HEALTH, ENVIRONMENT, AND DEVELOPMENT

A shared health, environmental, and development agenda could address the large share of the burden of disease that is environmentally related. World Health Organization.

History teaches that the improvement of human health at the population level is largely determined by good policies that protect the environment and people, that raise the quality of working and living environments, and that assure the permanence and safety of life’s necessities—air, water, food, and shelter—as widely as possible. The advent of health services and modern medicines as a response of the State to demands for health care by the public occurred late in the mortality transition of the industrializing West, as Thomas McKeown (1976) famously showed. Health services are a 20th century concept and practice, but the secular decline in mortality in northern Europe occurred long before. McKeown showed that between 1700 and the 1970s, the American standardized death rate declined by 35 points and the British rate by 21 points. About 70% of the American decline and about 50% of the British decline took place before 1911. Modern medicine (e.g., antibiotics) is a 20th century intervention and access to health services of life-saving potential was remote for most people during this rapid mortality decline.1

By the process of elimination, McKeown concluded that improved nutrition was the main cause of mortality decline, supported by gradual improvements in the quality of the physical environment that influenced the health of the burgeoning industrial working class.

Of necessity, the industrial revolution focused on increasing yields of a broad range of staple foods to ensure the quantity and adequate quality of the working people’s diet. This prevented urban riots and stabilized parliamentary government through wage-food price parity.

Parallel political advances for housing quality, safe water supply, and environmental sanitation reduced respiratory and pulmonary illness and child stunting.

Nobel Laureate Robert Fogel studied the changes in height and weight of European populations (England, Wales, and Scandinavia) during the same period. Changes in average body size of men and women were assumed to be a proxy for increased brain development, reduced stunting and obstetric risks from environmental causes, better diet, improved immune response from good nutrition, and lifespan. Using accepted econometric methods, Fogel demonstrated that more than half of long-term economic growth in northern Europe during the height of the industrial revolution was attributable to the dramatic rise in human physical stature (increased height and weight from birth). Fogel used established models

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1 This observation is in keeping with the history of health in the developed world, where life expectancy increased from about 50 years to 75-80 years during the 20th century. Of the 25-30 years of increased life expectancy seen in that century, about 80% can be attributed to public health measures (improved water and sanitation, nutrition, immunizations, decreased environmental pollution, reductions in major injuries, and healthier and safer work places) and only about 20% to technical advances in health care.
concerning the predictive power of height and body mass index with respect to morbidity and mortality at later ages (Fogel 1993, 1994).

The point is that just as health services are viewed as the provision of the right to health, regardless of the political influence of the sufferer, improvement of the natural and human environments for life and work address mortality and disability arguably as profoundly as the cumulative impact of health services. At the same time, the balance between environmental and social determinants of health will arguably vary from one setting to another, with a bias toward the environmental determinants in political systems where dealing with social issues is blocked by major disparities in power.

THE ENVIRONMENTAL WEDGE: HEALTH, WEALTH, AND EQUITY

Human resources economics have demonstrated the positive correlation between income per capita and health, but only recently has the literature recognized that health is fundamental to sustained economic growth. Healthier populations have lower mortality and fertility rates and higher labor productivity, and are more inclined to invest in higher levels of skills training for themselves and education for their children, leading to higher permanent incomes, savings rates, and national investment over time. Improvements in population health set in motion a virtuous cycle of rising incomes and poverty reduction (Bloom and Canning 2000).

Health equity, normally relegated to abstract reflections on social justice, has concrete influence on sustained economic growth. According to Sen (2002), countries that pursue “growth-mediated” processes often find that inequalities in income persist or exacerbate inequalities in health, and reduction of income poverty alone does not necessarily catalyze health equity. Given the acceptance that health is a universal human right, inequalities in health can be seen as a transitional state of affairs in developing societies struggling to raise incomes, and are viewed as inequities only when they are avoidable, unnecessary, and unfair. Sen argues that countries adopting “support-led” processes are more likely to address the socially controllable determinants of health that include establishing levels of basic human needs by essential services for all and by pro-health policies assuring education and health care for all, food security, water supply, and public sanitation at a minimum.

The main assumption of this Primer is that all countries, regardless of income level or natural endowment, can adopt environmental prudence as the decision rule that shapes public policy across all development sectors and avoids inadvertent harm to the health of the poor and vulnerable, especially women and children. To an extent, health-friendly infrastructure policies may be easier to implement than pro-poor policies favoring/targeting health care for the poor, because inequalities in income, education, and health are a powerful determinant of persistent poverty in developing countries. As demonstrated below, the environmental determinants of health are very powerful in low-income countries, and it would be a cruel delusion to wait for economic growth and rising incomes to solve environmental problems that can and should be urgently addressed. Environmental protection and preventive health strategies are closely interconnected.
ASSESSING RISKS TO HUMAN HEALTH

According to the World Health Organization (WHO), almost one third of the global disease burden can be attributed to environmental risk factors. That means that preventive strategies can be deployed by many sectors in society to avert harm in the form of death, disability, and illness. Current assessment of trends in global health includes a ranking of risk factors that contribute to the burden of disease to life and disability, expressed as disability-adjusted life years (DALYs). The World Health Report (2002) ranked the risks of death and DALYs lost globally, with interesting implications for environmental health planning. This approach is more expressive than simply ranking diseases because many risks are mediated by influences in the physical and policy environments (natural resource endowments, home and work environments, food and price policies, trade agreements, and subsidy structures, among others). Health risks may not display their full impact until well into the future; policies and actions should be based on current prevalence and projected trends in major risk factors.

The ordering of major health risk factors in developed and developing countries shows similarities and differences (Table 1.1). In the poorest regions of the world, childhood and maternal underweight, unsafe sex, unsafe water and sanitation, poor hygiene, indoor smoke from solid fuels, and various micronutrient deficiencies are major contributors to loss of healthy life. In both developing and developed regions, tobacco, alcohol, high blood pressure, and high cholesterol are major causes of the disease burden.

Several striking features emerge. First, despite clear differences driven by wealth and degree of industrialization, there is a convergence of risks throughout the world, albeit with varying weights. Most of these risks can be influenced by prudent management of the natural, work, and policy environments to a degree not appreciated before.

Table 1.1 Leading 10 Risk Factors that Contribute to the Burden of Disease

<table>
<thead>
<tr>
<th>High Mortality</th>
<th>Low Mortality</th>
<th>Developed countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Underweight</td>
<td>Alcohol</td>
<td>Tobacco</td>
</tr>
<tr>
<td>2 Unsafe sex</td>
<td>Underweight</td>
<td>Blood pressure</td>
</tr>
<tr>
<td>3 Unsafe water</td>
<td>Blood pressure</td>
<td>Alcohol</td>
</tr>
<tr>
<td>4 Indoor smoke</td>
<td>Tobacco</td>
<td>Cholesterol</td>
</tr>
<tr>
<td>5 Zinc deficiency</td>
<td>Body mass index</td>
<td>Body mass index</td>
</tr>
<tr>
<td>6 Iron deficiency</td>
<td>Cholesterol</td>
<td>Low fruit &amp; vegetable intake</td>
</tr>
<tr>
<td>7 Vitamin A deficiency</td>
<td>Iron deficiency</td>
<td>Physical inactivity</td>
</tr>
<tr>
<td>8 Blood pressure</td>
<td>Low fruit &amp; vegetable intake</td>
<td>Illicit drugs</td>
</tr>
<tr>
<td>9 Tobacco</td>
<td>Indoor smoke</td>
<td>Underweight</td>
</tr>
<tr>
<td>10 Cholesterol</td>
<td>Unsafe water</td>
<td>Iron deficiency</td>
</tr>
</tbody>
</table>


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1 A composite index of health linked to a productive life referred to as a “year of healthy life saved.” DALY is a weighted index that takes into account loss of life, morbidity, and disability and their collective impact on productivity. The leading risk factors globally (in DALYs) are child and maternal underweight, 138 million; unsafe sex, 92 million; high blood pressure, 64 million; tobacco, 59 million; and alcohol, 58 million. These make up more than a fourth of total disease burden as a group.
Second, developing countries suffer most or all of the burden from many of the leading risks.

Third, infrastructure policies in developing countries will be influenced to reallocate resources to health-promoting investments if the healthy and productive lives of the poor are factored into the equation. This is because such investments often reach the general population more effectively than efforts to target health services to the very poor. The benefits of safe water, sanitation, and energy for household use make a compelling case to improve population health.

Fourth, the key role of nutrition in health worldwide, and selecting the correct policies to influence nutrition status, is evident. According to Ezzati et al. (2002, 2003), about 15% of the global disease burden can be attributed to the joint effects of “undernutrition”—child and maternal underweight and micronutrient deficiencies. But diet-related chronic diseases (cardiovascular disease, diabetes, and obesity) also have substantial dietary determinants: high blood pressure, high cholesterol, high body mass index, and low fruit and vegetable intake. The latter set of risk factors accounts for almost the same proportion of disease burden as undernutrition.

Fifth, the broad overlap of risk factors in all three types of countries (Table 1.1) suggests that while lifestyle matters, policies that shape collective and individual “choice” may matter even more. Of deep concern is the inexorable progress of tobacco in destroying lives across all country types. Tobacco’s contribution to the global disease burden is predicted to increase to about 8.3 million deaths and 124 million DALYs by 2020, with more than 70% of these in developing countries (Institute of Medicine 1998). It has been suggested that core policies that evenly reduce risk factors across populations could add a decade of healthy life expectancy globally.

The leading causes of death in the poorest, high-mortality countries (Figure 1.1) show the difficulty of the poor in gaining healthy years of life unless health is seen as an environmental and development issue of great importance. Eight of the top 10 killers in the poorest countries (except for perinatal conditions and childhood diseases) have a heavy environmental burden that coherent policies could reduce markedly. For example, cardiovascular disease (#1) and cancer (#7) can be reduced by

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3 The International Agency for Research on Cancer (2002) projects a 50% increase in cancer cases to 15 million by 2020, most of the increase in developing countries. Four fifths of cervical cancer deaths occur in developing countries (precipitated by infections in early life) and one fourth of all cancers in poor countries are precipitated by preventable infections (Hepatitis B and C, and human papillomavirus (HPV)). Through the cooperation of economic sectors with the public health services and regulatory authorities, one third of cancers can be prevented and another third can be detected early and treated. The core strategy (not yet deployed in developing countries) is tobacco control; infection control; promotion of healthy diets through public education and supportive price, trade, and agricultural policies; a curable cancer program; and palliative care.
healthy dietary strategies, workplace safety, air pollution abatement, and publicly supported exercise programs. The HIV/AIDS pandemic (#2) can only be averted if seen as a broad development and security issue, requiring cross-sectoral preventive strategies to alter risky behaviors and create affordable treatment regimes. Reducing injuries (#4) and accidents in transport, workplace, and home requires new approaches to safety management and accountability. New approaches to land-use management and community protection are needed to reduce diarrheal diseases (#6) and malaria (#10). The point is clear.

CHILD HEALTH AND THE ENVIRONMENT

Some 40% of the environmentally related disease burden falls on children less than 5-years old (the “under five” group), who account for only 10% of the world’s population. Thousands of children die daily from polluted drinking water and contaminated food. The effects of climate change and air pollution are more damaging to children than to adults, with a growing toll of early deaths. Ten million children under five in developing countries die needlessly each year, and the capacity of health services to cope with this load is limited. Environmental protection through safe energy and safe water and sanitation would reduce deaths from diarrhea and pneumonia by millions each year, and create a new child health revolution. Global immunization and child survival programs do not easily reach the poorest children and the remotest regions in the developing world, where investments in environmentally benign technologies would reap the greatest benefits. The main environmental problems for children are the following:

- **Water and sanitation.** Polluted drinking water and lack of adequate sanitation are responsible for 1.8 million deaths annually, mostly poor children under five suffering from severe diarrhea in developing countries. Some 80–90% of diarrheal disease events are environmentally related. Children drink twice as much water as adults, so the frequency and severity of diarrhea are proportionately higher. Public health programs worldwide have done a good job of saving one million lives each year through case treatment over the last 10 years, but diarrhea prevalence is still very high because of inadequate investment by countries in water supply and sanitation. Children who survive frequent diarrhea bouts early in life are likely to be stunted and frail, with negative consequences later in life.

- **Lead in ambient air and residential materials.** Urban Asian children are regularly exposed to 15 micrograms per deciliter, 50% higher than the United States Center for Communicable Diseases’ “level of concern” where neurological damage and permanent IQ loss have been demonstrated in young children; 80% of Karachi children exceed that level of concern in average blood levels, compared to only 4% of American urban children. Removing lead from gasoline is the single greatest step to prevent lead poisoning.

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4 Over the last quarter century, the mean lead blood level of children in the United States fell by 80%, and the number of children with elevated blood levels declined by 90%, because of stricter regulation that gradually detoxified the air, water, and food supply (Perkle et al. 1994). Lead paint is the only remaining contaminant in older, substandard housing. For Karachi data, see Rahbar et al. (2002).
• *Outdoor air pollution*. Outdoor pollution has doubled child asthma rates over the past decade in many Asian cities and communities near major highways, and damages immature lungs, often permanently.

• *Indoor air pollution*. Indoor pollution from biomass fuel combustion causes millions of respiratory and pulmonary injuries to young children, and life-threatening illness to their mothers exposed to carcinogens released by traditional cooking stoves. Indoor air pollution is responsible for a considerable portion of the acute respiratory infections that kill children under five in the developing world.

• *Pesticides*. Pesticides used in agriculture affect the health of thousands of child laborers and children in plantations and other formal agricultural production industries where exposure to toxic chemicals is continuous. Respiratory and pulmonary illnesses, plus acute toxic poisoning in agricultural communities where pesticide-laced irrigation systems pollute groundwater and wells used for residential needs, are other causes of death and disability for young children. Obviously, children absorb greater concentrations per unit body weight through inhalation, ingestion, and contact with the skin, and are less protected because of immature immune systems. Even small doses of neurotoxins can drastically impair the learning process in children.

• *Life-cycle risks*. Life-cycle risks to physical and mental development of children include poor nutrition and inappropriate food policies including subsidies to non-nutritious foods. Rising obesity in school-age children is a stark contrast to pervasive undernutrition in the region, but both states (over- and undernutrition) diminish potential and shorten life.

• *Climate change and other global environmental issues*. Children are disproportionately vulnerable to global environmental problems, such as climate change, the depletion of the ozone layer, and the loss of the planet’s biological diversity (WHO, UNICEF, and UNEP 2002).

**REPRODUCTIVE HEALTH AND THE ENVIRONMENT**

There are clear and present environmental risks for reproductive health in both sexes, and these risks are greater in the developing world. Lead is a well recognized reproductive toxin that accumulates in the environment. The extent of potential harm that chemicals used in agriculture and industry do to human reproductive health and functions is not yet clear. Known mutagens and teratogens have been widely used throughout Asia in the past, but over time they are gradually becoming subject to regulation, although full population protection is far from assured. The gray (but alarming) area concerns the endocrine disruptor chemicals (EDCs), chemicals that include

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5 While many developing countries are moving to unleaded gasoline, this does not deal with the substantial amounts of lead already in the environment because metals are indestructible; hence, lead and carcinogens like cadmium will continue to pose an untreated problem for unborn generations.

6 Defined by WHO as “exogenous substances that alter function(s) of the endocrine system and consequently cause adverse health effects in an intact organism, or its progeny, or (sub)populations.”
natural and synthetic hormones, pesticides, monomers, additives in the plastics and detergent industries, and persistent environmental pollutants. At present, it is difficult to demonstrate a direct link between exposure and effect, but the multiagency-supported International Programme on Chemical Safety (IPCS 2002) has initiated a long-term research program on EDC effects.

Based on published studies, the human health effects potentially linked to EDC exposure include breast, prostate, and testicular cancer; diminished semen quantity and quality; and impaired behavioral/mental, immune, and thyroid function in children. Some EDCs, e.g., DDT, may interfere with the processes that control development and growth of children. Infants and toddlers are at special risk, because of the crucial role that the endocrine system plays in development. Potential ecological effects include altered sex differentiation, malformations in reproductive organs, altered immune function, and altered population levels.7 Hormonal disruptions affect developing organisms more severely and permanently than adult organisms. Under WHO leadership, regional health risk assessments are ongoing and should be watched carefully for guidance on restricted production and trade practices in the chemical industry.

ADULT HEALTH AND THE ENVIRONMENT

The emerging role of adult health in the economic welfare of developing countries cannot be overly emphasized. Working-age adults are the economic engine for growth and development. Economic growth requires a sophisticated and skilled work force that can utilize resources efficiently. The “disposable worker” idea runs contrary to sustaining a skilled and experienced work force that can be efficient.

Developing nations now face a set of new adult health problems superimposed on traditional health concerns. By 2020, with the exception of sub-Saharan Africa, all countries are expected to have more deaths from chronic noncommunicable diseases than all communicable diseases combined. Even in the face of an expanding HIV/AIDS epidemic, the so-called western diseases (cardiovascular diseases, hypertension, cancer, chronic respiratory diseases, diabetes, among others) will be the major causes of mortality even in the poorest nations. Changes in nutrition, increased smoking habits, greater environmental pollution, and increased workplace hazards are the main reasons for the shift from communicable to noncommunicable causes of mortality and morbidity. This is not to say that communicable diseases will decline to the extent that noncommunicable diseases increase, but rather that developing nations will have to contend with a double burden of diseases. Reducing the effects of risk factors that can be minimized is of major importance if developing countries are to be spared some of the economic implications of the epidemic of adult diseases.8

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7 These effects have been observed in invertebrates, fish, amphibia, reptiles, birds, and mammals.
8 Private communication from Dr. Ian Greaves, University of Minnesota School of Public Health.
GLOBALIZATION AND HEALTH

Economic globalization has been described as a “mixed blessing” for health (McMichael and Beaglehole 2000). Global environmental changes include “altered composition of the atmosphere, land degradation, depletion of terrestrial aquifers and ocean fisheries, and loss of biodiversity... Contemporary public health must therefore encompass the interrelated tasks of reducing social and health inequalities and achieving health sustaining environments.”

Consider the visceral public reaction to the Asian brown cloud9 that has threatened millions of Asian lives and dimmed hopes for a better future. There are no panaceas, but this draws attention to health as a regional public good and to the intersectoral linkages needed to create development and economic policies that create and sustain such goods. The controversial role of trade, given the fractious closure to the World Trade Organization (WTO) September 2003 meeting in Cancun, is easier to avoid, but it is argued that without breakthroughs in trade policy it will be difficult to alter the social determinants of health.

FRAMEWORK AND STRUCTURE OF THE PRIMER

This Primer examines the heavy weight of environmental factors on disease burden of the poor in developing Asian countries, and discusses effective policies, programs, and project design principles that will help poor countries meet the millennium development goals (MDGs) for health described in Figure 1.2.

The Primer focuses on sectors of the economy that have powerful influence on the determinants of health: agriculture and forestry, water and sanitation, energy, transport, urban development, and education. It explores the opportunities for the public and private sectors to interact with civil society for health improvement as a governance triumph and safeguard, and concludes with reflection on regional public goods for health and environmental protection as a challenge for governments and development partners collectively.

The sectoral chapters are the core and address the decision-making framework of a minister or a program manager in a development agency. Each chapter asks and attempts an answer to four questions: How can sectoral policies and strategies be shaped to reach their technical objectives while protecting and promoting human health at a high level? If existing approaches inadvertently harm human health, how can programs take midcourse corrective actions that improve the healthy life expectancy of the poor? What are the key issues and questions that a minister or program manager needs to consider in designing an effective and sustainable set of initiatives that promote health as a defining development outcome? Are there referenced “best practices” for pro-health sectoral strategies and examples of model programs with potential for replication?

Underlying these questions is the quest to identify performance indicators that monitor progress toward the health MDGs and true poverty reduction. Improvement in population health emerges from this exercise as a common coin whose expenditure will

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9 According to a recent WHO report, this cloud covers the entire South Asian subcontinent with a mixture of combustion particulates of fossil fuels and biomass that is constantly replenished by economic and domestic activities of one third of the global population, but is also fragmented and recirculated as pollution concentrates worldwide.
**Figure 1.2 Health-related Millennium Development Goals**

<table>
<thead>
<tr>
<th>Goal # 1: Eradicate Extreme Poverty and Hunger</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Target: halve, between 1990 and 2015, the proportion of people who suffer from hunger</td>
</tr>
<tr>
<td>• Indicators: prevalence of underweight children under five years of age; proportion of population below minimum level of dietary energy consumption</td>
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<thead>
<tr>
<th>Goal # 2: Achieve Universal Primary Education</th>
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<tbody>
<tr>
<td>• Target: ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling</td>
</tr>
<tr>
<td>• Indicators: net enrollment ratio in primary education; proportion of pupils starting grade 1 who reach grade 5; primary completion rate; literacy rate of 15 to 24-year olds</td>
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<thead>
<tr>
<th>Goal # 3: Promote Gender Equality and Empower Women</th>
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<tbody>
<tr>
<td>• Target: eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015</td>
</tr>
<tr>
<td>• Indicators: ratio of girls to boys in primary, secondary, and tertiary education; ratio of literate females to males among 15- to 24-year olds; share of women in wage employment in the nonagricultural sector; proportion of seats held by women in national parliament</td>
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<table>
<thead>
<tr>
<th>Goal # 4: Reduce Child Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Target: reduce by two thirds, between 1990 and 2015, the under-five mortality rate</td>
</tr>
<tr>
<td>• Indicators: under-five mortality rate; infant mortality rate; proportion of 1-year-old children immunized against measles</td>
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</tbody>
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<tr>
<th>Goal # 5: Improve Maternal Health</th>
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<tbody>
<tr>
<td>• Target: reduce by three quarters, between 1990 and 2015, the maternal mortality ratio</td>
</tr>
<tr>
<td>• Indicators: maternal mortality ratio; proportion of births attended by skilled health personnel</td>
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<thead>
<tr>
<th>Goal # 6: Combat HIV/AIDS, Malaria and Other Diseases</th>
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<tbody>
<tr>
<td>• Target: have halted by 2015 and begun to reverse the spread of HIV/AIDS</td>
</tr>
<tr>
<td>• Indicators: HIV prevalence among young people aged 15 to 24 years; condom use rate of the contraceptive prevalence rate; number of children orphaned by HIV/AIDS</td>
</tr>
<tr>
<td>• Target: have halted by 2015 and begun to reverse the incidence of malaria and other major diseases</td>
</tr>
<tr>
<td>• Indicators: prevalence and death rates associated with malaria; proportion of population in malaria-risk areas using effective malaria prevention and treatment measures; prevalence and death rates associated with tuberculosis; proportion of tuberculosis cases detected and cured under directly observed treatment short-course (DOTS)</td>
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<tr>
<th>Goal # 7: Ensure Environmental Sustainability</th>
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</thead>
<tbody>
<tr>
<td>• Target: integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources</td>
</tr>
<tr>
<td>• Indicator: proportion of population using solid fuel</td>
</tr>
<tr>
<td>• Target: halve by 2015 the proportion of people without sustainable access to safe drinking water</td>
</tr>
<tr>
<td>• Indicator: proportion of population with sustainable access to an improved water source, urban and rural</td>
</tr>
<tr>
<td>• Target: by 2020 to have achieved a significant improvement in the lives of at least 100 million slum dwellers</td>
</tr>
<tr>
<td>• Indicator: proportion of urban population with access to improved sanitation</td>
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<tr>
<th>Goal # 8: Develop a Global Partnership for Development</th>
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<tbody>
<tr>
<td>• Target: in cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries</td>
</tr>
<tr>
<td>• Indicator: proportion of population with access to affordable essential drugs on a sustainable basis</td>
</tr>
</tbody>
</table>
revalue a range of investments by generating a powerful stream of benefits through heightened awareness of new design possibilities across all development sectors.

The structure of the sectoral chapters follows a common format. First, indicators of potential impact of health interventions, including the relevant MDGs, are set out. An overview of health-related issues in the sector follows and the key issues are detailed in tabular format. Some key questions that a minister, project officer, or project assessor could ask in relation to improving health outcomes are provided, and a prototype project is outlined to show how health interventions have benefited or would benefit the project outcomes. A set of frequently asked questions is given next to increase the knowledge of project officers on the nature of the health issues in the sector. A glossary at the end of the book explains the technical terms used. Finally, some best practices with regard to improving health are provided. References to sources used and to further information close each chapter.

The last two chapters step beyond the confines of individual sectors dominated by the public sector at country level. The chapter on Public-Private Partnerships takes the issues further than what might be supported with standard loans to the public sector and places sustainable health and environment in a broader context of interested parties and advocates. Through examples, the chapter illustrates how public-private partnerships with civil society have worked effectively. These are time-consuming relationships to create, but the sustainability of initiatives funded by development partners will increasingly depend on these types of partnerships.

The final chapter presents a priority set of “regional public goods” to sustain health and environment that are far reaching in their potential importance. The common problems and solutions to environmentally-related health issues argue that regional solutions should be effective and well received. ADB is one of several regional development institutions that can help facilitate these solutions.

**Toward Health Impact Assessment as a Decision Tool for ADB and Development Partners**

The Primer does not attempt to make any original contribution to health impact assessment (HIA) methodology (for which see ADB 1992; Birley 1995; and WHO 2001c). The Primer is a practical decision tool for project managers in ADB and similar agencies, as well as their counterparts in ministries of developing countries. For ADB officers, the sectoral reviews are intended as an additional reference in designing their projects from the initial preparatory stage to the appraisal and ultimately the implementation phase. Experienced ADB specialists in all the covered sectors provided invaluable assistance in defining relevant issues and questions and in devising prototype projects that incorporate health protection and/or health monitoring as core components. Thus, the Primer is both a “building block” toward a formal HIA process and a work in progress that needs continuous updating based on informed experience and reflective practice.
REFERENCES


