

# HEALTH

Sector Policy Paper

40968

World Bank, February 1980





the 1990s, the number of people in the UK who are aged 65 and over has increased by 1.5 million (1990–1999) and is projected to increase by a further 1.5 million by 2010 (Office for National Statistics 2000). The number of people aged 65 and over is projected to increase by 2.5 million by 2020 (Office for National Statistics 2000).

There is a growing awareness of the need to develop strategies to meet the needs of the ageing population. The Department of Health (2000) has identified the need to develop strategies to meet the needs of the ageing population. The Department of Health (2000) has identified the need to develop strategies to meet the needs of the ageing population.

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## Sector Policy Paper

Second Edition  
Second Printing  
February 1980

**World Bank**  
1818 H Street, N.W.  
Washington, D.C. 20433, U.S.A.

*HEALTH*, Sector Policy Paper  
February 1980

This paper incorporates revised portions of *Health*, a Sector Policy Paper, published in March 1975, and the memorandum on health presented to the Executive Directors of the World Bank in July 1979. Fredrick Golladay is the author. Alexa Dru Deric contributed substantially to the research. Emmanuel D'Silva had the responsibility of editing the paper.

# HEALTH

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## Summary

The World Bank<sup>1</sup> adopted a formal health policy in 1974 after several years of informal activity in the sector. The Health Sector Policy Paper published in March 1975 described this policy. The paper limited health operations to components of projects in other sectors, reflecting concern at that time about the feasibility of low-cost health care systems, and uncertainty about the Bank's proper role in the sector and about how its activities should relate to those of the World Health Organization (WHO). The health sector policy of the Bank is supplemented by policies in education, population, and nutrition. In 1974, it was indicated that the Bank's health policy would be reviewed after a few years' experience in lending for health components; that review is the purpose of current paper.

From 1975 through June 1978, the Bank provided technical and financial assistance to 44 countries for 70 health components of projects in other sectors. In addition, the Bank prepared seven health sector studies, conducted several population sector studies, and established working relationships with WHO and other major external assistance agencies active in the health sector. These experiences have given the Bank opportunities to test new concepts in health care, on a modest scale, and have improved its understanding of the major issues confronting the sector.

This paper briefly describes health conditions in developing countries, then examines some of the most common obstacles to improving them, the underlying sources of these obstacles, and the lessons of experience that will guide the Bank's activities in the sector. It concludes by outlining changes in Bank policy.

### Health Conditions in Developing Countries

Health conditions vary greatly from country to country and within most countries, but throughout the developing world they are substantially inferior to those in affluent countries. While life expectancy has improved in most countries over the past three decades, the rate of improvement is declining and the level remains low relative to developed countries. Low life expectancy reflects very high death rates among children under five years of age. In the poorest regions of low-income countries, half of all children die during the first year of life. For people who survive beyond age five, life expectancy is six to eight years less than in developed countries. Among survivors, disability, debility, and temporary incapacity are often serious problems. It is estimated that one-tenth of the life of the average person in a developing country is seriously disrupted by ill-health.

The major killers of small children are gastrointestinal and respiratory infections, measles, and malnutrition—conditions for which

<sup>1</sup>All references to the World Bank in this paper refer to the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA). The fiscal year of these institutions runs from July 1 to June 30. All money terms are expressed in US dollars. A billion equals 1,000 million.

inexpensive, effective prevention or treatment is technically possible. The principal nonfatal diseases in developing countries are gastrointestinal and respiratory infections, skin diseases, and the major tropical diseases.

Improving health is a popular priority in developing countries. Most countries now have publicly financed systems of health care and programs of investment in sanitation, water supply, and health education. Government health care facilities generally reach to the district or, in a few countries, even to the village level. Fragmentary evidence suggests that in total as much as 6 percent to 10 percent of gross domestic product (GDP) is spent by the public sector and by private individuals on health care. This percentage amounts to about \$75 billion annually in the developing countries as a group. Additional sums of money are spent on family planning, water supply, sanitation, and nutrition.

### **External Assistance in Health**

Bilateral, multilateral, and private voluntary agencies financed about 0.5 percent of the total expenditures on health care in developing countries, or about \$400 million in 1977. If the definition of health activities is widened to include family planning, water supply, sanitation, and nutrition, external assistance was about \$1.1 billion in 1977. Most donor agencies now focus on improving access to basic health services rather than construction of hospitals and medical schools, as was common in the 1960s.

The WHO is the leading United Nations (UN) agency in the sector. It strongly advocates improving access to health care, and promotes the concept of low-cost primary health care through its conferences, publications, and public statements. WHO has so far concentrated largely on technical assistance; it has rather modest financial resources to undertake field programs, and relatively little experience in identification, appraisal, or supervision of large-scale projects in developing countries.

The World Bank has become a major lender in the health sector under its health, population, education, and nutrition policies even though it has not directly funded health projects. Over the past three years, the Bank has financed basic health care and vector control activities costing over \$400 million; family planning and nutrition activities with total project costs of about \$160 million; and water supply and sanitation activities costing an additional \$3.9 billion. The Bank has developed close working relationships with WHO and other organizations promoting health in developing countries, and is carrying out a small program of operational research on health services.

### **Improving Health Conditions in the Developing Countries**

Despite the large expenditures on health, and the technical feasibility of dealing with many of the most common health problems,

efforts to improve health have had modest impact on the health of the vast majority of the population in most developing countries. This is commonly attributed to two main reasons. First, health activities have typically overemphasized sophisticated, hospital-based care, while neglecting preventive public health programs and simple primary care provided at conveniently located facilities. Second, even where health facilities have been geographically and economically accessible to the poor, deficiencies in logistics, inadequate training of staff, poor supervision, inappropriate services, and lack of social acceptability have often compromised the quality of the care they offer and limited their usefulness.

Though not present in all developing countries, the following problems are frequently encountered:

- Health facilities are geographically inaccessible to the majority of people. Women with children are most likely to experience difficulties in reaching a source of care.
- Economic barriers exclude many people. Even where users are not charged for service, the costs of transportation and time away from work can be prohibitive for the poor, particularly those who live in urban areas.
- Curative care is emphasized while prevention and early treatment are neglected.
- Hospital facilities built are excessive relative to primary health care facilities.
- Education of physicians is often not geared to the conditions in the country; it neglects common local health problems and appropriate technologies, while emphasizing rare diseases and the use of costly equipment.
- Health workers, particularly those in rural health positions, frequently are not sufficiently trained, supported, or supervised.
- The availability of services is erratic, particularly in more remote areas, because of unreliable delivery of drugs, pesticides, and other essential supplies.
- The services provided are sometimes not socially acceptable or not perceived to be efficacious by their intended beneficiaries.
- Community participation and integration with other sectors is underdeveloped.

It is now evident that the most persistent problems in improving health do not result from the complexity of medical technology, and only partially from the scarcity of financial resources; rather, they derive principally from problems in the design and implementation of policy, management, and logistics.<sup>2</sup> The obstacles most frequently encountered by the Bank in its lending for health components are:

<sup>2</sup>Declarations at the Alma-Ata Conference on Primary Health Care in September 1978, organized by WHO and the United Nations Children's Fund (UNICEF), confirmed that this perception is held by the health authorities in most developing countries. Delegates to this conference, representing the entire membership of WHO, unanimously endorsed the idea that low-cost, accessible, relevant health care, supported through community participation, should be pursued and integrated with broader efforts toward economic and social development.

- Lack of sound, long-term planning, particularly for the financing of recurrent costs, and for the coordination of program elements.
- Limited capacity for implementing new programs.
- Inconsistencies between new health programs (especially for training paramedical workers) and existing laws and regulations.
- Inadequate methods of procurement, distribution, and control of drugs and pesticides.
- Insufficient and poorly managed transport.
- Inadequate technical supervision and personnel administration.
- Poorly designed curricula for training health manpower and insufficiently prepared procedures for clinical care.

### **Changes in the Bank's Health Policy**

The Bank will now begin lending directly for health projects in addition to financing health components as in the past. These projects will include such elements as development of the basic health infrastructure, training of community health workers and paraprofessional staff, strengthening of logistics and supply of essential drugs, promotion of proper nutrition, provision of maternal and child health care, including family planning, prevention and control of endemic and epidemic diseases, and development of management, supervision, and evaluation systems. The components of a project will vary among countries depending on existing programs, needs, resources, institutional capacity, and national priorities. Projects might be located in rural or urban areas, or both.

The change in policy is justified for several reasons. First, the Bank's capacity in country programming and sectoral analysis can be utilized to help ensure the success of emerging major national programs to expand the coverage of health care. Its technical assistance in formulating detailed health projects and in developing appropriate institutions is also important. Second, a broader policy of lending for health is an essential element of the Bank's commitment to alleviating poverty. Third, lending for health projects is required to complement and rationalize the Bank's current activities in the health sector. Fourth, by lending for health projects in countries which have not yet adopted formal family planning policies, the Bank can have more opportunities for dialogue on population issues and for supporting family planning services, where desired, through the health care system.

The Bank's initial program is to begin with one project in fiscal 1981, and expand to four or five projects annually by 1984. These projects should improve access to acceptable services that would significantly reduce mortality and morbidity, and should strengthen the recipient countries' primary health care systems. The choice of countries and projects to be financed will take into account: (a) the willingness of countries to develop sector planning capacity and pre-

pare long-term plans to make basic services generally accessible within a reasonable period of time; (b) the financial and institutional feasibility, cost effectiveness, and replicability of projects; (c) the social acceptance of activities that take into account the needs perceived by the target population as well as scientific assessment of their needs; (d) the reliability, effectiveness, and technical appropriateness of techniques and delivery systems; and (e) the capability of health institutions to absorb the assistance.

# Chapter 1: Health Conditions in Developing Countries

## General Measures of Health

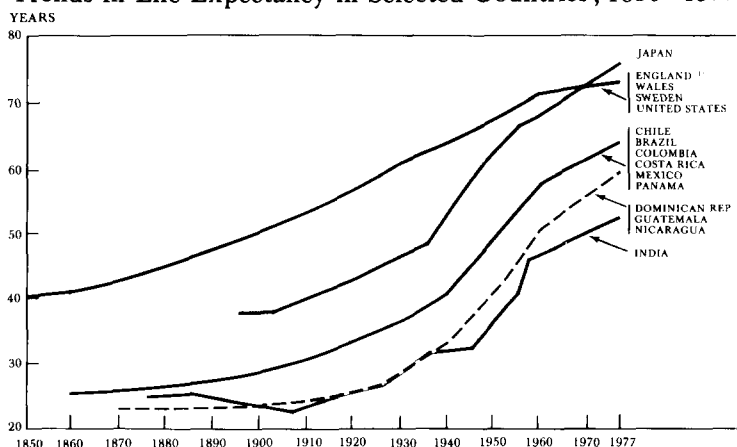
For the developing countries as a group, life expectancy at birth is about 53 years. Life expectancy increased by a dramatic 50 percent between the early 1940s and the early 1970s, but this trend began to falter in the 1960s, and has continued to slow<sup>1</sup> (see Figure 1). Life expectancy at birth in Africa is now about 47 years; in South Asia it is about 49 years, and in Latin America, about 61 years. In contrast, life expectancy in the developed regions is about 70 years (see Table 1).

The low life expectancy in developing countries can largely be attributed to very high death rates among children. In the poorest regions of low-income countries, half of all children die during the first year of life; in Africa as a whole, the infant mortality rate is over 100 deaths per thousand births compared with 15 per thousand in developed countries. In developing countries, children between the ages of one and five years are 12 to 15 times more likely to die than children born in developed countries. In much of Africa, half of all deaths occur among children under the age of five (see Figure 4, page 87).

<sup>1</sup>This leveling off began at a much earlier stage than in the developed countries, where life expectancy at birth continued to improve at an accelerating pace until it reached roughly 70 years.

Figure 1

### Trends in Life Expectancy in Selected Countries, 1850–1977



(1) Life expectancy in England and Wales for 1977 is approximated with United Kingdom statistics in 1977. Sources: Arriaga, E. and Davis, K., "The Pattern of Mortality Change in Latin America," *Demography* 6 (3): 223-242, 1969, Tables A-3 and A-4; and World Bank, *World Development Report*, 1979.

Table 1

**Life Expectancy at Birth in Some Major Areas of the World**  
(in years)

Region	1950-55	1955-60	1960-65	1965-70	1970-75
Developing regions	42.5	45.7	48.7	51.3	53.2
Africa	37.5	39.8	42.2	44.5	46.5
Latin America	52.0	54.9	57.2	59.3	61.2
East Asia	47.5	51.7	55.9	59.8	63.3
South Asia	39.2	42.1	44.9	47.4	49.3
Developed regions	64.3	67.2	68.6	69.3	70.3
WORLD TOTAL	47.2	50.1	52.5	54.4	56.0

Source: United Nations. **Demographic Estimates and Projections for the World, Regions and Countries as Assessed in 1970.** Prepared by the Population Division, Department of International Economic and Social Affairs (Provisional Report), 1979.

For those in developing countries who reach the age of five, life expectancy is only six to eight years less than in developed countries. However, these people suffer frequently from nonfatal diseases. Data on health conditions are available for only a few countries and are of doubtful reliability; little information has been collected on the impact of disease on economic and social activities. The few detailed studies that are available suggest that illness disrupts normal activities for roughly one-tenth of people's time in most developing countries. Many of the illnesses are intermittent with recurrent acute episodes; these illnesses disrupt economic activity, often at critical times, such as the planting and harvesting seasons in the case of malaria. Chronic and debilitating diseases impair people's ability to concentrate, students' ability to learn, and adults' productivity. Degenerative chronic diseases (heart disease, stroke, diabetes, cancer, etc.) are less prevalent in developing than in developed countries, partly because smaller proportions of the total population survive to late adulthood. However, these diseases are becoming serious problems in developing countries, especially among affluent, middle-aged, urbanized persons. Accidental injuries are also emerging as a major cause of death and disability in many countries.

#### **Differences between and within Countries**

A striking association exists between measures of per capita income and health status. Annex 1 presents the relationship between per capita income and life expectancy, infant mortality, and the crude death rate. African countries, which have the lowest per capita incomes in the world, report the lowest levels of health, while the Latin American countries, which are among the wealthiest of the developing countries, report a health status approaching that of the developed world.<sup>2</sup>

<sup>2</sup>The correlation coefficient for GNP per capita and life expectancy is 0.580 for the countries reported in Annex 1. If the United States is excluded from the analysis, the coefficient becomes 0.726.

Substantial intercountry differences in health are accompanied by equally notable variations within countries. These differences are pronounced between urban and rural areas in developing countries. The crude death rate for 1960 in the rural areas of the developing world was estimated by the UN at 21.7 per thousand, compared with 15.4 for urban areas.<sup>3</sup> Data on infant mortality are especially pertinent as they refer to the population most vulnerable to health hazards. Infant mortality is grossly underreported in most developing countries; the degree of underreporting is probably much greater for rural than for urban areas. Nonetheless, mortality rates, as reported, are much higher in the rural areas. These differences are the results of the marked contrast in socioeconomic conditions between rural and urban areas. Such rural-urban differentials tend to disappear in advanced European countries, where living standards are much less disparate than in the developing countries.

Interestingly, the contrast between rural and urban health status in today's developing countries is opposite to that which prevailed in the advanced nations when they were becoming industrialized. In 1841, overall life expectancy for males in England and Wales was about 40 years, but in London it was only 35 years, and in the industrial cities of Liverpool and Manchester, it was only 25 years and 24 years, respectively.<sup>4</sup> Compared with rural people, the health status of urban dwellers in the now developing countries is better because of higher incomes, better sanitation and water supplies, greater literacy, and superior personal health services.

### **The Disease Pattern**

Assessment of the health situation requires knowledge not only of death rates and life expectancy rates for all age groups, but also of the distribution, by cause, of mortality and morbidity. Reliable information on patterns of disease is unavailable on a countrywide basis for most nations.<sup>5</sup> Nonetheless, it is possible to convey a general idea of the difference in disease patterns on the basis of models developed by the UN (see Table 2). These models simulate the pattern of disease under specific assumptions regarding population characteristics, environmental conditions, and socioeconomic circumstances. The first model represents a population characteristic of a developing country: life expectancy at birth of 40 years and a young age structure. The second model represents a developed country: an older age structure and a life expectancy at birth of 70 years. These statistics broadly indicate the different disease patterns of developed and developing countries.

<sup>3</sup>United Nations. *Demographic Trends in the World and Its Major Regions, 1950-1970* (New York: United Nations, 1973), Table 12.

<sup>4</sup>United Nations, Department of Economic and Social Affairs. *The Determinants and Consequences of Population Trends* (New York: United Nations, 1973), vol 1, p. 133.

<sup>5</sup>Many problems arise in analyzing such data: underreporting is more common for some diseases than for others; multiple causation leads to misreporting; and many deaths are registered without identification of causes (in Thailand, for example, such deaths account for 59 percent of the total reported, and in Iraq the proportion is 44 percent).



Percentage Distribution of Deaths by Cause  
in Two Selected Models

Table 2

	Model developing country	Model developed country
Infectious, parasitic, and respiratory diseases	43.7	10.8
Cancer	3.7	15.2
Diseases of the circulatory system	14.8	32.2
Traumatic injury	3.5	6.8
Other causes	34.3	35.0
All causes	100.0	100.0

Source: Adapted from *Population Bulletin of the United Nations* No. 6 (New York: United Nations, 1963), pp. 111-112, particularly Table V.33. See also pp. 106-110 for a description of methods used in constructing these and other models.

The most widespread diseases in developing countries are those transmitted by human feces—the intestinal parasitic and infectious diarrheal diseases, but also poliomyelitis, typhoid, and cholera. These diseases spread easily in areas without community water supply systems. The category “bacillary dysentery and amoebiasis, enteritis, and other diarrheal diseases” was the leading identified cause of death in Paraguay (1971), Guatemala (1970), and El Salvador (1971). The category “all forms of dysentery” was the most frequently notified communicable disease in Pakistan.<sup>6</sup> In a case study in the Punjab, India, a death rate of 3,446 per 100,000 infants from acute diarrheal diseases was reported.<sup>7</sup> In Egypt, Iran, and Venezuela, the monthly incidence of diarrhea among children of preschool age has been estimated to be between 40 percent and 50 percent.<sup>8</sup>

Intestinal parasitic diseases are frequently chronic and debilitating rather than causes of acute illness or death. Their incidence in the developing world is often high. WHO estimates that in 1971 there were 650 million people in the world with ascariasis, 450 million people with ancylostomiasis, 350 million people with amoebiasis, and 350 million people with trichuriasis.<sup>9</sup> A World Bank case study of the labor force engaged in civil construction at three sites in West Java, Indonesia, found 85 percent infected with hookworm.<sup>10</sup>

Possibly one of every four persons in the world is infected by round worms.<sup>11</sup> Studies in Sri Lanka, Bangladesh, and Venezuela

<sup>6</sup>World Health Organization. *The Fifth Report on the World Health Situation, 1969-1972—Part II; Review by Country and Territory* (Geneva: WHO, 1974).

<sup>7</sup>Scrimshaw, N.S., Taylor, C.E., and Gordon, J.E. *Interactions of Nutrition and Infection*, WHO Monograph Series No. 57 (Geneva: WHO, 1968), p. 240.

<sup>8</sup>Van Zijl, W.J. “Studies in Diarrheal Diseases in Seven Countries,” *Bulletin of the World Health Organization* 35 (Geneva: WHO, 1966), pp. 249-261.

<sup>9</sup>Smith, C.E. Gordon. “Major Disease Problems in the Developing World,” *Conference Proceedings: Pharmaceuticals for Developing Countries* (Washington: Institute of Medicine, National Academy of Sciences, 1979). These figures do not reveal the multiple incidence of parasites per person that occurs very often.

<sup>10</sup>Basta, S.S. and Churchill, A. *Iron Deficiency Anemia and the Productivity of Adult Males in Indonesia*. World Bank Staff Working Paper No. 175 (Washington: World Bank, 1974).

<sup>11</sup>Wilcocks, Charles, and Manson-Bahr, P.E.C. *Manson's Tropical Diseases*, Seventeenth Edition (Baltimore: Williams and Wilkins, 1972), p. 247.

found an average infection rate in preschool children of between 50 percent and 70 percent for both round worm and whipworm; at the age of six, the infection rates for helminths were 95 percent in Sri Lanka, 97 percent in Bangladesh, and 93 percent in Venezuela.<sup>12</sup>

The second major disease group consists of the airborne diseases. The group includes tuberculosis, pneumonia, diphtheria, bronchitis, whooping cough, meningitis, influenza, measles, smallpox, and chicken pox. These diseases are spread by inhaling the airborne respiratory secretions of infected persons. According to government statistics, these diseases accounted for 16 percent of the reported deaths in Chile and 29 percent of the deaths in Guatemala, in 1975.

A study of deaths among children of five years of age in selected areas of Latin America and the Caribbean reveals that over 70 percent of the deaths beyond the perinatal period were due to fecally related diseases, airborne diseases, or malnutrition. Table 3 presents a detailed analysis.

These three major disease groups account for the majority of deaths among the poorest people in developing countries and particularly among children below the age of five. Other debilitating and fatal diseases are limited to particular geographical areas or particular ways of life. The waterborne diseases are the most significant of this group. However, direct contact with the exudate from infections is also an important transmission process for such diseases as syphilis, gonorrhea, and leprosy. The contact diseases are generally of relatively minor significance except in limited areas.

Vectorborne diseases are less widespread and figure less prominently in mortality and morbidity statistics, but are, nonetheless, significant in the developing world. There has been a startling increase in their incidence over the last decade. The most widespread of these diseases are malaria, trypanosomiasis (sleeping sickness), Chagas' disease, schistosomiasis (bilharzia), and onchocerciasis (river blindness). About 850 million people live in areas where malaria continues to be transmitted despite activities to control it. An additional 345 million people reside in areas with little or no active malaria control efforts.<sup>13</sup>

The disease is endemic, and adults have acquired a higher degree of natural immunity through the process of adaptation. However, in the Indian subcontinent, epidemics break out periodically because adults have not achieved this level of adaptation. Malaria eradication campaigns launched in the 1950s and backed by international agencies were largely successful in 37 countries.<sup>14</sup> However, there is evidence of recent setbacks in Indonesia, Sri Lanka, and the Indian subcontinent. The number of new malaria cases increased by over 230% between 1972 and 1976.

<sup>12</sup>Van Zijl, "Studies on Diarrheal Diseases in Seven Countries," Table 12.

<sup>13</sup>World Health Organization. *Malaria: Processed Report for the Special Programme for Research and Training in Tropical Diseases* (Geneva: WHO, 1976).

<sup>14</sup>Weller, T.H. "World Health in a Changing World," *Journal of Tropical Medicine and Hygiene* 77(4) Supplement 54, 1974.

Table 3

Percentage of Deaths under the Age of Five for which Fecally related Diseases, Airborne Diseases, or Malnutrition were the Primary Cause of Death<sup>(1)</sup>

Areas	Deaths caused by			Total
	Fecally related diseases	Airborne diseases	Nutritional deficiency	
Chaco, Argentina, rural	40	36	2	79
San Juan, Argentina, central urban	38	32	3	72
San Juan, Argentina, suburban	34	38	8	80
San Juan, Argentina, rural	35	42	8	84
Chaco Resistencia, Bolivia, rural	52	27	6	84
La Paz, Bolivia, urban	29	55	3	87
Viacha, Bolivia, rural	25	65	0	91
Recife, Brazil, urban	42	41	5	88
Ribeirao Preto, Brazil, urban	49	36	2	87
Ribeirao Preto, Brazil, rural	50	29	3	81
Ribeirao, Preto Franca, Brazil, rural	55	20	7	82
Sao Paulo, Brazil, urban	40	33	5	78
Santiago, Chile, central urban	31	37	6	73
Santiago, Chile, suburban	33	38	3	74
Cali, Colombia, urban	44	25	15	84
Cartagena, Colombia, urban	38	23	17	78
Medellin, Colombia, urban	49	22	11	82
San Salvador, El Salvador, urban	52	28	6	86
San Salvador, El Salvador, rural	51	22	13	86
Kingston, Jamaica, urban	37	21	5	63
St. Andrew, Jamaica, rural	23	23	23	69
Monterrey, Mexico, urban	43	35	4	83

(1) Excludes deaths due to birth defects and complications of birth.

Source: Puffer, Ruth R., and Serrano, Carlos V. *Inter-American Investigation of Mortality in Childhood*, Provisional Report (Washington: Pan American Health Organization, 1971), pp. 133-154, Appendix Table 1.

Trypanosomiasis occurs in a very wide band across the middle of Africa.<sup>15</sup> It is generally fatal if not treated in its earliest stages. In the early twentieth century, as the movement of people was stimulated by colonization, the disease spread disastrously on the continent; in Uganda and the Congo, the population was estimated to have been cut in half by epidemics of the disease. Between the World Wars, mobile health teams and enforced mass testing and treatment of populations substantially reduced the prevalence of trypanosomiasis. The disease was brought under control in most areas by the

<sup>15</sup>Cattle are highly vulnerable to some forms of the trypanosome which are harmless to humans. For a long time, much of sub-Saharan Africa did not have draft animals because of animal trypanosomiasis, and this was probably a major reason for slow technological development in the area.

1950s but has, since the mid-1960s, once again become a serious problem because control measures have dwindled.<sup>16</sup>

Chagas' disease, the American form of trypanosomiasis, is concentrated in the rural areas. It is endemic in most countries of South America, and in much of Central America. The disease is chronic and can continue for years. Many cases show no symptoms, but heart disease is a common sequel, and no satisfactory treatment exists.

Schistosomiasis is a debilitating disease of varying severity transmitted by snails. Large areas of slow-moving water and water vegetation provide an ideal habitat for the snails, and thus, the most severe instances of the disease are found in East Asia and in the irrigated areas of Africa and Latin America. In arid regions, the disease is not a problem since enough surface water is rarely available to support snail colonies. The disease is now spreading rapidly with the development of irrigated agriculture. An estimated 180 million persons are infected.

Onchocerciasis, although less common in the world as a whole, is hyperendemic to Western Africa and parts of Central America. Heavy infections of long duration produce clinical results which, even apart from blindness, can be very severe. In some areas, the disease has led to the depopulation of fertile river valleys. The vector, the simulium fly, prefers swift running water as its habitat. Although man-made lakes above dams tend to flood simulium breeding grounds, the turbulent water near the sluice gates can create ideal breeding conditions below the dam. Thus, the development of water resources may help spread the prevalence of the simulium fly and the incidence of the disease.

In addition to these vectorborne diseases, tetanus is of real concern in many areas. Its prevalence is related both to specific occupations and practices. The disease is caused by anaerobic bacteria that live in dung or earth. In many areas of the developing world, tetanus in newborn children is a major danger, often because dung is used to stem the bleeding of the umbilical cord. Agricultural workers wounded while working are also susceptible to tetanus. The use of animal manure as fertilizer may worsen the problem.<sup>17</sup> Induced abortion in insanitary surroundings is a common cause of tetanus infection. Without sophisticated medical care for the disease, the fatality rate approaches 100 percent.

### **Controlling Common Diseases**

The health problems of developing countries can be controlled or treated with presently known technologies. Infectious diseases could be reduced through good hygiene, early diagnosis and treatment, and immunization. Improvements in water supply and waste dis-

<sup>16</sup>Burke, J. "Historique de la Lutte contre la Maladie du Sommeil au Congo," *Colloque International sur la Lutte contre les Grandes Endémies, 1970* (Antwerp: Prince Leopold Institute of Tropical Medicine, 1970), pp. 93-110.

<sup>17</sup>In Kenya, the incidence of tetanus increased rapidly and was highest in areas where agricultural activity was greatest. See Fendall, N.R.E., "Agronomy and Health," *Lancet*: 648, 1965.

posal would greatly facilitate control of fecally related diseases, but good personal hygiene, careful preparation of food, and use of safe drinking water are also essential. Immunizations against the most common and serious childhood diseases, such as measles, polio, tetanus, diphtheria, and pertusis are available at moderate cost. Use of better weaning foods and continuation of breastfeeding would reduce early childhood malnutrition and diminish the seriousness of infectious diseases. The foods and practices required are generally available and inexpensive. Prenatal care, screening for difficulties in delivery, safe delivery, and neonatal care would drastically reduce maternal and neonatal mortality and greatly improve the health prospects of children. The materials and training needed for these activities are simple and inexpensive. Care of wounds is particularly important in rural, tropical areas where the risks of infection are very high because of the abundance of infective agents in the environment. Facilities for the emergency care of victims of serious accidents and for their transport to small hospitals are urgently needed.

The common tropical diseases are difficult to control, but major successes have been achieved in the past in the case of malaria, yellow fever, and trypanosomiasis. For most, interruption of transmission through control of the vector is possible, though very costly. Effective drugs to combat malaria, schistosomiasis, and several other tropical diseases are also available. However, with long-term application, parasites and insects become resistant to chemicals. Furthermore, the distribution of essential drugs and pesticides is subject to interruptions which can result in serious new outbreaks of the disease. Permanent control requires monitoring of incidences of disease and prompt appropriate remedial measures; well-developed health infrastructure is needed for these purposes. The Special Programme for Research and Training in Tropical Diseases cosponsored by WHO, the United Nations Development Programme, and the Bank is expected to produce simpler, more effective control measures.

### National Health Care Activities

Health care<sup>18</sup> is a high priority in all developing countries and is a constitutional right in a number of them. Over the past five years,

<sup>18</sup>The term "primary health care" is used in this paper as defined by a conference convened by WHO and UNICEF at Alma-Ata, USSR, in September 1978. It means "essential health care based on practical, scientifically sound, and socially acceptable methods, and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford. . . . (It) addresses the main health problems in the community, providing promotive, preventive, curative, and rehabilitative services accordingly; . . . (and) includes at least: education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; and adequate supply of safe water and basic sanitation; maternal and child health care, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs." The term "basic health care" refers to maternal and child health care, family planning, immunization, prevention and control of endemic diseases, and treatment of common diseases and injuries, but excludes such health-related activities as education, nutrition, water supply, and sanitation.

national policies have shifted sharply from expansion of facilities for hospital-based care toward extension of rudimentary health services to the underserved (particularly rural) populations. This new commitment has been reflected in policy documents and health plans, but has not yet reversed the thrust of earlier programs. Publicly financed health care systems have been established by most governments, but these systems do not yet provide adequate access to essential services except in densely populated areas.

Health care systems in developing countries have often been patterned after those found in industrialized countries. They have focused on the institutional care of sick people, often in highly sophisticated hospitals. At the same time, physicians in the developing countries have been supported by fewer auxiliary health workers—nurses, technicians, clerks, administrators, etc.—than is customary in industrialized countries. Instead of a health manpower pyramid in which a few physicians are supported by a much larger number of nurses and auxiliary workers, most developing countries have a manpower hourglass with doctors at the top, indigenous practitioners at the bottom, and few people in between. Most of the capital and operating budgets for health are absorbed by the costs of medical education and related teaching hospitals; two-thirds of the health budget in many countries is devoted to these two functions.

In many countries, health centers, in theory, serve 50,000 to 100,000 people, and in some rural areas, more than a thousand square kilometers. Numerous studies have shown that the use of these centers diminishes sharply beyond a three-to-five kilometer radius, since people travel greater distances only in case of very serious problems. Two-thirds of the population may live beyond the effective service area of existing health facilities even in countries with relatively well-developed health services. Thus, routine preventive and promotive activities are generally neglected. Furthermore, cultural and social obstacles often exclude people from utilizing available health care facilities (especially the poor in urban and urban fringe areas).

In addition to health centers and district hospitals, some countries provide health posts or dispensaries at the village level to bring services closer to the people and thereby encourage the use of preventive and promotive services. However, these facilities often do not enjoy people's confidence because they are understaffed or poorly supplied; as a result, they are often underutilized.

Sanitarians and/or public health inspectors are provided by most countries to police water supplies, waste disposal and food processing facilities, restaurants, and so forth. Their effectiveness is often compromised by lack of transport and of enforcement of sanitary regulations. In a few countries, the duties of sanitarians now include education in hygiene, sanitation, and community organization to promote local self-reliance in dealing with environmental health problems. Although they typically provide more effective coverage than other village health workers, sanitarians/public health inspectors have, nonetheless, had only a modest impact on health conditions.

Many countries have special operations, such as national family planning programs, and campaigns against specific diseases, such as malaria, leprosy, and tuberculosis. These programs are usually managed independently of other health care activities and are very organized and effective. They are typically better supplied with vehicles and materials than the remainder of the health care system. These programs rely upon an extensive network of field workers to motivate acceptors and distribute family planning materials, or to maintain surveillance and take measures to control malaria and onchocerciasis. Some of these campaigns were designed to eradicate a particular disease within a stipulated period of time and were subsequently frustrated by their inability to stamp out the disease; the sole exception has been the highly successful smallpox eradication program.

### **Financing Health Care**

Health care expenditures in developing countries are substantial; governments report annual public spending of about \$1 to \$8 per capita, excluding outlays by local authorities, voluntary agencies, and individuals. Payments by households to private providers of traditional and modern health care, and for purchase of drugs, generally exceed government health expenditures. In addition to paying for health services and drugs, households frequently must also pay for transportation and may have to sacrifice substantial earnings while seeking health care. Fragmentary evidence suggests that about 6 percent to 10 percent of the gross domestic product (GDP) is spent on health care; additional sums are devoted to water supply, waste disposal, nutrition, and family planning, in part, to improve health. Total expenditures for health care in the developing countries currently are of the order of \$75 billion a year; this contrasts with an estimated annual expenditure on education of \$40 billion to \$45 billion.

Publicly operated health care systems are usually financed from general government revenues. Many systems impose modest user charges for amenities, such as private hospital rooms. To discourage overutilization of services, a few countries require a small registration fee from patients presenting a problem for the first time. Nominal charges for drugs are also imposed in many countries. User charges are unpopular with governments because of the high cost of their administration and widespread problems of misappropriation of cash by health workers. User charges are also criticized for discouraging the use of preventive services and early treatment of disease. Many countries have proclaimed the right to free health care, thereby limiting opportunities to impose charges. Private practice is common; by paying a fee, the inconvenience and opportunity costs of long lines at government clinics can be avoided and a more personalized service obtained. Government health workers sometimes use their positions to promote private practices they conduct after hours in competition with the regular government services.

## Chapter 2: Causes of Poor Health

Even though life expectancy is increasing and the incidence of many diseases is on the decline, poor health persists as a major problem in many developing countries. The conditions responsible for this situation need to be understood if effective policies are to be formulated. Climate, cultural practices, and life styles undoubtedly have an impact on health. However, the socioeconomic characteristics of a population have an even more pervasive influence.

Improvements in health standards in Western Europe and North America were brought about much more by rising living standards and improving socioeconomic conditions than by medical care *per se*. For example, the incidence of cholera and typhoid fell in Britain and the United States long before effective methods of treatment were available. In Sweden, death rates have been falling steadily since about 1800.<sup>1</sup> In the United States, tuberculosis deaths went down from 200 per 100,000 population in 1900, to 1.6 per 100,000 in 1975.<sup>2</sup> Yet sanatoria and collapse therapy for treatment of tuberculosis were not widely available until the 1930s—when the death rate was already down to about 70. Chemotherapy became available only in the 1950s when the rate was below 30.<sup>3</sup> It is the poverty in developing countries, and the consequent rapid growth of population, inadequate nutrition, and crowded and insanitary living conditions that are at the root of the health problems described in Chapter 1. The ways in which these elements of a low level of socioeconomic development interact and foster disease are explored here.

### Demographic Factors

A number of health risks derive from high fertility rates in developing countries. When large numbers of people live in poor households located in crowded, insanitary surroundings, communicable diseases spread easily, and high mortality and morbidity rates result, particularly in the case of children. High mortality rates, in turn, induce families to have many children so they can assure themselves of surviving progeny. This circular pattern of high fertility and mortality rates is difficult to break; lower mortality rates are followed slowly, and then only partially, by lower birth rates. In countries with high birth rates, children compose a relatively high proportion of the population. Children under five years of age make up 15 percent to 20 percent of the total population of developing countries, com-

<sup>1</sup>Scrimshaw, N. S. "Myths and Realities in International Health Planning," *American Journal of Public Health* 64 (8):792-798, 1974. Scrimshaw argues that better nutrition has been the main factor in mortality declines in both developed and developing countries.

<sup>2</sup>Pan American Health Organization. *Health Conditions in the Americas, 1973-76*. Scientific Publication No. 364. (PAHO: Washington, 1978), p. 281.

<sup>3</sup>For a review of these issues, see Winkelstein, Jr., Warren, "Epidemiological Considerations Underlying the Allocation of Health and Disease Care Resources," *International Journal of Epidemiology* 1(1):69-74, 1972.



pared with about 8 percent in developed countries. Because children have less immunity to disease than adults, children's diseases predominate in developing countries.

Because so many children die at an early age, many others are born. Thus, another element is introduced: maternal mortality, in which a sharp and steady increase in the risk of death occurs after the third birth. Although the differentials are most marked where obstetric care is minimal, higher maternal morbidity due to toxemia, placental disorders, malpresentations, and hemorrhage continues to occur in women who have experienced multiple births after improved obstetrical care has reduced mortality.<sup>4</sup>

At the family level, population pressure increases the resort to abortion, a practice which can carry major health risks. Data on induced abortion are very difficult to obtain because the practice is illegal in most developing countries. Nevertheless, it is known that between 1958 and 1960 in Chile, abortions accounted for 8 percent of all admissions to National Service Hospitals and 27 percent of all blood transfusions; they were responsible for over \$1 million in hospital care expenditures in 1960. Studies in Turkey in the early 1960s estimated that, in a population of less than 30 million, 500,000 abortions were performed every year, and resulted in 10,000 deaths. One study in Turkey found 6.7 maternal deaths from abortion per 100 live births. The overall abortion rate in three metropolitan areas of Turkey was 56 abortions per 100 live births. For women over 30 years of age there were 1.1 to 1.5 abortions per live birth.<sup>5</sup> Studies of several areas have found the rate of abortion to be much higher among women who have already had several children.<sup>6</sup> Thus, abortion can be interpreted principally as a response to population pressures.

Demographic factors may influence health at the community level as well as at the family level.<sup>7</sup> Population pressure on the land may lead to overcropping, soil degradation, and poor nutrition for an entire community. It may force people to migrate, resulting in emotional and physical health problems of social disorganization. Growth in population makes it more difficult to ensure safe or sufficient water supply, garbage disposal, and sanitation for the community. It increases the cost of providing adequately trained health manpower and medical facilities. When population pressure exists in a community, housing is likely to become congested. While high

<sup>4</sup>World Health Organization for the United Nations Economic and Social Council. *Health Aspects of Population Trends and Prospects*. Working Paper No. 8 for the World Population Conference, 1974 (New York: United Nations, 1973), p. 17. This is an extremely useful paper on the interrelation of health and population.

<sup>5</sup>Helpern, Milton, et al. "Abortion and Public Health," *Abortion in a Changing World*, vol. 2, Robert E. Hall (ed.) (New York and London: Columbia University Press), pp. 47-48. The figures should be regarded as approximate.

<sup>6</sup>Chow, L. P. "Abortion in Taiwan," *Ibid.*, vol. 1, pp. 253-254; Requena, Mariano. "Abortion in Latin America," *Ibid.*, vol. 1, pp. 341, 345-346.

<sup>7</sup>World Bank. *Population Policies and Economic Development* (Baltimore and London: The Johns Hopkins University Press, 1974), pp. 68-72.

population density in a favorable environment may not create major health problems, in an environment of poverty, the probability that any infection will spread is very high.<sup>8</sup>

### Malnutrition

Widespread malnutrition is a characteristic of many low-income countries that contributes to the incidence and severity of health problems. It poses a major threat to children. Data presented earlier (in Table 3) listed malnutrition as a *primary* cause of death of children under five years of age in selected locations in Latin America and the Caribbean. Malnutrition also creates serious health problems by contributing to premature births and to abnormally low weight at birth. A major study of child mortality in Latin America—a comparatively well-fed part of the developing world—found that nutritional deficiency and immaturity (i.e., premature and/or underweight babies) were the direct cause of 6 percent of the deaths before the age of five and with one or the other factor, an associated cause in 57 percent of all deaths.<sup>9</sup>

Malnutrition is also a major contributing factor in infectious disease; it impairs normal body responses to disease and reduces immunity that has been acquired. The importance of malnutrition as a contributing cause of illness and death has been widely documented. For example, it has been observed that, except where populations are malnourished, or otherwise uncommonly susceptible to disease, the incidence of tuberculosis is significantly lower than would be expected by the widespread presence of the tubercule bacillus.<sup>10</sup> Diarrheal diseases have resulted in large numbers of deaths among undernourished children in Guatemala.

Similarly, it has been observed that mortality due to measles was 274 times as high in Ecuador as in the United States in 1960–61—before the development of immunization to the disease. At the time of the study, the incidence of the disease in the two countries was probably not significantly different. A recent study of Recife, Brazil, identified nutritional deficiencies in 74 percent of measles deaths.<sup>11</sup>

Just as malnutrition can increase susceptibility to disease, so also can disease contribute to malnutrition. Epidemics of diarrheal diseases are often followed after a few weeks by outbreaks of nutritional diseases. This phenomenon has been both well documented and fre-

<sup>8</sup>Cassel, John. "Health Consequences of Population Density and Crowding." *Rapid Population Growth: Consequences and Implications* (Baltimore and London: The Johns Hopkins University Press, 1971), pp. 462–478.

<sup>9</sup>Calculated from data in Puffer, Ruth R., Serrano, C. V., and Dillon, Ann. *The Inter-American Investigation of Mortality in Childhood* (Washington: Pan American Health Organization/WHO, 1971), pp. 2–6.

<sup>10</sup>Scrimshaw, N. S., Taylor, C. E., and Gordon, J. E. *Interactions of Nutrition and Infection* (Geneva: WHO, 1968), pp. 60–142.

<sup>11</sup>Puffer, Ruth R., and Serrano, Carlos V. *Patterns of Mortality in Childhood*. Scientific Publication No. 262 (Washington: PAHO/WHO, 1973), Table 99.

quent in many countries, including Mexico, India, and Brazil.<sup>12</sup> Intestinal infections inhibit the absorption of nutrients in the intestinal tract, thereby increasing the intake required to maintain nutritional status. Furthermore, fevers associated with infections increase the rate of metabolism and boost nutritional requirements.

The problem of inadequate nutrition is compounded by rapid population growth. Large family size and close spacing of births frequently reduce the availability of food and care to children.<sup>13</sup> Evidence of the correlation comes from Nigeria, Thailand, and India.<sup>14, 15, 16,</sup>

### Insanitary Conditions and Housing

The fecally related and fecally transmitted diseases found throughout the developing world share a common origin: the contamination of food, water, or soil with human waste. If water is not safe for drinking, or is insufficient for personal hygiene, diarrheal disease will spread easily. Typhoid, dysentery, and cholera are spread in this way, as are other intestinal infections, which not only cause much illness among adults, but are also often fatal to infants or undernourished young children. Several diseases are related to personal cleanliness rather than fecal contamination. These include trachoma, conjunctivitis, and other skin infections.

Surveys of water supply and sanitation facilities in the developing world have been conducted by the World Bank and WHO.<sup>17, 18</sup> Data on the proportion of populations served by community water supply and excreta disposal facilities are presented in Table 4 and Figure 2. These data should be interpreted cautiously since they indicate installed facilities that would provide reasonable access<sup>19</sup>; in a number of cases, equipment failures and poor maintenance have interrupted service of tolerable quality. Nevertheless, even from these approximate data, it is evident that rural populations in the low-income countries have minimal access to waste disposal facilities. In urban

<sup>12</sup>Scrimshaw, Taylor, and Gordon, op. cit., pp. 216-221.

<sup>13</sup>Aguirre, A., and Wray, J. "Estudios Epidemiológicos sobre Desnutrición en Candelaria" (unpublished paper, 1965), cited in Bryant, John. *Health and the Developing World* (Ithaca, New York: Cornell University Press, 1969), p. 103.

<sup>14</sup>Morley, D. C., Bicknell, Joan, and Woodland, Margaret. "Factors Influencing the Growth and Nutritional Status of Infants and Young Children in a Nigerian Village," *Transactions of the Royal Society of Tropical Medicine and Hygiene* 62(2):164-195, 1968.

<sup>15</sup>Wray, J.D. "Population Pressure on Families: Family Size and Child Spacing," *Rapid Population Growth*, op. cit., vol. 2, p. 408.

<sup>16</sup>Gopalan, C., and Rao, K. Visweswara. "Nutrition and Family Size," *Journal of Nutrition and Diet* 6(3):258-266, 1969.

<sup>17</sup>See World Bank. "Water Supply and Sewerage." World Bank Operations: Sectoral Programs and Policies (Washington: World Bank, 1972), pp. 239-254.

<sup>18</sup>World Health Organization. *World Health Statistics Report* 26(11):720-783, 1973.

<sup>19</sup>"Reasonable access" is defined as follows: in urban areas, within 200 meters of a public hydrant; in rural areas, sufficiently close that family members do not spend a disproportionate part of the day in fetching water. Source: United Nations Water Conference. "Report on Community Water Supplies," Mar del Plata, Argentina, March 14-25, 1977, E/CONF. 70/14.

Table 4

**Access to Community Water Supply and Excreta Disposal Services  
for Selected Developing Countries, 1975**  
(% population served)

Selected countries by GNP per capita	Water Supply			Excreta Disposal		
	Urban	Rural	Total	Urban	Rural	Total
<b>Less than \$150</b>						
India	80	18	31	87	2	20
Ethiopia	58	1	8	56	8	14
Zaire	38	12	19	65	6	22
<b>\$150 to \$299</b>						
Pakistan	75	5	25	21	...	6
Tanzania	59	36	38	100	4	10
Indonesia	41	4	11	60	5	15
<b>\$300 to \$599</b>						
El Salvador	89	28	53	71	17	39
Philippines	82	31	50	76	44	56
Ghana	86	14	35	95	40	56
<b>\$600 to \$999</b>						
Chile	78	28	70	36	11	32
Turkey	74	64	68	13	5	8
Malaysia	100	6	34	100	43	60
<b>\$1,000 to \$1,499</b>						
Uruguay	100	87	98	97	17	83
Iraq	100	11	66	75	1	47
Costa Rica	100	56	72	94	93	93

Symbol: ... refers to "not available."

Sources: Report by the Director General, **WHO Community Water Supply and Wastewater Disposal (Mid-Decade Progress Report)**. Twenty-ninth General Assembly, World Health Organization, May 1976, derived from Annex 2 and 3, and **World Bank Atlas**, 1978. Regional Classification from **World Economic and Social Indicators**, World Bank, 1979.

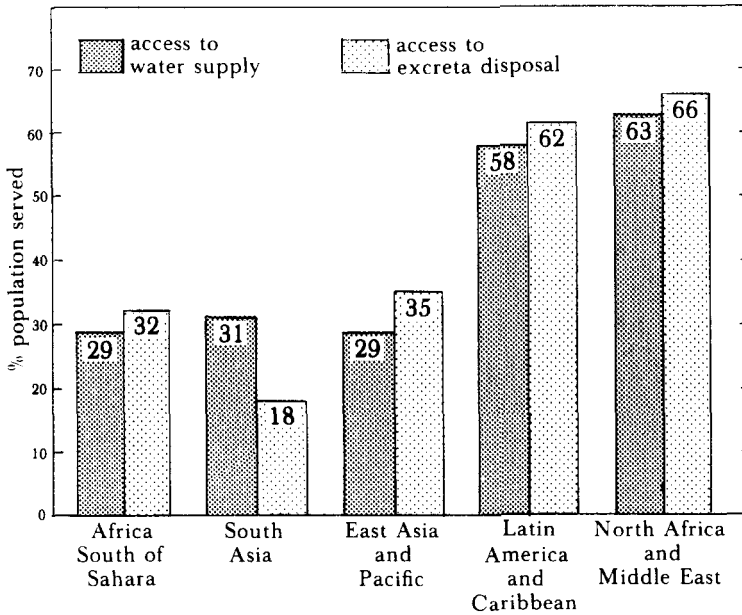
areas, there is considerable reliance on buckets, pit privies, and septic tanks which are not connected to a public sewer system. Facilities connected with the city sewer systems are not widespread, except in the higher-income developing countries.

In most countries, only a small proportion of the rural population has access to modern water systems. In the urban areas of countries with per capita incomes below \$300, roughly one-fourth of the population depends on public standposts,<sup>20</sup> and only the middle-income and higher-income groups use more sophisticated facilities. A substantial part of the population—rural and urban—relies on polluted river water, or other unsafe sources.

<sup>20</sup>World Health Organization. Report by the Director General, WHO; *Community Water Supply and Wastewater Disposal (Mid-Decade Progress Report)* (Geneva: WHO, May 1976), derived from Annex 2.

Figure 2

### Access to Community Water Supply and Excreta Disposal Services in Developing Regions<sup>1</sup>



<sup>1</sup>Regional percentage calculations based on 61 countries for which data were available, thus results may be somewhat biased.

Sources: Report by the Director General, WHO Community Water Supply and Wastewater Disposal (Mid-decade Progress Report). Twenty-ninth General Assembly, World Health Organization, May 1976, derived from Annex 2 and 3, and 1978 *World Bank Atlas*. Regional classification from *World Economic and Social Indicators*, World Bank, April 1979.

For both water supply and sanitation facilities, the proportion of the population that is well served rises with the level of socioeconomic development. Rural and shantytown populations, however, still have access to only the most rudimentary facilities, or no facilities at all.

The link between sanitary conditions and health is illustrated by studies that report on health improvement resulting from better water supply and sewerage facilities. Studies in several developing countries document a reduction in diarrheal diseases brought about by better water supply and sanitation facilities.<sup>21</sup> Privy construction in Costa Rica helped halve the death rate from diarrhea and enteritis

<sup>21</sup>Van Zijl, "Studies on Diarrheal Disease in Seven Countries," pp. 249-261.

between 1942 and 1954.<sup>22</sup> In a Philippines case study, improved water supply and toilet facilities cut cholera incidence by about 70 percent.<sup>23</sup> In nineteenth-century Britain, cholera was brought under effective control several decades before the causative agent, cholera vibrio, was discovered. In the United States, studies in California and Kentucky indicate that the incidence of dysentery in children varies dramatically, depending on the water and sewerage standards of dwellings.<sup>24</sup> The incidence among children living in dwellings with inside water supply, but with outside privies, was twice as great as for children in dwellings with inside water and flush toilets. The rates of incidence doubled again for children in dwellings using both outside water supplies and outside privies.

Not all studies, however, show that better water supply systems and sanitation facilities result in improvements in health. Several studies have concluded that the source of water supply for a family matters less than might be expected: "the bacteriological purity of water as measured by type, city, or well, did not influence infection rates."<sup>25</sup> The answer to this paradox may possibly be found in the cultural practices of the population studied. For example, drinking water is often stored in cooling jars that are nearly always contaminated. Or families may continue to drink well or river water because of greater convenience, better taste, social reasons, or its supposed special qualities.

Cases can also be found where privies had little effect on the prevalence of disease<sup>26</sup> or even had a negative effect.<sup>27</sup> Here, too, cultural habits may offer an explanation. A poorly maintained privy may be worse than none at all. Alternatively, even where public acceptance of privy campaigns has been good, as in some areas of Latin America, the privies have frequently been used as chicken coops or grain silos.<sup>28</sup> Obviously, the health benefits will be limited in such cases. The ambiguous findings do not cast doubt on the link between sanitary conditions and disease. Rather, they point to the difficulties encountered in trying to change traditional patterns of behavior. Re-

<sup>22</sup>Schliessman, D. J. "Diarrheal Disease and the Environment," *Bulletin of the World Health Organization* 21(3):381-386, 1959.

<sup>23</sup>Philippines Cholera Committee. "Field Evaluation of Environmental Sanitation Measures against Cholera," *Strategy of Cholera Control*, BD/CHOLERA/71.5:31 (Geneva: WHO, 1971), Table 5.

<sup>24</sup>For a review, see Schliessman, "Diarrheal Disease and the Environment," pp. 381-386. Many studies of the impact of environmental factors on health have failed to control for the effects of correlated variables—most notably, the level of socioeconomic development and of nutrition. Thus, they overestimate the importance of environmental measures. Several studies have sought to resolve this problem: e.g., Hollister, Arthur C., Beck, M. Dorothy, Gittelsohn, Alan, and Hemphill, Emmarie C. "Influence of Water Availability of Shigella Prevalence in Children of Farm Labor Families," *American Journal of Public Health* 45(3):354-362, 1955.

<sup>25</sup>Stewart, William H., McCabe, Jr., Leland J., Hemphill, Emmarie C., and DeCapito, Thelma. "The Relationship of Certain Environmental Factors to the Prevalence of Shigella Infection," *American Journal of Tropical Medicine and Hygiene* 4:718-724, 1955.

<sup>26</sup>Scrimshaw, Taylor, and Gordon, op. cit., pp. 248-249.

<sup>27</sup>Van Zijl, "Studies on Diarrheal Disease in Seven Countries," p. 252.

<sup>28</sup>Wagner, E. G., and Lanoix, J. N. *Excreta Disposal for Rural Areas and Small Communities*. World Health Organization Monograph Series No. 39 (Geneva: WHO, 1958), p. 22.

cent Bank research suggests that community sanitation standards are important to transmission. If neighborhood schools and workplaces are contaminated, individual hygiene may have little impact on the prevalence of disease.

Relatively simple techniques of waste and water treatment are available which, if applied, would greatly diminish the risks of catching fecally transmitted disease. Sanitary storage of human excreta accomplishes a great deal; within two weeks, many of the harmful bacteria die because they cannot survive for long outside the human host. Viruses are also delicate organisms and can be expected to die quickly. Helminths can remain a hazard for a longer period of time, particularly in the form of resistant cysts; eventually, the cysts also die. Another technique of waste disposal is sedimentation or filtration. In both cases, the solid particles to which bacteria cling are separated out and retained until they are harmless.

In addition, two decomposition processes, which occur naturally, render sewage harmless: oxidation (using oxygen from air or water) and anaerobic fermentation. Which of the two processes occurs depends upon the availability of oxygen for oxidation. Many "modern" processes, such as trickling filters and aeration, are simply intended to speed the natural process. Most decomposition processes rely on successive biological cycles that involve different algae. During the course of these cycles, organisms that are harmful to man are destroyed. Even helminths may be killed by the heat generated by a composting system of anaerobic fermentation. If at all possible, a biologically safe source of water should be chosen; otherwise, processes such as storage and sedimentation-filtration should be employed. Disinfection (usually chlorination) of water is also effective in destroying a wide variety of disease agents.

In addition to poor sanitation and water supplies, many urban dwellers in developing countries live in substandard dwellings lacking in space, ventilation, and sunlight. Such conditions tend to increase the incidence of airborne diseases. It is probable that overcrowding is the main reason why children in low-income countries contract airborne diseases at an earlier age than in developed countries. In addition, the extended family system brings a child into regular contact with many other children at a very early age, thus increasing its exposure to disease. Among children whose immunity is not yet fully developed, the risk of serious multiple infections is very high. In developed countries, the risk does not arise until the child enters school.

### **Effects of Primary Health Services**

Few worthwhile studies have been conducted concerning the effects of health service on health, and those that exist are difficult to evaluate. In some cases, concurrent improvements in water supply, sanitation, or housing have not always been fully taken into account, or nutrition may have improved, but its effect has not been identified.

**Impact of Health and Nutrition  
Improvements on Mortality<sup>(1)</sup>**

Table 5

Project area	Infant mortality rate per 1,000 live births		Mortality rate per 1,000 children among children one-to- four years old	
	Before	After	Before	After
Indian study	128 <sup>(2)</sup>	81	19	10-13
Nigerian study	295	72 <sup>(3)</sup>	69	28 <sup>(4)</sup>
Guatemalan study	139 <sup>(5)</sup>	55	28	6

**Notes:**

(1) All these programs involved costs such that they would be difficult to replicate on a national scale in a developing country. For instance, health care costs were about \$5 to \$8 per year in the Nigerian and Guatemalan projects, although this figure may exclude some overhead costs. Indirect health care costs, such as nutrition, were not specified.

(2) Control groups versus medical care and nutrition groups.

(3) After an additional year, the infant mortality rate was 48.

(4) After an additional year, the child mortality rate was 19.

(5) This figure is based on recall by mothers and can be compared with the national official statistic at that time of 89.

**Sources:**

Indian study: World Bank. Experimental design provided four groups of two-to-three villages, each of which received the following health service packages: nutrition care, infectious disease control and primary medical care; a combination of both; and a control group.

Nigerian study: Morley, David. *Paediatric Priorities in the Developing World* (London: Butterworths, 1973), pp. 316-340. Experiment provided some nutrition, physician-staffed primary care, and some hospital referral.

Guatemalan study: Habicht, Jean-Pierre. "Delivery of Primary Care by Medical Auxiliaries: Techniques of Use and Analysis of Benefits Achieved in Some Rural Villages in Guatemala," *Medical Auxiliaries: Proceedings of a Symposium Held during the Twelfth Meeting of the PAHO Advisory Committee on Medical Research*. Scientific Publication No. 278 (Washington: PAHO, 1973), pp. 24-37, especially Table 10. Experiment provided nutrition, auxiliary staff primary care, and some referral to physicians and hospitals.

Sophisticated health approaches are generally inappropriate unless backed by outreach and preventive services. Modern drugs, in some instances, bring immediate relief, or even eventual cure, but may have no lasting effect on the health of a person who must return to a disease-ridden environment. Treatment for parasitic infection may mitigate the clinical symptoms, but is not likely to keep a person from becoming reinfected. The limitations of curative health care are illustrated by a medical school program for hospital care of premature infants in Colombia that achieved survival rates comparable with those in North America, but in which 70 percent of the infants discharged from the nursery were dead within three months.<sup>29</sup>

Research projects—in Guatemala, Nigeria, and in the northern Indian state of Uttar Pradesh—have demonstrated that primary health care and increased nutrition could have a substantial impact on mortality among both infants and children in the one-to-four age group (see Table 5). The studies also show that such health care

<sup>29</sup>J. D. Wray, personal communication, cited in Bryant, John. *Health and the Developing World* (Ithaca, New York: Cornell University Press, 1969), p. 240.



could be effective even if delivered by auxiliaries, with only limited referrals to physicians or hospitals.<sup>30</sup> However, the relative importance of nutrition *vis-à-vis* primary health care is very difficult to determine. In addition, infant mortality in an environment of poverty is likely to remain greatly in excess of that in a developed country. Child morbidity is likely to remain at a high level, too.

In general, improvements in water supply, sanitation, and housing can reduce the incidence of disease, and in this way affect mortality. Nutrition not only reduces the incidence but also the effects of disease. Health care can do little to alter the incidence of many infectious and parasitic diseases common in developing countries, although it can often speed recovery. Immunization (if properly performed), management of pregnancy, and care of injuries are of great value in improving health.

<sup>30</sup>In the cases covered by the Guatemalan study, 99 percent of all visits were handled by primary health care personnel and only 1 percent was referred to a physician, while at Imesi, Nigeria, roughly 30 children per thousand were referred to a hospital. Even if no such referral had been possible, and all those referred would otherwise have died, the fall in mortality would have been considerable due to care by auxiliaries. See Habicht, Jean-Pierre. "Delivery of Primary Care by Medical Auxiliaries: Techniques of Use and Analysis of Benefits Achieved in Some Rural Villages in Guatemala," *Medical Auxiliaries: Proceedings of a Symposium Held during the Twelfth Meeting of the PAHO Advisory Committee on Medical Research*. Scientific Publication No. 278 (Washington: PAHO/WHO, 1973), pp. 24-37. For the Nigerian study, see Morley, David. *Paediatric Priorities in the Developing World* (London: Butterworths, 1973), pp. 146 and 318.

## Chapter 3: Approaches to Health Policy

Improvements in health satisfy directly a basic need and contribute to economic development. While, in principle, the benefits and costs of health schemes should be assessed to determine the order of priorities, in practice, these calculations are difficult and unreliable. With the shift in the emphasis of development from economic growth to meeting basic needs, measures of the level of GNP per capita are being supplemented by other indicators that measure social welfare gains. The Physical Quality of Life Index (PQLI) is one of the more prominent of these indicators. It serves as a composite index, assigning values to each country, determined by a weighted average of life expectancy, infant mortality, and literacy rates.<sup>1</sup> The level of progress achieved by any country can now be indicated by basic needs measures, in addition to general economic growth.

### A Productive Investment

Good health and freedom from the threat of disease contribute to economic development. Ill health is thought to impose economic costs by: (a) reducing the availability of labor; (b) impairing the productivity of employed workers and capital goods; (c) wasting current resources, particularly nutrients; and (d) impeding the development of natural resources, animal wealth, and tourism potential. Each of these costs is elaborated below.

#### *Reducing Availability of Labor*

Both premature death and absenteeism due to illness reduce the availability of labor. However, the sizable unemployment and underemployment in developing countries imply that premature mortality may not impose an economic cost in itself. If ill health results in replacement, at no cost, of deceased workers by the able-bodied unemployed, there may be no reduction in output.

Morbidity in the labor force leading to absenteeism may have a greater economic impact. Absenteeism usually disrupts the production process; even under conditions of high unemployment, the temporary replacement of absent workers is likely to result in loss of output. Only a few surveys provide data on the effects of diseases on absenteeism and, therefore, on output. A careful study of tuberculosis control in the Republic of Korea concluded that an optimal health program resulting in increased work life and decreased absenteeism would yield a return of \$150 for each dollar spent.<sup>2</sup> Additional examples of disease control programs that have substantially

<sup>1</sup>See Morris, Morris D. *Measuring the Condition of the World's Poor: The Physical Quality of Life Index* (New York: Pergamon Press for the Overseas Development Council, 1979).

<sup>2</sup>Feldstein, Martin A., Piot, M. A., and Sunderesan, T. K. *Resource Allocation Model for Public Health Planning: A Case Study of Tuberculosis Control*. Supplement to volume 48 of the Bulletin of the World Health Organization, (Geneva: WHO, 1973), p. 95.

reduced absenteeism include anti-malaria programs in the Philippines and southern Africa, and yaws control programs in Haiti.<sup>3</sup> Various efforts have been made to estimate the cost of absenteeism due to disease, by valuing days lost at current wages. The resulting estimates are often very large, although they are misleading under conditions of high unemployment.

### *Impairing Productivity of Labor*

Ill health affects the productivity of workers since their strength, stamina, and ability to concentrate suffer; the statistical evidence on this is limited. A Bank study of construction and rubber plantation workers in Indonesia showed that the effects can be very important. The prevalence of hookworm infestation was 85 percent, and 45 percent of the victims suffered from a resulting iron deficiency anemia. Treatment of the anemic workers with elemental iron for 60 days, at a total cost of 13 US cents per laborer, resulted in an increase in productivity of approximately 19 percent. The resultant benefit-cost ratio works out to 280 to 1. Studies of the effects of disease on labor productivity in a developing country have produced ambiguous and contradictory results. A major reason for this confusion is that researchers have not adequately measured the severity of disease; the economic effects of many helminthic infections, including schistosomiasis, depend upon the intensity of infection.<sup>4</sup>

A conceptually distinct effect of ill health on productivity derives from its impact on education and training. Ability to learn is impaired by sickness and malnutrition.<sup>5</sup> Absence from school because of disease may reduce cognitive achievements. Early mortality and disability will reduce the period of time over which the payoff from an investment in human capital can be expected, and thus diminish the productivity of training.

### *Wasting Current Resources*

Many helminthic diseases waste resources because nutrients are consumed by the helminths themselves. Calories are wasted when a person has a fever because of the extra metabolic demands made on the body. In enteric diseases, intestinal absorption of nutrients is impaired. One study in Panama reports, for example, that the value of excess food consumed in cases of enteric infections amounted to about \$10 per person per year.<sup>6</sup>

<sup>3</sup>Winslow, C. E. A. *The Cost of Sickness and the Price of Health*. WHO Monograph Series No. 7 (Geneva: WHO, 1973), pp. 22, 25, and 30.

<sup>4</sup>Basta, S. S., and Churchill, A. "Iron Deficiency Anemia and the Productivity of Adult Males in Indonesia." World Bank Staff Working Paper No. 175 (Washington: World Bank, 1974), pp. 6-8.

<sup>5</sup>Selowsky, Marcelo, and Taylor, Lance. "The Economics of Malnourished Children: An Example of Disinvestment in Human Capital." *Economic Development and Cultural Change* 2(1):18-19, 1973.

<sup>6</sup>United States. Office of International Health, Department of Health, Education and Welfare. *Syncrisis: The Dynamics of Health*, vol. 1: Panama (Washington: Government Printing Office, 1972), p. 44.

Disease also leads to expenditures on treatment. Coverage by modern health services is limited in many developing countries, but often money is spent in other ways on treating diseases: self-medication with local or modern drugs, or payments to traditional medical workers. Regardless of the effectiveness of modern or traditional medicine, the costs of treating illness are a burden on the community.

### *Impeding Development of Resources*

Enormous waste occurs when poor health conditions restrict settlement in areas with fertile land or other natural resources. The presence of onchocerciasis has restricted access to land and resources in Western Africa. Studies of Nepal, Sri Lanka, and parts of Mexico reveal instances where malaria control has induced a movement of labor and capital into resource-rich districts from less well-endowed areas, resulting in a net increase in the total output.<sup>7</sup> A similarly successful settlement scheme was carried out in the Anchau corridor in Nigeria after the control of sleeping sickness.<sup>8</sup>

Some human diseases also infect animals in certain areas,<sup>9</sup> and programs can improve human and animal health simultaneously, thereby facilitating the use of animals for food or as draft animals. The possibilities of fostering livestock development while benefiting human health are not limited to disease-control programs only. For example, providing water in arid areas not only permits the development of livestock and crops, but can also help improve the health of people. It may cut time spent in carrying water back and forth, which can be a considerable saving.<sup>10</sup>

The tourism potential of a country can be undermined if the likelihood of contracting serious diseases is unusually high. Similarly, commodity exports may also be affected because of controls imposed by importing countries.

### **Better Health for Socioeconomic Development**

As shown in previous chapters, the pattern of disease in a particular area is intimately related to levels of fertility, standards of living, and cultural habits. Poverty, ill health, high fertility, high mortality, fatalism, and short planning horizons constitute a possible low-level social equilibrium. In practice, this equilibrium has already been disturbed in most developing countries by a fall in the death rate, and, in some countries, by the start of a fall in birth rates. Better health is

<sup>7</sup>Taylor, Carl E., and Hall, Marie-Françoise. "Health, Population and Economic Development," *Science* 157:651-654, 1967.

<sup>8</sup>McKelvey, Jr., John J. *Man Against Tsetse* (Ithaca, New York: Cornell University Press, 1973), pp. 156-173.

<sup>9</sup>The pork and beef tapeworm, trypanosomiasis, brucellosis, anthrax, hydatid disease, and sometimes schistosomiasis in the *S. japonicum* form.

<sup>10</sup>Wagner, E. G., and Lanoix, J. N. *Water Supply for Rural Areas and Small Communities*. WHO Monograph Series No. 42 (Geneva: WHO, 1957), p. 19.

one way people achieve more positive control of their environment, and that, in turn, increases their desire and ability to plan their future. Within this framework are many linkages. Economic and educational development may encourage family planning;<sup>11</sup> family planning improves nutrition; nutrition improves health; health can improve attitudes toward family planning, reduce absenteeism, increase labor availability and productivity, and facilitate exploitation of natural resources. The net impact of these factors on economic development, however, is ambiguous, and will depend critically on the time lags involved and the magnitude of each response.

Paradoxically, health improvements may pose a threat to well-being if the net effect is a significant increase in the rate of population growth. Changes in health status affect population growth in a number of ways. First, an overall improvement in health in a developing country will lower mortality among the very young; this, by itself will tend to increase population growth. Second, by reducing the many diseases that interfere with completion of pregnancy, better health and nutrition tend to increase fecundity. Third, lowering maternal morbidity and mortality increases the number of women who can bear children. For example, venereal diseases reduce fecundity; infectious hepatitis, tuberculosis, and malaria interfere with completion of pregnancy; malnutrition contributes to maternal mortality, fetal loss, and shorter time spans of fertility. Thus, better health and nutrition may well increase the *ability* to produce healthy babies and their chance of survival.

The effects of better health on the will to reproduce, however, is unclear. If parents aim for a target number of surviving children, a decline in mortality among young children could lead to a reduction in fertility. There is some evidence that parents respond to a child's death by a desire to replace it, suggesting that a fall in child mortality would tend to be partly compensated by a fall in fertility.<sup>12</sup>

The data suggest that a decline in the birth rate is related to a fall in the infant mortality rate, but that the birth rate is less than perfectly responsive. Studies of sharp changes in mortality, such as those conducted in Sri Lanka and Mauritius, suggest that the birth rate falls less sharply than the death rate.<sup>13</sup> There are also cases, such as Jamaica, where death rates fell steadily but birth rates did not decline significantly for a long time. While death rates and birth rates have tended to move together, it is difficult to determine which is the causative factor. It does seem, however, that a fall in mortality is frequently accompanied by a less pronounced fall in fertility. The

<sup>11</sup>Especially education for women. See UN Secretariat. "Women's Rights and Fertility." U.N. World Population Conference, Bucharest, Romania, August 1974, Conference Background Paper, E/CONF. 60/CBP/5 (New York: United Nations, 1974), pp. 3-9. Many of the factors affecting fertility have been discussed in World Bank, *Population Policies and Economic Development* (Baltimore and London: The Johns Hopkins University Press, 1974), Appendices A and B, pp. 141-163.

<sup>12</sup>World Bank. *Population Policies and Economic Development*, pp. 52-53.

<sup>13</sup>Frederiksen, Harald. "Feedbacks in Economic and Demographic Transition," *Science* 166(3907):837-847, 1967.

speed and the extent of the response may, perhaps, be increased by the delivery of effective family planning services.<sup>14</sup>

When satisfactorily integrated with other socioeconomic advances, health improvements are a vital part of the development process. But if promoted in isolation, improved health could have unbalancing effects, because the adverse effects of more rapid population growth may undermine health gains. A constructive health policy will aim at maintaining the delicate balance between better health and overall economic development.

### **Role of Government**

The private market cannot be expected to allocate to health either the amount or the composition of resources that is best from a social perspective. The most critical failure of the market derives from the inability of consumers of health services to make well-informed, rational choices. This inability is, in part, a consequence of the extraordinary complexity of medical problems, but also reflects the fact that consumers typically have little information or experience pertinent to specific health problems. Market failure also results from the presence of externalities. For example, procedures that halt the spread of communicable disease yield benefits to entire communities and, therefore, cannot be chosen properly by individuals acting in their own interest. Moreover, the health care system possesses many of the characteristics of public utilities. Often the unit producing services (health station, clinic, or hospital) must be large relative to the local service area in order to employ staff efficiently; thus, effective competition is not possible. For these and other reasons, governments have found it necessary to intervene in the health sector.

The role of governments in the health sector can be illustrated by reference to three distinct situations. The first relates to health for a special group of workers or in a small zone of critical economic importance. Often the private market mechanism will direct resources to those health expenditures that have an attractive financial payoff. Private corporations frequently undertake disease control programs before opening up new land for commercial plantation or mineral exploitation. Private industry provides nutritional supplements or subsidized dispensary facilities for workers if this increases profits as a result of reduced absenteeism and increased labor productivity. Financially rewarding opportunities for health investment do exist, but the market mechanism breaks down all too frequently due to ignorance, the riskiness of health technology, and the presence of indivisibilities, external economies and diseconomies.

<sup>14</sup>World Bank, *Population Policies and Economic Development*, pp. 133–140.

In principle, public investment need not be circumscribed by imperfections of cost-price signals, and many outlays on health can be justified if planners are sensitive to the health dimension of production or infrastructure projects. Lack of such sensitivity in the past has caused considerable damage to the health of people in the areas where government projects are located. The neglect of the health aspect has been most unfortunate in projects connected with the use of water: hydroelectric dams and irrigation/drainage schemes. They may have contributed to the spread of water-related diseases, such as malaria, onchocerciasis, and schistosomiasis. These adverse consequences can be mitigated by paying attention to health considerations at the project design stage and by introducing health components, if necessary. Wherever the extra cost of the health component is more than offset by additional benefits, the overall economic return on the investment will rise. Economic benefits of health outlays can usually be identified, but there will be many instances in which they defy precise measurement. Accordingly, it is easier to specify the critical minimum size of the health component that should be introduced in a project than to determine its optimum level.

Secondly, it is necessary to consider programs to control specific diseases on a nationwide basis. In this case, indivisibilities and external economies are such that the market mechanism is most unlikely to function. The application of benefit-cost analysis may, however, help to identify the size of the government expenditure on health that can be justified as "investment." Alternatively, cost-effectiveness analysis may provide suggestive evidence. However, even at this level, the possible importance of demographic effects may make a standard economic approach to project analysis hazardous.

Thirdly, there are programs to improve most people's health. In this case, the private market mechanism undeniably operates, but the distortions are very serious. Maldistribution of incomes in countries where average incomes are also very low means that the health needs of the poor are not translated into effective demand. While the distortion caused by income inequality applies to all sectors, the consequences for health are particularly tragic. Because of the emotional appeal of health issues, it may be politically attractive to redistribute welfare through government provision of health care.

Affluent groups in developing countries have the economic capacity to pay at market prices for most of the health services they require. Public subsidy to them is difficult to justify by any standard. However, it will be appropriate for governments to encourage the development of insurance schemes and prepayment mechanisms for the relatively affluent. While such a program might be expected to enroll only a small part of the population, it would nonetheless foster the private alternative in health care and relieve the public sector health budget. It is important that any private scheme be devised in such a way that it does not claim a disproportionate share of health resources or encourage their misallocation.

Government health programs should be cost effective. This subject has not been explored adequately, so there are many unanswered questions. It is possible, however, to illustrate the technique by comparing the cost effectiveness of immunization and sanitation measures in the case of cholera. Vaccination gives only about 50 percent protection from cholera for four to six months. The per capita cost of such immunization is 15 US cents. In the Philippines, rudimentary privies were built at a cost of under \$1 per privy, excluding self-help labor. This was equivalent to a per capita cost of about 15 cents. Such privies, where properly maintained, cut cholera rates by about 60 percent. Even after allowing for maintenance and replacement costs, privy construction was more cost effective than immunization. Even when the costs of privies are three times that of immunization, the privy program would be cheaper after the sixth year.<sup>15</sup>

In comparing privy construction with merely treating those who fall ill, the rate of incidence of other fecally related diseases is an important factor to be taken into account. If viewed as a way to cut down on the incidence of cholera alone, privy construction would be slightly the more expensive alternative—even in a cholera endemic area—because clinical cholera occurs in only a small proportion of those infected and, in any case, is a relatively rare disease even in infested areas. However, use of privies can reduce the incidence of a wide range of killing or disabling diseases that account for a very large part of the total disease pattern. This fact implies that privies that are properly used and maintained would be far more economical than personal curative care.

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<sup>15</sup>Cvjetanovic, B. "Sanitation versus Vaccination in Cholera Control: Cost-Effect and Cost-Benefit Aspects." World Health Organization, Strategy of Cholera Control, BD/CHOLERA/71.5, (Geneva: WHO, 1971), p. 36.



## Chapter 4: Policies of Developing Countries

Few governments in developing countries have selected health policies after rational consideration of the questions discussed in the previous chapters. The objectives of health expenditures in terms of consumption and investment have rarely been articulated. The administrative framework for making decisions is usually fragmented, the data base is deficient, and specific measures are seldom evaluated for cost effectiveness.

### **Common Deficiencies in Programs**

Invariably, there are differences among countries in such areas as political philosophy, wealth, environmental conditions, literacy, and past investments in health care. Nonetheless, a consensus has emerged among experts regarding important characteristics of health in many developing countries:

1. Government expenditures on health in low-income countries are very low; a large proportion of the money spent goes for curative medicine, maintenance of hospitals, and medical personnel.
2. Many problems result from, or are exacerbated by, environmental conditions.
3. The overwhelming majority of people in the developing countries, especially the poor, are not being reached by modern health care.
4. The existing programs of health care are frequently inefficient in their use of financial and human resources.

### *Low Expenditures on Health*

Government expenditures on health in low-income countries seldom exceed 2 percent of GNP. The small sum spent on a per capita basis is one reason for the narrow coverage provided by public health services. Annex 3 presents data on government health expenditures per capita and as a percentage of the national budget. Of the 86 developing countries for which data are available, in 22 countries, government health outlays are less than \$1 per capita, and in almost half of developing countries, it is less than \$2 (see Table 6). At higher levels of GNP per capita, the health expenditures increase but still remain lower than those for the industrialized countries. For example, the average health expenditure per capita was \$231 for six industrialized countries with GNP per capita in the \$3,000–\$6,000 range.<sup>1</sup>

Public health services cover only a small proportion of the population in developing countries because heavy emphasis is placed on high-cost, individual, curative medicine, as opposed to environmen-

<sup>1</sup>Derived from *World Development Report, 1979* (Washington: World Bank, 1979).

tal and preventive measures. The bulk of the limited government outlays for health go toward maintaining expensive, well-equipped hospitals manned by highly trained medical personnel. These modern medical facilities are concentrated in urban centers. In Ghana, for example, 62 percent of physicians in 1969 were in urban areas, where 15 percent of the total population lived.<sup>2</sup> Similarly, the Greater Accra Metropolitan Area in the same period had 23 per cent of the nation's hospital beds, but only 9 percent of the total population. Figures for physician availability reinforce the impression that the geographical distribution of doctors' services is very uneven in developing countries.

Table 6

**Government Health Expenditures Per Capita in Developing Countries, 1976**

GNP per capita	Total number of countries	Health expenditures					
		\$1 or less	\$2 to \$3	\$4 to \$5	\$6 to \$10	\$11 to \$20	Above \$20
		number of countries					
Less than \$150	15	11	4	0	0	0	0
\$150 to \$299	22	7	10	4	1	0	0
\$300 to \$599	19	1	5	2	9	2	0
\$600 to \$999	16	3	1	0	6	6	0
\$1,000 to \$1,500	14	0	0	2	3	6	3
TOTAL	86	22	20	8	19	14	3

Source: Based on Annex 3, GNP per capita obtained from *World Bank Atlas*, 1978, pp. 14-23.

The present health policies are not only inefficient, but also inequitable in most developing countries. Large numbers of people living in the countryside or city slums are allowed to remain beyond the reach of the modern medical sector. The limited data available on private expenditures for health suggest that private health spending is often considerably larger than government spending, and the ratio between the two types of expenditures varies widely (see Annex 7).

Most private and public expenditures on health services are devoted to episodic curative care. Individuals tend to neglect preventive measures and early diagnosis, choosing to seek professional care only during health crises. Governments have ratified the practice by supporting the construction and staffing of curative-care facilities.

<sup>2</sup>Sharpston, M. J. "Uneven Geographical Distribution of Medical Care: A Ghanaian Case Study," *Journal of Development Studies* 8(2):210, 1972.

### *The Environment*

The health problems of developing countries are generally both more diverse and more severe than in the industrialized countries because the natural environment is peculiarly well-suited to the growth of disease vectors and to transmission of disease. Moist, warm climates are hospitable to insects and parasites. In addition, housing and clothing appropriate to these climates offer little protection against injuries or insects. Finally, food preservation and hygiene are typically more difficult because of the high temperatures, crowding, inadequate drainage, and high water tables.

### *Inadequate Coverage of Health Services*

Available evidence indicates that public health services cover only a small part of the population in many developing countries. The failure of modern health care to reach the majority of people can be attributed to the following problems:

- *Health facilities are not geographically accessible.* In some countries, as little as 10 percent of the population has access to modern health services. Because of a lack of roads and reliable, affordable transportation, the effective service area for health care facilities typically has a radius of only three to five kilometers (kms).

Most patients visiting health facilities come from the immediate vicinity. In Kenya, 40 percent of the outpatients attending a health center lived within eight kms; 30 percent lived eight to 16 kms away; and only 30 percent lived more than 16 kms away.<sup>3</sup> An Indian study showed that the proportion of a community attending a dispensary decreased by 50 percent for every additional half-mile (0.83 kms) between the community and the facility.<sup>4</sup> In another Indian study, over 60 percent of the patients came from within one mile (1.66 kms) of the primary health center.<sup>5</sup> To a large extent, the area of influence of an outpatient health facility is limited by the distance patients are prepared to walk. Thus, a highly dispersed system of health facilities is needed to achieve effective coverage. Access is especially difficult for women with children.

- *Availability of service is erratic.* The distribution of drugs, pesticides and other supplies is frequently interrupted and hence health facilities are often unable to provide services. Mobile clinics frequently do not reach remote posts because vehicles break down or fuel is not available. In the absence of reliable provision of services, patients become frustrated and cease to rely upon the services of government facilities.

<sup>3</sup>Fendall, N. R. E. "Medical Planning and the Training of Personnel in Kenya," *Journal of Tropical Medicine and Hygiene* 68:12, 1965.

<sup>4</sup>Frederiksen, H. "Maintenance of Malaria Eradication." Duplicated Report WHO/Mal/429 (Geneva: WHO, 1964), pp. 2, 6, Table 1.

<sup>5</sup>Rural Health Training Centre, Najafgarh, India. Cited in Roemer, Milton I. *Evaluation of Community Health Centres* (Geneva: WHO, 1972), p. 25.

- *Services are often of doubtful value.* For a variety of reasons, including lack of supplies, the services being provided may not meet minimum acceptable standards of quality as perceived by the patients. Undertrained staff, inadequate supervision, lack of equipment, low staff morale, and casual distribution of available drugs and materials by community health workers are frequent problems.

- *Economic barriers exclude many persons.* Even where free care is available, the costs of transportation and work loss may exceed the economic resources of many people. Where charges for services or drugs are imposed, the costs are often difficult for people in the subsistence sector to meet.

The provision of health services is typically inefficient, and the procedures being offered are often ineffective, even in the most developed countries; in many developing countries, these problems can have tragic implications.

- *Curative care is emphasized, while prevention and early treatment are neglected.* The curative emphasis of health care can be attributed in part to the professional bias of physicians, but it also reflects the mystique and popular appeal of hospital-based health care. The neglect of prevention can also be attributed to the fact that public policy is formed by urban elites who often have already achieved adequate nutrition and sanitation, and whose needs now are for sophisticated curative care.

- *Services provided are of low priority to the population.* In centrally designed primary health care programs, in particular, priorities have commonly been set by health authorities on theoretical grounds. Scientifically based intervention in health care may not comply with local understanding of health problems. Underutilization of health care has resulted from a consequent lack of confidence in the quality or range of services being offered and from discontent with the style of care being provided. The availability of care by traditional practitioners and insensitivity of modern health workers to traditional beliefs have also detracted from the use of modern services. A study of rural Thailand found the health service underutilized because people apparently preferred such alternatives as herbalists, priests, spirit doctors, pharmacists, "quacks," injectionists, traditional midwives, and friends and relatives.<sup>6</sup>

A wide cultural gap may exist between the personnel at a modern health facility and the tradition-bound people it is designed to serve. Even in a developed country, hospitals are frightening places to many people, and are only to be visited in times of extreme need. A villager is even more likely to react with anxiety to the sophisticated clinical facilities of an urban hospital.

- *Basic health care facilities are inadequate relative to sophisticated hospital care facilities.* In the early stages of development, national authorities invested heavily in medical schools and teaching hospitals to pro-

<sup>6</sup>Cunningham, Clark E. "Some Social Aspects of Rural Medicine in North-Central Thailand: A Preliminary Data Paper." Cited in Bryant, John. *Health and the Developing World* (Ithaca, New York: Cornell University Press, 1969).

vide the technical basis for a health care system. In addition, national preferences for sophisticated hospitals as symbols of independence and modernity, and the preferences of donors for large, capital-intensive projects resulted in overcapitalization of health care in many countries.

- *Medical education is often inappropriate.* Training for physicians and nurses in many developing countries follows international curricula. It neglects diseases that are common locally and presumes the existence of sophisticated facilities and equipment. As a consequence, health personnel are frequently inadequately prepared, particularly for work in rural areas.

Physicians usually settle in urban centers rather than respond to the critical needs of rural areas. In addition, many physicians from developing countries migrate to the developed world for specialty training not available at home. As a result, some developed countries have large, circulating pools of physicians from developing countries; in 1977, about 10,200 foreign medical graduates were studying in medical schools in the United States.<sup>7</sup>

The education of physicians is extremely expensive—often costing more than \$25,000 per physician in 1974 prices, but occasionally exceeding \$80,000. These estimates are for recurrent costs alone and exclude the capital costs of medical schools. They also do not include the costs of providing the elaborate teaching hospitals that are often attached to medical schools.

- *Health workers are not adequately supported or supervised.* Problems of staff morale adversely affect the quality of clinical work, especially at the village and district levels, and undermine acceptance of health care. Paraprofessional health workers have often been posted to isolated areas without professional support and without confidence in their own skills. Inservice training and continuing education have not been provided to enable workers to improve skills or prepare to meet the emerging needs and expectations of patients.

- *Health services are not based or focused in the community.* Too little attention is given to diagnosis of problems and intervention at the community level. Instead, services are provided to individuals who actively seek care. Essential public support and participation are discouraged by this individualistic style of health promotion. Consequently, community practices, beliefs, and attitudes toward health care are not improved as rapidly as desirable.

- *Local health workers are not adequately supplied with the drugs, supplies, and equipment necessary for treatment.* Without adequate supplies, community health care programs and workers are quickly discredited and demoralized. Failure to sustain efforts to control vectors or to distribute suppressive drugs have undermined programs to control endemic diseases.

- *Procurement and distribution of drugs and pesticides is inefficient.* Restrictions on ordering brand-name preparations are not imposed,

<sup>7</sup>See *The Journal of the American Medical Association 78th Annual Report; Medical Education in the United States*, 1978, Tables 1 and 2.

and thus, pharmaceutical manufacturers have been encouraged to market their products aggressively to health workers. Cumbersome procurement methods have introduced excessive delays in replenishing supplies. Warehousing and transportation are inadequate to deliver drugs and supplies to local health facilities. Poor inventory management has resulted in excessive stocks of some items and the expiration of drugs with limited shelf life.

- *Supervision systems usually do not have the capacity to detect errors or misreported information.* Countries operating community health care activities attempt to provide supervision and management based upon formal, periodic reports from health workers. However, these reports often provide data of little practical interest. They are too voluminous, not prepared with care, and typically not analyzed or followed up. These data do not identify operational problems such as negligence, waste, poor maintenance of facilities, etc. Because allocations of supplies and promotions frequently are determined on the basis of reported activities and needs, there are strong incentives to misrepresent actual operations.

- *Patients do not comply with recommendations for treatment.* Patients may fail to comply with treatment because they have misunderstood or because they lack the necessary facilities. Failure to comply with treatment is a universal problem but is compounded by the circumstances that prevail in developing countries. Prescribing drugs to be taken at specific hours by people who have no clocks is an example. Therapeutic regimens that could be interpreted in accordance with local beliefs are often presented in a way that conflicts with traditional practices. People frequently do not take drugs when they are free of symptoms, even though, doing so is essential for prevention or cure.

## **National Institutions**

The policies, institutions, and procedures employed at the national level and the performance of field programs at hospital, health center, and dispensary/health post levels are the sources of many of the deficiencies enumerated earlier.

First, programs to train manpower and to build structures have often been devised without a sufficient understanding of the long-run implications for recurrent costs, or of the immediate requirements for complementary investments in supervision, transportation, equipment and supplies. This problem has frequently been compounded by external donors whose assistance overexpands particular elements of the health care system. Where governments have undertaken long-term planning, assumptions regarding economic growth, government revenues, and the ministry of health's share in the government budget have frequently been overly optimistic.

Second, laws and regulations often have been inconsistent with new programs of basic health care. Training and licensure requirements for health workers have prohibited the use of medical aux-

iliaries at the village level. Civil service regulations frequently have not recognized new types of health workers, and thereby have frustrated efforts to develop career opportunities for them. Donors have introduced new categories of workers to serve temporarily in innovative or time-limited schemes who subsequently could not be readily absorbed by the civil service and health care systems. Restrictions on the private practice of medicine have limited opportunities for wealthy patients to meet some of the costs of their own care.

Third, the transportation of supplies and staff has frequently been made unnecessarily difficult. Spare parts and repair facilities have not been provided to maintain vehicles. The costs of transportation and personal expenses of health workers who must travel have not been reimbursed, thus undermining outreach and supervision activities. Vehicles of the ministry of health have been reassigned by governments to other ministries or users.

### **Effectiveness of Health Services**

Despite their obvious limitations, public health services have achieved some measure of success. A striking example is the use of residual pesticides for malaria eradication, where very significant results were obtained with large-scale international assistance. Other diseases have also been controlled by environmental measures. Trypanosomiasis has been controlled in much of Africa by cutting down undergrowth that forms a suitable habitat for the tsetse fly. Smallpox has been successfully eradicated. If sufficient coverage can be achieved, measles could be similarly contained by immunization. Yaws has also been contained throughout much of the world, an achievement possible only since the discovery of penicillin. Cholera control has reduced deaths in India from 800,000 per year during the epidemics at the turn of the century, to the current rate of about 3,000 a year.<sup>8</sup>

The extent to which personal health services have helped reduce the effects of disease probably varies widely according to the level of official health coverage. For example, in Sri Lanka and Cuba, the impact has probably been considerable, because of the excellent coverage and availability of doctors, even in the rural areas. In Sri Lanka, food subsidies for the poor have probably improved general nutrition and health levels.

<sup>8</sup>Mathen, K. K., Barua, D., Cvjetanovic, B., and Uemura, K. "Costs of Treatment and Prevention of Economic Losses Due to Cholera." World Health Organization, *Strategy of Cholera Control*, BD/CHOLERA/71.5 (Geneva: WHO, 1971), pp. 20-21.

## Chapter 5: A Health Policy For the Future

All countries have pledged to promote primary health care and, if possible, to extend its coverage to all their citizens by the year 2000. This commitment is clearly unattainable unless individual countries strengthen efforts to simplify health care delivery systems and increase budgetary commitments to the sector. Meeting needs for primary health care will be particularly difficult in developing countries where a large percentage of the underserved population lives in rural areas and has poor access to affordable transportation. In order to satisfy needs for health care, additional facilities will have to be provided, especially to villages. Moreover, the services offered to those who have had little previous contact with modern health care must be carefully chosen and introduced in order to achieve good utilization.

### A Pyramidal Structure

Technical, social, and economic factors demand that for most of the world, it will be necessary to adopt or extend simplified systems of health care. These systems should emphasize provision of services and education as near to the homes of clients as is practical. Community health workers, many of whom will serve on a part-time basis, will be essential elements of such a system. These workers will typically have only a few months of formal training in health care. Their duties will include diagnosis and treatment of common, simple ailments; referral of those patients with problems requiring care by more highly trained or better equipped workers; and education of the community in nutrition, hygiene, and personal health care. Experience suggests that persons with not more than six months of training can safely and effectively provide care for approximately two-thirds to three-fourths of all patients.

A second-level facility—a rural health center, an urban clinic, or a small district hospital—should be available to provide care to those whose problems are beyond the capacity of community health workers to treat. Ideally, patients served at this level would be accepted only upon referral. Problems appropriate to this level include care of serious accidental injuries, management of high-risk pregnancies, assistance with difficult deliveries, diagnosis of uncommon diseases, and administration of treatments with a high risk of adverse side effects. In addition, the second-level facility would typically have facilities for storing vaccines and drugs that are sensitive to temperature and would maintain inventories of drugs and supplies that are used only rarely. The second-level facility would usually be operated by at least a medical assistant and midwife who had received two years of formal training beyond basic secondary education.

The third level of the health care system would be the referral hospital, the only level at which fully qualified physicians would be employed in the poorest countries. The referral hospital would be



equipped with a diagnostic laboratory, X-ray facilities, an operating theater, and bedded wards. It would typically serve as the administrative center for a region and, as such, be responsible for monitoring and controlling diseases, for training and supervising lower levels of the health system, and for providing health care. In wealthier countries, the staff of the referral hospital would include specialists in obstetrics, surgery, pediatrics, and internal medicine. Depending on population densities and availability of transport, the hospital would serve a population of 100,000 to 250,000 and oversee the activities of three or more second-level facilities and, perhaps, 50 community health workers.

The pyramidal system of health care outlined here must, of course, be adapted to local conditions, local economic resources, and political expectations. However, it is critically important that a system be developed not only to conserve resources, but also to provide a network of facilities and staff to permit efficient training and supervision. Experience suggests that a community-level health facility—a minipost, dispensary, or health post—is unlikely to gain the confidence of its clientele or to provide services of an acceptable quality unless its staff is supported emotionally and technically by higher-level facilities. Local workers with very modest training require much greater supervision and support than highly trained, fully professional workers.

New programs of health care—particularly those that rely heavily on local, paraprofessional workers—should be responsive to the expectations of the community. Broad support of the community and its acceptance of innovations are critical to the sound functioning of the community health worker and to the development of informal accountability of the worker to the community. Priorities, such as sanitation education or family planning, may consequently need to be deemphasized until the community health facility is well rooted.

The effectiveness and credibility of health care depend critically on the timely availability of drugs and other supplies. Thus, countries should implement policies that ensure procurement and stocking of drugs and supplies before health care systems are expanded. Procedures for distributing supplies and controlling their use should also be established. Particular attention should be paid to the maintenance and allocation of vehicles to be used to distribute drugs and supplies, and to transport patients and supervisors.

### **Financing Health Care**

Even where efficiencies are obtained from these suggested innovations, governments will have to spend substantially more on health. It is very difficult to reduce spending on most existing health care programs, and especially to cut those which are most costly and of lowest priority (e.g., large, urban referral hospitals and medical schools). Thus, new funds must be provided to cover most of the additional costs. To a considerable extent, new programs at the village and district levels may be expected to displace less effective tra-

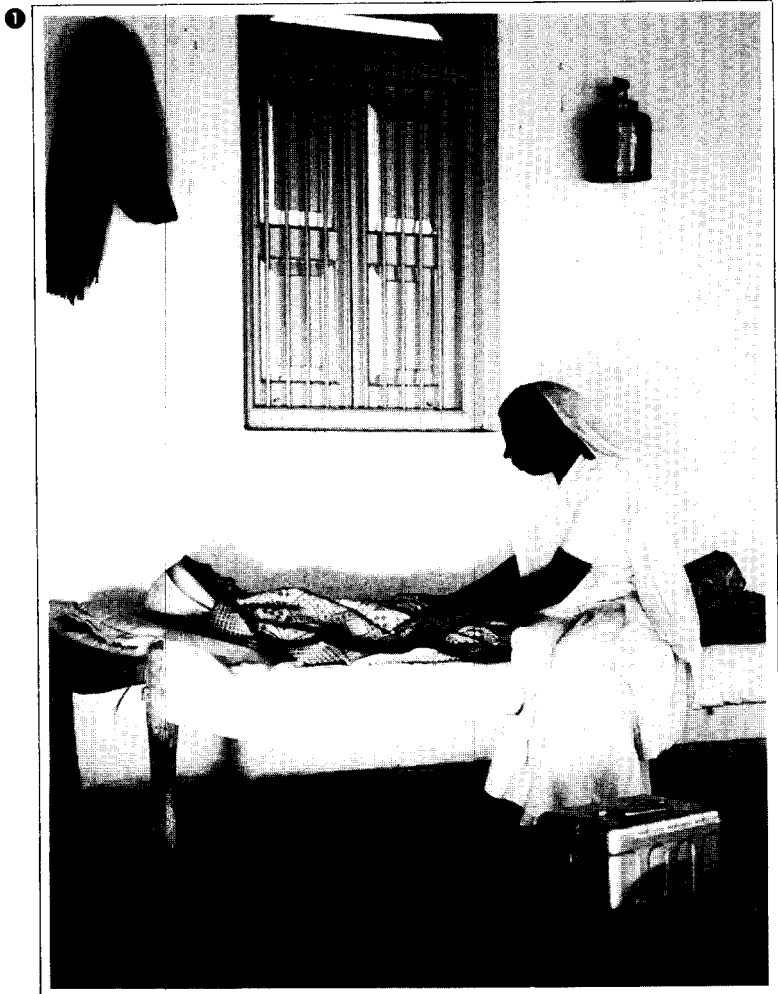
ditional methods of health care so that the economic cost may be much less than it first appears. In addition, growth in income and population implies that over the next two decades, total health expenditures may be expected to grow substantially; a large part of this growth can be devoted to primary health care. Finally, the operation of many existing health programs can be economized considerably. Improvements in the purchasing, distribution, and use of drugs offer opportunities for significant reductions in costs in many countries, even without changes in programs.

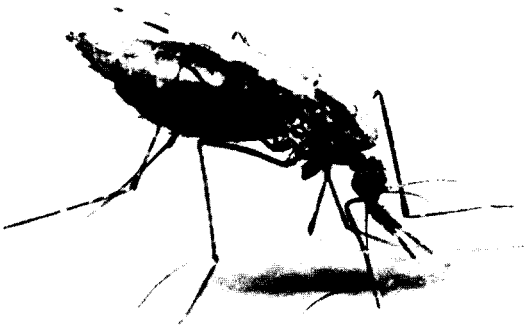
The mechanisms for supplying additional funds to the health sector should be selected to ensure a reasonably stable flow of resources. It is important that local health workers, in particular, continue to receive their salaries and be provided with essential drugs and supplies since their attachment and commitment to their jobs are often modest. Locally operated insurance schemes, cooperative purchasing and distribution of drugs, and payment to village health workers in kind may be used to supplement national government finances. Local financing also generally strengthens the accountability of the system to its clients. Wherever possible, national government resources should be provided on a per capita basis rather than as direct payments for staff or supplies in order to strengthen local participation in management and control and to minimize waste.

A well organized and properly operated health care program can be afforded even in the poorest countries. However, to achieve the goal of access to health care for all will require continuing evaluation and modification of activities as well as sustained government commitment.

## HEALTH—in pictures

An auxiliary nurse-midwife at work in India. With some formal training in health care, auxiliary workers can play an important role in the treatment of common, simple ailments.





## 2 The Disease Carriers

a. The female anopheles mosquito transmits the malaria parasite. Over 1 billion people live in areas where malaria continues to be transmitted.

b. The blackfly, *simulium damnosum*, carries the filarial parasite of onchocerciasis, the cause of river blindness in much of western Africa and Central America.

c. The tsetse fly transmits trypanosomes that cause African sleeping sickness.

d. *Rhodnius Prolixus*, one of the insects that transmits Chagas' disease that is endemic in the rural areas of Central and South America.

e. *Bulinas truncatus*, one of the snail hosts of the schistosome larvae. Slow-moving water and water vegetation provide an ideal habitat for snails; the disease is very common in the irrigated areas of Africa and Latin America.



3



A village in Chad abandoned by most of its inhabitants because of onchocerciasis (river blindness). The disease is transmitted by the black fly that breeds in running water. Of the village's population of 400, only nine are left—all of them blind. The World Bank has joined efforts of other international agencies in helping governments of the Volta Basin in a 20-year regional program aimed at eradicating river blindness.

Victims of river blindness being led by guides in Western Africa, in what appears to be a frightening replica of Breughel's painting, "The Blind Leading the Blind." In some villages, over 50 percent of adult males are blind.

4





- 5 An infant being weighed as part of a regular checkup for children at a clinic run by the Institute of Child Health in Katsina, northern Nigeria. Because children have less immunity to disease than adults, children's diseases predominate in developing countries.

At an open-air "clinic" set up in an Iranian village, members of the health team undertake a variety of activities: routine medical checkups, first-aid for minor injuries, vaccinations, and health education for mothers of small children. Experience suggests that persons with about six months of training can safely and effectively provide health care for two-thirds to three-fourths of patients.

6



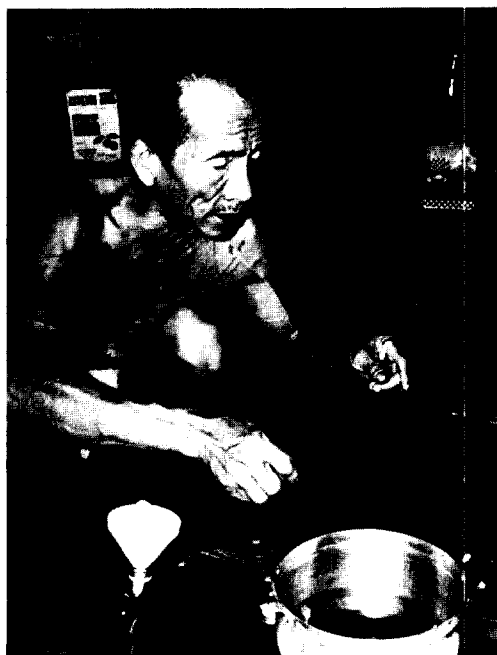


7

A health worker advising on the maintenance of latrines in an Iranian village. Rural populations in the low-income countries have minimal access to excreta disposal facilities.



- 8 Women carry water in jugs on their heads in Harrar, Ethiopia. In most developing countries, only a small proportion of the rural population has access to modern water systems; most rely on polluted river water or other unsafe sources.



- 9 Laim Gansa-noi, a village health volunteer in Thailand, prepares a cough syrup for his patients, using juices prepared from the bark of a tree. Many indigenous forms of medicine have a scientific basis, are effective, and can be integrated into the health care system.

- 10 Children being served mid-day meal in a rural school in Ecuador. Widespread malnutrition is a characteristic of many low-income countries and is a primary cause of death of children in many parts of the world.







11

A member of a malaria eradication team prepares to spray in a mosquito infested area of Ethiopia. Despite the successes of eradication campaigns in the 1950s, the incidence of malaria has increased over twofold, particularly in South Asia.

## Chapter 6: External Assistance in Health

In addition to the World Bank, several external agencies offer assistance to the health sector in developing countries. Like the Bank, most agencies now focus on increasing access to primary health care through the construction of community-level and district-level facilities and the training of community-level health workers. The total external assistance offered for health care in 1977 was about \$400 million. This figure includes activities in disease and vector control, basic health services, and health education. External assistance supplied about 0.5 percent of total financial resources spent on health care in the developing countries; about half of this external financing was provided for bilaterally. If the definition of health activities is broadened to include family planning, water supply, sanitation, and nutrition, external assistance totaled \$1.1 billion in 1977, including financing by the World Bank. External assistance in recent years has remained roughly constant in real terms.

The health policies of donors have shifted markedly over the past decade. In the 1960s, many donors financed large university teaching hospitals, regional specialty hospitals, bedded maternity units, and additions to medical schools. These activities corresponded closely to national judgments of priorities. In addition, they were attractive to some donors because they represented large-scale, capital-intensive investments with substantial foreign exchange and technical assistance requirements. Since the early 1970s, emphasis has shifted to improving access to health services by constructing, equipping, and staffing small district hospitals, rural health clinics, health centers, dispensaries, health posts, and maternity centers.

Extensive technical assistance has been offered by donors, but because of the political sensitivity of health issues, efforts to strengthen management, planning, logistics, and supervision have usually been modest. Instead, technical assistance has concentrated on such problems as the revision of curricula for training manpower, staffing new training institutions, and direct aid in operating hospitals and large clinics.

### **World Bank Activities in Health**

Improvement of the health and physical well-being of poor people is an essential part of the development strategy being promoted by the Bank. Since 1973, the Bank's poverty-oriented projects, particularly in agriculture and rural development, have stressed improving the earning capacity of low-income people. Its efforts in health have sought to reduce mortality and morbidity, and thereby to increase people's intellectual and physical capacities. With more attention being paid to the beneficiaries of development activities and increased efforts to provide public services to a larger proportion of the population, improvements in health are becoming an increasingly important aspect of development.

The World Bank has financed health components of development projects in various sectors for many years, but a formal policy toward health was adopted only in 1974. The Health Sector Policy Paper published in March 1975 concluded that ill health impeded development in many countries, and that improving health conditions was a major development objective. The paper outlined the Bank's commitment to improving access to basic health services, and to controlling health problems created by development projects by lending for health components of projects in other sectors. This policy reflected a recognition that health is an important aspect of development. It also highlighted apprehensions about the extent to which the problems of designing and operating simple, low-cost health programs had been identified and resolved. The policy reflected doubts about the Bank's comparative advantage in the health sector and its proper relationship to other international agencies in promoting health. It was agreed, at that time, that the Bank should not immediately initiate lending for health projects, but that the issue should be reviewed after attaining additional experience in lending for health components.

Since 1974, the Bank has continued lending for education, population, and nutrition projects. Thus, it has financed medical education; the training of nurses, auxiliaries and assistants; the development of health education programs; and the construction and staffing of health care facilities to provide a delivery system for family planning and nutrition activities.

Over the period, fiscal 1976-1978, the Bank assisted health components in 70 projects in 44 countries, at a total cost of \$405 million (see Table 7). Health components in agriculture and rural development, education, and urban projects have totaled \$115 million; 80 percent of these expenditures have been in agriculture and rural development projects, 14 percent in urban projects, and 6 percent in education projects. Also, Bank-assisted projects in population, nutrition, water supply and sanitation are also expected to improve health; together they total an additional \$3.94 billion in the last three years, with specific health component activity estimated at \$290 million. New approaches to health care have been tested on a modest scale and have increased the Bank's understanding of the major problems affecting the sector. The health operations have also permitted the Bank to observe the working of health services and the activities of major donor agencies in some 50 countries.

Since fiscal 1975, the Bank has prepared health sector studies for Brazil, Indonesia, the Republic of Korea, Mali, Morocco, and Pakistan, as well as population/health sector analyses of the Dominican Republic, India, Kenya, and the Philippines; these studies have sought to establish a dialogue with national health authorities on programs and policies focusing on health priorities and evaluating existing and proposed health activities.

A Memorandum of Understanding on cooperation in the health sector has been signed with WHO, and informal working relationships have been established with the major bilateral assistance

Table 7

World Bank Lending for Health Components, 1976-78<sup>(1)</sup>

(in million US dollars)

	Total cost of parent project	Component cost	World Bank assistance of component
<b>1976</b>			
Health services			
Rural	227.73	8.56	6.29
Urban	383.50	6.80	3.05
Vector control	455.20	7.88	7.18
Health education/ manpower training	94.98	5.27	2.27
Population	13.20	9.24	4.36
Nutrition	71.96	4.22	1.56
Rural water supply	663.00	21.60	10.58
Total		63.57	35.29
<b>1977</b>			
Health services			
Rural	676.29	26.04	11.48
Urban	260.00	4.61	2.50
Vector control	436.60	32.50	18.30
Health education/ manpower training	81.65	1.35	1.34
Population	67.50	47.25	20.65
Nutrition	94.95	22.71	2.79
Rural water supply	1,569.50	64.35	31.53
Total		198.81	88.59
<b>1978</b>			
Health services			
Rural	518.33	11.47	4.97
Urban	185.48	4.17	2.07
Vector control	140.00	5.68	...
Health education/ manpower training	7.00	0.80	0.63
Population	68.60	48.02	21.23
Nutrition	0.00	0.00	0.00
Rural water supply	1,398.10	72.62	35.58
Total		142.76	64.48
Total health components, excluding rural water supply, 1976-78		246.57	110.67
Total health components, 1976-78		405.14	188.36

Symbol: ... for "not available."

<sup>(1)</sup>The years in this table refer to fiscal period, July 1-July 30.

agencies. The Bank continues to cosponsor the Onchocerciasis Control Programme and cosponsors, with WHO and the United Nations Development Programme (UNDP), a major program of research and training in tropical diseases and a research program in the control of diarrheal diseases. A study of design criteria for schistosomiasis control activities is under way, with funding from the Bank's Research Committee.

### **Other United Nations Agencies**

WHO, UNICEF, and the UNDP are active in promoting improvements in health in the developing countries. WHO has served primarily as a technical assistance agency, but has also operated major disease control programs, such as those against smallpox and malaria. Since the early 1970s, WHO has placed increasing emphasis on health care management. It has developed methods of national health planning (Country Health Programming) and project design (Project Systems Analysis). It has recently promoted integration of improvements in health care and socioeconomic development (Primary Health Care). In addition to its successful effort to eradicate smallpox and control such diseases as malaria and trypanosomiasis, WHO has made substantial contributions to standardization of nomenclature, taxonomies, job descriptions, training, research methods, and code of ethics for health care and biomedical research.

But the agency has little experience, compared with the Bank, in identification, appraisal, or supervision of health care programs. Furthermore, WHO has only modest financial resources with which to finance field programs. Its total annual budget for fiscal 1978 was approximately \$306 million, of which \$141 million was obtained from extrabudgetary sources. Approximately two-thirds of its combined regular and special budgets is devoted to promoting health services, family health, manpower development, control of communicable diseases, and environmental health. Thus, it has very limited resources to contribute to the capital and operating expenditures of national health programs.

UNICEF has worked with WHO in analyzing the issues in primary health care and in sponsoring the International Conference on Primary Health Care at Alma-Ata in the USSR in September 1978. Unicef also assists countries in developing small-scale health programs and in procuring drugs, equipment, and vehicles.

The UNDP is a joint sponsor of the Onchocerciasis Control Programme and other research programs in tropical and diarrheal diseases. The UNDP also administers assistance to countries for improving health care.

### **Lessons from Lending for Components**

The Bank's experiences in lending for health components confirm that basic health care can be provided at affordable cost. Health care properly conceived and operated, and low in cost can be of as high a quality as physician-dominated care. Persons can be trained to care

for a limited number of common problems and with specialization, can achieve high levels of skills and proficiency. However, unless a minimal quality of services is maintained, health care may be ineffective or even harmful. Bank-assisted personal health care components have cost from \$2 to \$28 annually per person to develop and from \$1 to \$10 to operate. The wide range in costs are because of variations in wage rates, construction standards and, most importantly, the adequacy of supporting health infrastructure. The least costly schemes have relied upon existing institutions and staff for such essential services as supervision, logistical support, and administration, and have emphasized the use of community health workers.

Village health workers can be adequately trained at low cost. Over the past four years, considerable advances have been made by national government ministries and academic institutions in simplifying procedures for the diagnosis and treatment of common diseases; the use of oral rehydration for the treatment of diarrhea is a dramatic example. Research on the value of specific items of information in diagnosing common diseases has been used in drafting simple, efficient standard procedures. The range of treatments to be used has also been narrowed. These measures are being formalized into training modules prepared by universities and research institutions that often include "standing orders" or "protocols" for dealing with particular complaints. These developments in training have reduced the role of intuitive judgment in health care.

Training programs of four to six weeks' duration have been provided successfully in Bank projects in Niger, Colombia, Indonesia, and several other countries. Candidates have been selected from literate community members in the 16-30 age bracket. In a few projects, particularly in population, traditional health workers have been given additional training in midwifery.

In Bank-assisted projects, it has proven useful to recruit community health workers from the areas they are expected to serve. Cultural differences among racial and ethnic groups, and variations in beliefs regarding disease argue strongly against assigning workers to unfamiliar settings. In addition, health workers are likely to stay longer if they are recruited locally. In most of the health components of projects the Bank has helped to fund, it has insisted that workers be nominated or selected by local communities to ensure that workers are acceptable to them. Bank-assisted population projects have offered training and supplies to local, traditional birth attendants. Some rural development projects have required that communities nominate one or more candidates for training as health workers; others have advertised the opportunity to become a health worker and selected trainees from among the applicants. Persons nominated by their villages have generally been more acceptable to the people. But those selected from among applicants have occasionally been less motivated than those nominated by local communities; this is due to the fact that the ability and motivation of the applicants have not systematically entered into the selection criteria.

In several projects, the process has been distorted; the selection committee sometimes has been unrepresentative or has been motivated by political considerations. Recruiting workers who are sensitive to the needs of the poorest and most deprived has been especially difficult. Community selection is least likely to succeed if the position of village health worker is financially attractive or provides valuable fringe benefits such as occasional travel. Individuals applying for the job may be more highly motivated and capable than village nominees, but often lack the confidence and support of the village.

National recruitment, training, and posting of workers in hospitals and administrative posts has generally been successful. Competitive selection has produced able candidates, though their motivation for work with people has commonly been given too little attention. For middle- and higher-level health workers, some centralization of training is necessary to provide diverse clinical experiences. Rapid promotion and frequent reposting have inhibited team building and the development of public confidence in providers of care in programs operated by several countries.

In conventional, physician-dominated health institutions, continuing education, review of performance, and reinforcement are provided through frequent, informal contacts with other health workers. The isolated village-level worker does not have these contacts and thus mechanisms for supervision and technical support must be established. The Bank's experiences underscore the need for continuing education and on-the-job training of village health workers through informal contacts with other health workers to reinforce and strengthen their skills. These requirements appear to be fulfilled most successfully through integration of village health care into a network of health care facilities and through routine referral of patients. Full-time supervisors who have had no field experience, even though they are more highly educated, have tended to be ineffective. Persons with recent experience in dealing with similar problems have been more effective because of their greater credibility and empathy, as educators, motivators, and supervisors than those trained as supervisors and managers.

Good logistical support is critical, especially at the village level. Better planning of delivery schedules, improved control and maintenance of vehicles, rigorous management of inventories, strict accounting for use of materials, and adequate financing rectify many of the present problems.

Maintenance of buildings and vehicles, hospitals and large clinics, personnel, and supplies should be administered using modern management techniques. However, few ministries of health have strong administrative procedures or well-trained managers. Competent middle-level managers are difficult to recruit and retain, particularly in view of the relatively limited career prospects in these ministries. The Bank's project components have not had opportunities to come to grips with health management issues at national level, but have revealed that the need is great.



If health programs are to be effective, they must be accepted by the target population, as well as meet the needs that have been scientifically identified. Appropriate interventions must be adapted to local beliefs, conditions, and priorities. Health components and small, first-phase projects may be used for adapting broad models. The experiences of the Bank and other organizations suggest that, in general, new approaches to health care should be introduced gradually. The approaches should initially emphasize problems that are highly responsive to modern medical technology (such as the management of childbirth, immunization, and treatment of infectious diseases) to obtain the respect and cooperation of the community. Attempts to improve hygiene and to modify people's habits, although of greater long-run health significance, are unlikely, by themselves, to gain support from the community. It is difficult for people to see the connection between such measures and improvements in their health.

Community participation has been a feature of most successful low-cost health care programs assisted by the Bank and other agencies. It has taken a variety of forms, including self-help for the construction of facilities, community contributions of construction materials, development of local cooperative mechanisms to finance drug purchases, unpaid volunteer workers, and community selection of health workers. Community participation requires that villagers be both willing and able to cooperate. In some cultures, there is a strong tradition of cooperation; in others, there is not. Many communities, especially the rural ones, are plagued by dissensions and rivalries that interfere with cooperation. In addition, where the notion of risk-sharing is unfamiliar, people who do not obtain substantial immediate benefits from cooperative activities often withdraw their support, thereby crippling the program.

There are several approaches for promoting community participation. One of them relies upon community leadership and the existing social network to mobilize resources and to bring about change. The project authority attempts to identify persons and organizations—the "change agents"—to whom the community can turn for help and advice in dealing with crises (e.g., childbirth, family quarrels, crop failures, etc.). Education efforts are focused on these people and new programs are adapted to involve them in the designing of programs.

A second approach seeks to build commitment to the idea of participation in local health care through a succession of meetings and acts of assent by the community. For example, one program, supported by a private voluntary agency, first offers a presentation on health problems to a local religious group. It then provides advice and instructions on organizing a local health committee and setting goals for health promotion. Finally, the program recommends that a building be provided for use as a health post. The person selected to become the village health worker is then trained. The strategy is to obtain successively larger and broader acts of participation from the community over an indefinite period; those villages that fail to main-

tain the momentum are dropped from the program. In a Bank assisted rural development project in northeastern Brazil, information about the opportunity to obtain financial assistance to establish a local health post and to train a community health worker has been distributed to teachers and extension workers. Villagers have been required to establish a health committee, select a suitable candidate for training, and contribute to the cost of constructing a simple building. They have then been given matching support in the form of training, equipment, and recurrent financing of salaries and supplies. The Republic of Korea has experimented with grants-in-aid to villages that meet broad requirements for standards and coverage of services.

A third approach to mobilizing community participation is to focus funding on activities that the communities prize enough to be willing to assume responsibility later for meeting the operating costs. This approach implies that the health care program must prepare a priority of needs and that the community must not regard continued financing of health care as being exclusively a government responsibility.

## Chapter 7: Changes in World Bank Health Policy

The World Bank will begin direct lending for health projects. In addition, the Bank will continue to finance health components of projects in other sectors, such as agriculture, education, family planning, urbanization, and nutrition. Health projects will aim to strengthen the recipient countries' sectoral planning and budgeting capacity, and their primary health care systems. The projects will include such elements as development of the basic health infrastructure, training of community health workers and paraprofessional staff, strengthening of logistics and supply of essential drugs, promotion of proper nutrition, provision of maternal and child health care, including family planning, prevention and control of endemic and epidemic diseases, and development of management, supervision, and evaluation systems. The components of a health project would vary among countries depending on existing programs, needs, resources, institutional capacity, and national priorities. The projects might be located in either rural or urban areas, or both. Generally, maternal and child health care, control of endemic diseases, immunization, and development of management capabilities would be among the first elements to be provided. Projects will be designed to lead progressively to improvement of comprehensive health care, with priority being given to those countries most in need. Where proposals satisfy normal Bank criteria for lending, projects to manufacture drugs, health care equipment, and other supplies will also be considered.

Projects to be assisted by the Bank will stress application of appropriate technologies. In particular, programs will be expected to:

- Rely largely on mid-level health workers rather than physicians to provide care.
- Employ simple, inexpensive buildings and equipment.
- Place modest demands on the administrative and supervisory capacity of the ministry of health.
- Produce reasonable standards of care and safety.
- Permit development of greater coverage and broader services over time.

Greater involvement by the Bank in the health sector is justified for several reasons. First, the Bank's expertise in country programming and in sector analysis is needed to help ensure the success of emerging national policies to expand the coverage of health care. The concept of primary health care and the goal of universal access to basic health services by the year 2000 have been widely accepted by governments. Major efforts are under way to mobilize resources and to devise plans of action to implement these objectives. The Bank already plays an important role in assisting governments in devising feasible, balanced, overall programs of social and economic development. It will now provide technical assistance essential in for-

mulating appropriate sector plans and detailed health project proposals, and in developing appropriate institutions.

Second, significant involvement in the health sector is an important element of the Bank's concern for alleviating poverty in the developing countries. An expanded policy for health operations is essential to deal effectively with the problems of poverty and low productivity among the poor. The Bank's lending policy for health projects will complement and rationalize its activities in the health sector. In countries that have not adopted formal family planning policies, lending for health would strengthen the Bank's opportunities for a dialogue on population issues and increase the effectiveness of family planning services through primary health care.

The Bank's health projects will also help meet several needs that cannot be met by health components of other projects. While assisting health projects, the resources needed for reform or reorganization in the borrower's health sector can be taken into account; in funds allocated for health components of projects in other sectors, sometimes, no provision is made. An expanded program of health operations will increase the Bank's profile in the sector, provide a better basis for discussion of national health policies and programs, and permit it to initiate discussion of the role of health in overall development. Furthermore, lending for projects will permit a more rational determination of health program boundaries. For example, the control of vectorborne diseases may require that pesticides be applied to an entire ecological zone, but the projects that might serve as vehicles for such health components frequently have not encompassed such large areas. Finally, project lending will, in some instances, help to simplify otherwise complex, integrated development projects for which large investments in health are appropriate.

The policy of lending for components will also be continued. It has provided the Bank with opportunities to obtain diverse experiences in the sector, promoted contacts with governments and other agencies interested in health, and contributed to productive projects in other sectors. Components have permitted integration of health and other project activities and have brought better health to beneficiaries of projects oriented toward the poor. Health components have also provided an attractive vehicle for exploring new approaches to health care and for assessing the performance of new institutional arrangements. Furthermore, components have dealt with health problems created by development projects.

The choice of countries and projects to be assisted by the Bank will take into account the following factors. Sound sector work will normally precede the identification of health projects. Understanding the role of national and regional health authorities, and other ministries, agencies, and professional organizations active in the sector, will be critical. Estimates of the long-term operational and financial implications of existing programs will be needed before the feasibility of new programs are assessed. An evaluation of the effectiveness of existing institutions and management procedures, and their ca-

capacity to support new activities is also important. In addition, sector work offers opportunities to consolidate support within governments for primary health care.

Countries should be willing to devise a strategy for providing access to basic health services to all citizens over a reasonable period of time. Development of health planning capacity and of a long-term plan for the health sector will be encouraged. Capacity to evaluate programs and to modify their design, management, and assessment in response to information on their performance will be available or introduced as part of a health project. Willingness on the part of health officials and professional medical practitioners to consider seriously possible reforms in the organization, delivery, and control of health care will also be a factor in determining country priorities. Health priorities will be established on the basis of mortality and morbidity attributable to specific diseases that can be controlled with simple, low-cost technologies.

A careful analysis of the sociocultural setting is critical. Since health care activities must be accepted by the local population, its preferences and beliefs will need to be ascertained. Field experimentation to test the appropriateness of specific approaches to health problems usually will be developed in parallel with general implementation of programs. Small-scale, first-phase health projects or project components may lead to savings in implementation later.

The priority of health in relation to other sectors in the economy will be assessed as part of the Bank's regular country economic reporting and programming efforts. Particular attention will be paid to the influence on health of activities in other sectors, and of health operations on the population and population programs. Because health services will generally be financed from public funds rather than user charges, efficient and equitable allocation of resources will be stressed.

The capacity of governments to finance the recurrent costs of programs will be carefully examined. Since most countries are likely to continue to spend large amounts of domestic resources and foreign exchange on health care, an important objective of lending operations will be to assist in achieving cost effectiveness throughout the sector. The Bank will be prepared, where necessary, to finance local and operating costs during project implementation, as is its practice in other sectors. The ability of the government to meet recurrent costs, both foreign and local, following project implementation will be carefully considered in establishing design standards.

Wherever feasible, the beneficiaries of programs will be the highly vulnerable groups. Since the costs of particular health activities depend in part on the range of other activities being undertaken at the same time, the cost effectiveness of groups of interventions will need to be examined. As in other sectors, trade-offs between efficiency and equity are expected. The risks attached to specific activities and to overall programs will be carefully balanced against their contributions to better health. The consequences of interruptions in the supply of essential materials, temporary failures to pay salaries and oth-

er obligations, serious and/or unusual side effects of control measures, and frustration of patients will be monitored. Projects will need to be designed to minimize the probability of inflicting harm on the population if their logistical arrangements are disrupted.

Lending to a country for health will take into consideration the absorptive capacity of health institutions. Initial operations in a country will generally stress the development of planning and management skills and the establishment of organizational structures and procedures for administration of the health care system.

The contents of health projects will normally be limited to activities under the control of the ministry of health. Although water supply, sanitation, food supply, and education are recognized to be major determinants of health, most ministries of health have limited capacity for management and implementation which argues against assigning them responsibility for coordination of integrated, multi-sectoral projects. Family planning should be a part of most primary health care projects because of the important interactions between health and population.

The Bank will expand its collaboration with other external assistance agencies and professional organizations active in the health sector. It will continue to employ technical staff from WHO and its regional offices to assist in assessing health problems and devising programs to improve health. The Bank's expanded activities in health will essentially complement the activities of WHO.

# Measures of Health Status by Level of Gross National Product (GNP) Per Capita in Selected Countries

	GNP per capita in US dollars <sup>(1)</sup>	Crude birth rate per thousand population <sup>(1)</sup>	Crude death rate per thousand population <sup>(1)</sup>	Life expectancy at birth <sup>(1)</sup>	Infant mortality rate per thousand (aged 0-1) <sup>(2)</sup>
	1977	1977	1977	1977	1975
Bhutan	80	44	23	41	...
Cambodia	70+	46	17	48	...
Bangladesh	90	46	18	47	140
Lao People's Democratic Republic	90	45	22	42	...
Ethiopia	110	49	25	39	...
Mali	110	49	22	42	120
Nepal	110	45	19	45	...
Somalia	110	48	20	43	...
Burundi	130	47	20	45	138
Chad	130	45	21	43	...
Rwanda	130	51	19	46	133
Upper Volta	130	48	22	42	...
Zaire	130	46	19	46	...
Burma	140	39	15	52	56
Malawi	140	52	20	46	142
India	150	35	14	51	122
Mozambique	150	46	19	46	93
Niger	160	52	22	42	162
Viet Nam	160	37	9	62	...
Afghanistan	190	48	22	42	269
Pakistan	190	45	15	51	113
Sierra Leone	190	46	19	46	...
Tanzania	190	48	16	51	...
Benin	200	49	19	46	...
Sri Lanka	200	26	6	69	45
Guinea	220	46	21	44	...
Haiti	230	43	17	51	150
Lesotho	240	41	17	50	114
Madagascar	240	45	19	46	53
Central African Republic	250	44	19	46	...
Kenya	270	51	14	53	51
Mauritania	270	50	22	42	...
Uganda	270	45	14	53	...
Sudan	290	45	19	46	132
Angola	300	48	23	41	24

## Annex 1

**Measures of Health Status by Level of Gross National Product (GNP) Per Capita in  
Selected Countries (continued)**

	GNP per capita in US dollars <sup>(1)</sup>	Crude birth rate per thousand population <sup>(1)</sup>	Crude death rate per thousand population <sup>(1)</sup>	Life expectancy at birth <sup>(1)</sup>	Infant mortality rate per thousand (aged 0-1) <sup>(2)</sup>
	1977	1977	1977	1977	1975
Indonesia	300	37	16	48	...
Togo	300	50	19	46	121
Egypt	320	36	13	54	101
Cameroon	340	43	19	46	...
Yemen, People's Democratic Republic of	340	49	19	47	40
Ghana	380	48	17	48	63
China, People's Republic of	390	22	9	64	...
Honduras	410	47	12	57	34
Liberia	420	51	18	48	159
Nigeria	420	50	18	48	163
Thailand	420	32	8	61	27
Senegal	430	49	22	42	158
Yemen Arab Republic	430	49	19	47	160
Philippines	450	35	9	60	72
Zambia	450	50	17	48	...
Congo, People's Republic of The	490	46	19	46	...
Papua New Guinea	490	42	17	48	...
Rhodesia	500	48	14	52	...
El Salvador	550	39	9	63	58
Morocco	550	45	13	55	117
Bolivia	630	44	15	52	...
Albania	630	29	6	70	...
Korea, Democratic Republic of	670	33	8	63	...
Ivory Coast	690	50	19	46	...
Jordan	710	47	13	56	22
Colombia	720	30	8	62	56
Paraguay	730	39	9	63	84
Ecuador	790	41	10	60	70
Guatemala	790	41	12	57	75
Korea, Republic of	820	21	8	63	38
Nicaragua	830	45	13	55	46
Mongolia	830	37	8	63	...
Dominican Republic	840	37	9	60	43
Peru	840	39	12	56	65
Tunisia	860	32	12	57	63
Syrian Arab Republic	910	46	13	57	22



## Annex 1

**Measures of Health Status by Level of Gross National Product (GNP) Per Capita in  
Selected Countries** (continued)

	GNP per capita in US dollars <sup>(1)</sup>	Crude birth rate per thousand population <sup>(1)</sup>	Crude death rate per thousand population <sup>(1)</sup>	Life expectancy at birth <sup>(1)</sup>	Infant mortality rate per thousand (aged 0-1) <sup>(2)</sup>
	1977	1977	1977	1977	1975
Cuba	910	19	6	72	...
Malaysia	930	29	6	67	35
Algeria	1,110	48	13	56	...
Turkey	1,110	30	10	61	...
Mexico	1,120	38	8	65	50
Jamaica	1,150	29	7	70	20
Lebanon	1,070*	32	8	65	...
Chile	1,160	22	7	67	79
China, Republic of	1,170	21	5	72	14
Panama	1,220	31	6	70	36
Costa Rica	1,240	28	5	70	38
South Africa	1,340	39	10	60	...
Brazil	1,360	36	9	62	...
Uruguay	1,430	20	9	71	48
Iraq	1,550	48	13	55	104
Romania	1,580	19	9	70	35
Argentina	1,730	21	8	71	59
Portugal	1,890	19	11	69	38
Yugoslavia	1,960	18	9	69	41
Iran	2,160	40	14	52	120
Trinidad and Tobago	2,380	22	6	70	38
Bulgaria	2,580	16	10	72	...
Hungary	2,580	16	12	70	...
Hong Kong	2,590	19	6	72	15
Venezuela	2,660	36	7	66	46
Greece	2,810	15	11	73	24
Israel	2,850	26	7	72	22
Singapore	2,880	19	6	70	14
Ireland	2,880	22	10	73	18
USSR	3,020	18	9	70	...
Poland	3,150	19	9	71	...
Spain	3,190	18	9	73	12
Italy	3,440	13	10	73	21
Czechoslovakia	3,890	18	11	71	...
New Zealand	4,380	17	8	72	16

**Measures of Health Status by Level of Gross National Product (GNP) Per Capita in  
Selected Countries** (continued)

	GNP per capita in US dollars <sup>(1)</sup>	Crude birth rate per thousand population <sup>(1)</sup>	Crude death rate per thousand population <sup>(1)</sup>	Life expectancy at birth <sup>(1)</sup>	Infant mortality rate per thousand (aged 0-1) <sup>(2)</sup>
	1977	1977	1977	1977	1975
United Kingdom	4,420	12	11	73	16
German Democratic Republic	4,680	13	13	73	...
Japan	5,670	15	6	76	10
Saudi Arabia	6,040	49	18	48	...
Austria	6,130	11	13	72	21
Finland	6,160	14	10	72	10
Libya	6,680	48	14	55	...
Netherlands	7,150	12	9	74	11
France	7,290	14	11	73	14
Australia	7,340	16	8	72	17
Belgium	7,590	12	12	72	15
Denmark	8,040	13	11	74	10
Germany, Federal Republic of	8,160	10	12	72	20
Canada	8,460	16	8	74	15
United States	8,520	15	9	73	16
Norway	8,550	13	11	75	11
Sweden	9,250	12	12	75	8
Switzerland	9,970	11	10	74	11
Kuwait	12,270	45	5	69	44

Note: Countries in this table are listed in the ascending order of GNP per capita.

Symbols: ... for "not available"

+ for 1974

\* for 1976

Sources: (1) World Bank. **World Development Report, 1979**, pp. 126, 127; 160-161; 166-67

(2) World Bank. **World Development Report, 1978**, pp. 108-109.

Figures on GNP per capita for Cambodia are drawn from **World Bank Atlas, 1976** and for Lebanon from **World Bank Atlas, 1978**.

## Annex 2

## Factors Influencing Health

	Population per physician <sup>(1)</sup>	Percentage of population with access to safe water <sup>(2)</sup>	Daily per capita calorie supply as percentage of requirement <sup>(3)</sup>	Adult literacy rate (%) <sup>(4)</sup>	Total fertility rate <sup>(5)(6)</sup>
Bhutan	...	...	94	...	6.2
Cambodia	15,910	...	85	...	6.6
Bangladesh	11,350	53	92	22	6.5
Lao People's Democratic Republic	21,570	...	93	...	6.4
Ethiopia	84,850	6	82	<u>10</u>	6.7
Mali	32,460	9	75	10	6.7
Nepal	38,650	9	95	19	6.5
Somalia	15,560	33	79	<u>50</u>	6.1
Burundi	45,430	...	99	10	6.3
Chad	41,160	26	75	15	5.9
Rwanda	39,350	35	90	23	6.9
Upper Volta	61,800	25	78	5	6.5
Zaire	27,950	16	85	15	6.1
Burma	5,410	17	103	67	5.5
Malawi	48,500	33	103	25	7.0
India	3,140	33	89	36	5.0
Mozambique	16,680	...	84	...	6.1
Niger	42,970	27	78	8	7.1
Viet Nam	5,340	...	111	87	5.5
Afghanistan	28,290	6	83	12	6.9
Pakistan	3,780	29	93	21	6.7
Sierra Leone	26,000 <sup>+</sup>	...	97	15	6.1
Tanzania	18,490	39	86	<u>66</u>	6.5
Benin	34,380	20	87	<u>11</u>	6.7
Sri Lanka	6,230	20	91	78	3.6
Guinea	15,500	10	84	...	6.2
Haiti	11,170	14	90	23	5.9
Lesotho	17,800	17	99	40	5.4
Madagascar	10,780	26	105	50	6.1
Central African Republic	29,410	16	102	...	5.7
Kenya	8,840	17	91	<u>40</u>	7.8
Mauritania	14,140	...	72	<u>17</u>	6.9
Uganda	28,330	35	90	25	6.1
Sudan	9,760	46	88	20	6.6
Angola	15,170	...	86	...	6.4

## Factors Influencing Health (continued)

	Population per physician <sup>(1)</sup>	Percentage of population with access to safe water <sup>(2)</sup>	Daily per capita calorie supply as percentage of requirement <sup>(3)</sup>	Adult literacy rate (%) <sup>(4)</sup>	Total fertility rate <sup>(5)(6)</sup>
Indonesia	16,430	12	98	62	4.9
Togo	18,360	16	96	16	6.7
Egypt	1,190	66	113	44	4.8
Cameroon	13,980	26	102	<u>12</u>	5.7
Yemen, People's Democratic Republic of	9,210	24	84	27	7.1
Ghana	10,200	35	101	30	6.7
China, People's Republic of	...	...	99	...	2.9
Honduras	3,300	46	90	57	6.9
Liberia	10,050	20	87	15	6.9
Nigeria	14,810	...	88	25+	6.9
Thailand	8,460	22	107	82	4.5
Senegal	16,450	37	97	10	6.5
Yemen Arab Republic	18,770	4	83	13	7.2
Philippines	3,150	38	87	87	5.0
Zambia	10,370	42	90	<u>39</u>	6.9
Congo, People's Republic of The	7,320	38	98	50	6.0
Papua New Guinea	11,990	20	98	32	6.0
Rhodesia	7,110	...	108	...	6.6
El Salvador	3,460	53	84	62	5.5
Morocco	11,100	55	108	28	6.5
Bolivia	2,120	34	77	63	6.5
Albania	1,200	...	105	...	4.2
Korea, Democratic Republic of	...	...	113	...	4.5
Ivory Coast	15,220	19	115	20	6.7
Jordan	2,250	56	90	59	7.0
Colombia	1,820	64	94	81	3.7
Paraguay	1,190	13	118	80	5.8
Ecuador	1,570	40	93	74	6.3
Guatemala	2,500	40	91	46	5.7
Korea, Republic of	1,680	62	112	91	2.8
Nicaragua	1,540	70	105	57	6.2
Mongolia	480	...	102	...	5.4
Dominican Republic	1,870	55	98	67	5.3
Peru	1,580	47	100	72	5.6
Tunisia	4,800	70	102	55	4.6
Syrian Arab Republic	2,510	75	104	53	7.0

## Factors Influencing Health (continued)

	Population per physician <sup>(1)</sup>	Percentage of population with access to safe water <sup>(2)</sup>	Daily per capita calorie supply as percentage of requirement <sup>(3)</sup>	Adult literacy rate (%) <sup>(4)</sup>	Total fertility rate <sup>(5)(6)</sup>
Cuba	1,100	...	117	96	2.5
Malaysia	4,350	62	115	60	3.8
Algeria	5,590	77	88	35	7.3
Turkey	1,720	75	113	60	4.3
Mexico	1,700 <sup>+</sup>	62	117	76	5.7
Jamaica	3,510	86	119	86	4.2
Lebanon	...	...	101	68	4.7
Chile	2,200	83	117	88	2.7
China, Republic of	1,590	...	119	82	2.5
Panama	1,270	79	105	78	4.1
Costa Rica	1,550	77	113	88	3.6
South Africa	1,970	...	118	...	5.1
Brazil	1,650	77	105	76	4.9
Uruguay	700	98	116	94	2.9
Iraq	2,530	62	101	26	7.0
Argentina	530	66	129	93	2.9
Portugal	800	65	141	70	2.5
Yugoslavia	790	...	136	85	2.2
Iran	2,570	51	98	50	5.9
Trinidad and Tobago	1,960	...	105	95	2.6
Bulgaria	450	...	138	...	2.2
Hungary	440	...	135	98	2.2
Hong Kong	1,350	...	110	90	2.6
Venezuela	870	...	98	82	4.9
Greece	470	...	132	82	2.3
Israel	350	...	122	88	3.5
Singapore	1,340	100	122	75	2.2
Ireland	830	...	141	98	3.5
Spain	560	...	135	94	2.6
USSR	300	...	138	99	2.4
Poland	620	...	134	98	2.3
Italy	490	...	140	98	1.9
Czechoslovakia	400	...	142	95 <sup>+</sup>	2.4
New Zealand	730	...	133	99	2.2
United Kingdom	670	...	133	99	1.7

## Factors Influencing Health (continued)

	Population per physician <sup>(1)</sup>	Percentage of population with access to safe water <sup>(2)</sup>	Daily per capita calorie supply as percentage of requirement <sup>(3)</sup>	Adult literacy rate (%) <sup>(4)</sup>	Total fertility rate <sup>(5)(6)</sup>
German Democratic Republic	520	...	133	...	1.8
Japan	850	...	121	99	1.8
Saudi Arabia	2,220	64	102	..	7.2
Austria	440	...	131	99	1.6
Finland	670	...	118	100	1.7
Libya	1,020	100	117	45	7.4
Netherlands	600	...	124	99	1.6
France	680	...	135	99	1.9
Australia	720	...	124	100	2.1
Belgium	500	...	141	99	1.8
Denmark	510	...	127	99	1.7
Germany, Federal Republic of	500	...	129	99	1.4
Canada	580	...	230	98	1.9
United States	600	...	133	99	1.8
Norway	560	...	120	99	1.8
Sweden	580	...	114	99	1.7
Switzerland	520	...	128	99	1.5
Kuwait	850	89	...	60	7.1

Symbols: + for 1960.

... for "not available."

## Notes:

(1) Refers to the period 1974-76.

(2) Reference year is 1975.

(3) Estimates for 1974.

(4) For years 1974, 1975.

(5) For 1977.

(6) Total Fertility Rate represents the average number of births per woman over her lifetime.

Sources: World Bank. **World Development Report**, 1978, Tables 17, 18.

World Bank. **World Development Report**, 1979, Table 18, 22, 23.

## Annex 3

Health Expenditures in Selected Countries<sup>(1)</sup>

	Year	Health expenditure as percentage of total central govern- ment expenditure <sup>(1)</sup>	Public health expenditure as percentage of GNP <sup>(2)</sup> (US\$)	Public expenditure on health per capita <sup>(2)</sup> (US\$)
Bhutan	1976	...	...	...
Cambodia	1976	...	0.8	1
Bangladesh	1976	...	0.8	1
Lao People's Democratic Republic	1976	...	0.7	1
Ethiopia	1976	4.5	0.9	1
Mali	1976	...	1.6	2
Nepal	1976	6.7	0.8	1
Somalia	1976	...	2.7	3
Burundi	1976	...	0.6	1
Chad	1976	4.2	0.9	1
Rwanda	1976	...	0.8	1
Upper Volta	1973	7.8	0.8	1
Zaire	1976	3.8	1.0	1
Burma	1976	6.6	0.9	1
Malawi	1976	...	1.4	2
India	1976	2.7	1.2	2
Mozambique	1976	...	0.7	1
Niger	1976	...	1.0	1
Viet Nam	1976	...	0.7	1
Afghanistan	1976	...	0.6	1
Pakistan	1976	1.8	0.6	1
Sierra Leone	1976	...	1.7	3
Tanzania	1975	7.0	1.9	3
Benin	1976	...	1.9	3
Sri Lanka	1975	6.1	1.9	4
Guinea	1976	...	1.8	4
Haiti	1976	...	0.6	1
Lesotho	1973	7.3	1.2	2
Madagascar	1973	8.1	1.6	4
Central African Republic	1976	...	1.0	2
Kenya	1976	7.9	1.8	4
Mauritania	1976	...	1.1	3
Uganda	1976	...	1.1	3
Sudan	1976	1.6	0.9	2
Angola	1976	...	1.0	3

### Health Expenditures in Selected Countries<sup>(1)</sup> (continued)

	Year	Health expenditure as percentage of total central govern- ment expenditure <sup>(1)</sup>	Public health expenditure as percentage of GNP <sup>(2)</sup> (US\$)	Public expenditure on health per capita <sup>(2)</sup> (US\$)
Indonesia	1976	...	0.7	1
Togo	1976	...	1.1	3
Egypt	1976	...	2.2	8
Cameroon	1976	...	1.0	3
Yemen, People's Democratic Republic of	1976	...	0.9	2
Ghana	1973	7.9	1.3	10
China, People's Republic of	1976	0.2	1.5	5
Honduras	1976	14.7	2.8	10
Liberia	1974	8.1	1.7	7
Nigeria	1976	...	0.7	3
Thailand	1976	4.3	0.7	2
Senegal	1975	5.7	1.0	4
Yemen Arab Republic	1974	2.9	0.5	1
Philippines	1976	4.5	0.7	3
Zambia	1976	7.0	2.6	13
Congo, People's Republic of The	1976	...	2.1	10
Papua New Guinea	1976	...	3.3	14
Rhodesia	1976	...	1.7	8
El Salvador	1976	...	1.4	7
Morocco	1976	3.3	1.4	7
Bolivia	1976	8.0	1.0	6
Albania	1976	...	1.2	7
Korea, Democratic Republic of	1976	...	0.2	1
Ivory Coast	1976	...	1.6	9
Jordan	1976	...	1.2	7
Colombia	1976	...	0.9	6
Paraguay	1974	3.0	0.4	2
Ecuador	1976	7.2	1.0	7
Guatemala	1976	8.4	0.9	6
Korea, Republic of	1977	1.9	0.2	1
Nicaragua	1976	4.1	1.5	11
Mongolia	1976	...	1.4	11
Dominican Republic	1976	8.9	1.5	11
Peru	1976	5.8	1.4	10
Tunisia	1976	6.6	2.1	15



## Annex 3

Health Expenditures in Selected Countries<sup>(1)</sup> (continued)

	Year	Health expenditure as percentage of total central govern- ment expenditure <sup>(1)</sup>	Public health expenditure as percentage of GNP <sup>(2)</sup> (US\$)	Public expenditure on health per capita <sup>(2)</sup> (US\$)
Syrian Arab Republic	1973	0.7	0.2	1
Cuba	1976	...	2.2	19
Malaysia	1976	5.7	1.6	13
Algeria	1976	...	1.3	13
Turkey	1976	2.5	0.6	6
Mexico	1976	4.2	0.7	9
Jamaica	1976	...	3.1	41
Lebanon	1976	...	0.5	4
Chile	1974	8.1	1.3	14
China, Republic of	1976	...	2.4	25
Panama	1976	8.1	1.6	19
Costa Rica	1974	5.4	1.1	12
South Africa	1976	...	0.4	5
Brazil	1977	6.3	1.2	13
Uruguay	1976	3.9	0.9	12
Iraq	1976	...	0.6	8
Romania	1976	0.3	1.9	48
Argentina	1976	...	1.0	15
Portugal	1976	...	2.2	38
Yugoslavia	1976	23.9	4.1	69
Iran	1976	3.3	1.5	27
Trinidad and Tobago	1976	...	1.8	42
Bulgaria	1976	...	2.4	59
Hungary	1976	...	2.9	67
Hong Kong	1976	...	...	...
Venezuela	1976	4.9	2.7	64
Greece	1976	8.7	2.6	64
Israel	1976	3.5	2.4	89
Singapore	1976	7.7	1.6	40
Ireland	1976	...	5.9	149
Spain	1976	...	3.0	87
USSR	1976	...	2.7	90
Poland	1976	...	2.9	82
Italy	1976	16.8	5.7	170
Czechoslovakia	1976	...	3.6	136

Health Expenditures in Selected Countries<sup>(1)</sup> (continued)

	Year	Health expenditure as percentage of total central govern- ment expenditure <sup>(1)</sup>	Public health expenditure as percentage of GNP <sup>(2)</sup> (US\$)	Public expenditure on health per capita <sup>(2)</sup> (US\$)
New Zealand	1976	...	5.5	217
United Kingdom	1976	12.9	5.2	204
German Democratic Republic	1976	...	2.6	421
Japan	1976	...	3.9	171
Saudi Arabia	1976	...	2.1	117
Austria	1976	12.5	4.9	266
Finland	1976	10.8	6.1	358
Libya	1976	...	1.3	78
Netherlands	1976	...	6.0	390
France	1975	15.1	5.6	370
Australia	1976	...	4.3	307
Belgium	1976	...	5.0	340
Denmark	1974	6.8	6.7	503
Germany, Federal Republic of	1976	19.6	5.8	117
Canada	1976	8.3	5.5	457
United States	1976	9.7	3.3	259
Norway	1976	12.9	7.0	534
Sweden	1976	3.3	6.1	550
Switzerland	1976	10.1	3.5	322
Kuwait	1977	5.9	1.6	244

Note: Public health expenditures are reported by ministries of health to the World Health Organization and may not include expenditures by state or local governments, or by other ministries. Therefore, data on "health expenditure as percentage of total central government expenditure" should be used with caution.

Sources:

(1) **Government Finance Statistics Yearbook**, volume II (Washington: International Monetary Fund, 1976), Table 8.

(2) Sivard, Ruth L. **World Military and Social Expenditures, 1979** (Leesburg, Virginia: World Priorities, Inc., 1979), Tables II and III.

## Annex 4

## Health Resources in Selected Countries

	Population per hospital bed	Percentage of government hospitals to total number of hospitals	Population per physician	Population per nursing and midwifery personnel
Bhutan	...	...	...	...
Cambodia	...	...	...	...
Bangladesh	5,640	100	15,050	38,540
Lao People's Democratic Republic	1,020	...	21,470	2,430
Ethiopia	3,080	...	69,340	22,320
Mali	1,350	...	42,770	2,480
Nepal	6,630	78	36,450	17,420
Somalia	...	...	15,560	...
Burundi	810	67	45,430	5,420
Chad	1,140	...	47,980	3,760
Rwanda	580	58	40,370	5,000
Upper Volta	1,170	...	56,480	3,980
Zaire	330	...	27,950	7,170
Burma	1,220	...	5,630	1,930
Malawi	760	28 <sup>(1)</sup>	48,500	4,370 <sup>(2)</sup>
India	1,620	...	4,100	3,960
Mozambique	770	97	16,680	3,790
Niger	1,200	88	55,420	6,790
Viet Nam	550	96	10,140	1,840
Afghanistan	6,590	91	28,310	19,400
Pakistan	2,070	78	3,920	5,680
Sierra Leone	930	71	17,110	2,590
Tanzania	700	...	18,490	2,740
Benin	780	91	32,760	2,370
Sri Lanka	330	...	4,010	1,300
Guinea	600	...	22,380	3,880
Haiti	570	51	11,630	5,570 <sup>(2)</sup>
Lesotho	480	34	21,200	3,120
Madagascar	410	...	10,770	2,470
Central African Republic	520	92	27,810	5,960
Kenya	760	...	16,300	2,470
Mauritania	2,320	...	15,150	1,580
Uganda	640	85	27,110	2,620
Sudan	1,110	95	12,680	980
Angola	320	67 <sup>(1)</sup>	15,170	1,710

# Health Resources in Selected Countries (continued)

	Population per hospital bed	Percentage of government hospitals to total number of hospitals	Population per physician	Population per nursing and midwifery personnel
Indonesia	1,560	55	18,160	4,730
Togo	680	85	20,770	2,530
Egypt	470	83	4,630	1,870
Cameroon	380	50	17,790	1,960
Yemen, People's Democratic Republic of	660	...	32,380	1,940
Ghana	600	74	10,510	1,200
China, People's Republic of	...	...	...	...
Honduras	660	41	3,300	1,170
Liberia	530	46	10,050	1,660
Nigeria	1,170	...	14,810	1,620
Thailand	800	58	8,460	1,530
Senegal	730	...	13,470	1,210
Yemen Arab Republic	...	...	26,440	10,810
Philippines	640	37	3,150	1,050
Zambia	250	77	10,370	1,970
Congo, People's Republic of The	190	98	6,310	550
Papua New Guinea	170	37	...	2,350 <sup>(2)</sup>
Rhodesia	320	42	6,750	940
El Salvador	560	61	3,590	1,020 <sup>(2)</sup>
Morocco	750	...	13,980	1,920
Bolivia	490	71	2,120	3,520 <sup>(2)</sup>
Albania	150	...	1,200	240
Korea, Democratic Republic of	...	...	...	...
Ivory Coast	660	...	15,220	1,470
Jordan	940	41	2,550	3,820
Colombia	670	79	2,180	1,920 <sup>(2)</sup>
Paraguay	690	92	1,190	1,570
Ecuador	500	49	2,160	1,460
Guatemala	460	77	4,430	1,450
Korea, Republic of	1,510	35	2,020	1,240
Nicaragua	460	49	1,540	...
Mongolia	100	...	540	250
Dominican Republic	350	41	1,870	1,300
Peru	510	60	1,800	2,370
Tunisia	440	...	4,770	960

## Annex 4

## Health Resources in Selected Countries (continued)

	Population per hospital bed	Percentage of government hospitals to total number of hospitals	Population per physician	Population per nursing and midwifery personnel
Syrian Arab Republic	1,070	36 <sup>(1)</sup>	3,060	3,430
Cuba	230	...	1,110	...
Malaysia	270	28	5,600	1,050
Algeria	340	...	7,860	2,460
Turkey	460	76	1,800	1,050
Mexico	860	...	1,840	1,400
Jamaica	260	85	3,510	490
Lebanon	260	15	1,330	1,100
Chile	270	85	2,320	420
China, Republic of	...	...	...	...
Panama	280	79	1,330	1,410 <sup>(2)</sup>
Costa Rica	260	86	1,550	570
South Africa	150	...	1,970	290
Brazil	270	...	1,660	4,070 <sup>(2)</sup>
Uruguay	260	...	910	3,810
Iraq	480	94	2,470	2,130
Romania	110	...	810	430
Argentina	180	...	450	930
Portugal	170	34	790	480 <sup>(2)</sup>
Yugoslavia	170	...	850	400
Iran	650	41	2,570	1,630
Trinidad and Tobago	220	64	1,960	580 <sup>(2)</sup>
Bulgaria	120	...	460	210
Hungary	120	...	500	200
Hong Kong	240	36	1,450	470
Venezuela	330	49	880	400
Greece	150	28	490	820
Israel	170	36	350	...
Singapore	280	...	1,390	340
Ireland	90	55	830	170
Spain	190	39	640	1,050
USSR	80	...	350	160
Poland	130	97	580	240
Italy	90	60	500	...
Czechoslovakia	130	...	420	160

### Health Resources in Selected Countries (continued)

	Population per hospital bed	Percentage of government hospitals to total number of hospitals	Population per physician	Population per nursing and midwifery personnel
New Zealand	140	52 <sup>(3)</sup>	750	160
United Kingdom <sup>+</sup>	120	...	760	240
German Democratic Republic	90	84	540	...
Japan	100	...	860	290
Saudi Arabia	860	74	2,480	1,290
Austria	90	...	480	260
Finland	70	86	700	120
Libya	...	93	950	330
Netherlands	...	...	630	300
France	...	...	680	190
Australia	80	...	720	...
Belgium	110	33	530	...
Denmark	100	...	620	120
Germany, Federal Republic of	80	37	520	270
Canada	110	...	580	130 <sup>(2)</sup>
United States	150	36	610	160
Norway	70	67	580	130
Sweden	70	69	620	140
Switzerland	90	...	560	...
Kuwait	230	77	910	200

**Notes:**

(1) indicates incomplete listing used.

(2) includes only nursing personnel.

(3) excludes mental hospitals.

(4) refers to England and Wales.

Source: **World Health Statistics Annual, 1977—Vol. III: Health Personnel and Hospital Establishments** (Geneva: WHO, 1977), Tables 2.1, 2.5, 2.6, 3, and 4.

## Indices of Hospital Utilization

Country	Year	Beds per 10,000 population	Admissions per 10,000 population	Bed occupancy rate (%)	Average days of stay
<b>General Hospitals</b>					
Burundi*	1972	2.5	60.4	74.6	11.5
Madagascar	1975	6.5	36.3	26.9	17.6
Senegal	1975	7.4	138.8	82.3	16.1
Canada	1974	57.1	1,599.7	75.7	9.9
Honduras	1975	11.7	298.2	59.4	8.5
Indonesia	1975	5.0	126.1	52.1	7.5
Sri Lanka	1973	10.1	619.6	112.8	6.7
Greece	1975	31.5	734.0	66.8	10.5
England*	1975	40.5	869.5	75.6	12.8
Western Samoa*	1975	18.7	423.6	62.5	10.1
<b>Local and Rural Hospitals</b>					
Burundi	1972	3.7	60.7	60.0	13.3
Mauritius*	1975	3.7	144.0	62.7	5.9
Senegal	1975	2.0	64.5	75.7	8.5
Canada†	1974	0.1	1.2	4.6	1.5
Costa Rica	1975	1.8	70.5	35.1	3.3
Sri Lanka	1973	11.2	726.4	84.2	4.7
Thailand	1974	6.6	310.8	64.3	5.0
Sweden	1974	3.4	33.3	84.7	31.9
Scotland	1975	4.4	42.2	79.5	30.1
Western Samoa	1975	22.5	339.6	23.1	5.6

Symbols: \* refers to government hospitals only.

† refers to government and private nonprofit hospitals.

Source: World Health Organization. **World Health Statistics Annual, 1977**—Vol 111: Health Personnel and Hospital Establishments (Geneva: WHO, 1977), Tables 4.2, 4.3.

**Percentage of Deliveries Attended by a Physician or by a Qualified Midwife in  
Selected Countries**

Country	Year	In hospital	At home	In hospital or at home
Bolivia	1971	5.5 <sup>(3)</sup>	12.8 <sup>(3)</sup>	18.3 <sup>(3)</sup>
Dominican Republic	1972	40.2 <sup>(3)</sup>	—	—
El Salvador	1972	26.0 <sup>(1)</sup>	—	—
France	1971	97.0 <sup>(1)</sup>	3.0 <sup>(1)</sup>	100.0 <sup>(1)</sup>
Guatemala	1970	—	—	25.0 <sup>(2)</sup>
Iraq	1971	6.5 <sup>(3)</sup>	21.7 <sup>(3)</sup>	28.2 <sup>(3)</sup>
Israel	1972	—	—	98.3 <sup>(1)</sup>
Libya	1972	48.8 <sup>(2)</sup>	3.7 <sup>(2)</sup>	52.5 <sup>(1)</sup>
Madagascar	1971	—	—	71.1 <sup>(1)</sup>
Panama	1972	—	—	69.2 <sup>(1)</sup>
Paraguay	1972	—	—	55.4 <sup>(1)</sup>
Peru	1971	15.2 <sup>(3)</sup>	—	—
Poland	1972	—	—	99.9 <sup>(1)</sup>
Singapore	1972	80.0 <sup>(1)</sup>	8.2 <sup>(1)</sup>	88.2 <sup>(1)</sup>
Sri Lanka	1972	75.0 <sup>(1)</sup>	20.0 <sup>(1)</sup>	95.0 <sup>(1)</sup>
Sudan	1971	—	—	10.0 <sup>(2)</sup>
Thailand	1971	19.2 <sup>(3)</sup>	—	—
Venezuela	1972	61.5 <sup>(2)</sup>	0.0 <sup>(4)</sup>	61.5 <sup>(2)</sup>
Viet Nam	1972	80.3 <sup>(1)</sup>	0.7 <sup>(1)</sup>	81.0 <sup>(1)</sup>

**Note:**

Percentage figures which have been calculated from the total number of live births may overestimate the actual percentage by one or two points.

(1) Percentage figure given in the source.

(2) Percentage figure calculated by dividing number of deliveries by total number of live births.

(3) Percentage figure calculated by dividing number of deliveries given in the source by World Bank estimates of total number of live births.

(4) Only 141 deliveries out of 412,435 live births.

**Source:**

World Health Organization. **The Fifth Report on the World Health Situation, 1969-1972—Part II: Review by Country and Territory**, "Population and Other Statistics" and "Specialized Units," by country (Geneva: WHO, 1974).



## Annex 7

Public and Private Health Expenditures as Percentage of Gross Domestic Product<sup>(1)</sup>

Developing countries (1970)			Developed countries (1973-75)		
	Government	Private		Government	Private
Ghana	1.1	2.9	Australia	5.0	1.5
Sudan	2.2	1.5	Belgium	4.2	0.8
India	0.4	2.1	Canada	5.1	1.7
Pakistan	0.9	1.5	Netherlands	5.1	2.2
Honduras	1.9	3.2	Sweden	6.7	0.6
Sri Lanka	1.8	1.2	United Kingdom	4.6	0.6
Philippines	0.4	1.5	United States	2.4	3.9

(1) These figures must be taken as approximate since major items may be missing from the public and private side. Comprehensive accurate data are rarely available; there are often numerous, disparate, and not easily quantifiable sources of finance for health care services within a country. Sources may include central governments, state and local governments, insurance plans, private households, voluntary organizations, employers, etc.

Source: Richards, P. J. Income Distribution and Employment Programme; **Some Distributional Issues in Planning for Basic Needs Health Care**. A World Employment Research Working Paper, Provisional Draft (Geneva: International Labour Office, 1979), p. 3.

## Annex 8

## Urban/Rural Variation in Crude Birth Rates in Selected Countries

	Urban crude birth rate	Rural crude birth rate
Developing Countries		
Panama	30.7	33.8
India	28.5	36.7
Israel	26.6	34.0
Egypt	32.0	37.9
El Salvador	39.3	39.6
Developed Countries		
Japan	17.6	15.2
German Democratic Republic	10.7	11.2
Bulgaria	19.1	13.0
Finland	15.2	12.2

Note: Data for Egypt are for 1974 and for other countries, 1975.

Source: United Nations. **Demographic Yearbook, 1977**, 29th issue (New York: UN, 1978), Table 9.

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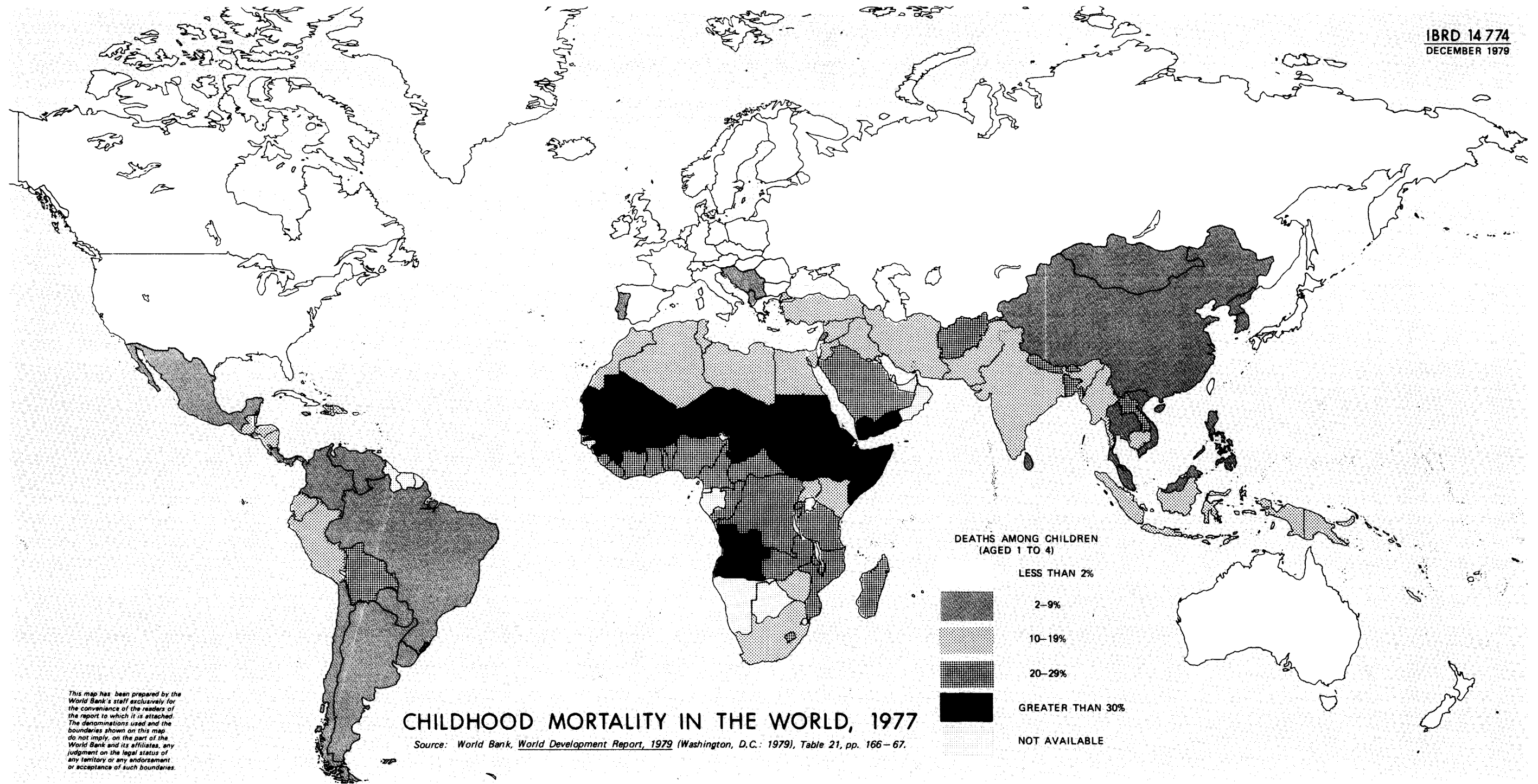
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