cells and the vasculature, both in maintaining healthy homeostatic conditions and regulating inflammatory responses. Therefore, for therapeutic applications, it is important to first understand these important cellular interactions."

The new findings may have immediate clinical implications because they suggest that platelet transfusion may actually aggravate sepsis or anaphylactic shock in patients. Boilard noted that transfusion remains important, especially because patients with sepsis or anaphylaxis often have low platelet levels, but it may be safer, for example, to block FcγRIIA before transfusion.

The research team is also investigating whether their findings may provide new insights into autoimmune diseases such as rheumatoid arthritis and lupus, which are characterized by the presence of circulating pathogenic ICs. ■

Note: Source references are available through embedded hyperlinks in the article text online.

The JAMA Forum

Income, Poverty, and Health Inequality

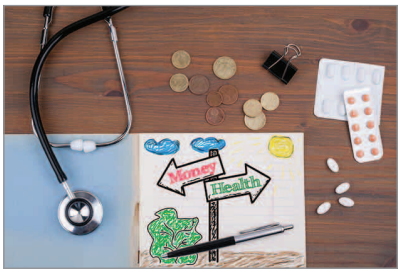
Dave A. Chokshi, MD, MSc

The health of people with low incomes historically has been a driver of public health advances in the United States. For example, in New York City, cholera deaths during outbreaks in 1832 and 1854 concentrated among the poor helped push forward the Metropolitan Health Law, which allowed for regulation of sanitary conditions in the city. The law was an exemplar for other municipalities across the United States, saving countless lives during subsequent cholera epidemics as well as from typhus, dysentery, and smallpox.

Health inequality persists today, though our public health response—our modern Metropolitan Health Laws—must address more insidious causes and conditions of illness. There is a robust literature linking income inequality to health disparities—and thus widening income inequality is cause for concern. US Census data show a steady increase in summary measures of income inequality over the past 50 years. The association between income and life expectancy, already well established, was detailed in a landmark 2016 *JAMA* study by Raj Chetty, PhD, of Stanford University, and colleagues. This study found a gap in life expectancy of about 15 years for men and 10 years for women when comparing the most affluent 1% of individuals with the poorest 1%. To put this into perspective, the 10-year life expectancy difference for women is equal to the decrement in longevity from a lifetime of smoking.

Probing the Income-Health Relationship

In an editorial that accompanied the article by Chetty et al, Angus Deaton, PhD, of Princeton University, commented on the study's geographical findings: "It is as if the top income percentiles belong to one world of elite, wealthy US adults, whereas the bottom income percentiles each belong to separate worlds of poverty, each unhappy and unhealthy in its own way." Prior research had tried to identify these separate worlds, describing "Eight Americas" defined by sociodemographic characteristics, such as low-income white people in Appalachia and the Mississippi Valley, Western Native Americans, and Southern low-income rural black people. To improve health, interventions may need to account for starkly different lived experiences across different geographic contexts.



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Educational attainment, sex, and race interact with and complicate the income-health relationship. Two additional dimensions add complexity: thinking beyond income to wealth and thinking beyond mortality to morbidity. Wealth refers to the total value of assets (and debts) possessed by an individual, not just the flow of money defined as income. Wealth is even more unequally divided than income: while the top 10% of the income distribution received a little more than half of all income, the top 10% of the wealth distribution held more than three-quarters of all wealth. This matters because it is one way that inequities persist over time—through, for instance, legacy effects of Jim Crow laws or discriminatory housing policy that affect family wealth and health over generations.

Studies on inequality and mortality may garner the most attention, but disparities in morbidity and quality of life are also evident. Low-income adults are more than 3 times as likely to have limitations with routine activities (like eating, bathing, and dressing) due to chronic illness, compared with more affluent individuals. Children living in poverty are more likely to have risk factors such as obesity and elevated blood lead levels, affecting their future health prospects.

Inequality or Inequity?

Is it the role of physicians and other health professionals to address poverty? Is it a "modifiable" risk factor, or should we focus on more proximate causes of illness, such as health behaviors? Our answers to these questions determine whether wealth gradients lead only to health inequality—or whether they contribute to health inequity, which is inequality that is avoidable and unfair.

Two arguments favor paying attention to income and wealth distributions as part of advancing health equity. First, health care spending—the realm of medical professionals—can worsen income inequality, at both individual and systemic levels. Individually, poor people have to spend a much greater proportion of their income on health care than richer people do. In 2014, medical outlays lowered the median income for the poorest decile of

US individuals by 47.6% vs 2.7% for the wealthiest decile. Systemically, medical spending can crowd out other government spending on social services, drawing resources away from education and environmental improvement, for example. Taken together, this supports the case that "first do no harm" must extend to the financial impact of delivering health care. Clinicians who care about the social determinants of health must also pay heed to the cost (and opportunity cost) of health care.

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Second, we are in a period when declines in key public health indicators may be wrought by policies that ostensibly have little to do with health—such as tax policy. The Centers for Disease Control and Prevention reported that average life expectancy decreased for the second year in a row in 2016. But mean mortality changes may obscure the full picture, which is more about increasing mortality being concentrated in lower-income groups. Meanwhile, the recent Tax Cuts and Jobs Act is likely to exacerbate income inequality. This is particularly true if the tax cuts trigger cuts in government spending, as Republican leaders have signaled. Medicaid and the Supplemental Nutrition Assistance Program (SNAP, also known as food stamps) are 2 programs for low-income individuals that are likely to be targeted for cuts. Even if Medicare and Social Security are spared, life expectancy differences by income means that more affluent US adults can expect to claim those benefits over a longer lifespan.

What would be today's analog to the Metropolitan Health Law of 1866? Addressing the root causes of health inequity requires interrupting the vicious cycle of poverty leading to illness leading to poverty—what Jacob Bor, ScD, and Sandro Galea, MD, of Boston University School of Health, have termed a "21st century health-poverty trap." Although there are many root causes to address, perhaps the place to begin is the health of children. For instance, economic policy like the Earned Income Tax Credit has been associated with decreases in low birth weight.

Congress' recent reauthorization of the Children's Health Insurance Program offers a glimmer of hope for such bipartisan paths toward health equity nationally. Focusing on resources to support children—such as nurse home visits to pregnant women, prekindergarten programs, and adolescent mental health care—can directly improve health while influencing intergenerational economic mobility. The city of Philadelphia offers a concrete example of how to do this: a tax on sugary drinks was used to fund prekindergarten, social services in neighborhood schools, and parks and libraries. In this way, health might lead to economic opportunity, leading to better health. ■

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