

The Impact of Primary Care and What States Can Do

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Despite the availability of evidence on the benefits of primary care on population health, little has been done to incorporate this evidence into planning for and evaluation of health services in the United States. In contrast, many industrialized nations have undergone major health system reform to make primary care the essential infrastructure of their health system. Some of these reforms resulted from legislation, as was the case in Spain and Australia, and others have entailed policy decisions to strengthen the practice of good primary care, as has occurred in the United Kingdom (UK) and is now occurring in various aspects of primary care in Sweden, France, and Germany. The reasons the US has not embraced primary care are complex and get to the heart of the characteristics of the US health services system, particularly its increasing dominance by special interest groups such as the academic medical establishment and specialty orientation, medical device manufacturers, and fee-for-service reimbursements that favor specialty practice.¹

In this paper we briefly review the evidence for the impact of primary care in improving health, increasing equity, and reducing total health system costs; discuss the rationale for benefits of a primary care orientation within health services systems; and conclude with a discussion of needed additional research and policy attention.

Benefits of primary care

The first systematic study of the benefits of primary care on health and costs of care consisted of an international comparison of 11 western industrialized nations using data from the mid-1980s.² The study was repeated a decade later with 13 countries including Japan.³ Both studies rated

countries on policy characteristics encouraging primary care and practice characteristics reflecting primary care organization: first contact care; person-focused care over time; degree of comprehensiveness within primary care; and coordination of care. The studies were consistent in showing that some countries rated very poorly on primary care whereas others rated better. Those in the former group had poorer health on many population health measures including but not limited to life expectancy at various ages, age-adjusted mortality, and infant mortality (neonatal and postneonatal separately). They also were more costly health systems. These findings were robust and persisted even after controlling for various health-related characteristics of the population (such as extent of risky behaviors in the population). Confidence in the findings was provided by a pooled time series analysis of 18 Organization for Economic Co-operation and Development (OECD) countries that controlled for additional health and health system-related characteristics (such as percent

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elderly, gross domestic product, and total number of physicians). This analysis showed that life expectancy in countries with weak primary care was lower than that in countries with stronger primary care, and that this difference had been widening over time.⁴

Although there is additional evidence of similar benefits of primary care from other studies,⁵ in this paper we focus primarily on findings from studies of US states because of the particular interest of North Carolina in the physician workforce. In all studies we included as primary care physicians, family physicians and general practitioners, general internists, and general pediatricians because earlier evidence showed that these “specialties” rated higher on primary care characteristics than did other specialties.⁶

Primary Care in US States

In the 1990s, a series of studies examined and found a significant and positive relationship between the supply of primary care physicians and a variety of measures of health including all-cause mortality, mortality from heart disease, cancer, and stroke, infant mortality, low birth weight, and self-reported health, even after controlling for personal and environmental characteristics at the state level including education, income, environmental pollution, unemployment, percentage elderly, percentage urban, minority composition, and lifestyle factors including seatbelt use, obesity, and smoking.^{7,8,9}

Consequent to the appearance of new literature on the relationship between income inequality at the state level and some health outcomes,^{10,11} a series of analyses was designed to examine the relationship between primary care physician supply and health measures at the state level, while also considering the influence of income inequality in the state. In 1999, Shi and colleagues¹² showed that both income inequality and primary care physician supply had strong relationships with life expectancy, all-cause mortality, stroke mortality, and postneonatal mortality. They also found that smoking rates were related to these outcomes, but the influence of primary care physician supply persisted after controlling for smoking rates.

Subsequent studies refined the analysis to take account of possible other influences on population health levels including the supply of other specialists. In both time-lagged as well as contemporaneous studies, the supply of primary care physicians was associated with lower all-cause mortality whereas a greater supply of specialists was associated with higher rates of all-cause mortality. Furthermore, the beneficial influence of primary care physicians was entirely due to the supply of family physicians (rather than general internists and pediatricians).¹³ Additional confirmation of these positive impacts of primary care physicians came from studies of mortality from stroke, using 11 years of state-level data and adjusting for degree of income inequality, educational level, unemployment rates, racial/ethnic composition, and percentage of the population living in urban areas.¹⁴ The benefit on stroke mortality of better access to primary care is consistent with hypothesized mechanisms by which better primary care is associated with earlier and better control of common risk factors for stroke (especially hypertension). Similarly, the reduction

in low birth weight and infant mortality (especially postneonatal mortality), even after one-, three-, and five-year lag periods, is associated with primary care physician supply,¹⁵ a finding that is consistent with better maternal health before pregnancy and better availability of resources to deal with infections – a common cause of death in the postneonatal period.

Analyses of the impact of access to primary care, and to different levels of quality of primary care services, are all consistent in showing that the greater the access to primary care and the better the quality of primary care, the better the health—regardless of the measure of health—whether at the aggregate or individual level of analysis. These benefits have also been quantified. Macinko and colleagues¹⁶ identified 10 studies that met the criteria for adequacy of study of the relationship between primary care physician supply and all-cause mortality; cancer, heart disease, stroke, and infant mortality; low birth weight; life expectancy; and self-rated health. The relationship held regardless of the year studied (from 1980-1995) and geographic level of analysis. Pooled results for all-cause mortality indicated that an increase of one primary care physician per 10 000 population was associated with an average mortality reduction of 5.3%, or 49 deaths per 100 000 population per year.

Additional analyses within some of these studies indicate that the beneficial impact of primary care on African Americans was even greater than for the majority population—evidence of an equity-producing effect of primary care.⁵

A wide variety of other studies conducted at different levels of geographic aggregation (metropolitan, county, urban, rural areas), both in the US and in the UK, support the conclusions of the US state-level analyses, with a few exceptions. For example, Ricketts and Holmes,¹⁷ using pooled 1996-2000 US county data, found that the association between primary care physician supply and mortality was not uniformly observed, and that strong regional patterns may explain the lack of a consistent national association based on their county-level data. Primary care physician supply was associated with decreased mortality on the East Coast and in the upper Midwest, but that correlation disappeared or was reversed in the west (with the exception of Washington state) and south central states. Further study is needed to understand these regional differences and policy alternatives to address them because it is likely that the balance between the supply of primary care and specialist physicians and the influence of major medical centers (with their strong specialty focus) have an influence on people's use of primary care rather than specialty care. Overall, these empirical analyses (particularly at the state level, where there is less of a “cross-over” effect, ie, people seeking medical care across state borders) are consistent with theoretical considerations as to why primary care should have a beneficial impact on population health. Primary care is more accessible than specialty care, and its individual features (first contact care, person-focused care over time, comprehensiveness of care, and coordination of care) have all been shown to produce better outcomes.^{5,18} International comparisons of countries show that, of the 4 features just mentioned, comprehensiveness of the package of services offered in primary care practices is the practice characteristic most consistently

associated with better primary care overall.³ That is, the more aspects of health care that are covered in primary care, the better the health outcomes, at least partly due to fewer unnecessary referrals to specialists. Common problems belong in primary care; less common or rare ones belong in specialty care because the training of specialists in tertiary medical centers better suits them to care for people who have been filtered by primary care and thus have a higher likelihood of serious or more uncommon illness. When patients go directly to specialty care, much of their care is inappropriate, as they are suffering from illnesses that are common in the population and thus better dealt with by physicians with training in how illness presents in the community, ie, primary care practitioners. As a result, US studies show that higher ratios of specialists to population are often associated with worse outcomes for common causes of mortality and morbidity.¹⁹

Popular belief that specialist care is superior to primary care is contradicted by the results of a variety of studies in which the outcomes are generic, ie, not specific to particular diseases. In this category are life expectancy, all-cause age-adjusted mortality, self-reported health, and low birth weight. In fact, for common causes of death, such as acute myocardial infarction, the outcomes are equally good for family physicians as for cardiologists, once a variety of patients' characteristics are taken into account.²⁰ The fact that generalists' patients are usually sicker than the patients of specialists in studies of this type provides clues about why direct access to specialists leads to worse population outcomes. Because of where specialists are usually trained, they are unaccustomed to seeing patients other than those with problems clearly in their field of specialty; these patients are not representative of patients in the community because the general population of patients has more comorbidity and a more complex pattern of illnesses, even though any given problem seen in a specialty clinic is more likely to be serious than the same problem in the community. Specialists thus learn to do more testing than would be necessary in generalist practice, with consequently more false positive results, adverse effects from the resulting cascade of tests, and with much higher costs.

What Can States Do to Maximize Population Health Through Workforce Policy?

In the absence of federal efforts to reform health care financing and to enable either a single payer system or more uniform health insurance policies through regulation of the many insurance programs, states have a limited number of options to encourage greater and better provision of primary care. At the very least, they can initiate policies to target state funding of medical teaching programs to institutions focusing on primary care training and provide greater financial support (as through loan forgiveness) to physicians who specialize in primary care. They also can encourage or mandate lower payments to specialists for patient visits NOT made by referral from a primary care practitioner. Additionally, they can increase reimbursement rates to providers who demonstrate that they deliver primary care in ways to achieve its benefits; instruments are available to document the primary care orientation of practices.¹⁸

States could also encourage professional collaboration to develop guidelines for referral or at least to examine the nature of the relative contributions of primary care practitioners and specialists in the care of people with particular health problems or combinations of health problems. The important characteristics of primary care are well known; the same is not the case for specialist practice.¹⁹ As licensing of medical practitioners is the jurisdiction of states, new licenses could be granted to practice in the state only for areas needing physicians, thus enabling more equitable distribution of both primary care and specialist physicians. Where states have jurisdiction over reimbursement for services, they can use this power to better equalize professional earnings of primary care and specialist physicians. States could also, through their support of medical training programs, require that physicians in training evaluate their own practices with regard to the costs of care that they generate, improvement of the patients' problems (not only biomedical markers for the disease of particular interest) as a result of their interventions, and occurrence of adverse effects consequent to their interventions. And, through the National Governors Conference, states could bring pressure on the federal government to develop a workforce policy that is better informed with evidence on population health needs and maldistribution of the physician workforce.

State efforts to use existing evidence to develop their own workforce policies could be key in improving the poor position of the US, relative to other industrialized countries, with regard to the population's health. **NCMJ**

REFERENCES

- 1 Bodenheimer T, Berenson RA, Rudolf P. The primary care-specialty income gap: why it matters. *Ann Intern Med.* 2007;146(4):301-306.
- 2 Starfield B. Primary care and health. A cross-national comparison. *JAMA.* 1991;266(16):2268-2271.
- 3 Starfield B, Shi L. Policy relevant determinants of health: an international perspective. *Health Policy.* 2002;60(3):201-218.
- 4 Macinko J, Starfield B, Shi L. The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970-1998. *Health Serv Res.* 2003;38(3):831-865.
- 5 Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q.* 2005;83(3):457-502.
- 6 Weiner JP, Starfield B. Measurement of the primary care roles of office-based physicians. *Am J Public Health.* 1983;73(6):666-671.

- 7 Shi L. The relationship between primary care and life chances. *J Health Care Poor Underserved*. 1992;3(2):321-335.
- 8 Shi L. Primary care, specialty care, and life chances. *Int J Health Serv*. 1994;24(3):431-458.
- 9 Vogel RL, Ackermann RJ. Is primary care physician supply correlated with health outcomes? *Int J Health Serv*. 1998;28(1):183-196.
- 10 Kennedy BP, Kawachi I, Prothrow-Stith D. Income distribution and mortality: cross sectional ecological study of the Robin Hood index in the United States. *BMJ*. 1996;312(7037):1004-1007 (Erratum: *BMJ*. 1996;312(7040):1194).
- 11 Kaplan GA, Pamuk ER, Lynch JW, Cohen RD, Balfour JL. Inequality in income and mortality in the United States: analysis of mortality and potential pathways. *BMJ*. 1996;312(7037):999-1003.
- 12 Shi L, Starfield B, Kennedy BP, Kawachi I. Income inequality, primary care, and health indicators. *J Fam Pract*. 1999;48(4):275-284.
- 13 Shi L, Macinko J, Starfield B, Wulu J, Regan J, Politzer R. The relationship between primary care, income inequality, and mortality in US states, 1980-1995. *J Am Board Fam Pract*. 2003;16(5):412-422.
- 14 Shi L, Macinko J, Starfield B, Xu J, Politzer R. Primary care, income inequality, and stroke mortality in the United States. A longitudinal analysis, 1985-1995. *Stroke*. 2003;34(8):1958-1964.
- 15 Shi L, Macinko J, Starfield B, et al. Primary care, infant mortality, and low birth weight in the states of the USA. *J Epidemiol Community Health*. 2004;58(5):374-380.
- 16 Macinko J, Starfield B, Shi L. Quantifying the health benefits of primary care physician supply in the United States. *Int J Health Serv*. 2007;37(1):111-126.
- 17 Ricketts TC, Holmes GM. Mortality and physician supply: Does region hold the key to the paradox? *Health Serv Res*. 2007; in press.
- 18 Starfield B. *Primary Care: Balancing Health Needs, Services, and Technology*. New York, NY: Oxford University Press; 1998.
- 19 Starfield B, Shi L, Grover A, Macinko J. The effects of specialist supply on populations' health: assessing the evidence. *Health Aff*. 2005 March 15;W5:97-107. <http://content.healthaffairs.org/cgi/reprint/hlthaff.w5.97v1>. Accessed April 12, 2007.
- 20 Hartz A, James PA. A systematic review of studies comparing myocardial infarction mortality for generalists and specialists: lessons for research and health policy. *J Am Board Fam Med*. 2006;19(3):291-302.