

## GLOBAL HEALTH

# Global Noncommunicable Diseases — Where Worlds Meet

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Like climate change, the relentless worldwide spread of noncommunicable diseases offers an opportunity for low-, middle-, and high-income countries to join forces in addressing a major global challenge that threatens health and economies alike. A recent report from the World Health Organization<sup>1</sup> identified six risk factors associated with noncommunicable diseases as the leading global risk factors for death: high blood pressure, tobacco use, high blood glucose levels, physical inactivity, overweight or obesity, and high cholesterol levels. Together, these factors contribute to a large proportion of the deaths resulting from cardiovascular diseases, metabolic causes, and cancer (see table). Moreover, they pervade countries of all income levels: even in low-income countries, 6 of the top 10 risk factors are associated with noncommunicable diseases.

The prevalence and impact of noncommunicable diseases continue to grow. Chronic diseases account for 60% of all deaths worldwide, and 80% of these deaths occur in low- or middle-income countries, where the toll is disproportionate during the prime productive years of youth and middle age.<sup>2,3</sup> Trends also suggest that the major risk factors for noncommunicable diseases — hypertension, high glucose levels, obesity, and inactivity — are on the rise, especially in developing countries. The long-term costs of treatment and the negative effects on productivity take devastating tolls on the economic

situations of individuals, families, and societies. According to the World Economic Forum's 2009 report, noncommunicable diseases are among the most severe threats to global economic development, more likely to be realized and potentially more detrimental than fiscal crises, natural disasters, or pandemic influenza. It is projected that in the next 10 years, China, India, and Britain will lose \$558 billion, \$237 billion, and \$33 billion, respectively, in national income as a result of largely preventable heart disease, strokes, and diabetes.<sup>2,3</sup> In the United States, cardiovascular disease and diabetes together cost the country \$750 billion annually.

Noncommunicable diseases are intricately linked to globalization, urbanization, and demographic and lifestyle transitions — all ubiquitous forces. Increasingly, such diseases are also linked to poverty and socioeconomic disparity and are no longer “diseases of affluence.” There are also complex but measurable associations between early life circumstances (e.g., maternal and childhood nutrition) and the risk of noncommunicable disease in adulthood; hence, many developing countries now find themselves at a stage of epidemiologic and behavioral transition in which they face a growing burden of noncommunicable disease on top of the ongoing hazards of undernutrition and communicable disease. Persons with a noncommunicable disease are also vulnerable to common infectious diseases, such as tuber-

culosis and community-acquired pneumonias — and therefore to the poorer outcomes associated with these complications. Furthermore, owing to burdensome health care costs, disability, absenteeism, and forgone income, noncommunicable diseases result in poverty, thus contributing to a vicious cycle. Because of their multiple interacting causes and complications, as well as their lifelong nature, noncommunicable diseases challenge current paradigms of health care organization and delivery.

Confronted by the ever-increasing threat of such diseases, high-, middle-, and low-income countries alike are struggling to find solutions at the levels of policy, health care delivery, health communication, and education.<sup>2</sup> But this common set of challenges also offers opportunities for global cooperation.

There is a paradox that complicates efforts to address noncommunicable diseases globally: modern processes of production and globalization are key components of economic development worldwide that have brought about many improvements in health, yet the negative effects of globalization (including increased incidence of noncommunicable diseases) contribute to poverty and widening disparities. Current political and economic incentives favor industry and other interest groups at the expense of health: consider the subsidies paid for corn-based agriculture and mass-produced processed foods, the tobacco revenue generated in coun-

The 10 Leading Risk Factors for Death, According to Income Level, 2004.*		
Risk Factor	Deaths (millions)	Percentage of Total
<b>World</b>		
1. High blood pressure	7.5	12.8
2. Tobacco use	5.1	8.7
3. High blood glucose level	3.4	5.8
4. Physical inactivity	3.2	5.5
5. Overweight and obesity	2.8	4.8
6. High cholesterol level	2.6	4.5
7. Unsafe sex	2.4	4.0
8. Alcohol use	2.3	3.8
9. Childhood underweight	2.2	3.8
10. Indoor smoke from solid fuels	2.0	3.3
<b>Low-income countries</b>		
1. Childhood underweight	2.0	7.8
2. High blood pressure	2.0	7.5
3. Unsafe sex	1.7	6.6
4. Unsafe water and poor sanitation and hygiene	1.6	6.1
5. High blood glucose level	1.3	4.9
6. Indoor smoke from solid fuels	1.3	4.8
7. Tobacco use	1.0	3.9
8. Physical inactivity	1.0	3.8
9. Suboptimal breast-feeding	1.0	3.7
10. High cholesterol level	0.9	3.4
<b>Middle-income countries</b>		
1. High blood pressure	4.2	17.2
2. Tobacco use	2.6	10.8
3. Overweight and obesity	1.6	6.7
4. Physical inactivity	1.6	6.6
5. Alcohol use	1.6	6.4
6. High blood glucose level	1.5	6.3
7. High cholesterol level	1.3	5.2
8. Low fruit and vegetable intake	0.9	3.9
9. Indoor smoke from solid fuels	0.7	2.8
10. Urban outdoor air pollution	0.7	2.8
<b>High-income countries</b>		
1. Tobacco use	1.5	17.9
2. High blood pressure	1.4	16.8
3. Overweight and obesity	0.7	8.4
4. Physical inactivity	0.6	7.7
5. High blood glucose level	0.6	7.0
6. High cholesterol level	0.5	5.8
7. Low fruit and vegetable intake	0.2	2.5
8. Urban outdoor air pollution	0.2	2.5
9. Alcohol use	0.1	1.6
10. Occupational risks	0.1	1.1

\* Countries are grouped according to their per capita gross national product: low income means \$825 or less per capita, high income \$10,066 or more per capita. Data are from the World Health Organization.<sup>1</sup>

tries with a government-owned tobacco industry, industrial growth in the face of environmental pollution, and the spread of the sedentary automobile-and-television culture. Although such megatrends may seem overwhelming, they merit the same level of global attention, cooperation, and “inconvenient” action as climate change or pandemic influenza.

Addressing these challenges requires proactive, preemptive intervention and participation from governments, multilateral institutions, research-funding agencies, donors, and others.<sup>2,3</sup> Action-oriented groups (such as the Oxford Health Alliance, a network of institutional and individual collaborators aimed at preventing and controlling noncommunicable diseases) and collaborative global priority-setting groups (such as the Global Alliance for Chronic Diseases, a consortium of six influential health agencies) exemplify this ethos. The Institute of Medicine (IOM), in a 2009 report on the U.S. commitment to global health, called for cooperation between developed and developing countries, specifically calling attention to global noncommunicable diseases. The IOM’s recommendations emphasized scaling up existing interventions, generating and sharing knowledge, investing in institutional and human capacity, increasing financial commitments, and engaging in respectful partnerships. We would add that innovation in health care and sustainable financing solutions for health care also warrant attention and may benefit all.

In the area of noncommunicable diseases, all countries share the challenge of closing the formidable gap between the exist-

ing evidence that supports proven interventions and the translation of this knowledge into policy and practice. Even in the United States, where \$132 billion is spent annually on diabetes care, simultaneous control of glucose levels, blood pressure, and lipid levels is achieved in less than 10% of people with diabetes. There is a consensus that effective and comprehensive strategies necessitate a mix of evidence-based environmental, regulatory, and behavioral interventions at the population and individual levels; a shifting of health care systems from curative models suited to acute illnesses to more integrated primary care systems with considerable patient empowerment; and appropriate restructuring of financial and insurance systems. Many low- and middle-income countries may have greater flexibility and political will to experiment with new models of care; for example, India is moving aggressively to expand the health care provided by nonphysicians and exploring innovative public-private models for public health education and health insurance coverage. Similarly, Brazil is becoming a global leader in manufacturing generic medicines. Lessons from such countries may enrich other countries' efforts to improve health care.

Global partnerships may encourage rapid and cost-effective scientific innovations. Phase 2 of the Indian Polycap Study demonstrated the safety of a combina-

tion pill containing aspirin, a generic statin, and an antihypertensive agent<sup>4</sup> — a pill whose use could have significant global effects, including lower costs, enhanced adherence, expanded accessibility, and improved control of multiple risk factors. Another low-cost innovation emerging from global collaboration is a new screening test for cervical cancer, which was developed and tested in India with funding from the Gates Foundation and is challenging the market dominance of the more costly Papanicolaou, or Pap, smear.<sup>5</sup> Large multicountry consortia are also needed to provide data from multiethnic populations for studies of genes and epigenetic phenomena, which could unravel the pathophysiological mechanisms behind some noncommunicable diseases; such consortia could also help to develop interventions that promote health globally.

Globalization is creating an interdependence that affects both the risks of disease and their potential solutions. Global connections are much more apparent in the case of communicable infectious diseases, since viruses and bacteria are more readily perceived as cross-border threats; consequently, these diseases prompt global cooperation, as evidenced by the Global Fund to Fight AIDS, Tuberculosis, and Malaria, among other initiatives. Although we must continue to address these threats, we must also increase the sense of urgency

regarding noncommunicable diseases that are “communicated” by means of the global promotion of products and lifestyles, lest they insidiously undermine the health and wealth of nations. We have a great opportunity: global noncommunicable diseases can unite high-, middle-, and low-income countries in a common purpose, given their common causation, increasingly similar mortality rates and economic burdens worldwide, and generalizable preventive and curative solutions. The first challenge, however, will be to energize policymakers to recognize that opportunity.

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