)	68.33 (20.72)	43.52 (24.29)	76.97 (36.25)	44.62 (11.41)	53.07 (19.26)	67.56 (27.88)	57.86 (29.45)

Note. ^aAll averages and SD's are of the 3,070 counties included in the OLS Regressions.

(no Alaska or Hawaii; counties/cities missing mortality data were: Alpine, CA, Arthur, NE, Banner, NE, Billings, ND, Blaine, NE, Borden, TX, Camas, ID, Clark, ID, Daggett, UT, Glasscock, TX, Grant, NE, Harding, NM, Hayes, NE, Hinsdale, CO, Jones, SD, Kenedy, TX, Keya Paha, NE, King, TX, Logan, NE, Loupe, NE, Loving, TX, McMullen, TX, McPherson, NE, Mineral, CO, Petroleum, MT, Roberts, TX, San Juan, CO, Sioux, NE, Slope, ND, Sully, SD, Thomas, NE, Treasure, MT, Wheeler, NE; counties missing data on mediators: Bedford City, VA, Broomfield, CO, Clifton Forge City, VA, Fairfax City, VA, Franklin City, VA, Manassas Park City, VA, Waynesboro City, VA)

Table 6. Model 1a: Male Mortality without Mediators

Mortality	Census		Mortality	Woodard		Mortality	Garreau	
	Coef	Beta		Coef	Beta		Coef	Beta
Intercept	848.79*** (9.20)	--	Intercept	866.39*** (4.41)	--	Intercept	851.12** * (9.04)	--
Region			Region			Region		
New England (ref)	0	0	Yankeedom (ref)	0	0	New England (ref)	0	0
Mid Atlantic	45.60*** (12.10)	0.058	Deep South	238.38*** (8.50)	0.517	The Empty Quarter	8.54 (13.36)	0.013
East North Central	97.92*** (10.59)	0.201	El Norte	24.26 (16.73)	0.023	Ecotopia	-0.86 (17.00)	-0.001
West North Central	59.83*** (11.02)	0.139	Far West	11.62 (9.27)	0.023	Breadbasket	69.50*** (10.16)	0.188
South Atlantic	174.85*** (11.37)	0.403	Greater Appalachia	194.99*** (6.54)	0.524	MexAmerica	14.41 (15.50)	0.017
East South Central	317.43*** (11.97)	0.602	Left Coast	-40.49* (15.70)	-0.031	The Foundry	78.91*** (10.57)	0.160
West South Central	194.80*** (11.61)	0.409	Midlands	49.10*** (6.96)	0.103	Dixie	238.43*** (10.08)	0.684
Mountain	23.37 (13.21)	0.039	New France	219.36*** (20.99)	0.116	The Islands	-85.57* (35.31)	-0.024
Pacific	-10.12 (12.89)	-0.012	New Netherlands	-89.04*** (15.76)	-0.046			
			Spanish Caribbean	-44.61 (34.82)	-0.016			
			Tidewater	111.88*** (13.47)	0.139			
N	3,070		N	3,070		N	3,070	
Adj. R²	0.3033		Adj. R²	0.3256		Adj. R²	0.2954	
AIC	39160.44		AIC	39062.58		AIC	39193.99	
BIC	39214.7		BIC	39128.91		BIC	39242.23	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001
 Dependent variable: Male mortality (rates) in 2010 (2008-2012)

Table 7. Model 1b: Female Mortality without Mediators

Mortality	Census		Mortality	Woodard		Mortality	Garreau	
	Coef	Beta		Coef	Beta		Coef	Beta
Intercept	605.80*** (6.15)	--	Intercept	619.00*** (3.36)	--	Intercept	607.19*** (6.08)	--
Region			Region			Region		
New England (ref)	0	0	Yankeedom (ref)	0	0	New England (ref)	0	0
Mid Atlantic	35.40*** (7.96)	0.064	Deep South	163.73*** (5.58)	0.506	The Empty Quarter	30.66*** (9.16)	0.067
East North Central	75.18*** (7.22)	0.219	El Norte	0.58 (11.29)	0.001	Ecotopia	16.30 (12.11)	0.019
West North Central	34.04*** (7.82)	0.113	Far West	21.07** (6.89)	0.059	Breadbasket	51.69*** (7.17)	0.198
South Atlantic	126.94*** (7.56)	0.416	Greater Appalachia	146.89*** (4.77)	0.562	MexAmerica	9.12 (10.15)	0.016
East South Central	218.15*** (7.95)	0.589	Left Coast	-15.53 (11.69)	-0.017	The Foundry	64.63*** (7.13)	0.186
West South Central	151.54*** (7.92)	0.453	Midlands	34.56*** (5.50)	0.103	Dixie	168.72*** (6.76)	0.689
Mountain	37.05*** (8.84)	0.088	New France	157.97*** (17.64)	0.119	The Islands	-81.21** (26.00)	-0.032
Pacific	9.32 (9.31)	0.016	New Netherlands	-64.24*** (9.95)	-0.047			
			Spanish Caribbean	-30.12 (35.14)	-0.016			
			Tidewater	73.77*** (7.98)	0.130			
N	3,070		N	3,070		N	3,070	
Adj. R²	0.2942		Adj. R²	0.3300		Adj. R²	0.2686	
AIC	37031.92		AIC	36874.12		AIC	37140.42	
BIC	37086.18		BIC	36940.44		BIC	37188.65	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001
 Dependent variable: Female mortality (rates) in 2010 (2008-2012)

Table 8. Model 2a: Male Mortality with “Place” Mediators

Mortality	Census		Mortality	Woodard		Mortality	Garreau		Mortality	No Regions	
	Coef	Beta		Coef	Beta		Coef	Beta		Coef	Beta
Intercept	370.02*** (38.06)	--	Intercept	388.04*** (36.60)	--	Intercept	328.09*** (35.54)	--	Intercept	125.05** * (32.72)	--
Region			Region			Region			Region		
New England (ref)	0	0	Yankeedom (ref)	0	0	New England (ref)	0	0	--	--	--
Mid Atlantic	25.20* (12.29)	0.032	Deep South	159.26*** (9.37)	0.345	The Empty Quarter	-38.43** (13.59)	-0.059			
East North Central	58.15*** (10.94)	0.119	El Norte	-43.34** (16.29)	-0.042	Ecotopia	-42.23* (16.70)	-0.035			
West North Central	16.15 (11.93)	0.038	Far West	-3.28 (9.28)	-0.007	Breadbasket	14.51 (10.90)	0.039			
South Atlantic	106.07*** (11.54)	0.244	Greater Appalachia	140.52*** (6.78)	0.377	MexAmerica	-70.48*** (15.26)	-0.085			
East South Central	205.48*** (12.66)	0.390	Left Coast	-43.72** (15.19)	-0.034	The Foundry	47.41*** (10.64)	0.096			
West South Central	89.17*** (12.88)	0.187	Midlands	46.80*** (7.05)	0.098	Dixie	138.93*** (10.77)	0.399			
Mountain	-24.41 (13.63)	-0.041	New France	138.28*** (21.22)	0.073	The Islands	- 127.98*** (36.48)	-0.036			
Pacific	-53.53*** (13.09)	-0.064	New Netherlands	-49.78** (18.79)	-0.026						
			Spanish Caribbean	-56.25 (36.85)	-0.021						
			Tidewater	95.62*** (11.91)	0.119						
RUC Code^a			RUC Code^a			RUC Code^a			RUC Code^a		
1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0
2	8.72 (8.80)	0.016	2	3.22 (8.71)	0.006	2	-3.48 (8.52)	-0.006	2	-7.40 (9.89)	-0.013
3	13.09 (8.96)	0.024	3	2.94 (8.98)	0.005	3	10.41 (8.90)	0.019	3	-4.89 (10.06)	-0.009
4	34.51*** (9.73)	0.052	4	30.55** (9.66)	0.046	4	28.30** (9.42)	0.043	4	2.61 (10.66)	0.004
5	49.24** (14.71)	0.052	5	37.69* (14.71)	0.039	5	42.51** (14.54)	0.045	5	10.70 (16.08)	0.011

6	41.29*** (8.96)	0.097	6	29.88** (8.86)	0.070	6	34.87*** (8.87)	0.082	6	15.29 (9.95)	0.036
7	28.74** (10.05)	0.059	7	27.19** (9.79)	0.056	7	21.88* (9.65)	0.045	7	-9.12 (11.00)	-0.019
8	7.67 (12.87)	0.012	8	9.43 (12.83)	0.014	8	2.87 (12.77)	0.004	8	-11.42 (14.13)	-0.018
9	11.83 (12.28)	0.023	9	17.85 (12.03)	0.035	9	2.42 (12.01)	0.005	9	-24.28 (13.34)	-0.048
Typology^b			Typology^b			Typology^b			Typology^b		
Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)	0	0
Farming	-49.33*** (9.34)	-0.099	Farming	-50.07*** (9.30)	-0.100	Farming	-45.13*** (9.23)	-0.090	Farming	-69.03*** (10.10)	-0.138
Mining	63.15*** (14.05)	0.073	Mining	58.58*** (14.53)	0.068	Mining	70.01*** (13.41)	0.081	Mining	63.49*** (15.00)	0.074
Manufacturing	8.16 (5.69)	0.022	Manufacturing	20.91*** (5.40)	0.056	Manufacturing	7.23 (5.61)	0.019	Manufacturing	40.80*** (5.96)	0.109
Government	-27.33** (9.25)	-0.052	Government	-18.83* (8.93)	-0.036	Government	-24.95** (9.12)	-0.048	Government	-27.60** (9.84)	-0.053
Service	-79.27*** (9.44)	-0.144	Service	-72.55*** (9.42)	-0.132	Service	-81.69*** (9.33)	-0.149	Service	-98.46*** (10.57)	-0.179
Medical Care			Medical Care			Medical Care			Medical Care		
Active MDs (rate)	-20.72*** (3.00)	-0.163	Active MDs (rate)	-17.47*** (2.73)	-0.137	Active MDs (rate)	-22.37*** (3.09)	-0.176	Active MDs (rate)	-26.90*** (3.73)	-0.211
Hospital Beds (rate)	2.29** (0.695)	0.069	Hospital Beds (rate)	2.27** (0.66)	0.069	Hospital Beds (rate)	2.16** (0.67)	0.065	Hospital Beds (rate)	2.14** (0.69)	0.065
Inequality			Inequality			Inequality			Inequality		
Gini ^c	12.68*** (0.93)	0.287	Gini ^c	13.04*** (0.94)	0.294	Gini ^c	14.00*** (0.86)	0.317	Gini ^c	20.46*** (0.81)	0.463
N	3,070		N	3,070		N	3,070		N	3,070	
Adj. R ²	0.4305		Adj. R ²	0.4438		Adj. R ²	0.4474		Adj. R ²	0.3100	
AIC	38557.48		AIC	38486.68		AIC	38464.27		AIC	39138.55	
BIC	38708.22		BIC	38649.48		BIC	38608.98		BIC	39241.05	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001

Dependent variable: Male mortality (rates) in 2010 (2008-2012)

^a = Rural Urban Continuum Code (2003)

^b = (2004); (all other control variables are 2000 unless otherwise noted)

^c = Gini Index multiplied times 100 to see increment changes

Table 9. Model 2b: Female Mortality with “Place” Mediators

Mortality	Census		Mortality	Woodard		Mortality	Garreau		Mortality	No Regions	
	Coef	Beta		Coef	Beta		Coef	Beta		Coef	Beta
Intercept	348.73*** (29.97)	--	Intercept	297.77*** (28.14)	--	Intercept	276.60*** (27.03)	--	Intercept	159.72*** (23.68)	--
Region			Region			Region			Region		
New England (ref)	0	0	Yankeedom (ref)	0	0	New England (ref)	0	0	--	--	--
Mid Atlantic	20.57* (8.07)	0.037	Deep South	111.51*** (6.85)	0.344	The Empty Quarter	-1.55 (9.41)	-0.003			
East North Central	45.05*** (7.60)	0.132	El Norte	-49.06*** (11.81)	-0.067	Ecotopia	-14.58 (11.95)	-0.017			
West North Central	5.71 (8.57)	0.019	Far West	12.92 (9.79)	0.036	Breadbasket	17.06* (7.92)	0.066			
South Atlantic	82.05*** (7.95)	0.269	Greater Appalachia	109.64*** (5.04)	0.419	MexAmerica	-53.32*** (10.89)	-0.092			
East South Central	147.35*** (8.99)	0.398	Left Coast	-22.52* (11.16)	-0.025	The Foundry	41.29*** (7.51)	0.119			
West South Central	83.53*** (9.07)	0.250	Midlands	34.71*** (5.37)	0.104	Dixie	100.46*** (7.79)	0.410			
Mountain	3.98 (9.12)	0.009	New France	97.89*** (16.78)	0.073	The Islands	-109.79*** (26.49)	-0.044			
Pacific	-19.83* (9.40)	-0.034	New Netherlands	-41.88** (12.92)	-0.031						
			Spanish Caribbean	-40.15 (32.27)	-0.021						
			Tidewater	59.50*** (7.50)	0.105						
RUC Code^a			RUC Code^a			RUC Code^a					
1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0
2	1.91 (6.10)	0.005	2	-3.14 (5.91)	-0.008	2	-7.52 (5.98)	-0.019	2	-9.11 (6.79)	-0.023
3	4.01 (6.30)	0.011	3	-6.00 (6.13)	-0.016	3	-0.89 (6.34)	-0.002	3	-9.11 (7.00)	-0.024
4	14.37* (6.77)	0.031	4	11.04 (6.53)	0.024	4	8.05 (6.57)	0.017	4	-7.75 (7.51)	-0.017
5	27.72** (10.17)	0.041	5	13.76 (9.83)	0.021	5	16.44 (9.88)	0.025	5	-2.02 (10.80)	-0.003

6	20.46** (6.33)	0.068	6	9.88 (6.07)	0.033	6	13.14* (6.25)	0.044	6	1.84 (6.98)	0.006
7	14.55* (7.20)	0.043	7	8.44 (6.83)	0.025	7	4.42 (6.84)	0.013	7	-13.85 (7.63)	-0.041
8	-6.95 (9.42)	-0.015	8	-12.07 (9.29)	-0.026	8	-16.61 (9.44)	-0.036	8	-23.74* (10.37)	-0.052
9	1.84 (8.78)	0.005	9	-2.86 (8.40)	-0.008	9	-13.28 (8.51)	-0.037	9	-29.00** (9.45)	-0.081
Typology^b			Typology^b			Typology^b			Typology^b		
Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)		
Farming	-40.79*** (6.67)	-0.116	Farming	-40.93*** (6.53)	-0.117	Farming	-37.84*** (6.67)	-0.108	Farming	-53.35*** (7.19)	-0.152
Mining	52.93*** (10.75)	0.087	Mining	53.64*** (10.48)	0.089	Mining	62.24*** (10.11)	0.103	Mining	60.33*** (11.04)	0.100
Manufacturing	3.37 (4.09)	0.013	Manufacturing	10.44** (3.87)	0.040	Manufacturing	1.96 (4.09)	0.007	Manufacturing	24.31*** (4.31)	0.092
Government	-12.29 (7.01)	-0.033	Government	-2.63 (6.50)	-0.007	Government	-8.26 (6.76)	-0.022	Government	-9.69 (7.25)	-0.026
Service	-55.56*** (6.48)	-0.144	Service	-51.40*** (6.25)	-0.133	Service	-58.36*** (6.37)	-0.151	Service	-68.60*** (7.19)	-0.178
Medical Care			Medical Care			Medical Care			Medical Care		
Active MDs (rate)	-14.67*** (2.18)	-0.164	Active MDs (rate)	-12.56*** (2.02)	-0.140	Active MDs (rate)	-16.65*** (2.33)	-0.186	Active MDs (rate)	-19.60*** (2.76)	-0.219
Hospital Beds (rate)	1.17* (0.45)	0.050	Hospital Beds (rate)	0.93* (0.42)	0.040	Hospital Beds (rate)	0.85 (0.45)	0.037	Hospital Beds (rate)	0.88 (0.47)	0.038
Inequality			Inequality			Inequality			Inequality		
Gini ^c	7.21*** (0.75)	0.232	Gini ^c	8.28*** (0.73)	0.267	Gini ^c	9.27*** (0.67)	0.298	Gini ^c	13.29*** (0.59)	0.428
N	3,070		N	3,070		N	3,070		N	3,070	
Adj. R²	0.3996		Adj. R²	0.4305		Adj. R²	0.4098		Adj. R²	0.2832	
AIC	36551.61		AIC	36390.89		AIC	36497.99		AIC	37087.26	
BIC	36702.35		BIC	36553.68		BIC	36642.7		BIC	37189.76	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001

Dependent variable: Male mortality (rates) in 2010 (2008-2012)

^b = (2004); (all other control variables are 2000 unless otherwise noted)

^c = Gini Index multiplied times 100 to see increment changes

Race			Race			Race			Race		
Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0
White	-1.93*** (0.43)	-0.173	White	-1.97*** (0.43)	-0.177	White	-1.54*** (0.43)	-0.138	White	-1.52*** (0.43)	-0.136
Black	0.17 (0.45)	0.014	Black	0.33 (0.48)	0.027	Black	0.18 (0.45)	0.015	Black	1.00* (0.44)	0.084
Health Indicator			Health Indicator			Health Indicator			Health Indicator		
Obesity	5.55*** (1.23)	0.102	Obesity	3.61** (1.17)	0.066	Obesity	4.63*** (1.24)	0.085	Obesity	4.70*** (1.21)	0.086
Physical Activity	-3.72*** (0.68)	-0.153	Physical Activity	-3.93*** (0.63)	-0.162	Physical Activity	-4.41*** (0.63)	-0.182	Physical Activity	-4.89*** (0.57)	-0.201
Smoking	18.95*** (0.97)	0.430	Smoking	17.70*** (0.94)	0.402	Smoking	18.43*** (0.97)	0.418	Smoking	22.33*** (0.91)	0.507
Labor Force			Labor Force			Labor Force			Labor Force		
Unemployed (rate)	0.74*** (0.10)	0.128	Unemployed (rate)	0.78*** (0.09)	0.136	Unemployed (rate)	0.70*** (0.10)	0.122	Unemployed (rate)	0.61*** (0.09)	0.106
N	3,070		N	3,070		N	3,070		N	3,070	
Adj. R ²	0.6269		Adj. R ²	0.6335		Adj. R ²	0.6210		Adj. R ²	0.6073	
AIC	37252.57		AIC	37199.73		AIC	37299.14		AIC	37401.42	
BIC	37361.1		BIC	37320.32		BIC	37401.64		BIC	37461.71	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001

Dependent variable: Female mortality (rates) in 2010 (2008-2012)

^a = Age 25+; (%)

Table 11. Model 3b: Female Mortality with “People” Mediators

Mortality	Census		Mortality	Woodard		Mortality	Garreau		Mortality	No Regions	
	Coef	Beta		Coef	Beta		Coef	Beta		Coef	Beta
Intercept	498.94*** (77.51)	--	Intercept	588.90*** (77.70)	--	Intercept	621.88*** (82.58)	--	Intercept	637.03*** (78.49)	--
Region			Region			Region			Region		
New England (ref)	0	0	Yankeedom (ref)	0	0	New England (ref)	0	0	--	--	--
Mid Atlantic	-25.02*** (6.84)	-0.045	Deep South	60.13*** (6.99)	0.186	The Empty Quarter	-0.53 (9.68)	-0.001			
East North Central	-6.11 (6.81)	-0.018	El Norte	-11.96 (12.66)	-0.016	Ecotopia	1.58 (9.28)	0.002			
West North Central	-15.61* (7.23)	-0.052	Far West	19.85** (6.67)	0.056	Breadbasket	-6.83 (7.28)	-0.026			
South Atlantic	20.90** (7.36)	0.069	Greater Appalachia	59.58*** (4.65)	0.228	MexAmerica	-42.17*** (10.70)	-0.072			
East South Central	50.17*** (8.86)	0.135	Left Coast	13.09 (7.34)	0.014	The Foundry	-11.08 (6.78)	-0.032			
West South Central	53.42*** (8.14)	0.160	Midlands	18.30*** (4.51)	0.055	Dixie	17.64* (7.47)	0.072			
Mountain	25.76** (9.78)	0.061	New France	38.72* (16.04)	0.029	The Islands	-140.68*** (16.05)	-0.056			
Pacific	-2.76 (9.06)	-0.005	New Netherlands	-51.80*** (13.18)	-0.038						
			Spanish Caribbean	-54.85* (27.13)	-0.029						
			Tidewater	16.34* (6.82)	0.029						
Medical Care			Medical Care			Medical Care			Medical Care		
No Health Ins (%)	-0.00 (0.66)	-0.000	No Health Ins (%)	1.69** (0.59)	0.070	No Health Ins (%)	2.88*** (0.57)	0.119	No Health Ins (%)	2.51*** (0.52)	0.104
Education			Education			Education			Education		
<HS ^a (ref)	0	0	<HS ^a (ref)	0	0	<HS ^a (ref)	0	0	<HS ^a (ref)	0	0
HS/Some College	1.12* (0.52)	0.064	HS/Some College	0.13 (0.50)	0.007	HS/Some College	0.54 (0.52)	0.031	HS/Some College	0.33 (0.49)	0.019
4yr College +	0.81 (0.56)	0.048	4yr College +	0.10 (0.57)	0.006	4yr College +	0.49 (0.58)	0.029	4yr College +	0.47 (0.57)	0.028

Race			Race			Race			Race		
Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0
White	-1.96*** (0.48)	-0.261	White	-1.98*** (0.48)	-0.264	White	-1.75*** (0.48)	-0.233	White	-1.76*** (0.48)	-0.235
Black	-1.18* (0.52)	-0.148	Black	-1.13* (0.53)	-0.142	Black	-1.09* (0.52)	-0.137	Black	-0.56 (0.51)	-0.070
Health Indicator			Health Indicator			Health Indicator					
Obesity	3.92*** (0.78)	0.165	Obesity	2.43** (0.80)	0.102	Obesity	1.96* (0.83)	0.083	Obesity	1.38 (0.82)	0.058
Physical Activity	-2.85*** (0.49)	-0.190	Physical Activity	-2.51*** (0.49)	-0.167	Physical Activity	-3.89*** (0.48)	-0.259	Physical Activity	-4.21*** (0.42)	-0.281
Smoking	13.21*** (0.70)	0.417	Smoking	11.81*** (0.71)	0.373	Smoking	12.07*** (0.76)	0.381	Smoking	13.81*** (0.71)	0.436
Labor Force			Labor Force			Labor Force			Labor Force		
Unemployed (rate)	0.45*** (0.09)	0.106	Unemployed (rate)	0.47*** (0.09)	0.109	Unemployed (rate)	0.46*** (0.09)	0.108	Unemployed (rate)	0.44*** (0.09)	0.103
N	3,070		N	3,070		N	3,070		N	3,070	
Adj. R ²	0.6063		Adj. R ²	0.6094		Adj. R ²	0.5913		Adj. R ²	0.5797	
AIC	35249.21		AIC	35226.9		AIC	35362.79		AIC	35441.95	
BIC	35357.74		BIC	35347.49		BIC	35465.29		BIC	35502.24	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001

Dependent variable: Female mortality (rates) in 2010 (2008-2012)

^a = Age 25+; (%)

Table 12. Model 4a: Male Mortality with Mediators (except Smoking and LFP^a)

Mortality	Census		Mortality	Woodard		Mortality	Garreau	
	Coef	Beta		Coef	Beta		Coef	Beta
Intercept	893.61*** (98.87)	--	Intercept	1023.11*** (101.66)	--	Intercept	910.74*** (100.46)	--
Region			Region			Region		
New England (ref)	0	0	Yankeedom (ref)	0	0	New England (ref)	0	0
Mid Atlantic	-64.15*** (10.59)	-0.081	Deep South	67.07*** (9.70)	0.145	The Empty Quarter	-85.60*** (12.31)	-0.132
East North Central	-36.48*** (9.72)	-0.075	El Norte	-48.76** (18.00)	-0.047	Ecotopia	-71.47*** (12.92)	-0.059
West North Central	-78.32*** (10.89)	-0.183	Far West	8.06 (8.62)	0.016	Breadbasket	-75.64*** (9.91)	-0.204
South Atlantic	-5.81 (10.48)	-0.013	Greater Appalachia	93.35*** (6.38)	0.251	MexAmerica	-146.80*** (14.27)	-0.177
East South Central	66.37*** (12.67)	0.126	Left Coast	6.20 (11.97)	0.005	The Foundry	-40.38*** (9.45)	-0.082
West South Central	-12.66 (11.96)	-0.027	Midlands	16.84** (6.48)	0.035	Dixie	12.39 (10.09)	0.036
Mountain	-51.07*** (13.23)	-0.085	New France	14.65 (21.56)	0.008	The Islands	-189.95*** (28.41)	-0.053
Pacific	-87.94*** (11.98)	-0.105	New Netherlands	-83.11*** (21.66)	-0.043			
			Spanish Caribbean	-82.33** (30.94)	-0.030			
			Tidewater	31.62** (11.31)	0.039			
RUC Code^b			RUC Code^b			RUC Code^b		
1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0
2	-7.76 (6.94)	-0.014	2	-7.56 (6.88)	-0.014	2	-14.89* (6.89)	-0.027
3	-11.15 (7.31)	-0.021	3	-12.84 (7.21)	-0.024	3	-13.44 (7.33)	-0.025
4	-1.02 (7.95)	-0.002	4	3.28 (7.84)	0.005	4	-6.20 (7.84)	-0.009
5	25.77* (11.74)	0.027	5	18.24 (11.42)	0.019	5	16.98 (11.72)	0.018
6	-9.23 (7.33)	-0.022	6	-13.91 (7.34)	-0.033	6	-15.48* (7.36)	-0.036
7	-15.41 (8.27)	-0.032	7	-15.21 (8.14)	-0.031	7	-23.78** (7.94)	-0.049
8	-36.32** (10.78)	-0.056	8	-35.41** (10.67)	-0.054	8	-41.34*** (10.58)	-0.063
9	-29.25** (10.45)	-0.058	9	-27.51** (10.30)	-0.054	9	-43.06*** (10.14)	-0.085
Typology^c			Typology^c			Typology^c		
Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)	0	0
Farming	-60.50*** (8.69)	-0.121	Farming	-62.97*** (8.59)	-0.126	Farming	-65.73*** (8.69)	-0.132
Mining	46.83*** (11.91)	0.054	Mining	46.62*** (12.04)	0.054	Mining	51.85*** (11.85)	0.060
Manufacturing	5.66 (4.90)	0.015	Manufacturing	12.92** (4.80)	0.034	Manufacturing	10.12* (4.80)	0.027

Government	-9.22 (7.30)	-0.018	Government	-3.40 (7.33)	-0.006	Government	-4.89 (7.28)	-0.009
Service	-17.22* (6.93)	-0.031	Service	-7.99 (6.93)	-0.015	Service	-20.88*** (7.07)	-0.038
Medical Care			Medical Care			Medical Care		
Active MDs (rate)	11.15*** (2.36)	0.088	Active MDs (rate)	11.70*** (2.52)	0.092	Active MDs (rate)	8.01*** (2.22)	0.069
Hospital Beds (rate)	1.76** (0.51)	0.053	Hospital Beds (rate)	1.59** (0.49)	0.048	Hospital Beds (rate)	1.73*** (0.49)	0.052
No Health Ins (%)	1.55 (1.00)	0.045	No Health Ins (%)	1.94* (0.89)	0.056	No Health Ins (%)	5.11*** (0.85)	0.148
Education			Education			Education		
<HS ^d (ref)	0	0	<HS ^d (ref)	0	0	<HS ^d (ref)	0	0
HS/Some College	4.08*** (0.66)	0.177	HS/Some College	2.57*** (0.62)	0.112	HS/Some College	4.10*** (0.61)	0.178
4yr College +	-3.84*** (0.65)	-0.196	4yr College +	-4.52*** (0.62)	-0.230	4yr College +	-2.92*** (0.64)	-0.148
Race			Race			Race		
Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0
White	-3.69*** (0.51)	-0.331	White	-3.60*** (0.51)	-0.323	White	-3.14*** (0.49)	-0.282
Black	-2.46*** (0.52)	-0.207	Black	-1.77** (0.56)	-0.149	Black	-2.55*** (0.51)	-0.215
Health Indicator			Health Indicator			Health Indicator		
Obesity	9.07*** (1.33)	0.167	Obesity	6.09*** (1.27)	0.112	Obesity	7.14*** (1.36)	0.131
Physical Activity	-5.80*** (0.71)	-0.239	Physical Activity	-5.99*** (0.66)	-0.246	Physical Activity	-6.93*** (0.65)	-0.285
Inequality			Inequality			Inequality		
Gini ^e	6.99*** (0.93)	0.158	Gini ^e	6.41*** (0.94)	0.145	Gini ^e	7.02*** (0.92)	0.159
N	3,070		N	3,070		N	3,070	
Adj. R ²	0.6022		Adj. R ²	0.6103		Adj. R ²	0.6068	
AIC	37463.17		AIC	37401.43		AIC	37425.93	
BIC	37656.11		BIC	37606.43		BIC	37612.84	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001

Dependent variable: Female mortality (rates) in 2010 (2008-2012)

^a = Labor Force Participation

^b = Rural Urban Continuum Code (2003)

^c = (2004); (all other control variables are 2000 unless otherwise noted)

^d = Age 25+; (%)

^e = Gini Index multiplied times 100 to see increment changes

Table 13. Model 4b: Female Mortality with Mediators (except Smoking and LFP^a)

Mortality	Census		Mortality	Woodard		Mortality	Garreau	
	Coef	Beta		Coef	Beta		Coef	Beta
Intercept	849.54*** (87.54)	--	Intercept	862.82*** (85.28)	--	Intercept	814.04*** (88.87)	--
Region			Region			Region		
New England (ref)	0	0	Yankeedom (ref)	0	0	New England (ref)	0	0
Mid Atlantic	-44.62** (7.67)	-0.080	Deep South	54.30*** (7.16)	0.168	The Empty Quarter	-34.16*** (9.51)	-0.075
East North Central	-26.66*** (7.26)	-0.078	El Norte	-82.13*** (13.49)	-0.113	Ecotopia	-35.38*** (10.06)	-0.041
West North Central	-56.06*** (7.73)	-0.186	Far West	12.81 (6.74)	0.036	Breadbasket	-42.82*** (7.30)	-0.164
South Atlantic	1.05 (7.84)	0.003	Greater Appalachia	59.00*** (4.93)	0.226	MexAmerica	-119.19*** (11.03)	-0.205
East South Central	35.67*** (9.37)	0.096	Left Coast	-0.46 (9.35)	-0.001	The Foundry	-24.36** (7.19)	-0.070
West South Central	10.22 (8.66)	0.031	Midlands	11.48* (4.88)	0.034	Dixie	7.30 (7.71)	0.030
Mountain	-8.92 (10.04)	-0.021	New France	17.36 (17.39)	0.013	The Islands	-183.39*** (20.35)	-0.073
Pacific	-39.67*** (9.72)	-0.067	New Netherlands	-71.26*** (16.34)	-0.052			
			Spanish Caribbean	-68.95* (28.92)	-0.036			
			Tidewater	17.57* (7.16)	0.031			
RUC Code^b			RUC Code^b			RUC Code^b		
1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0
2	-9.08 (5.29)	-0.023	2	-11.34* (5.02)	-0.029	2	-14.74** (5.20)	-0.038
3	-9.00 (5.51)	-0.024	3	-16.22** (5.17)	-0.043	3	-15.50** (5.39)	-0.041
4	-4.97 (6.00)	-0.011	4	-7.52 (5.72)	-0.016	4	-12.38* (5.86)	-0.027
5	17.27* (7.95)	0.026	5	3.23 (7.70)	0.005	5	1.46 (7.87)	0.002
6	-6.20 (5.53)	-0.021	6	-15.07** (5.23)	-0.050	6	-16.06** (5.40)	-0.053
7	-6.04 (6.44)	-0.018	7	-13.90* (5.91)	-0.041	7	-19.82** (6.11)	-0.058
8	-25.75** (7.80)	-0.056	8	-33.41*** (7.53)	-0.073	8	-37.18*** (7.65)	-0.081
9	-11.92 (7.73)	-0.033	9	-21.78** (7.15)	-0.061	9	-30.85*** (7.37)	-0.086
Typology^c			Typology^c			Typology^c		
Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)	0	0
Farming	-39.75*** (6.13)	-0.113	Farming	-44.93*** (6.05)	-0.128	Farming	-45.89*** (6.17)	-0.131
Mining	36.81*** (9.22)	0.061	Mining	42.59*** (9.09)	0.070	Mining	42.70*** (8.97)	0.071
Manufacturing	-1.08 (3.67)	-0.004	Manufacturing	2.83 (3.56)	0.011	Manufacturing	1.40 (3.61)	0.005

Government	-1.15 (5.21)	-0.003	Government	6.85 (5.01)	0.019	Government	3.26 (5.02)	0.009
Service	-18.73*** (5.15)	-0.049	Service	-11.89* (5.00)	-0.031	Service	-19.68*** (5.16)	-0.051
Medical Care			Medical Care			Medical Care		
Active MDs (rate)	2.98* (1.24)	0.033	Active MDs (rate)	4.14** (1.27)	0.046	Active MDs (rate)	1.78 (1.18)	0.020
Hospital Beds (rate)	0.92* (0.36)	0.040	Hospital Beds (rate)	0.66 (0.35)	0.028	Hospital Beds (rate)	0.75* (0.35)	0.032
No Health Ins (%)	-0.88 (0.75)	-0.036	No Health Ins (%)	1.54* (0.65)	0.064	No Health Ins (%)	3.22*** (0.64)	0.133
Education			Education			Education		
<HS ^d (ref)	0	0	<HS ^d (ref)	0	0	<HS ^d (ref)	0	0
HS/Some College	3.39*** (0.63)	0.195	HS/Some College	1.52** (0.58)	0.087	HS/Some College	2.69*** (0.60)	0.154
4yr College +	-2.12** (0.62)	-0.126	4yr College +	-3.08*** (0.60)	-0.183	4yr College +	-2.01** (0.61)	-0.119
Race			Race			Race		
Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0
White	-3.37*** (0.53)	-0.450	White	-2.91*** (0.53)	-0.388	White	-2.75*** (0.52)	-0.367
Black	-3.79*** (0.55)	-0.476	Black	-3.20*** (0.56)	-0.402	Black	-3.60*** (0.54)	-0.452
Health Indicator			Health Indicator			Health Indicator		
Obesity	3.42*** (0.91)	0.144	Obesity	2.53** (0.86)	0.107	Obesity	2.44** (0.89)	0.103
Physical Activity	-6.20*** (0.53)	-0.413	Physical Activity	-5.02*** (0.50)	-0.334	Physical Activity	-6.08*** (0.47)	-0.405
Inequality			Inequality			Inequality		
Gini ^e	4.65*** (0.74)	.150	Gini ^e	4.08*** (0.72)	0.131	Gini ^e	4.80*** (0.71)	0.155
N	3,070		N	3,070		N	3,070	
Adj. R ²	0.5653		Adj. R ²	0.5848		Adj. R ²	0.5760	
AIC	35566.72		AIC	35428.11		AIC	35489.52	
BIC	35759.66		BIC	35633.11		BIC	35676.44	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p≤0.01, ***p≤0.001

Dependent variable: Female mortality (rates) in 2010 (2008-2012)

^a = Labor Force Participation

^b = Rural Urban Continuum Code (2003)

^c = (2004); (all other control variables are 2000 unless otherwise noted)

^d = Age 25+; (%)

^e = Gini Index multiplied times 100 to see increment changes

Table 14. Model 5a: Male Mortality with All Mediators

Mortality	Census		Mortality	Woodard		Mortality	Garreau		Mortality	No Regions	
	Coef	Beta		Coef	Beta		Coef	Beta		Coef	Beta
Intercept	224.58* (99.01)	--	Intercept	342.13** (100.83)	--	Intercept	269.44** (101.53)	--	Intercept	191.63 (103.25)	--
Region			Region			Region			Region		
New England (ref)	0	0	Yankeedom (ref)	0	0	New England (ref)	0	0	--	--	--
Mid Atlantic	-43.41*** (9.73)	-0.055	Deep South	68.45*** (9.70)	0.148	The Empty Quarter	-67.70*** (11.70)	-0.104			
East North Central	-42.59*** (9.11)	-0.087	El Norte	-7.27 (17.06)	-0.007	Ecotopia	-59.33*** (11.50)	-0.049			
West North Central	-60.59*** (10.21)	-0.141	Far West	12.34 (8.16)	0.024	Breadbasket	-52.34*** (9.39)	-0.141			
South Atlantic	-10.79 (9.96)	-0.025	Greater Appalachia	73.23*** (6.45)	0.197	MexAmerica	-100.45*** (13.65)	-0.121			
East South Central	34.89** (12.42)	0.066	Left Coast	5.87 (9.54)	0.005	The Foundry	-41.52*** (8.69)	-0.084			
West South Central	2.83 (11.31)	0.006	Midlands	17.29** (6.12)	0.036	Dixie	-2.31 (9.58)	-0.007			
Mountain	-36.32** (12.47)	-0.060	New France	3.72 (20.84)	0.002	The Islands	-186.81*** (25.99)	-0.052			
Pacific	-69.41*** (11.06)	-0.083	New Netherlands	-40.05* (19.62)	-0.021						
			Spanish Caribbean	-85.97** (28.64)	-0.031						
			Tidewater	22.19* (10.92)	0.028						
RUC Code^a			RUC Code^a			RUC Code^a			RUC Code^a		
1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0
2	-10.50 (6.71)	-0.019	2	-11.34 (6.73)	-0.020	2	-15.02* (6.66)	-0.027	2	-10.37 (6.91)	-0.019
3	-6.25 (6.99)	-0.012	3	-9.34 (6.92)	-0.017	3	-10.42 (7.04)	-0.019	3	-6.09 (7.19)	-0.011
4	-5.60 (7.41)	-0.008	4	-3.00 (7.47)	-0.005	4	-9.64 (7.41)	-0.015	4	-8.68 (7.57)	-0.013
5	23.39* (10.94)	0.024	5	15.54 (10.60)	0.016	5	12.93 (10.99)	0.014	5	16.24 (11.00)	0.017

6	-4.77 (7.07)	-0.011	6	-8.70 (7.10)	-0.020	6	-11.70 (7.12)	-0.027	6	-9.19 (7.18)	-0.021
7	-12.64 (7.84)	-0.026	7	-13.73 (7.72)	-0.028	7	-22.75** (7.67)	-0.047	7	-19.89* (7.75)	-0.041
8	-14.62 (10.58)	-0.022	8	-16.91 (10.41)	-0.026	8	-24.00* (10.47)	-0.037	8	-16.19 (10.55)	-0.025
9	-8.49 (10.19)	-0.017	9	-10.20 (10.04)	-0.020	9	-25.33* (10.00)	-0.050	9	-17.62 (10.05)	-0.035
Typology^b			Typology^b			Typology^b			Typology^b		
Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)	0	0
Farming	-32.43*** (8.42)	-0.065	Farming	-31.89*** (8.38)	-0.064	Farming	-39.00*** (8.51)	-0.078	Farming	-39.68*** (8.53)	-0.079
Mining	43.03*** (10.95)	0.050	Mining	45.39*** (10.66)	0.053	Mining	50.58** (10.89)	0.059	Mining	51.17*** (10.70)	0.059
Manufacturing	1.68 (4.77)	0.004	Manufacturing	5.16 (4.68)	0.014	Manufacturing	5.27 (4.73)	0.014	Manufacturing	5.93 (4.78)	0.016
Government	-13.68 (6.96)	-0.026	Government	-9.83 (7.00)	-0.019	Government	-9.79 (6.97)	-0.019	Government	-9.30 (7.09)	-0.018
Service	-26.46*** (6.54)	-0.048	Service	-20.30** (6.59)	-0.037	Service	-26.20*** (6.61)	-0.048	Service	-25.54*** (6.63)	-0.046
Medical Care			Medical Care			Medical Care			Medical Care		
Active MDs (rate)	3.83* (1.87)	0.030	Active MDs (rate)	4.82* (1.96)	0.038	Active MDs (rate)	2.58 (1.82)	0.020	Active MDs (rate)	1.80 (1.76)	0.014
Hospital Beds (rate)	1.78*** (0.47)	0.054	Hospital Beds (rate)	1.68*** (0.45)	0.051	Hospital Beds (rate)	1.69*** (0.47)	0.051	Hospital Beds (rate)	1.56** (0.46)	0.047
No Health Ins (%)	4.18*** (0.92)	0.121	No Health Ins (%)	4.23*** (0.85)	0.122	No Health Ins (%)	7.00*** (0.81)	0.203	No Health Ins (%)	5.34*** (0.75)	0.155
Education			Education			Education			Education		
<HS ^c (ref)	0	0	<HS ^c (ref)	0	0	<HS ^c (ref)	0	0	<HS ^c (ref)	0	0
HS/Some College	4.17*** (0.60)	0.181	HS/Some College	3.05*** (0.57)	0.132	HS/Some College	4.01*** (0.57)	0.174	HS/Some College	3.31*** (0.55)	0.144
4yr College +	1.11 (0.69)	0.056	4yr College +	0.46 (0.65)	0.023	4yr College +	1.33* (0.66)	0.068	4yr College +	1.70** (0.64)	0.087
Race			Race			Race			Race		
Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0
White	-2.30*** (0.45)	-0.206	White	-2.25*** (0.46)	-0.202	White	-1.92*** (0.45)	-0.172	White	-1.95*** (0.46)	-0.175
Black	-0.57 (0.47)	-0.048	Black	-0.33 (0.50)	-0.028	Black	-0.63 (0.47)	-0.053	Black	0.13 (0.47)	0.011
Health Indicator			Health Indicator			Health Indicator			Health Indicator		

Obesity	6.43*** (1.28)	0.118	Obesity	4.42*** (1.21)	0.081	Obesity	5.16*** (1.28)	0.095	Obesity	5.13*** (1.24)	0.094
Physical Activity	-3.44*** (0.68)	-0.142	Physical Activity	-3.69*** (0.64)	-0.152	Physical Activity	-4.41*** (0.64)	-0.182	Physical Activity	-4.67*** (0.60)	-0.192
Smoking	17.02*** (1.02)	0.386	Smoking	15.54*** (0.97)	0.362	Smoking	15.85*** (0.99)	0.360	Smoking	19.87*** (0.96)	0.451
Labor Force			Labor Force			Labor Force			Labor Force		
Unemployed (rate)	0.43*** (0.10)	0.074	Unemployed (rate)	0.50*** (0.10)	0.087	Unemployed (rate)	0.39*** (0.10)	0.068	Unemployed (rate)	0.29** (0.09)	0.051
Inequality			Inequality			Inequality			Inequality		
Gini ^d	5.40*** (0.91)	0.122	Gini ^d	4.98*** (0.92)	0.113	Gini ^d	5.90*** (0.91)	0.134	Gini ^d	6.44*** (0.91)	0.146
N	3,070		N	3,070		N	3,070		N	3,070	
Adj. R²	0.6434		Adj. R²	0.6487		Adj. R²	0.6410		Adj. R²	0.6276	
AIC	37128.8		AIC	37085.03		AIC	37148.66		AIC	37254.74	
BIC	37333.8		BIC	37302.09		BIC	37347.63		BIC	37411.5	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001

Dependent variable: Male mortality (rates) in 2010 (2008-2012)

^a = Rural Urban Continuum Code (2003)

^b = (2004); (all other control variables are 2000 unless otherwise noted)

^c = Age 25+; (%)

^d = Gini Index multiplied times 100 to see increment changes

Table 15. Model 5b: Female Mortality with All Mediators

Mortality	Census		Mortality	Woodard		Mortality	Garreau		Mortality	No Regions	
	Coef	Beta		Coef	Beta		Coef	Beta		Coef	Beta
Intercept	405.69*** (81.64)	--	Intercept	494.64*** (82.21)	--	Intercept	478.89*** (86.79)	--	Intercept	515.74*** (82.42)	--
Region			Region			Region			Region		
New England (ref)	0	0	Yankeedom (ref)	0	0	New England (ref)	0	0	--	--	--
Mid Atlantic	-29.39*** (7.10)	-0.053	Deep South	58.19*** (6.92)	0.180	The Empty Quarter	-11.82 (9.58)	-0.026			
East North Central	-11.99 (6.98)	-0.035	El Norte	-28.15* (12.85)	-0.039	Ecotopia	-13.86 (9.53)	-0.016			
West North Central	-22.49** (7.40)	-0.075	Far West	17.92** (6.59)	0.051	Breadbasket	-13.40 (7.42)	-0.051			
South Atlantic	15.74* (7.56)	0.052	Greater Appalachia	54.11*** (4.60)	0.207	MexAmerica	-62.59*** (11.15)	-0.108			
East South Central	44.81*** (8.94)	0.121	Left Coast	6.32 (7.52)	0.007	The Foundry	-18.10* (6.98)	-0.052			
West South Central	41.08*** (8.30)	0.123	Midlands	19.23*** (4.52)	0.057	Dixie	11.45 (7.60)	0.047			
Mountain	14.42 (9.88)	0.034	New France	22.94 (16.17)	0.017	The Islands	-149.43*** (18.06)	-0.060			
Pacific	-11.47 (9.30)	-0.019	New Netherlands	-52.84*** (13.90)	-0.039						
			Spanish Caribbean	-57.85* (26.76)	-0.030						
			Tidewater	14.67* (6.92)	0.026						
RUC Code^a			RUC Code^a			RUC Code^a			RUC Code^a		
1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0	1 (ref)	0	0
2	-8.02 (5.04)	-0.021	2	-10.94* (4.85)	-0.028	2	-11.95* (5.02)	-0.031	2	-6.89 (5.19)	-0.018
3	-7.35 (5.08)	-0.019	3	-12.86** (4.88)	-0.034	3	-12.67* (5.11)	-0.034	3	-5.28 (5.13)	-0.014
4	-8.41 (5.40)	-0.018	4	-10.97* (5.37)	-0.023	4	-13.81* (5.49)	-0.030	4	-10.96 (5.62)	-0.023
5	11.27 (7.00)	0.017	5	1.75 (6.89)	0.003	5	-1.48 (7.24)	-0.002	5	6.56 (7.12)	0.010

6	-6.15 (5.08)	-0.020	6	-12.11* (4.98)	-0.040	6	-14.46** (5.12)	-0.048	6	-8.20 (5.14)	-0.027
7	-9.67 (5.80)	-0.028	7	-13.99* (5.51)	-0.041	7	-21.06*** (5.77)	-0.062	7	-13.65* (5.71)	-0.040
8	-19.88** (7.50)	-0.043	8	-25.28** (7.39)	-0.055	8	-31.05*** (7.55)	-0.068	8	-20.75** (7.63)	-0.045
9	-9.00 (7.26)	-0.025	9	-16.43* (6.94)	-0.046	9	-26.16*** (7.17)	-0.073	9	-16.09* (7.07)	-0.045
Typology^b			Typology^b			Typology^b			Typology^b		
Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)	0	0	Non-dependent (ref)	0	0
Farming	-20.52** (6.02)	-0.058	Farming	-25.11*** (6.03)	-0.072	Farming	-28.71*** (6.21)	-0.082	Farming	-25.84*** (6.16)	-0.074
Mining	34.49*** (8.68)	0.057	Mining	40.90*** (8.54)	0.068	Mining	41.77*** (8.58)	0.069	Mining	44.05*** (8.46)	0.073
Manufacturing	-1.05 (3.46)	-0.004	Manufacturing	0.68 (3.38)	0.003	Manufacturing	1.77 (3.48)	0.007	Manufacturing	1.30 (3.48)	0.005
Government	-4.06 (4.77)	-0.011	Government	1.09 (4.71)	0.003	Government	-0.034	-0.000	Government	-0.54 (4.81)	-0.001
Service	-21.60*** (4.89)	-0.056	Service	-19.03*** (4.88)	-0.049	Service	-21.37*** (4.99)	-0.055	Service	-23.13*** (5.10)	-0.060
Medical Care			Medical Care			Medical Care			Medical Care		
Active MDs (rate)	0.78 (1.12)	0.009	Active MDs (rate)	1.52 (1.11)	0.017	Active MDs (rate)	-0.14 (1.13)	-0.002	Active MDs (rate)	-1.19 (1.14)	-0.013
Hospital Beds (rate)	0.96** (0.36)	0.041	Hospital Beds (rate)	0.82* (0.34)	0.035	Hospital Beds (rate)	0.74* (0.36)	0.032	Hospital Beds (rate)	0.74* (0.35)	0.032
No Health Ins (%)	0.46 (0.73)	0.019	No Health Ins (%)	2.24** (0.65)	0.092	No Health Ins (%)	3.61*** (0.64)	0.149	No Health Ins (%)	2.74*** (0.60)	0.113
Education			Education			Education			Education		
<HS ^c (ref)	0	0	<HS ^c (ref)	0	0	<HS ^c (ref)	0	0	<HS ^c (ref)	0	0
HS/Some College	1.87** (0.56)	0.107	HS/Some College	0.79 (0.53)	0.045	HS/Some College	1.52** (0.55)	0.087	HS/Some College	1.19* (0.53)	0.068
4yr College +	0.75 (0.59)	0.045	4yr College +	-0.17 (0.60)	-0.010	4yr College +	0.32 (0.61)	0.019	4yr College +	0.57 (0.59)	0.034
Race			Race			Race			Race		
Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0	Other (ref)	0	0
White	-2.06*** (0.49)	-0.274	White	-1.98*** (0.49)	-0.264	White	-1.78*** (0.49)	-0.237	White	-1.87*** (0.49)	-0.250
Black	-1.45** (0.54)	-0.182	Black	-1.43** (0.55)	-0.179	Black	-1.49** (0.54)	-0.188	Black	-0.84 (0.52)	-0.106
Health Indicator			Health Indicator			Health Indicator			Health Indicator		

Obesity	3.89*** (0.81)	0.164	Obesity	2.64** (0.81)	0.111	Obesity	2.32** (0.83)	0.098	Obesity	1.35 (0.82)	0.057
Physical Activity	-2.94*** (0.49)	-0.196	Physical Activity	-2.68*** (0.48)	-0.179	Physical Activity	-3.83*** (0.47)	-0.255	Physical Activity	-4.32*** (0.42)	-0.288
Smoking	12.18*** (0.72)	0.385	Smoking	10.60*** (0.73)	0.335	Smoking	10.44*** (0.78)	0.330	Smoking	12.73*** (0.72)	0.402
Labor Force			Labor Force			Labor Force			Labor Force		
Unemployed (rate)	0.31** (0.10)	0.074	Unemployed (rate)	0.31** (0.09)	0.073	Unemployed (rate)	0.28** (0.10)	0.066	Unemployed (rate)	0.27** (0.09)	0.064
Inequality			Inequality			Inequality			Inequality		
Gini ^d	2.28** (0.70)	0.074	Gini ^d	2.28** (0.70)	0.073	Gini ^d	3.06*** (0.69)	0.099	Gini ^d	2.84*** (0.70)	0.091
N	3,070		N	3,070		N	3,070		N	3,070	
Adj. R²	0.6174		Adj. R²	0.6229		Adj. R²	0.6089		Adj. R²	0.5954	
AIC	35176.55		AIC	35134.34		AIC	35243.31		AIC	35340.98	
BIC	35381.55		BIC	35351.4		BIC	35442.28		BIC	35497.75	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p≤0.01, ***p≤0.001

Dependent variable: Female mortality (rates) in 2010 (2008-2012)

^a = Rural Urban Continuum Code (2003)

^b = (2004); (all other control variables are 2000 unless otherwise noted)

^c = Age 25+; (%)

^d = Gini Index multiplied times 100 to see increment changes

Table 16. Male Mortality Models: Census

Census	Model 1a		Model 2a		Model 3a		Model 4a		Model 5a	
	Coef	Beta	Coef	Beta	Coef	Beta	Coef	Beta	Coef	Beta
Intercept	848.79*** (9.20)	--	370.02*** (38.06)	--	425.54*** (90.58)	--	893.61*** (98.87)	--	224.58* (99.01)	--
Region										
New England (ref)	0	0	0	0	0	0	0	0	0	0
Mid Atlantic	45.60*** (12.10)	0.058	25.20* (12.29)	0.032	-40.18*** (9.54)	-0.051	-64.15*** (10.59)	-0.081	-43.41*** (9.73)	-0.055
East North Central	97.92*** (10.59)	0.201	58.15*** (10.94)	0.119	-42.22*** (9.07)	-0.087	-36.48*** (9.72)	-0.075	-42.59*** (9.11)	-0.087
West North Central	59.83*** (11.02)	0.139	16.15 (11.93)	0.038	-55.67*** (10.10)	-0.130	-78.32*** (10.89)	-0.183	-60.59*** (10.21)	-0.141
South Atlantic	174.85*** (11.37)	0.403	106.07*** (11.54)	0.244	-6.16 (9.92)	-0.014	-5.81 (10.48)	-0.013	-10.79 (9.96)	-0.025
East South Central	317.43*** (11.97)	0.602	205.48*** (12.66)	0.390	41.71** (12.57)	0.079	66.37*** (12.67)	0.126	34.89** (12.42)	0.066
West South Central	194.80*** (11.61)	0.409	89.17*** (12.88)	0.187	16.86 (11.23)	0.035	-12.66 (11.96)	-0.027	2.83 (11.31)	0.006
Mountain	23.37 (13.21)	0.039	-24.41 (13.63)	-0.041	-32.56** (12.17)	-0.054	-51.07*** (13.23)	-0.085	-36.32** (12.47)	-0.060
Pacific	-10.12 (12.89)	-0.012	-53.53*** (13.09)	-0.064	-66.46*** (11.02)	-0.079	-87.94*** (11.98)	-0.105	-69.41*** (11.06)	-0.083
RUC Code^a										
1 (ref)	--	--	0	0	--	--	0	0	0	0
2	--	--	8.72 (8.80)	0.016	--	--	-7.76 (6.94)	-0.014	-10.50 (6.71)	-0.019
3	--	--	13.09 (8.96)	0.024	--	--	-11.15 (7.31)	-0.021	-6.25 (6.99)	-0.012
4	--	--	34.51*** (9.73)	0.052	--	--	-1.02 (7.95)	-0.002	-5.60 (7.41)	-0.008
5	--	--	49.24** (14.71)	0.052	--	--	25.77* (11.74)	0.027	23.39* (10.94)	0.024
6	--	--	41.29*** (8.96)	0.097	--	--	-9.23 (7.33)	-0.022	-4.77 (7.07)	-0.011

7	--	--	28.74** (10.05)	0.059	--	--	-15.41 (8.27)	-0.032	-12.64 (7.84)	-0.026
8	--	--	7.67 (12.87)	0.012	--	--	-36.32** (10.78)	-0.056	-14.62 (10.58)	-0.022
9	--	--	11.83 (12.28)	0.023	--	--	-29.25** (10.45)	-0.058	-8.49 (10.19)	-0.017
Typology^b										
Non-dependent (ref)	--	--	0	0	--	--	0	0	0	0
Farming	--	--	-49.33*** (9.34)	-0.099	--	--	-60.50*** (8.69)	-0.121	-32.43*** (8.42)	-0.065
Mining	--	--	63.15*** (14.05)	0.073	--	--	46.83*** (11.91)	0.054	43.03*** (10.95)	0.050
Manufacturing	--	--	8.16 (5.69)	0.022	--	--	5.66 (4.90)	0.015	1.68 (4.77)	0.004
Government	--	--	-27.33** (9.25)	-0.052	--	--	-9.22 (7.30)	-0.018	-13.68 (6.96)	-0.026
Service	--	--	-79.27*** (9.44)	-0.144	--	--	-17.22* (6.93)	-0.031	-26.46*** (6.54)	-0.048
Medical Care										
Active MDs (rate)	--	--	-20.72*** (3.00)	-0.163	--	--	11.15*** (2.36)	0.088	3.83* (1.87)	0.030
Hospital Beds (rate)	--	--	2.29** (0.695)	0.069	--	--	1.76** (0.51)	0.053	1.78*** (0.47)	0.054
No Health Ins (%)	--	--	--	--	4.41*** (0.86)	0.128	1.55 (1.00)	0.045	4.18*** (0.92)	0.121
Education										
<HS ^a (ref)	--	--	--	--	0	0	0	0	0	0
HS/Some College	--	--	--	--	3.34*** (0.61)	0.145	4.08*** (0.66)	0.177	4.17*** (0.60)	0.181
4yr College +	--	--	--	--	1.75** (0.67)	0.089	-3.84*** (0.65)	-0.196	1.11 (0.69)	0.056
Race										
Other (ref)	--	--	--	--	0	0	0	0	0	0
White	--	--	--	--	-1.93*** (0.43)	-0.173	-3.69*** (0.51)	-0.331	-2.30*** (0.45)	-0.206
Black	--	--	--	--	0.17 (0.45)	0.014	-2.46*** (0.52)	-0.207	-0.57 (0.47)	-0.048
Health Indicator										
Obesity	--	--	--	--	5.55*** (1.23)	0.102	9.07*** (1.33)	0.167	6.43*** (1.28)	0.118

Physical Activity	--	--	--	--	-3.72*** (0.68)	-0.153	-5.80*** (0.71)	-0.239	-3.44*** (0.68)	-0.142
Smoking	--	--	--	--	18.95*** (0.97)	0.430	--	--	17.02*** (1.02)	0.386
Labor Force										
Unemployed (rate)	--	--	--	--	0.74*** (0.10)	0.128	--	--	0.43*** (0.10)	0.074
Inequality										
Gini ^d	--	--	12.68*** (0.93)	0.287	--	--	6.99*** (0.93)	0.158	5.40*** (0.91)	0.122
N	3,070		3,070		3,070		3,070		3,070	
Adj. R²	0.3033		0.4305		0.6269		0.6022		0.6434	
AIC	39160.44		38557.48		37252.57		37463.17		37128.8	
BIC	39214.7		38708.22		37361.1		37656.11		37333.8	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001

Dependent variable: Female mortality (rates) in 2010 (2008-2012)

^a = Rural Urban Continuum Code (2003)

^b = (2004); (all other control variables are 2000 unless otherwise noted)

^c = Age 25+; (%)

^d = Gini Index multiplied times 100 to see increment changes

Table 17. Female Mortality Models: Census

Census	Model 1a		Model 2a		Model 3a		Model 4a		Model 5a	
	Coef	Beta	Coef	Beta	Coef	Beta	Coef	Beta	Coef	Beta
Intercept	605.80*** (6.15)	--	348.73*** (29.97)	--	498.94*** (77.51)	--	849.54*** (87.54)	--	405.69*** (81.64)	--
Region										
New England (ref)	0	0	0	0	0	0	0	0	0	0
Mid Atlantic	35.40*** (7.96)	0.064	20.57* (8.07)	0.037	-25.02*** (6.84)	-0.045	-44.62** (7.67)	-0.080	-29.39*** (7.10)	-0.053
East North Central	75.18*** (7.22)	0.219	45.05*** (7.60)	0.132	-6.11 (6.81)	-0.018	-26.66*** (7.26)	-0.078	-11.99 (6.98)	-0.035
West North Central	34.04*** (7.82)	0.113	5.71 (8.57)	0.019	-15.61* (7.23)	-0.052	-56.06*** (7.73)	-0.186	-22.49** (7.40)	-0.075
South Atlantic	126.94*** (7.56)	0.416	82.05*** (7.95)	0.269	20.90** (7.36)	0.069	1.05 (7.84)	0.003	15.74* (7.56)	0.052
East South Central	218.15*** (7.95)	0.589	147.35*** (8.99)	0.398	50.17*** (8.86)	0.135	35.67*** (9.37)	0.096	44.81*** (8.94)	0.121
West South Central	151.54*** (7.92)	0.453	83.53*** (9.07)	0.250	53.42*** (8.14)	0.160	10.22 (8.66)	0.031	41.08*** (8.30)	0.123
Mountain	37.05*** (8.84)	0.088	3.98 (9.12)	0.009	25.76** (9.78)	0.061	-8.92 (10.04)	-0.021	14.42 (9.88)	0.034
Pacific	9.32 (9.31)	0.016	-19.83* (9.40)	-0.034	-2.76 (9.06)	-0.005	-39.67*** (9.72)	-0.067	-11.47 (9.30)	-0.019
RUC Code^a										
1 (ref)	--	--	0	0	--	--	0	0	0	0
2	--	--	1.91 (6.10)	0.005	--	--	-9.08 (5.29)	-0.023	-8.02 (5.04)	-0.021
3	--	--	4.01 (6.30)	0.011	--	--	-9.00 (5.51)	-0.024	-7.35 (5.08)	-0.019
4	--	--	14.37* (6.77)	0.031	--	--	-4.97 (6.00)	-0.011	-8.41 (5.40)	-0.018
5	--	--	27.72** (10.17)	0.041	--	--	17.27* (7.95)	0.026	11.27 (7.00)	0.017
6	--	--	20.46*** (6.33)	0.068	--	--	-6.20 (5.53)	-0.021	-6.15 (5.08)	-0.020

7	--	--	14.55* (7.20)	0.043	--	--	-6.04 (6.44)	-0.018	-9.67 (5.80)	-0.028
8	--	--	-6.95 (9.42)	-0.015	--	--	-25.75** (7.80)	-0.056	-19.88** (7.50)	-0.043
9	--	--	1.84 (8.78)	0.005	--	--	-11.92 (7.73)	-0.033	-9.00 (7.26)	-0.025
Typology^b										
Non-dependent (ref)	--	--	0	0	--	--	0	0	0	0
Farming	--	--	-40.79*** (6.67)	-0.116	--	--	-39.75*** (6.13)	-0.113	-20.52** (6.02)	-0.058
Mining	--	--	52.93*** (10.75)	0.087	--	--	36.81*** (9.22)	0.061	34.49*** (8.68)	0.057
Manufacturing	--	--	3.37 (4.09)	0.013	--	--	-1.08 (3.67)	-0.004	-1.05 (3.46)	-0.004
Government	--	--	-12.29 (7.01)	-0.033	--	--	-1.15 (5.21)	-0.003	-4.06 (4.77)	-0.011
Service	--	--	-55.56*** (6.48)	-0.144	--	--	-18.73*** (5.15)	-0.049	-21.60*** (4.89)	-0.056
Medical Care										
Active MDs (rate)	--	--	-14.67*** (2.18)	-0.164	--	--	2.98* (1.24)	0.033	0.78 (1.12)	0.009
Hospital Beds (rate)	--	--	1.17* (0.45)	0.050	--	--	0.92* (0.36)	0.040	0.96** (0.36)	0.041
No Health Ins (%)	--	--	--	--	-0.00 (0.66)	-0.000	-0.88 (0.75)	-0.036	0.46 (0.73)	0.019
Education										
<HS ^a (ref)	--	--	--	--	0	0	0	0	0	0
HS/Some College	--	--	--	--	1.12* (0.52)	0.064	3.39*** (0.63)	0.195	1.87** (0.56)	0.107
4yr College +	--	--	--	--	0.81 (0.56)	0.048	-2.12** (0.62)	-0.126	0.75 (0.59)	0.045
Race										
Other (ref)	--	--	--	--	0	0	0	0	0	0
White	--	--	--	--	-1.96*** (0.48)	-0.261	-3.37*** (0.53)	-0.450	-2.06*** (0.49)	-0.274
Black	--	--	--	--	-1.18* (0.52)	-0.148	-3.79*** (0.55)	-0.476	-1.45** (0.54)	-0.182
Health Indicator										
Obesity	--	--	--	--	3.92*** (0.78)	0.165	3.42*** (0.91)	0.144	3.89*** (0.81)	0.164

Physical Activity	--	--	--	--	-2.85*** (0.49)	-0.190	-6.20*** (0.53)	-0.413	-2.94*** (0.49)	-0.196
Smoking	--	--	--	--	13.21*** (0.70)	0.417	--	--	12.18*** (0.72)	0.385
Labor Force										
Unemployed (rate)	--	--	--	--	0.45*** (0.09)	0.106	--	--	0.31** (0.10)	0.074
Inequality										
Gini ^d	--	--	7.21*** (0.75)	0.232	--	--	4.65*** (0.74)	.150	2.28** (0.70)	0.074
N	3,070		3,070		3,070		3,070		3,070	
Adj. R²	0.2942		0.3996		0.6063		0.5653		0.6174	
AIC	37031.92		36551.61		35249.21		35566.72		35176.55	
BIC	37086.18		36702.35		35357.74		35759.66		35381.55	

Note. Coefficients with robust standard error in parentheses. *p<0.05, **p<0.01, ***p<0.001

Dependent variable: Female mortality (rates) in 2010 (2008-2012)

^a = Rural Urban Continuum Code (2003)

^b = (2004); (all other control variables are 2000 unless otherwise noted)

^c = Age 25+; (%)

^d = Gini Index multiplied times 100 to see increment changes

Figure 1. US Census Bureau's Divisions

Note: It is ill-advised to create monochrome choropleth maps with so many categories, but due to printing considerations, all figures are in black and white. The counties are too small to fill with patterns to differentiate either. See Literature Review section to determine which nations are which based on descriptions if colors are too similar.

Figure 2. Woodard's "American Nations"

Note: It is ill-advised to create monochrome choropleth maps with so many categories, but due to printing considerations, all figures are in black and white. The counties are too small to fill with patterns to differentiate either. See Literature Review section to determine which nations are which based on descriptions if colors are too similar.

Figure 3. Garreau's "Nine Nations"

Note: It is ill-advised to create monochrome choropleth maps with so many categories, but due to printing considerations, all figures are in black and white. The counties are too small to fill with patterns to differentiate either. See Literature Review section to determine which nations are which based on descriptions if colors are too similar.

Figure 4. Male Age-Adjusted All-Cause US Mortality with Census Divisions

Note: Rates are per 100,000 males.

Figure 5. Female Age-Adjusted All-Cause US Mortality with Census Divisions

Note: Rates are per 100,000 females

Figure 6. Male Age-Adjusted All-Cause US Mortality with Woodard's "American Nations"

Note: Rates are per 100,000 males.

Figure 7. Female Age-Adjusted All-Cause US Mortality with Woodard's "American Nations"

Note: Rates are per 100,000 females.

Figure 8. Male Age-Adjusted All-Cause US Mortality with Garreau's "Nine Nations"

Note: Rates are per 100,000 males.

Figure 9. Female Age-Adjusted All-Cause US Mortality with Garreau's "Nine Nations"

Note: Rates are per 100,000 females.

Figure 10. Male Age-Adjusted All-Cause US Mortality with Woodard, Garreau, and Census Classifications

Note: Rates are per 100,000 males.

Figure 11. Female Age-Adjusted All-Cause US Mortality with Woodard, Garreau, and Census Classifications

Note: Rates are per 100,000 females.