



Editorial

The social determinants of health



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The determinants of health that most physicians focus on include biologic factors such as genes, biology, and pathogens, but health and health outcomes are also determined by important social factors. These social determinants include socioeconomic conditions, poverty, quality and level of education, access to employment, social and physical infrastructure, behaviors, social support and norms, public safety, and other factors. I was not taught about the social determinants of health in medical school or residency and rarely read about it in journals or other medical information. However, as I have cared for patients, I have seen the consequences that social factors have for people's health, quality of life, and longevity.

Recently I have been motivated to learn more about the social determinants of health because of the choices that we in the United States will need to make about controlling the rising costs of medical care and in controlling expenditures by government, businesses, and individuals.

The support and development of modern biomedical science and the translation to health care practice has made an incredible difference for some patients and has transformed

what we can do to care for and treat illness and disease. For example, our investment in medical research rapidly resulted in sequencing of the human genome which has helped us understand single gene related diseases and how changes in our DNA increase susceptibility to some diseases. Recently, teams of scientists have reported on how much of our DNA functions to up or down regulate genes and that these genomic switches may help us find the final common pathways in many diseases and illnesses. This is important progress. However, most of the improvements in lifespan, quality of life, infant mortality, and other indicators of public health actually occurred prior to the discovery of the causative factors of diseases and preceded the widespread use of vaccines, antibiotics, and other modern medical treatments.

We have learned that health is dramatically influenced by physical and social factors in our environment, and these social determinants of health markedly influence individual and population differences in health and health outcomes. It has been estimated that only about five years of the almost thirty years of increase in life expectancy in the United States has been due to preventive and therapeutic medicine.

Former chimney sweeper Mose Noble's kitchen is seen in Booneville, Kentucky. Mario Tama/Getty Images.



Johnny Noble, 9, sits in Mose's trailer during a visit on April 21, 2012 in Owsley County, Kentucky. Mario Tama/Getty Images.

Approximately eighty percent of improvement in life expectancy and health outcomes has been attributed to improvements in the social determinants of health, including income, sanitation, nutrition, education, and general conditions of life. Important examples of health outcomes affected by social determinants include: infant mortality, lifetime risk of maternal death, life expectancy at birth, prevalence of long-term disabilities, quality-of-years, and others.

Most of our attention in the United States has been on medical care or sickness care for individuals and the related costs of providing medical care with much less focus on our population's health. As dramatic and consequential as medical care is for some individual patients, medical care is not the major determinant of overall levels of our population's health.

Perhaps the most important contributor to poor health is poverty. Poverty leads to unhealthy behaviors, chronic stress, and few resources for good health or access to preventative and medical care. Poor health and associated disabilities related to poverty compromise the ability to get an education, to enter the work force, to advance to higher levels of income, to work on a regular basis, and to function at a satisfactory level. The official poverty rate in the United States in 2011 was fifteen percent or about 46.2 million people, including about 16 million children. Although the poverty rate is not increasing, median household income declined by 1.5 percent in 2011.¹ This also means that people have less discretionary income for health and health care.

The Whitehall II study in the United Kingdom, begun in 1985 and still ongoing, followed fully employed civil servants with universal health care coverage. The study demonstrated

a social gradient in death and disease for men and women, with a four-fold difference in death rates between the bottom grade (clerical and other) and the top grade (administrative and professional/executive) for those aged forty to sixty-four who were followed for ten years. Although the gradient was less for the cohorts aged sixty-five to sixty-nine and seventy to eighty-nine, it was still significant. The study concluded that "the more senior you are in the employment hierarchy, the longer you might expect to live compared to people in lower employment grades." The researchers subsequently documented a similar gradient in morbidity. They also found a social gradient for lifestyle and other risk factors, including smoking, lack of physical activity, obesity, plasma cholesterol, and blood pressure. These lifestyle and risk factors accounted for about one-quarter of the social gradient in health outcomes. This gradient was observed for those with heart disease, some cancers, chronic lung disease, gastrointestinal disease, depression, suicide, sickness absence, back pain, and general feelings of ill health.^{2,3}

An American study published in the *American Journal of Public Health* in 1997 classified people according to household income and demonstrated a continuous gradient in mortality, with the poorest having the highest mortality rates, the middle income group intermediate mortality rates, and the higher income group the lowest mortality rates.⁴ Many other studies have confirmed that poverty, social class, and other social factors affect health outcomes.

Education is another important determinant of health. Higher levels of education equip people with the skills to cope with day-to-day challenges and further enable them to

participate more fully in work, employment, economic markets, social and family support, and in their communities. Education provides foundations for one to make choices that positively influence health. Education further gives people more control over their future incomes, where they live, and other factors that determine their health and well-being over their lifespan. A large and positive correlation between education and health has been reported.⁵

Socio-economic status and income are higher with more education, but even when controlling for those and other factors, education has a beneficial effect on health and mortality. The all-cause mortality and coronary heart disease mortality has been reported to be related to level of education. For example, one study showed the following reductions in CAD mortality: in men, fourteen percent reduction with high school compared to elementary school; seventeen percent for community college; and thirty-eight percent for university education; for women, thirty-four percent with high school and fifty-five percent for junior college. The all cause mortality rate reductions were similar.⁶

Cutler and Lleras-Muney reported a 1.8 percent reduction

in five-year mortality with four additional years of education. They also reported the subjects were less likely to have or die from an acute or chronic disease or to report anxiety or depression. There was a reduction in five-year mortality, heart disease, diabetes, fair/poor health, and number of sick days. The more educated are less likely to smoke, drink a lot, be obese, or to use illegal drugs. These associations remain after controlling for job characteristics, income, and family history and background.⁷

Since investing in education and improving quality of schools appears to have a major positive effect on health and well-being, good public policy would be to increase support for education to improve our population's health. In fact, education of our people could be our most effective public health intervention to improve health, quality of life, and decrease premature mortality.

What brought me to learn more about the social determinants of health is my concern about our societal financial challenges and how some of our choices may adversely affect our population's health. We are clearly going to need to control our rapidly rising medical care expenditures and make



A patient receives eye drops at the Remote Area Medical (RAM) free clinic at the Bristol Motor Speedway, located in the mountains of Appalachia. Mario Tama/Getty Images.

selected reductions in government spending. We all know that U.S. medical and health care costs have been rising more rapidly than inflation for the last twenty-five years. In 1985, health care accounted for about ten percent of our GDP. Now it is about eighteen percent of the GDP and is projected by some to rise to twenty-five percent in the next ten years. Despite this level of expenditure we still have 48 million people who are uninsured. The United States currently pays much more for medical care per capita than any other developed country with little evidence that we are receiving the expected value for that investment. The country has fallen from being among the top in life expectancy and infant mortality to near the bottom among comparable nations. The United States spends unparalleled amounts on health care and medicine, but with limited population and societal benefit from the large expenditures. This is clearly unsustainable. We will, as a profession and society have to find interventions that will provide better care at a more reasonable investment.

Nearly all agree that current government expenditures are unsustainable. Most of us understand that we will have to reduce future government spending and control increasing health care costs. We need to understand that some of the choices that could be made can actually worsen our society's

health, independent of reductions in medical expenditures. We have already seen decreased funding for education at every level. This has resulted in a significant shift of expenditures to individuals and families, leaving them with less money to spend on other needs, including food, housing, and medical care. We also know that our current high unemployment levels are much higher for those without a high school or college education. If this results in a decrease in educational opportunity or completion rates we can project adverse affects on health.

We have also seen significant cuts in support of medical education with negative consequences for students and families, but also in the students teaching and education. The public funds were usually used to compensate medical faculty for teaching, but now faculty mostly make their incomes from patient care, research, and administrative activities. This has resulted in fewer faculty teaching as regularly and as well as in the past. This is a close-to-home example of how these problems affect us at every level. Although medical students and their families have to borrow more to pay their educational costs, it is still an excellent investment. Most physicians after graduation, residency, and fellowship will be amongst the top earners in society and many will be in the top one percent, with excellent job security and important professional,



Two years after Katrina, Ninth Ward kindergarden reopens. Mario Tama/Getty Images.



Rural Louisiana town celebrates high school graduation. Mario Tama/Getty Images.

personal, and social benefits from being a physician and caring for people.

I believe we need to think about health and medical care from a different perspective given our challenges. We need to learn and understand more about the social determinants of health that adversely affect our communities, families, and patients. The adverse health effects of social determinants do not have simple interventions. However, better knowledge and understanding of those factors and how changes in our societal investments can adversely affect health can help. We should worry about the adverse effects on health that some choices can make. The interventions and choices are not simple. The issues and choices need your input as a better informed profession and we need to help others understand the possible adverse affects on health that may result from some of the choices. We need to contemplate the following questions:

How can we give every child the best start in life?

How can we help everyone to have the best health and life?

How can we provide educational opportunities for everyone?

How can we strive for an adequate standard of living that supports health and sustainable communities?

How can we prevent disease and disabilities?

I know that physicians rarely have the opportunity to change the social determinants for individual patients and their families, but we can work in our communities as leaders to promote interventions that will positively influence the social determinants. We can use our positions and expertise to advocate for change in areas outside of traditional medical care to promote research and to identify social and other

measure to promote good health. As physicians, we can make a difference by working to control the rising health care expenditures. We can also influence how we reinvest our societal revenue wisely and in a way that complements and supplements what we are doing in medicine to improve our society's health and quality of life.

We need to continue to fulfill our professional responsibilities through understanding the many complex elements that determine our patients and population's health and well-being and continually strive to find ways to improve the health and well-being of our society.

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