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The five articles in this issue together support the contention that there are social determinants of health that are at least as influential as access to health care and individual behaviors. The Centers for Disease Control and Prevention identifies these social determinants as “the conditions in the places where people live, learn, work, and play.” In the first article, Geoffrey Swain details how economic and social disadvantage affects health, and describes some policy approaches to improve health and reduce health inequities by addressing socioeconomic disadvantage. Next, Pamela Herd, Robert Schoeni, and James House look at the health effects of the Supplemental Security Income program on single elderly individuals, and find support for the theory that socioeconomic status is a fundamental cause of health differences. In the third article, Janet Currie reviews research that links health at birth to future outcomes, and identifies factors that can account for reductions in health inequality among infants and children. Next, Marni Brownell, Mariette Chartier, and Nathan Nickel evaluate receipt of an unconditional prenatal income supplement in Canada, and find it was associated with reduction in low birth weight and preterm births. Finally, Diana Hernández takes a qualitative view and, drawing from interviews of low-income families living in an inner-city neighborhood, describes the health implications of their strategies to respond to neighborhood safety risks, and suggests alternative approaches to enhance prospects for improved health and social change. Together, these articles provide support for the argument that social and economic policy is also health policy.

How does economic and social disadvantage affect health?

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The World Health Organization (WHO) defines health as not just the absence of disease, but rather in the broad sense of physical, economic, emotional, and social well-being at an individual, family, and community level. Health is thus affected not only by individual risk factors and behaviors, but also by a range of economic and social conditions. These *social determinants of health*—the circumstances in which people are born, grow up, live, work, and age—are shaped

by a variety of economic, social, and political policies and forces. These policies and forces—what the WHO describes as the *social determinants of health inequities*—in turn determine access to life chances and opportunities for health based on social markers of advantage and disadvantage such as race and ethnicity, class, and gender. In this article I explore some of the mechanisms through which social determinants affect health (and life) outcomes, and describe some policy approaches to improving health by addressing socioeconomic disadvantage.

How does socioeconomic disadvantage drive poor health outcomes?

Why is it that the United States has the best health care in the world, but is nowhere near the healthiest country? The County Health Rankings framework developed by the University of Wisconsin School of Medicine and Public Health’s Public

Health Institute, shown in Figure 1, shows that health outcomes, as measured by length and quality of life, are influenced by a set of four modifiable health factors: health behaviors, clinical care, social and economic factors, and the physical environment. (Genetics, while important, is, at present, functionally non-modifiable, and therefore excluded from the model.) These modifiable health factors are in turn strongly influenced by a broad set of policies and programs.

Although this framework is broad and inclusive, our national discussion about improving health outcomes tends to focus on clinical care and on individual responsibility for health behaviors; the other two modifiable health factors, social and economic factors and the physical environment, are generally not included in the conversation. This reflects a widely held belief in the United States that if an individual engages in healthful behaviors (such as exercising, eating healthfully, and not smoking) and goes to the doctor regularly, she will be healthy. However, these two factors, while certainly important, only account for *at most* half of what determines health outcomes.

The other two factors—social and economic factors, and the physical environment—constitute the social determinants of health. Together, they are likely even more important to health outcomes than health behaviors and clinical care. As will be delineated in more detail below, the social determinants of health affect health both indirectly (by affecting access to and quality of clinical care, by influencing health behaviors, and by determining risk of exposure to toxic physical environments) and directly (through hormonal changes due to chronic stress, and through epigenetic changes, which change whether particular genes are expressed in particular cells).

Indirect mechanisms through other health factors

In the three indirect mechanisms described below, social and economic factors affect one of the other three health factors: health behaviors, clinical care, and the physical environment.

First, social and economic factors can support or constrain healthful behaviors. For example, people with social or economic disadvantage may not be able to easily eat a healthful diet, or provide this to their families, if they live in a neighborhood where such food is not easily available or affordable. Similarly, people may not be able to easily exercise if they live in a neighborhood that is not safe enough to walk in, or to permit children to play outside. Work, school, child care, and commuting schedules (especially on public transit) may also not leave enough time in the day to accommodate such healthful behaviors.

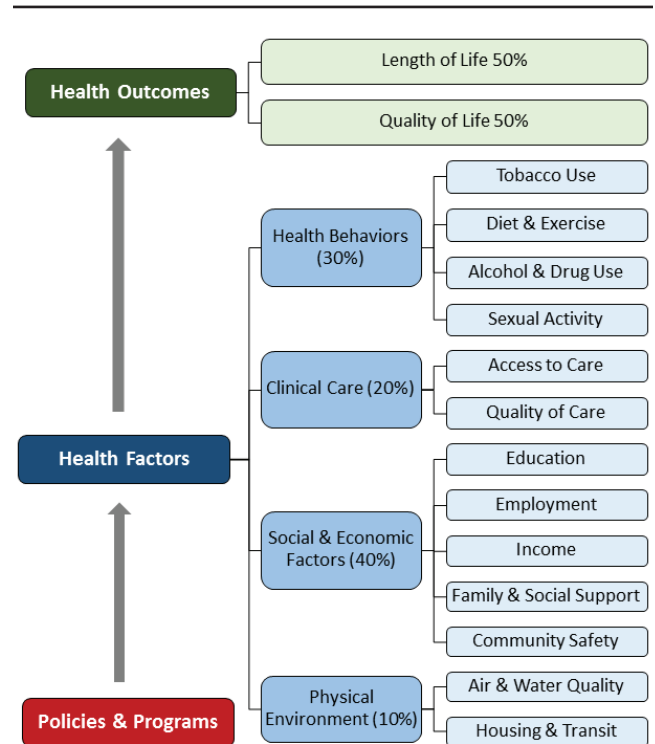


Figure 1. County Health Rankings framework.

Source: University of Wisconsin Population Health Institute, *County Health Rankings 2014*. Accessible at www.countyhealthrankings.org/our-approach.

Second, social or economic disadvantage also affects the ability to access clinical care, as well as the quality of care received. Work hours, work sick-leave policies, clinic hours, and transportation and childcare issues can make seeing a health care professional very difficult. Further, there is ample evidence to show that those with lower educational attainment, those with lower incomes, and people of color all receive lower quality health care.¹

Third, social and economic factors drive one’s exposure to a healthy or unhealthy physical environment. For example, education level largely determines employment choices, which in turn largely determine income level. These factors greatly influence the probability of being able to afford to live in a health-supporting physical environment, such as housing without lead paint or other safety hazards, in a safe community, and at a sufficient distance from industrial polluting sites.

Direct mechanisms

Social and economic disadvantage also directly affects biology, “getting under the skin” through chronic unmitigated

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stress (which drives increases in stress hormone levels) and epigenetic mechanisms. Everybody has stress, but people with higher education, income, and social status have more resources to mitigate that stress, whereas those with lower incomes are likely to have considerably less access to such resources. There are other factors that can compound the adverse effects of chronic stress such as the experience of discrimination on the basis of race, gender, social class, or other characteristics. Research suggests that discrimination can exacerbate health disparities.²

How does chronic stress “get under the skin?” Unmitigated stress results in chronic elevations of stress hormones such as adrenaline and cortisol. These hormones are normally secreted only for short periods of time in response to a perceived threat. While these occasional spikes in stress hormone levels may be advantageous in assisting the body to appropriately respond to a threat, the continuous elevated presence of these hormones results in numerous negative health effects. Increased levels of adrenaline results in increased blood pressure, which raises the risk for heart disease and stroke. Chronically elevated adrenaline levels also raise the risk of preterm labor for pregnant women and low birth weight for infants, which can have enduring negative effects. Chronically elevated levels of cortisol impairs glucose metabolism, which increases the risk of obesity and diabetes; and also impairs the immune system, which increases the risk of cancer and other chronic diseases.³

Chronic unmitigated stress can also directly affect biology through epigenetic changes. The epigenome is a series of on-off switches that controls whether particular genes are expressed in particular cells. When adrenaline and cortisol are chronically elevated, chemical changes to these switches alter the degree to which these genes are expressed or not, resulting in adverse health effects. Moreover, these epigenetic changes can be passed on to the next generation, so a parent who experiences chronic stress can pass these changes to their children, even if those children are not experiencing the conditions that caused their parents’ stress in the past.

Social determinants of health across the life course

Across the life course, the likelihood of someone being healthy depends greatly on their social determinants of health. Thus, someone with a strong positive set of social determinants of health, such as being white, highly educated, and well-off financially, will have a large number of protective factors over their lifetime that increase their likelihood of good health, and relatively few risk factors that depress that potential. In contrast, someone with a more adverse set of social determinants of health, such as being non-white, having a low level of education, and being poor, will begin life with a relatively low likelihood of good health, have few protective factors promoting good health over their lifespan, and many risk factors working against it. In this case, not only is the level of health likely to be much worse

over the life course, but the life span is also likely to be much shorter.

Policy approaches to social determinants of health

The social determinants of health—including material living conditions as well as the factors that make healthy living conditions more or less likely (such as education, income, and being in a group experiencing discrimination)—are in turn shaped by a wider set of forces, including most importantly economic, social, and other public policies. Unfortunately, from the point of view of health inequities, these policies have resulted in the stratification of these social determinants of health based on social markers of advantage or disadvantage. That is, public policy choices to date have ensured that the conditions exist for only a subsection of the population to be as healthy as possible, rather than maximizing good health for everyone.

Figure 2 shows the World Health Organization’s conceptual framework for the social determinants of health. This framework illustrates how the socioeconomic and political context interact with socioeconomic position and other “structural” characteristics, all of which in turn strongly influence material circumstances, behavioral, biological, and psychosocial factors—ultimately all converging to affect equity in health and well-being.

As Figure 2 shows, there are a wide variety of policies that can have an effect on health inequities. Harvard epidemiologist David Williams has noted that any type of policy that improves health and reduces disparities in health can be considered “health policy,” including not only health care policy, but also policies that (among many other possible examples) improve education, reduce poverty, enhance early childhood experiences, enhance neighborhood and housing conditions, expand transportation options, offer transitional jobs to the unemployed, and reduce disparities in incarceration rates.⁴

One policy that improves health by assuring equality of opportunity is the Earned Income Tax Credit (EITC), a refundable tax credit for low-income working families with children. One study found that an increase in income from the EITC reduced the incidence of low birth weight, and increased mean birth weight.⁵ For single mothers with a high school education or less, an increase of \$1,000 in EITC income is associated with a 6.7 to 10.8 percent reduction in the probability of low birth weight (weighing less than 2,500 grams, or 5.5 pounds), with larger positive effects for African American mothers.

Another health-improving policy is paid sick leave, which nearly half of all workers in the United States do not receive.⁶ Among the working population receiving the lowest wages, more than three-quarters receive no paid sick leave.⁷ Health impact assessments conducted by a health research

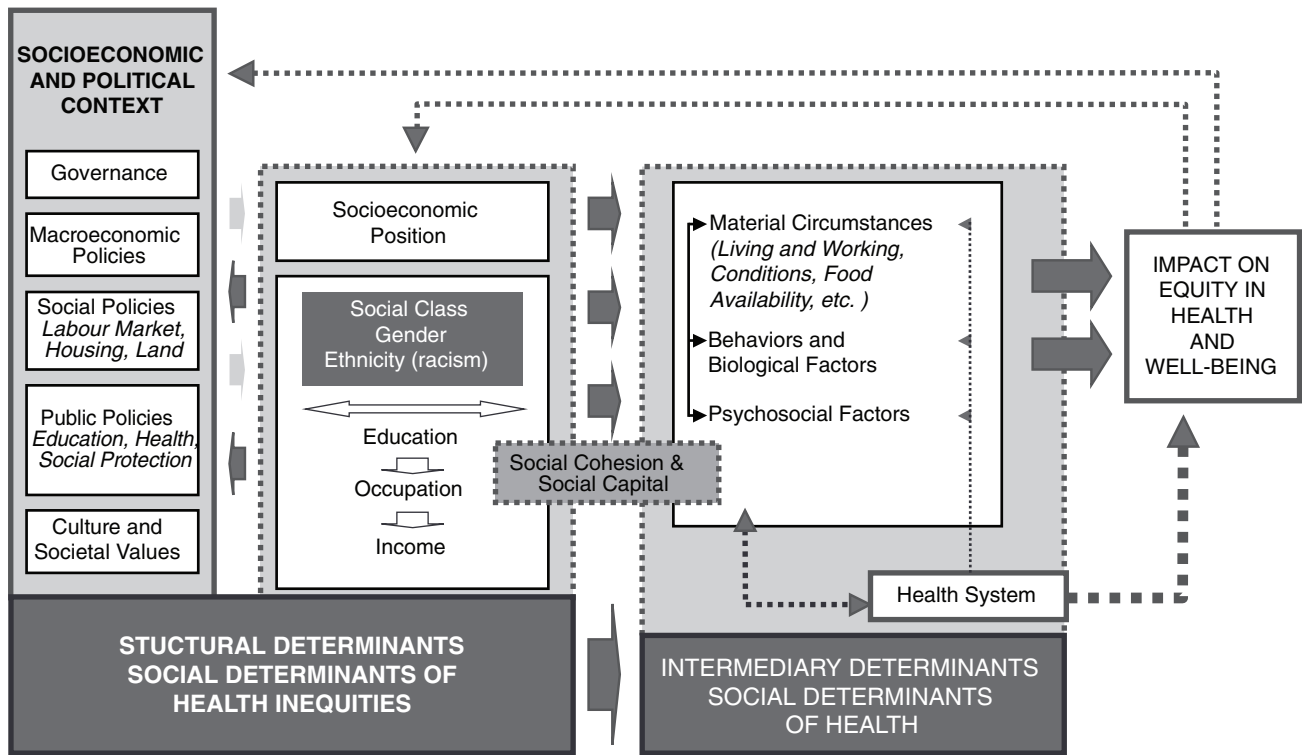


Figure 2. World Health Organization conceptual framework on social determinants of health.

Source: Commission on Social Determinants of Health, *A Conceptual Framework for Action on the Social Determinants of Health*, World Health Organization, Geneva, 2010.

organization suggest that guaranteed paid sick days would significantly improve public health, including reducing the spread of influenza and other communicable disease to the public in community settings such as restaurants and nursing homes.⁸ Such a policy would also likely prevent financial hardship among low-income workers by insuring continued wages while they were sick or needed to care for a sick dependent. Finally, allowing workers to take time off to see primary care physicians during regular business hours could reduce the use of unnecessary (and expensive) emergency room care.

There is strong evidence that universal pre-kindergarten improves cognitive outcomes, especially for disadvantaged children.⁹ There is also evidence that attending good-quality preschools results in gains in both educational attainment and earnings that persist even if short-term improvements in concrete achievement skills fade.¹⁰ Since children from low-income families are less likely to be enrolled in preschool than their peers from higher-income families, increasing preschool access and attendance would help assure equality of opportunity.¹¹

Housing First programs provide rapid access to permanent housing and ongoing support services for homeless people with persistent mental illness or substance abuse problems. Evidence shows that Housing First reduces homelessness and hospital utilization, improves mental health and physical

well-being, and increases treatment for substance use disorders.¹²

Transitional Jobs programs generally provide short term wage-paying work opportunities to previously unemployed individuals. These programs may include support services, placement, and training; they offer significant advantages to employers as well as to the employees. A health impact assessment of a transitional jobs program in Wisconsin found that expansion of this program could be expected to have positive effects on a number of health outcomes including chronic disease, mental health, domestic violence, birth outcomes, and child physical and mental health.¹³

The last example I will highlight of a policy or program that may improve health by addressing social disadvantage is providing treatment rather than prison for people with substance abuse disorders and mental health issues. Health impact assessments suggest that treatment alternatives improve recovery from substance abuse.¹⁴ The great majority of Wisconsin prison growth in the last decade is accounted for by drug offenders and drunk drivers, and dedicated drug courts are six times more likely than prison programs to keep offenders in treatment programs long enough for them to enter recovery. Similarly, dedicated mental health courts, which are intended to diagnose and treat underlying medical/psychological disorders that may lead to crime, have been found to reduce both the future likelihood of psychiatric

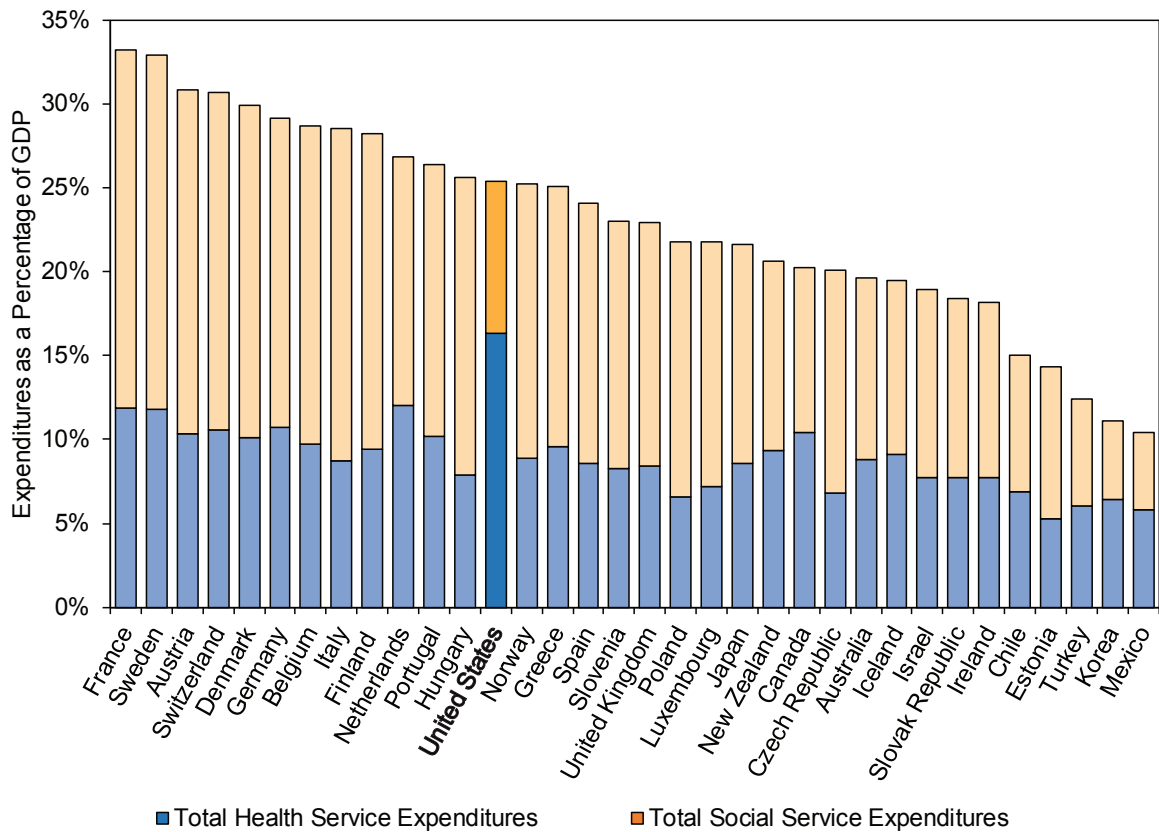


Figure 3. Total health care and social service spending in Organisation for Economic Co-operation and Development countries and the United States, 2009.

Source: E. H. Bradley and L. A. Taylor, *The American Health Care Paradox: Why Spending More is Getting Us Less* (New York: PublicAffairs, 2013).

hospitalization and the amount of future jail time for those who complete the programs to which they are assigned, and in turn improve health.

Economic effects of health equity

In addition to promoting social justice, it turns out that reducing health inequities also makes economic sense. A national study of medical costs and vital statistics reports from 2003 through 2006 found that eliminating health inequities for people of color would have reduced direct medical care expenditure over that period by \$229.4 billion, and indirect costs associated with illness and premature death by more than \$1 trillion.¹⁵ The same study found that nearly one-third of direct medical care expenditures for people of color were excess costs attributable to health inequities. Similarly, an estimate of the benefits of raising the health of all Americans to that of college-educated Americans totaled over \$1 trillion worth of increased health.¹⁶ Although policy change to reduce concentrated disadvantage and provide socioeconomic resources and opportunities needed to achieve well-being between groups with differing levels of social disadvantage would certainly incur costs, these high benefit estimates suggest that eliminating health inequities could result in a net financial gain.

Issues related to social determinants of health may be fundamentally important to explaining why the United States, despite having the best (and most expensive) health care in the world, is nowhere near the healthiest. The United States ranked 43rd among all countries for life expectancy in 2015, and Figure 3 shows differences in total health care and social service spending in OECD countries compared to the United States.¹⁷ In the OECD countries, roughly two dollars are spent on social services for every dollar spent on health care, while in the United States only about 55 cents goes to social services for every health care dollar.

Conclusion

The prevailing, but incorrect, narrative about health is that all one needs to do to be healthy is to engage in healthful behaviors and go to the doctor regularly. While healthful behaviors and access to high-quality health care are certainly important, arguably more important are the social determinants of health; social and economic factors, and the physical environment. Research has shown these factors to be more strongly associated with health outcomes than either health behaviors or clinical care. In addition, these factors appear to be very important in the degree to which some communities and even larger groups of people

experience health inequities, and even why some countries are healthier than others.

Social determinants of health are powerful because they interact with other health factors, by affecting individuals' access to (and quality of) health care, their ability to maintain healthful behaviors, and the safety of the physical environments in which they live, work, learn, and play. They are also powerful because they directly affect health, through physical environmental exposures, the effects of chronically elevated stress hormones, and epigenetic factors.

Because of this, it is crucial that policies aimed at improving health and reducing health inequities need to address not only health care and healthful behaviors, but also the social and economic conditions that so strongly affect the root causes of health.■

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³H. Avey, "How U.S. Laws and Social Policies Influence Chronic Stress and Health Disparities," Politics of Race, Culture, and Health Symposium, Ithaca College, November 14, 2002. http://unnaturalcauses.org/assets/uploads/file/Avey-Chronic_Stress_and_Health_Disparities.pdf

⁴See "Unnatural Causes: Place Matters," television series transcript, California Newsreel, 2008. http://unnaturalcauses.org/assets/uploads/file/UC_Transcript_5.pdf

⁵H. Hoynes, D. Miller, and D. Simon, "Income, the Earned Income Tax Credit, and Infant Health," *American Economic Journal: Economic Policy* 7, No. 1, (February 2015): 172–211.

⁶*A Health Impact Assessment of the Healthy Families Act of 2009*, Summary Report, Human Impact Partners, Oakland, CA, 2009. Accessible at <http://www.humanimpact.org/projects/hia-case-stories/paid-sick-days-hias/>

⁷*A Health Impact Assessment of the Healthy Families Act of 2009*.

⁸*A Health Impact Assessment of the Healthy Families Act of 2009*.

⁹See, for example, M. D. Fitzpatrick, "Starting School at Four: The Effect of Universal Pre-Kindergarten on Children's Academic Achievement," *The B.E. Journal of Economic Analysis & Policy* 8, No. 1 (November 2008): 1935–1682.

¹⁰G. J. Duncan and K. Magnuson, "Early Childhood Interventions for Low-Income Children," *Focus* 31, No. 2 (Fall/Winter 2014–15): 1–5. <http://www.irp.wisc.edu/publications/focus/pdfs/foc312a.pdf>

¹¹<http://www.childtrends.org/?indicators=early-childhood-program-enrollment>

¹²See, for example, S. Tsemberis and R. F. Eisenberg, "Pathways to Housing: Supported Housing for Street-Dwelling Homeless Individuals With Psychiatric Disabilities," *Psychiatric Services* 51, No. 4 (April 2000): 487–493; G. Nelson, W. Laurier, T. Aubry, and A. Lafrance, "A Review of the Literature on the Effectiveness of Housing and Support, Assertive Community Treatment, and Intensive Case Management Interventions for Persons With Mental Illness Who Have Been Homeless," *American Journal of Orthopsychiatry* 77, No. 3 (July 2007): 350–361.

¹³*Transitional Jobs Programs: A Health Impact Assessment*, University of Wisconsin Population Health Institute, January 2013. Accessible at: <http://>

uwphi.pophealth.wisc.edu/publications/other/transitional-jobs-program-hia-full-report.pdf

¹⁴K. Gilhuly, L. Farhang, C. Tsui, K. Puccetti, and D. Liners, "Healthier Lives, Stronger Families, Safer Communities: How Increasing Funding for Alternatives to Prison Will Save Lives and Money in Wisconsin," Health Impact Assessment Report, Human Impact Partners, November 2012. <http://www.humanimpact.org/projects/hia-case-stories/treatment-instead-of-prison-hia/>

¹⁵T. A. LaVeist, D. Gaskin, and P. Richard, "Estimating the Economic Burden of Racial Health Inequalities in the United States," *International Journal of Health Services* 41, No. 2 (2011): 231–238.

¹⁶W. Dow and R. F. Schoeni, "Economic Value of Improving the Health of Disadvantaged Americans," Technical Report for *Overcoming Obstacles to Health*, Report from the Robert Wood Johnson Foundation to the Commission to Build a Healthier America. January 21, 2008.

¹⁷*The World Factbook 2014–15* (Washington, DC: Central Intelligence Agency, 2015).

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