Population Health and Economic Development in the United States

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THE RELATIONSHIPS BETWEEN HEALTH AND ECONOMIC conditions have been known for many years.[1-3] Richer nations generally have better overall health conditions than do poorer nations and more affluent individuals within a country have, on average, better health than do poorer individuals. Also, less healthy individuals enter the labor market less often, work fewer hours, and earn lower wages, with direct financial consequences to themselves, their families, and the businesses for which they work.

An expanded understanding of the relationship between health and macroeconomic performance is that "health is an economic engine."[2,3] This concept proposes that better population health leads to economic growth. The World Health Organization has supported this concept to encourage direct international investment in health-promoting services in developing nations as a means to advance economic growth.[3] This concept of health as an economic engine also has important implications for US domestic health policy.

From Population Health to Economic Development

Improved population health may promote economic growth through many paths.[2,3] At a basic level, better population health reflects the improved health of many individuals, and better individual health increases individual economic productivity. Health improvements that extend healthy life may result in an increase in working years to prolong the duration of economic productivity. Interventions that enhance the quality of life may increase the economic output of each year of life. Improvements in survival and health in the United States from 1970 to 1999 increased the value from the output of the formal labor force by as much as 8%.[4]

Improved population health also promotes macroeconomic development by increasing savings that provide financial capital for investment. A 10-year increase in life span is associated with an increase of 4.5 percentage points in savings rates because healthier individuals with increased longevity are more concerned with future financial needs.[5] Moreover, in a healthier population, a smaller proportion of available funds is required for current health care, making more funds available for investment and other needed infrastructure projects.

In addition, better population health encourages outside investment, technology transfer, and access to global markets. Poor health conditions raise concerns about the capability of the local workforce to meet the needs of investors. Each additional year of life expectancy in developing nations is associated with a 7% increase in foreign investment.[6]

Another link between health and economic development is mediated by education. Unhealthy children are not prepared for school, miss more days of school, attend school for fewer years, and learn less when in school. An increase in average longevity is associated with an increase in the length of education, and each additional year of schooling results in a 15% higher starting wage and a doubling of the rate of subsequent salary increases.[7]

An additional long-term macroeconomic effect of health on economic development is mediated through the relationship between health and birth rates.[8] Less healthy societies typically have higher birth rates and larger families than healthier societies. High birth rates and more children per family often reduce parental investment per child in, for example, education, and thereby slow economic development. An increase of 1 percentage point in the growth rate of the population younger than 15 years is associated with a 0.4% decrease in the rate of growth of gross domestic product per capita.[8]

Improvements in childhood health can have powerful positive economic effects. Parents eventually respond to lower childhood death rates by having fewer children. This set of events leads to a bulge in the age distribution of the population. As relatively large population cohorts reach the age at which they constitute the working-age population, a variety of mechanisms (involving labor supply and savings) come into play and may spur economic growth. As much as one-third of the recent rapid economic growth of east Asia might be attributed to this demographic dividend.[8]

The influence of population health on economic development is substantial. Historical studies[9] have found that half of the overall economic growth in the United States during the last century may be associated with improvements in popu-

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lation health. Cross-national studies[3] also have shown that the 27-year difference in the life expectancy between a typical low-income and a typical high-income country (ie, a life expectancy of 51 vs 78 years) is associated with a difference of 1.6 percentage points in annual economic growth rates. Although the evidence is not decisive, the statistical methods used in many of these studies suggest that these growth differentials might be interpreted as causal effects. The magnitude of these changes is apparent in comparison with the worldwide increase in gross domestic product from 2004 to 2005 of 2.3% and when compounded over multiple years.

Implications for US Health Care Policy

The macroeconomic effects of improved health are of considerable magnitude, are long lasting, and affect everyone in a country—not only those who are not in good health. Health is a form of human capital that is an important input into the economic system as a factor of production, not simply a valued consumption good resulting from health care expenditures. The newer concept argues for direct, well-chosen investments in health and envisages that economic improvements will follow, whereas the classic model argues that health can be improved only when the overall economy becomes stronger.

Application to the United States. There is reason to believe that these concepts promoted for the developing world broadly apply within the United States. More than 11 million southern, low-income, and urban blacks have health outcomes worse than residents of low- to middle-income developing nations.[10] Individuals residing in particularly unhealthy places, including the Appalachia and the lower Mississippi River Delta regions, are also among the poorest, with income levels comparable with those in developing countries. Other aspects of the evidence also have parallels within the United States. For example, the evidence that poor health deters foreign investment in developing nations also may relate to transregional investments within the United States.

Health as Human Capital. A major implication of health as an economic engine model is that population health is a major component of human capital in the form of health capital that contributes to the generation of output and income. Individuals are born with a certain amount of health capital that declines with age and with disease; health capital can be increased, as with other forms of capital, by purposive investment (ie, by interventions that reduce morbidity and mortality).[11] Although traditional studies have focused on education and on-the-job training as primary determinants of human capital, the large economic influence of health places it as an equivalently important source of human capital.

Health as an Investment. Because health is a form of capital, the cost of improving health is much like an investment and not simply a consumption expenditure. As an investment, health care can be considered to be similar to other investments made by businesses or governments to build industrial or public infrastructure.

Improving health may be an economically productive investment. A 10% reduction in heart disease mortality is estimated to be worth more than $4 trillion and a 1% reduction in cancer mortality is estimated to be worth more than $400 billion to current and future generations.[12] New treatments for low-birth-weight infants developed between 1950 and 1990 add $40 000 of health care costs for each infant, whereas the present value of the resulting 12-year increase in longevity is estimated to be $240 000 per individual—for a 6:1 return on the investment.[13] In contrast, detrimental behaviors, such as cigarette smoking, have high economic costs.

The role of health as an investment does not supplant but rather extends the conventional view of economic development as a precursor to improved health. The 2 models interact and can produce either a health-poverty trap or a virtuous cycle.[2] Poor health limits economic growth which, in turn, inhibits health improvements, resulting in a vicious cycle that is difficult to escape. In contrast, improved health contributes to greater economic development, and the resulting increase in wealth contributes to a further increase in health. This interaction produces a virtuous cycle. Because of these cycles, an appropriately timed, specific intervention to improve health may have long-term economic benefits, whereas a short-term, acute health shock to the economy or to an individual may lead to long-term economic loss that is difficult to recover.

Intervening for Health Improvement. These concepts suggest that interventions to improve health are both strategic economic and humanitarian efforts. The interventions must address the broad determinants of health such as increasing health-promoting personal behaviors, reducing environmental health hazards, and improving basic social systems that facilitate health rather than only or predominantly medical care.[14]

The concept of a virtuous cycle suggests the possibility of intervening in a region with both health deficits and economic poverty with either a primarily economic or a primarily health intervention, or a combination of the 2. An initial health intervention may be more beneficial and may be a necessary parallel or sequel to economic interventions because limits in human capital may constrain the effective application of expanded fiscal capital.

There are, however, reasons to be cautious in applying these concepts within the United States. The greatest influence of health on development occurs at the lowest levels of national income,[1] which may be exceeded in poor regions of an overall wealthy nation, although the relationship between lower- and higher-income populations also may apply to poor regions in an otherwise wealthy nation. Health and wealth dynamics also may differ between poor regions of relatively wealthy nations and poor nations. For example, the diffusion of resources and information from richer to poorer regions within a country may be better than between richer and poorer nations.

Increasing direct financial support for health-promoting activities is not the sole solution to poor health, and health gains are not a panacea for poverty. The economic value of health interventions will vary with the cost and effectiveness of the in-

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tervention and the size and characteristics of the population that is targeted. Many clinically proven interventions are relatively cost-effective but not cost saving and may affect only small portions of an overall population,[15] and some clinically effective interventions do not have positive rates of return as investments.[13] Also, many nonfinancial barriers to health improvement must be overcome and other nonhealth problems must be addressed for health effects to translate into economic gain. The outcome depends on the political commitment to improving health, the political and policy decisions that are made, and the prioritization of needs and deployment of resources within a society. What is important is that the role of health as a productive economic investment be captured and that focused efforts to improve health should be part of the economic development plan.

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Health Care Reform Requires Accountable Care Systems

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MOST HEALTH CARE REFORM PROPOSALS FOCUS ON expanding health insurance to cover all US individuals. But the companion challenge is how to make such coverage affordable given the fragmentation, waste, and variation in quality of care of the current delivery system. Comprehensive health care reform will require proposals that both expand coverage and redesign the delivery system so as to achieve greater value for the increased investment.

At the heart of the challenge is transforming a 19th-century craft-oriented delivery system to provide 21st-century biomedical science and technology. Most physicians still practice alone, in partnerships, or in small groups. Small practices generally have less capacity to implement electronic medical records, less frequently use teams to care for patients with chronic illness, and are less able to provide statistically reliable and valid data on quality and efficiency measures. A more solid foundation of physician organizations is needed to avoid having the system crumble under the increased weight of greater demand for care and technological advances.

Accountable Care Systems

To address this challenge, we propose the concept of accountable care systems (ACS). An ACS is an entity that can implement organized processes for improving the quality and controlling the costs of care and be held accountable for the results. These entities also might be called accountable care organizations,[1] but the term system is preferred because systems of care must be established to assume responsibility for patients across providers (eg, physicians, nurse practitioners, other clinicians, etc) and settings (eg, hospitals, nursing homes, etc) over time. An ACS may be made up of several or many accountable care organizations covering the continuum of care (ie, outpatient, in-patient, home health, rehabilitation, long-term, and palliative care). We suggest 5 different ACS models: multispecialty group practice, hospital medical staff organization, physician-hospital organization (PHO), interdependent physician organization, and health plan–provider organization or network.

Multispecialty Group Practice. The potential advantages of the multispecialty group practice model were recog-

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