

VOLUME **9**

DISEASE CONTROL PRIORITIES • THIRD EDITION

Disease Control Priorities: Improving Health and Reducing Poverty

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Foreword

Bill and Melinda Gates

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During the past 25 years, many countries have achieved significant improvements in human health and well-being. Huge problems persist, and terrible inequities must still be addressed to ease the suffering of the world's poorest and most vulnerable. But that does not diminish several remarkable accomplishments: Since the early 1990s, the world has seen substantial reductions in extreme poverty; child and maternal mortality; and the incidence of deadly and debilitating diseases, such as tuberculosis, malaria, and HIV/AIDS. The incidence of polio has decreased by 99 percent, bringing the world to the verge of eradicating a major infectious disease for only the second time in history.

Credit for these and other advances in global health belongs to many institutions, governments, and individuals, including the scholars who organized and contributed to the first and second editions of *Disease Control Priorities*. We hope and expect this third edition also will have a large, salutary impact.

The first edition, *DCPI*, was published by the World Bank in 1993. It was the first comprehensive effort to systematically assess the effectiveness of interventions against the major diseases of low-income and middle-income countries. *DCPI* also analyzed the relative costs of interventions, enabling policy makers and aid donors to make smarter decisions about how to allocate scarce health dollars for the greatest impact. *DCPI* helped bring about dramatic shifts in how countries and the global community invest in health.

Indirectly, *DCPI* also influenced our personal decision to devote much of our philanthropy to improving the health of people in poor countries. This came about because data from *DCPI* was a basis for the World Bank's 1993 *World Development Report*, which focused on investing in health and catalyzed our thinking about how and where we could make a difference. We were

stunned to read that 11 million young children were dying every year from preventable causes such as pneumonia, diarrhea, malaria, and other infections that are rare or rarely fatal in the developed world. We were shocked by the disparities in health outcomes between rich countries and poorer ones. Every page screamed out that human life was not being valued as it should be.

In addition, our eyes were opened to the fact that most preventable deaths and disability in lower-income countries were caused not by hundreds of diseases but by relatively few, and that the costs of preventing and treating them were often low, relative to the benefits. Our shock turned to excitement. Here were points of leverage where we could work to reduce inequity and help realize a world where every person has the opportunity to live a healthy, productive life.

DCP2, published in 2006, again advanced the conversation on global health. Where *DCPI* focused on the benefits and costs of interventions against individual diseases, contributors to *DCP2* also considered how countries might gain greater traction by organizing their efforts around multi-purpose health platforms, ranging from village clinics and school-based health programs to district hospitals with emergency services and surgical units. *DCP2* showed how investments in health platforms, especially for community-based primary care, could magnify impact despite limited budgets. Several countries, particularly India and Ethiopia, have pursued this approach with good results.

In important and useful ways, this third edition of *Disease Control Priorities* further widens the frame for discussion of health policies and priorities, innovatively addressing the different needs of countries at different stages in the development of their health systems. This edition maps out pathways—essential packages of related, cost-effective interventions—that countries can

consider to speed their progress toward universal health coverage. *DCP3* also draws attention to the catastrophically impoverishing effects that many medical procedures can have on poor families. This analysis, combined with data on the lost productivity caused by various diseases, provides insights into how investing in health, particularly in expanded access to health insurance and prepaid care, can not only save lives but also help alleviate poverty and bolster financial security.

Across the three editions, some conclusions remain constant. Childhood vaccinations, nutrition

programs, access to treatment for common infections—these pay enormous returns in lives saved and suffering avoided. Family planning, maternal health programs, and gender equity benefit communities and society as a whole. Major infectious diseases can be beaten through collaborative, international efforts, as the past 25 years have shown. Overall, improving the health of the world's most vulnerable people remains one of the best investments the global community can continue to make toward realizing a better, safer world.

Introduction

Lawrence H. Summers

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Most economists pride themselves on combining social concern with hard analysis. This trait they share with an important strand of the human rights community working on global health. The late Jonathan Mann, to take a leading example, both argued for an idealistic vision of health as a human right for all and created, from almost nothing, the World Health Organization's (WHO) effective and pragmatic Global Programme against AIDS. Paul Farmer continues to provide global leadership in advocating health as a human right, but he rightly emphasizes that advocacy alone remains insufficient. In *Partners in Health*, an organization Farmer cofounded with Jim Kim (now president of the World Bank), Farmer created a vehicle to go beyond advocacy and develop the practical dimensions of the aspiration to provide the highest quality of health care in rural Haiti, Rwanda, and elsewhere. In his essay "Rethinking Health and Human Rights," Farmer points to the importance of research in this agenda: "The purpose of this research should be to do a better job of bringing the fruits of science and public health to the poorest communities" (2010, p. 456). Farmer and I may well have a different take on the contributions that have been made over time by the World Bank and other international financial institutions. But I think it fair to say that the pragmatic task of bringing technical knowledge to bear on the needs of the poor is a shared goal—and a goal that the *Disease Control Priorities* series has sought to advance for over two decades.

Each year the World Bank's flagship publication, the *World Development Report* (*WDR*), attempts to assemble knowledge and to inspire action that serves the world's poorest communities. These reports develop and take stock of research and other evidence on a specific topic to inform the World Bank's own policies and to stimulate discourse among member countries, other development

agencies, civil society, and the academic community. The *WDRs* are probably the world's most widely distributed economic publication. They are prepared by the World Bank's research arm, under the direction of its Chief Economist, a position I had the good fortune to hold in the period 1991–93. I selected health as the topic for *WDR 1993*.

Why health? First, health and poverty intertwine closely, and having a *WDR* on health provided an opportunity to provide insight into the World Bank's central goal of reducing poverty. Second, health represents an area where governments can play a necessary and constructive role. And third, I believed that the potential gains from getting health policy right were enormous. Thus, the *WDR 1993: Investing in Health*, was published in June of 1993 (World Bank 1993).

Several features dominated the global health landscape at the time of *the WDR 1993*. First, and most visibly, the HIV/AIDS epidemic had emerged from nowhere to grow into a major problem in Africa and globally. Second, but much less visibly, government policies to control undernutrition, excess fertility, and infection had begun to bear fruit. Consolidating and expanding the scope of these successes promised enormous gains. As a consequence of success, however, China and other countries with early progress were already experiencing substantial relative growth in their older populations—and concomitant growth in the incidence of cancer, heart disease, and stroke. Intervention against these diseases is less decisive and often far more costly than intervention against infection. Policy makers thus experienced strong pressures to divert resources from high payoff infection control to responding to noncommunicable diseases.

In response to these features of the health landscape, the World Bank's policy staff had initiated a review of

priorities for disease control. Its purpose was to identify effective yet affordable responses to the epidemics of HIV/AIDS and noncommunicable disease while expanding successes in control of childhood infection. Work began on the *WDR 1993* while the priorities review was drawing to a close. The detailed analyses of value for money in that review provided strong intellectual underpinnings for the *WDR 1993*. Oxford University Press published the *WDR 1993* and the first edition of *Disease Control Priorities in Developing Countries* at about the same time (Jamison, Mosley, Measham, and Bobadilla 1993; World Bank 1993).

On the occasion of the 20th anniversary of publication of the *WDR 1993*, *The Lancet* invited me to chair a commission to reassess health policies in light of two decades of remarkable change (mostly for the good) in health and related institutions around the world. *Global Health 2035*, the report of the *Lancet* Commission on Investing in Health (Jamison, Summers, and others 2013) took stock of those changes and drew policy implications for coming decades. Perhaps the most important message from *Global Health 2035* is that our generation, uniquely in history, has the resources and knowledge to close most of the enormous health gap between rich and poor within a generation. The work of the *Lancet* Commission provided a policy framework for this concluding volume of the third edition of *Disease Control Priorities (DCP3)*. For evidence-oriented decision makers in ministries and in development agencies, and for a broader community, the *DCP* series has provided (as it did for *Global Health 2035*) a wealth of information relevant to informing policies for improving health and reducing health-related poverty.

Let me close by placing *DCP3* into a context not just of health policy formulation but also of macroeconomic policy formulation. Macroeconomic policy encompasses three major components:

- Establishing and enforcing an environment for secure and inclusive economic growth. Creating this environment includes finance of domestic and international security, enforcement of contracts and property rights, regulation of cross border flows (goods and services, capital, persons), and establishing the broad structure and regulation of the financial system. Global warming and the risk of severe pandemics pose particular challenges to long-term economic growth. In chapter 18 of this volume, I report work undertaken with several colleagues that assesses the magnitude of pandemic influenza risk (Fan, Jamison, and Summers 2018). Suffice it to say that low probability but potentially devastating pandemics pose a

global risk—but particularly a risk to lower-income countries—that warrants inclusion on the macroeconomic policy agenda.

- Establishing mechanisms for social insurance—insurance that enables income security in old age; that provides a financial safety net against permanent disability, against transitory job loss, and against inadequate earning power; and that provides financial protection against medical expenses. *DCP3*'s extended cost-effectiveness analysis introduces an approach to efficient purchase of financial protection against medical expenses.
- Allocation of resources within and across those sectors where efficient levels of investment require substantial public finance. These sectors include much of physical infrastructure, research, education, environmental protection and population health.

DCP3's methods and conclusions provide critical guidance on resource allocation to and within the health sector. Spending the resources available for health investments on the wrong interventions is worse than inefficient: it costs lives. As *DCP3*'s findings make clear, huge variation remains in how many lives can be saved from a million dollars spent on different interventions. Transferring resources from low- to high-yield health interventions is, therefore, a moral imperative. Nor should resources available to the health sector be taken as given. Careful consideration of the social returns to increasing the health sector's share of national budgets and of national income suggests that, in many countries, macroeconomic policy makers underinvest in health.

My own career has centered on macroeconomic policy and on research to improve macroeconomic policy. Over the years I have increasingly come to feel that getting health policy right contributes importantly to improving the social insurance and public sector investment dimensions of macroeconomic policy. For this reason, I have closely followed the 20-year evolution of the disease control priorities agenda. This new edition continues *DCP*'s tradition of informing the efficient selection of health interventions. And it extends that agenda to informing choices where health policy can contribute to poverty reduction as well as health improvement.

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Preface

Budgets constrain choices. Policy analysis helps decision makers achieve the greatest value from limited available resources. In 1993, the World Bank published *Disease Control Priorities in Developing Countries* (DCP1), an attempt to systematically assess the cost-effectiveness (value for money) of interventions that would address the major sources of disease burden in low- and middle-income countries (LMICs). The World Bank's 1993 *World Development Report* on health drew heavily on DCP1's findings to conclude that specific interventions against noncommunicable diseases were cost-effective, even in environments where high burdens of infection and undernutrition remained top priorities.

DCP2, published in 2006, updated and extended DCP1 in several aspects, including explicit consideration of the implications for health systems of expanded intervention coverage. One way health systems expand coverage is through selected *platforms* that deliver interventions that require similar logistics but address heterogeneous health problems. Platforms often provide a more natural unit for investment than do individual interventions. Analysis of the costs of providing platforms—and of the health improvements they can generate in given epidemiological environments—can help to guide health system investments and development.

DCP3 differs importantly from DCP1 and DCP2 by extending and consolidating the concepts of platforms and by offering explicit consideration of the

financial risk protection objective of health systems. In populations lacking access to health insurance or prepaid care, medical expenses that are high relative to income can be impoverishing. Where incomes are low, seemingly inexpensive medical procedures can have catastrophic financial effects. DCP3 offers an approach (extended cost-effectiveness analysis, or ECEA) to explicitly include financial protection as well as the distribution across income groups of financial and health outcomes resulting from policies (for example, public finance) to increase intervention uptake. DCP3 provides interested policymakers with evidenced-based findings on financial as well as health interventions to assist with resource allocation.

This volume of DCP3, volume 9, places the findings from the first eight volumes into a framework identifying an efficient pathway toward essential universal health coverage (EUHC) through the identification of 21 essential *packages* that include health interventions, and fiscal and intersectoral policies. The intervention packages are defined by groups with common professional interests (for example, child health or surgery) and include interventions delivered across a range of platforms. The volume also provides an up-to-date summary of levels and trends in deaths by cause and an early attempt to assess which elements of disease burden most contribute to impoverishment. While most of DCP3's 21 packages of interventions are developed in the first eight volumes, several of the packages are presented here, including discussion of pandemic

preparedness. Along with these new elements, *DCP3* updates the efforts of *DCP1* and *DCP2* to synthesize cost-effectiveness analysis of health interventions.

The overall convergence of many countries and international development partners around the UN Global Goals for 2030 has raised in particular the need for careful analytic work that informs priorities and choices. *DCP3* stands unique in taking on this challenge, providing analyses of the contributions of 218 health system interventions and 71 intersectoral policies grouped into 21 essential packages.

DCP3 is a large-scale enterprise involving an international community of authors, editors, peer reviewers, and research and staff assistants who contributed their time and expertise to the preparation and completion of this

series. We convey our acknowledgements elsewhere in this volume. Here we express our particular gratitude to the Bill & Melinda Gates Foundation for its sustained financial support, to the University of Washington's Department of Global Health for hosting *DCP3*'s Secretariat, and to the World Bank, the original home for the *DCP* series and accomplished publisher of its products.

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Abbreviations

ACE	Advisory Committee to the Editors
AIDS	acquired immune deficiency virus
ANM	auxiliary nurse midwifery
ARI	acute respiratory illness
ART	antiretroviral therapy
BCA	benefit-cost analysis
BMI	body mass index
CCT	conditional cash transfer
CEA	cost-effectiveness analysis
CEPI	Coalition for Epidemic Preparedness Innovations
CHE	catastrophic health expenditure
CHWs	community health workers
CLAS	local health administration communities
COPD	chronic obstructive pulmonary disease
CPD	continuing professional development
CRS	Creditor Reporting System
CVD	cardiovascular disease
DAC	Development Assistance Committee
DALY	disability-adjusted life year
<i>DCP2</i>	<i>Disease Control Priorities in Developing Countries</i> (second edition)
<i>DCP3</i>	<i>Disease Control Priorities</i> (third edition)
DOTs	directly observed treatment, short course
ECEA	extended cost-effectiveness analysis
EP	essential package
EPHF	Essential Public Health Functions
EQA	external quality assurance
EUHC	essential universal health coverage
FRP	financial risk protection
FTE	full-time equivalent
Gavi	Gavi, the Vaccine Alliance
GBD	global burden of disease
GBHS	global burden of health-related suffering
GDP	gross domestic product

GHE	Global Health Estimates
GST	goods and services tax
HICs	high-income countries
HIV	human immunodeficiency virus
HIV/AIDS	human immunodeficiency virus/acquired immune deficiency syndrome
HPP	highest-priority package
IAMP	Interacademy Medical Panel
ICD	International Classification of Diseases
ICER	incremental cost-effectiveness ratio
ICU	intensive care unit
IHD	ischemic heart disease
IHME	Institute of Health Metrics and Evaluation
IHR	International Health Regulations
INEGI	National Institute of Statistics and Geography (Mexico)
IPCC	Intergovernmental Panel on Climate Change
LC-GAPCPC	<i>The Lancet</i> Commission on Global Access to Palliative Care and Pain Control
LICs	low-income countries
LIS	laboratory information systems
LMICs	low- and middle-income countries
LPG	liquefied petroleum gas
MDGs	Millennium Development Goals
MERS	Middle East respiratory syndrome
MICs	middle-income countries
MTB/RIF	mycobacterium tuberculosis/rifampicin
NAM	National Academy of Medicine
NCDs	noncommunicable diseases
NCEF	National Clean Energy Fund
NGO	nongovernmental organization
NTCP	National Tobacco Control Programme
NTDs	neglected tropical diseases
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
OOP	out of pocket
P4P	pay for performance
PDS	public distribution system
PEF	Pandemic Emergency Financing Facility
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
POCT	point-of-care testing
PPA	public-private alliance
PPP	purchasing power parity
PT	proficiency testing
QALYs	quality-adjusted life years
QIDS	Quality Improvement Demonstration Study
RBF	results-based financing
R&D	research and development
RNTCP	Revised National Tuberculosis Control Program
SARA	Service Availability and Readiness Assessment
SARS	severe acute respiratory syndrome