State Variation in Life Expectancy and Its Relationship to Internal Migration in the United States

Introduction

The mortality experience of Americans is unequal in many dimensions, and is more unequal than other nations that are comparable in standard of living (Kulkarni et al. 2011). Considering race and geography together, life expectancy differentials within the United States can be as large as twenty years between different groups (Murray et al. 2006). Previous research has explored how differences in race, socioeconomic status, and health behaviors, among many others, have resulted in inequalities in health and mortality, but geography is an important manner in which mortality can vary systematically. Deprivation is thought to be one of the primary mechanisms through which mortality varies geographically, and this topic can be found throughout the literature (Brown and Leyland 2006; Brown and Leyland 2010; Brown and Rees 2006; Pearce and Dorling 2006). Yet this relationship may deteriorate when controlling for individual level characteristics (Jongeneel-Grimen et al. 2013). However, it is clear that geography is a proxy for variation in health inputs that leads to differentials in observed mortality across space, and that there are mechanisms through which these inequalities are maintained.

The focus of this paper is the relationship between geographic mortality differentials and internal migration, specifically how the movement of individuals across space affects observed inequalities in mortality in the United States. Though there is research exploring this relationship domestically, it is a theme that is more greatly emphasized overseas (Brimblecombe, Dorling and Shaw 1999; Brown and Leyland 2006; Hu, Cook and Salazar 2008; Rasulo et al. 2012). Current scholarship lacks consensus as to the effect of internal migration on mortality differentials. Some studies suggest that population movement tends to exacerbate inequalities (Harper 2006; Hu et al. 2008; Jongeneel-Grimen et al. 2013). Many other studies do not offer strong support for any positive or negative effect, and there are those that suggest that migration may attenuate inequality in health and mortality (Jongeneel-Grimen et al. 2011). The goal of this paper is to add to this discussion, and to do so by exploring the United States context. The analysis measures mortality on the state level, and uses a lifetime measure of migration.

The importance of this issue should not be understated. There are many studies that explore regional mortality differentials in the United States, and though many do address migration, it is not often the focus of the discussion (Ezzati et al. 2008; Fenelon 2013). Internal

migration as it relates to geographic mortality differentials cannot be ignored, as it may be scale dependent (Dunn, Schaub and Ross 2007), and could also depend on what causes of death are investigated (Larson, Bell and Young 2004). In addition, the choice of when and how to measure migration undoubtedly has an effect on the result (Jongeneel-Grimen et al. 2013). As a result, any study examining regional differentials in health and mortality must give more than a cursory glance to the effect of internal migration. Beyond this, if migration does indeed attenuate inequality, then the health situation for those in truly deprived areas may be understated in general discourse, and thus does not truly reflect the seriousness of the situation in these areas. Essentially, the direction of the effect is very policy relevant.

Data, Methods, and Expected Findings

The data for this analysis originates from two sources. Mortality data is taken from the US National Vital Statistics System through the Multiple Cause of Death public-use microdata. Three years of deaths are used for each year of analysis, in order to follow conventional methods in creating state-level life tables. The death records contain information on the state of birth, state of residence at death, sex, and age, among a host of other information about each individual. Population denominators for the calculation of death rates are obtained using information from the 5% sample of the appropriate US Census or the American Community Survey (for later years). This data was accessed through IPUMS, and uses person weights. Since state of birth and state of death are used to define all deaths and exposure terms, all the analyses exclude the foreign born and those residing outside the United States.

Mortality rates are constructed as any demographic rate, with events in the numerator and an exposure term in the denominator. The deaths in the three years are pooled and used for the numerator, and they are classified by state of birth and state of residence at death, in addition to age and sex. Population denominators are similarly indexed. In order to ensure the numerator and denominator refer to the same interval of time, the death counts in the numerator are divided by three. The mortality rates are then grouped into life tables by state and sex, and five different tables are used for comparison: each state-sex pairing has a residence, inmigrant, nonmover, outmigrant, and nativity life table. The residence life table is the typical life table used to summarize mortality conditions by state, and it includes all people dying in that state, regardless of birthplace. The inmigrant life table only considers individuals dying in the designated state who were born elsewhere. In the nonmover life table, place of birth and place of death must be

the same. The outmigrant life table summarizes mortality conditions for those who were born in the indicated state but died elsewhere. Finally, the nativity life table is composed of all individuals born in the specified state, regardless of location of death. The migration statuses used to define each table are lifetime measures of migration, which capture early life experience, an element that exerts a strong effect on eventual mortality. The main outcome measure is life expectancy at age 15 (e15), which is used to eliminate the effects of early life mortality, especially infant mortality. However, other measures will be explored.

The residence life table is the usual state-level life table. The nonmigrant life table includes only individuals that are indexed in the same state at birth and death. The nativity life table represents a re-shuffling of the population to their state of birth. The first measure can be thought of as a world where migration occurs, while the latter two represent a hypothetical world without internal migration. By comparing these two worlds, the analysis can look at differences that may be attributable to migration. The values from these tables are used to calculate measures of inequality between states, including the Gini coefficient and the slope index of inequality. It is through the analysis of these inequality measures that an argument can be constructed.

An earlier version of this analysis only examined the year 2000, and the focus of the first draft was very different. However, preliminary results from that version suggest that internal migration may attenuate life expectancy differentials between states. However, only one inequality measure was calculated, and only e15 was used. The hope for this analysis is to utilize more mortality measures (to include temporary life expectancy), to calculate several more inequality measures (as they are subject to different biases), and to look over time at how the effect may have changed.

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