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The influence of state policy and proximity to medical services on health outcomes

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ABSTRACT

This paper examines two factors that help to explain geographic variation in health outcomes. The first factor concerns proximity to medical services. The second factor is state-specific health care policy that may impede access to nearby medical services. Four key findings are obtained. First, the effect of local doctors on reducing mortality rates of various diseases in a county attenuates with distance. Second, at approximately the same distance, in-state doctors contribute more to lowering mortality rates in the primary county than do out-of-state doctors. Third, the lesser impact of nearby out-of-state doctors is further reduced when the primary state adopts more stringent policies that restrict entry of out-of-state physicians. Fourth, the impact of nearby doctors is found to be stronger in more urbanized areas. This is consistent with agglomeration economies being effective in contributing, at least in part, to the productivity of treating patients.

1. Introduction

Mortality rates for heart disease, cancer, and stroke differ dramatically across locations in the United States. As shown in Figs. 1a–1c, mortality rates associated with these diseases are generally the highest in certain eastern rural states, such as West Virginia, Alabama, Mississippi, and the lowest in states like Utah, Arizona, and New Mexico. Traditional explanations for geographic variation in health outcomes have mainly focused on the impact of health care expenditures and environmental factors.[1] This paper extends the literature by examining the effect of proximity to medical professionals on local population health outcomes and the degree to which state physician licensing policies reduce the impact of out-of-state physicians. A better understanding of these factors is important for improving national health since restricted access to medical services is one of the leading causes for poor health outcomes in lightly developed areas.[2]

The focus on proximity to medical professionals in explaining local health status is motivated by sharp urban–rural differences in patient outcomes.[3] Using data from the Compressed Mortality File (CMF), Table 1a reports mortality rates from heart disease, cancer, and stroke for areas with different degrees of urbanization. As shown in the table, mortality rates are significantly lower in large cities relative to small cities or remote "non-core" areas. For instance, while the mortality rate for heart disease is as low as 214 per 100,000 residents for large metropolitan areas, it rises up to 248 per 100,000 residents for "non-core" areas. Similar patterns can also be found for cancer and stroke.

One possible explanation of this phenomenon is that larger metropolitan areas provide residents with better access to medical services. This is suggested by Table 1b, which shows that medical services, as measured by the number of doctors per capita, are highly concentrated in large cities. For instance, more than 100 cardiologists per ten million residents are present in large metropolitan areas, but only 28 are present per ten million residents in lightly developed "non-core" areas. This, together with Table 1a, further suggests that better access to medical professionals likely contributes to lower mortality rates from heart disease, cancer and stroke.

A second factor that may also help to explain lower mortality rates in large cities is that doctors may be more productive in

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[1] Previous studies examining the impact of health care expenditures find inconsistent evidence. Studies using available cross-sectional datasets show almost complete absence of a positive relationship between expenditures and the quality of care (Fisher et al., 2003a, 2003b; Baicker and Chandra, 2004; Fisher et al., 2009). In contrast, instrumental variables and panel data evidence suggest that higher spending is associated with significantly lower mortality (McClellae et al., 1994; Cutler, 2007; Chandra and Staiger, 2007; Doyle, 2011).

[2] See, for example, Casey et al. (2001), and Coughlin et al. (2002).

[3] In the United States, residents in rural areas generally have poorer health than those in more urbanized areas. See, for example, Eberhardt and Pamuk (2004), Eberhardt and Ingram (2001), and Ricketts (1999).

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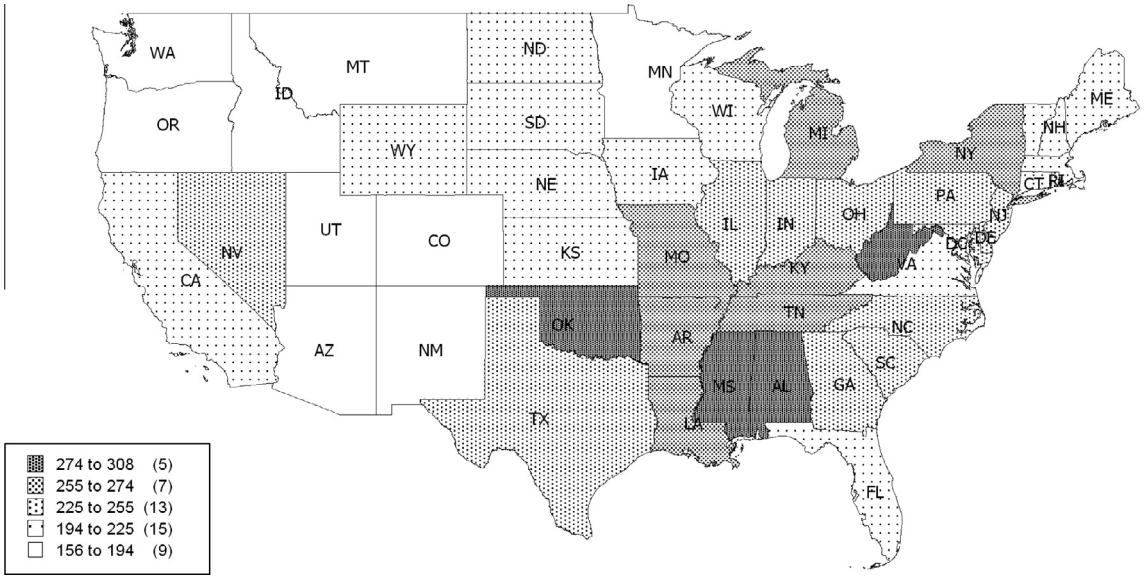

Fig. 1a. State variation in mortality rates (per 100,000 residents) for heart disease.

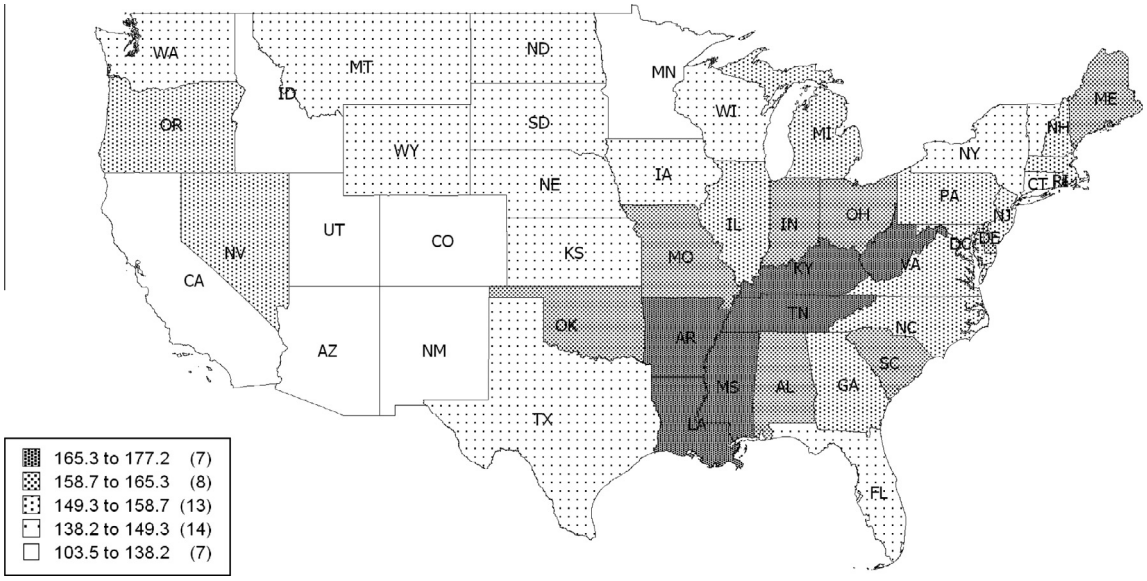

Fig. 1b. State variation in mortality rates (per 100,000 residents) for cancer.

urban areas populated with large numbers of medical professionals. This would be consistent with literature on agglomeration economies, which has provided evidence that productivity is often enhanced when companies operate in agglomerated locations.[4] The increase in productivity is thought to arise from a combination of learning from nearby workers and firms (i.e., knowledge spillovers), sharing of valuable intermediate input providers (i.e., input sharing), and/or opportunities to draw upon skilled pools of nearby labor (i.e., labor market pooling).[5]

Both explanations suggest that the impact of doctors on local patient outcomes will diminish with distance. High travel costs associated with long distances impede access to nearby medical services. Potential spillover effects that may enhance physician productivities in treating patients also tend to attenuate with distance, as suggested in the literature.[6]

The first goal of this paper is to examine the extent to which proximity to medical services affects local patient outcomes and how quickly the impact of nearby doctors attenuates with geographic distance. To this end, I examine the impact of key features of the local medical industry (e.g., the number of physicians) in two concentric rings that extend out to fifty miles from the geographic centroid of a primary county.[7] As will become apparent, the medical environment in the inner ring has a notably stronger effect on nearby population health outcomes.

[4] This idea is introduced in Marshall (1920) and surveyed extensively in later literature (Quigley, 1998; Rosenthal and Strange, 2004; Glaeser and Gottlieb, 2009).

[5] See, for instance, Glaeser and Maré (2001), and Moretti (2004) for evidence of knowledge spillovers, Holmes (1999), Ellison et al. (2010), and Li (2013) for evidence of input sharing, and Rosenthal and Strange (2001), and Costa and Kahn (2000) for evidence of labor market pooling.

[6] See, Rosenthal and Strange (2003, 2005, 2008), Andersson et al. (2009), and Arzaghi and Henderson (2008).

[7] As a comparison, the median of county area in the United States is 645.18 square miles, which corresponds to a circle with a 14.33-mile radius; the seventy-fifth percentile is 973.41 square miles, which corresponds to a circle with a 17.61-mile radius.