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## PRO-POOR GROWTH



Tools & Key Issues for Development Specialists

# HEALTH ISSUES

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# HEALTH ISSUES

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### ANNEX A: ESTIMATES OF THE GLOBAL BURDEN OF DISEASE IN 2001 A-1



## **INTRODUCTION AND OBJECTIVES**

The focus of this issues paper is poverty reduction from economic growth and, specifically, how health sector policy can contribute to poverty reduction by increasing pro-poor economic growth. The paper begins by reviewing the potential contributions of improved health to pro-poor economic growth. It then briefly examines some of the ways improved health can also contribute directly to poverty reduction. The paper also reviews the obstacles to optimal health investments by the poor and concludes with recommendations designed to strengthen the contribution of improved health to pro-poor economic growth and to poverty reduction directly.

## **HEALTH AND PRO-POOR ECONOMIC GROWTH**

Pro-poor economic growth, which always leads to decreases in absolute income poverty, is defined as economic growth (for example, increases in per capita gross domestic product) in which the incomes of the poor increase more rapidly than those of the non-poor. Accordingly, health can contribute to pro-poor economic growth either by increasing the overall rate of economic growth or by increasing the share of income from economic growth that is received by the poor. Although it is widely believed that health investments can make an important contribution to pro-poor growth, a balanced assessment of the available evidence is not as conclusive as some accounts suggest. This uncertainty may in part reflect a lack of attention given to relationships between health and economic development in development research (Strauss and Thomas, 1998).

### **Macro Relationships between Health and Pro-Poor Growth**

Some recent studies suggest that improved health is strongly and positively related to economic growth (Barro and Sala-I-Martin, 1995; Bloom and Sachs, 1998; Bhargava et al., 2001). In fact, a recent major research effort on the relationships between health and economic growth supported by the World Health Organization (WHO) concludes that “investments in health should be a central part of an overall development and poverty reduction strategy” (Commission on Macroeconomics and Health, 2001). The same study reports that typical econometric estimates of the relationship between health and economic growth indicate that each 10 percent improvement in life expectancy at birth is associated with an increase in economic growth of at least 0.3 to 0.4 percent per year, with other factors held constant. The study also reports that high prevalence of diseases such as malaria or HIV/AIDS are also associated with reduced rates of economic growth. According to one study, for example, annual economic growth in a country with a zero prevalence of malaria is about 1 percent higher than in a country with a high prevalence of malaria (Gallup and Sachs, 2001). Unfortunately, although some international studies on health and economic growth suggest a strong association between health and economic growth, they do not establish beyond reasonable doubt that economic growth is causally related to changes in health status, possibly because of econometric problems such as endogeneity, measurement error, and omitted variables.

## Micro Relationships between Health and Pro-Poor Growth

### *Health and Labor Supply and Productivity*

Because labor is the main productive resource of the poor, pro-poor economic growth should be labor-using growth. The fact that the labor supplied by the poor is mostly manual increases the potential importance of improved health (including nutrition). Recent reviews of the available evidence conclude that improved health and nutrition likely increases the supply of labor and possibly also the productivity of labor (Strauss and Thomas, 1998; Thomas, 2001). In addition, there is some evidence that the effects of improved health and nutrition on labor supply and productivity are stronger among the poor, among those engaged in manual labor, and among men as compared with women. Although studies in this area must confront problems of endogeneity and measurement error in health and nutrition measures, the following examples include some carefully designed randomized experiments that were relatively successful in avoiding these problems:

A study in Tanzania that provided chemotherapy to randomly selected sugarcane workers infected with schistosomiasis found that their earnings increased (but not quite to the levels of uninfected individuals), while the earnings of untreated workers were unchanged (Fenwick and Figenschou, 1972).

A study in Indonesia that involved increasing the price of public health services in randomly selected districts found evidence that some measures of health status that worsened as the result of the increased cost of health care in the treatment districts were negatively related to labor supply and possibly also to wages (Dow et al., 1997).

A study using data from the 1993 Indonesia Family Life Survey investigated relationships between symptoms of mental illness (depression) and labor market outcomes (Bir and Frank, 2001). The study found that the symptoms of depression were negatively related (but only at the 0.10 level of significance) both to the likelihood of employment and to the number of hours worked among males but not among females. The estimated coefficients were substantial in magnitude—that is, a male with symptoms of depression was only 52 percent as likely to be employed at the sample mean and, if employed, was estimated to be working about 27 percent fewer hours, as compared with a male without symptoms of depression.

A longitudinal study of 302 rubber tappers and weeders in Indonesia found that about one-half were initially anemic, recording about 20 percent lower productivity per day than non-anemic workers (Basta et al., 1979). After a randomly selected group of the workers were given a special iron supplement for 60 days (the controls were given a placebo), the hemoglobin levels,

aerobic capacity, and productivity of initially anemic workers receiving the treatment rose practically to the same levels as those of non-anemic workers.

A study randomly assigned 47 Kenyan road construction workers to receive either calorie supplementation or a placebo (Wolgemuth et al., 1982). Those receiving the calorie supplement were observed to dig slightly more dirt per hour compared with those receiving the placebo. Similarly, a study in urban Brazil in which calorie intakes were weighed and measured found that wages were positively and significantly related to calories consumed at low intake levels (Thomas and Strauss, 1997).

Several studies have found a positive relationship between height and wages and labor force participation, with other factors (such as schooling) held constant (Strauss and Thomas, 1998; Thomas, 2001). Some studies have also found wages related to body weight (conditional on height), particularly among males performing physically demanding jobs (Strauss and Thomas, 1998; Thomas, 2001).

Apart from a few health disorders mentioned above (for example, schistosomiasis, iron deficiency anemia, and depression), not much is known about the impact of specific health disorders on labor productivity and supply. However, there have been substantial efforts in recent years to quantify levels of disability associated with a wide range of health disorders in connection with the preparation of Global Burden of Disease estimates (Murray and Lopez, 1996; WHO, 2002). Estimates for 2001 (discussed in Annex A) indicate that:

- The health disorders that cause disability differ markedly from those that cause mortality; and
- There are important age, gender, regional, and income differences in the health disorders that cause disabilities.

In the Africa WHO region, for example, the 10 leading causes of years lived with disabilities (YLDs) among working-age adults (15-59) are estimated to be (in descending order of importance): HIV/AIDS (accounting for 12.3 percent of all YLDs among working-age adults); all pregnancy-related health conditions (9.1 percent); unipolar depressive disorders (7.3 percent); other unintentional injuries (4.6 percent); adult hearing loss (3.9 percent); bipolar disorders (3.4 percent); schizophrenia (3.4 percent); other digestive diseases (3.3 percent); violence (3.3 percent); and sexually transmitted diseases, excluding HIV (3.3 percent). The 10 leading causes of YLDs in the South/East Asia WHO region include 8 of the same causes as those for the Africa WHO region. However, in evaluating this information, it is important to consider that the estimates of disability used have not been empirically related to economic consequences, such as reduced labor supply or reduce labor productivity.

## *Health and Human Capital Investments*

Improved health may also contribute to human capital investments, increasing the supply and the productivity of labor over the longer term. For example, improved health may increase the marginal productivity of both health and education investments by increasing the likelihood of a person surviving through his or her working life (Bloom et al., 2001). Selected investments in the health and nutrition of school-age children have also been shown in some studies to be effective in improving school performance (Behrman, 1996; Strauss and Thomas, 1998). Examples include:

Several randomized experiments have demonstrated that iron supplements provided to school-age children improve their cognitive achievement (Pollitt, 1997; Nokes et al., 1998). However, although behavioral studies indicate significant differences between iodine-deficient and normal children in cognitive skills, randomized trials with iodine supplementation alone have failed to find any benefit for cognitive function of school children (Belli and Appaix, 2002).

Some (but not all) randomized experiments have demonstrated that school-based de-worming interventions can improve cognitive achievement (Dickson et al., 2000; Knowles and Behrman, 2003a). In Busia District of western Kenya, a World Bank-sponsored randomized experiment has been evaluating the effect of mass deworming treatment (that is, treating all students in a school) on education outcomes (Miguel and Kremer, 2001; Glewwe, 2002). After two years, observed effects of deworming treatment included fewer absences (a 25 percent reduction in the treatment schools), lower dropout rates, and evidence of reduced helminthic infection in populations not treated (externalities). However, there was no effect on test scores. Based on the effect of the treatment in reducing absences among both the students in treatment schools and the surrounding population, Miguel and Kremer (2001) estimate the benefit-cost ratio for the intervention to be about 10 to 1.

In the Philippines, a randomized experiment was conducted in 30 schools in which two of the four interventions tested, included school feeding (Glewwe, 2002). Large effects were observed with respect to test scores, with the largest effects recorded for the intervention that combined parent-teacher partnerships (through structured meetings) with school feeding—that is, ranging between 0.28 and 0.44 standard deviations for math, Filipino, and English test scores. School feeding alone had statistically significant effects on English (and for math in one of three specifications).

There is also some evidence that health and nutrition investments in pre-school children (and possibly even in the health and nutrition of their mothers during pregnancy) enhance their subsequent performance in school and in the labor force. Adult height, for example, largely reflects nutrition during the first two years of life. Adult height is strongly associated with higher earnings among both men and women (Strauss and Thomas, 1998). In addition, recent

estimates suggest 15 percent lower earnings as adults for every kilogram less of weight at birth (Behrman and Rosenzweig, 2002).

Reproductive health interventions targeted to youth may also help them (and particularly young women) remain in school by reducing teen pregnancies (as well as the risk of HIV infection). However, the empirical evidence on the effects of reproductive health interventions targeted to youth, as well as the duration of any effects, is very limited in developing countries (FOCUS on Young Adults, 2001; Knowles and Behrman, 2003a).

### *Health, Demographic Change, and Pro-Poor Growth*

The evidence continues to accumulate that demographic change may play an important role in pro-poor economic growth by increasing both the overall rate of growth and the share of income received by the poor (Eastwood and Lipton, 1999, 2000; Barro, 2000; Osmani, 2000; Birdsall et al., 2001). Changes in the dependency burden (that is, the ratio of the population of non-working ages to the working-age population) are one of the main channels through which demographic change is believed to affect economic growth (Merrick, 2002). A lower dependency burden increases per capita household incomes in the short run. Over the longer term, a lower dependency burden may induce additional household savings and investment in both human and material capital (Bloom et al., 2001). Health can affect the dependency burden in two ways:

- Reductions in infant and child mortality as well as reductions young adult mortality (for example, HIV/AIDS prevention) may reduce the demand for children sufficiently to initiate a demographic transition in which fertility and the youth dependency burden begin to decline, especially in the presence of other reinforcing changes (that is, an effective family planning program, increased female education, and improved status of women).
- Some diseases (such as HIV/AIDS) increase the dependency burden directly by raising mortality rates among working-age adults, whereas some other diseases reduce the dependency burden directly (for example, fatal diseases of the elderly).

### *Other Health Effects on Pro-Poor Growth*

Some endemic diseases can limit the productivity of land for agriculture or tourism (Commission on Macroeconomics and Health, 2001; Gallup and Sachs, 2001). Examples of diseases that have prevented agricultural development in some countries include malaria and onchocerciasis, while diseases that may negatively affect tourism include malaria, dengue fever, and HIV/AIDS. Improved health also extends the lifespan of the population, possibly leading to higher savings rates (Bloom et al., 2001).

## HEALTH AND POVERTY

The relationships between poverty and health are numerous and complex. The available evidence suggests that improved health and nutrition can contribute to pro-poor economic growth. In addition, poor health is an important element in most broader definitions of poverty, while poor health can also be a direct cause of poverty under certain conditions.

### Poor Health in Broader Definitions of Poverty

Any discussion of the role of improved health in poverty reduction should consider that poor health is an important aspect of most broader definitions of poverty, such as those used in the U.N.'s Human Development Reports (Deaton, 2001; Wagstaff, 2001). Targets for several health indicators are also included in the Millennium Development Goals adopted at the Millennium Summit in 2000.

The available evidence indicates that the poor are severely disadvantaged in their health status (Strauss and Thomas, 1998). Such evidence is most abundant in the case of the health status of young children (Wagstaff, 2002). In Bolivia, for example, the poorest quintile of the population has an under-5 child mortality rate of 150, compared with 32 in the richest quintile (Wagstaff, 2001). However, not all countries exhibit such marked differentials in health outcomes by income. Those in Vietnam, although still substantial, are considerably smaller, while there is almost no poor-rich child mortality differential in Kazakhstan.

An interesting question is, What seems to explain the variation in the size of the rich-poor differentials in child health status among countries? One recent study addressing this question found, surprisingly, that there is only a weak relationship between inequality in health status and either overall income inequality or the degree of public financing of health care (Wagstaff, 2002). However, the study found a strong positive relationship between the degree of inequality in health status and per capita income. The study also found a positive relationship between changes in the degree of health inequality over time and the rate of economic growth—that is, health inequality tended to increase during periods of rapid economic growth in both developed and developing countries.

In contrast, information on differences in health outcomes by income group among adults is limited. Information on adult mortality by socioeconomic status is rarely available. Morbidity data are more readily available. However, there is evidence of systematic reporting biases in morbidity data (Strauss and Thomas, 1998). Better-educated people tend to report more illness than less-educated people. Some of this tendency may be because the better educated are more often employed in the formal sector, where they enjoy sick leave benefits unavailable to the poor. Awareness of health problems may also be closely related to contacts with health providers. Richer people tend to visit health providers more often than the poor, so their awareness of health problems may be greater.

## Poor Health as a Cause of Poverty

Poor health can also be an important cause of poverty (Wagstaff, 2001). The channels through which poor health can lead to increased poverty include:

- Mortality and disability among working-age adults; and
- Catastrophic health care costs.

### *Adult Mortality and Disability*

The death of a working adult, and particularly of a parent, can be a catastrophic shock to a household. Apart from the loss in household earnings, the death of a husband in some parts of South Asia may result in severe social exclusion, including loss of property by the surviving wife. Death of a mother is also generally a severe shock, particularly for the health and welfare of her children (Commission on Macroeconomics and Growth, 2001). The leading causes of adult mortality differ markedly from those of the general population, which are dominated by deaths among very young children and the elderly. According to Global Burden of Disease estimates for 2001 (see Annex A), the leading causes of adult mortality in the Africa WHO region include HIV/AIDS (accounting for 46.2 percent of deaths among adults of working age), tuberculosis (6.1 percent), and all maternal disorders (6 percent). The leading causes of adult mortality in the South/East Asia WHO region include tuberculosis (10.8 percent), ischaemic heart disease (10.8 percent), HIV/AIDS (9 percent), and road traffic accidents (5.4 percent).

Although premature mortality of a working adult may provide a strong impetus toward poverty in some settings, particularly if death follows a long period of illness involving large household outlays on health care, this is not always the case. In situations in which the adult consumes more than he or she produces, the impetus toward poverty is much weaker. For example, in several Southeast Asian countries, female-headed households (including those headed by widows) are less likely to be poor than male-headed households.

The most serious impact of health on a household's economic welfare can occur when an otherwise working adult becomes permanently disabled as the result of illness. The disabled adult may not contribute any income to the household but is likely to consume at least as much as other adult household members. In this case, health-related disabilities serve to raise the household's effective dependency burden.

### *Catastrophic Health Care Costs*

Very few of the poor and near poor in developing countries have health insurance. Under these circumstances, the fees, both formal and informal, that are increasingly charged at government hospitals can themselves be an important cause of poverty (Wagstaff, 2001). The effect can be immediate, either by reducing post-payment household incomes of the near

poor below the poverty line or by increasing the poverty gap for those who are already poor (Wagstaff, 2001).

There may also be a dynamic effect on poverty of catastrophic health care costs, which often lead to the sale of a household's productive assets (for example, land, livestock, and agricultural equipment) to pay for needed medical care (Commission on Macroeconomics and Health, 2001). In Cambodia, for example, catastrophic illness (including HIV/AIDS) was found to be the leading reason for the loss of land among landless households (Oxfam, 2000). Alternatively, households may go heavily into debt and subsequently lose productive assets when the loan cannot be repaid. While the household is attempting to pay off debts incurred to pay for medical care expenses, it may also pull children out of school and put them to work, or it may substitute cheaper, less nutritious foods for more nutritious foods.

### **BARRIERS TO IMPROVED HEALTH AMONG THE POOR AND NEAR POOR**

The preceding discussion suggests that households may have strong economic incentives to make the kinds of investments necessary to maintain the health stocks of their members, and particularly those of working-age adults. However, particularly among the poor, there are important constraints that impede households from making optimal levels of health investments (Wagstaff, 2001; Commission on Macroeconomics and Health, 2001). These constraints include:

- Limited access to good-quality health care;
- Lack of education and information;
- Poor nutritional status;
- Limited access to safe water and sanitation;
- Poor housing conditions;
- Unhealthy environmental conditions; and
- Market failures.

The collective effect of these constraints is to raise the cost of health investments to the poor (Wagstaff, 2001). Consequently, the poor generally do not invest as much in their health as the non-poor. In fact, in most developing countries, the poor fail even to capture a pro-poor (that is, greater than proportionate) share of the public health subsidies that are often officially intended mainly for their benefit (Castro-Leal et al., 2000; Yaqub, 1999). Although pro-poor distributions of public health subsidies have been found in some countries (for example, Malaysia, the Indian state of Kerala, some Latin American countries, Denmark, and the United Kingdom), pro-rich distributions are mostly found in low-income developing countries (Wagstaff, 2002). In Guinea, for example, the poorest quintile of the population has been estimated to capture only 4 percent of public health subsidies, compared with 48 percent received by the richest quintile (Castro-Leal et al., 2000). The share of public subsidies directed to hospitals (and particularly to hospital outpatient care) is almost uniformly pro-rich. The imposition of user fees for hospital services, in the presence of high continuing absolute unit subsidies, has exacerbated this situation.

## Limited Access to and Utilization of Good-Quality Health Care

For health care, the poor are more likely to use primary care facilities, traditional care, and self-treatment or to go without any treatment, whereas the rich are more likely to use private doctors and public hospitals. These differences reflect the following differences between the rich and the poor:

- The poor have less favorable physical access to good-quality health care than the rich;
- Good-quality health care is less affordable for the poor than for the rich; and
- The poor and other disadvantaged groups face other barriers to the utilization of health care that are less often faced by the rich.

### *Physical Access to Good-Quality Health Services*

The poor generally reside farther away from health facilities, especially hospitals (Wagstaff, 2001). Roads serving the poor are often lacking or are in poor condition, and the poor do not usually have access to private means of transportation (such as cars, motorbikes, and boats). Although reliable information on the quality of care by socioeconomic groups is limited, the available data indicate that facilities serving the poor are also generally of poorer quality (Filmer et al., 2000; Wagstaff, 2001).

### *Affordability of Good-Quality Health Services*

Fees, both formal and informal, can be an important barrier to the use of health care by the poor (Wagstaff, 2001). In fact, the poor often do not even know how much they will have to pay when visiting a public health facility. Although it may be official government policy to exempt the poor from having to pay fees at public health facilities, fee exemptions are often difficult to get and may depend on ad hoc decisions made by providers on the basis of criteria such as the client's physical appearance. Another problem is that exemptions are often inadequately funded, so that providers lose money on every exemption granted. The available evidence suggests that most fee exemptions granted under these conditions are received by the non-poor—for example, friends and relatives of providers, civil servants, and influential persons (Gilson et al., 1995; Gwatkin, 2000; Wagstaff, 2001).

The fact that formal fees may limit access of the poor in some settings does not mean that charging user fees is always a bad policy for the poor. Some studies have found, for example, that introducing formal fees has improved quality and actually increased health care utilization among the poor (for example, Litvack and Bodard, 1993; Diop et al., 1995). This is more likely to happen, however, when overall funding is too low to permit good quality care or where political pressures lead to distortions in public health budgets (such as when almost the entire budget is absorbed by salary costs).

Informal fees are also common in the public health systems of most developing and transitional countries (Ensor and Savelyeva, 1998; Delcheva et al., 1997; Killingsworth et al.,

1999). When the quality of services is very poor, informal fees (like formal fees) may improve the quality of care and may improve access even for the poor (for example, when the quality of care in the absence of informal fees is very poor). However, in other cases the effects of informal fees are simply to transfer public subsidies intended for patients to providers and to restrict levels of output.

In addition to fees (formal and informal), the poor face many other costs in obtaining health care (Abel-Smith and P. Rawall, 1992). Most important is probably the opportunity cost of the time required to obtain health care from distant health facilities. However, other costs are also incurred for transportation (including transportation of an accompanying family member in the case of hospitalization), for drugs and other materials that the patient is instructed to purchase, and for accommodation for accompanying family members (and frequently also for food for the patient). Some studies have found that these non-fee costs are several times higher than the fees paid to providers.

### *Other Barriers to Access Faced by the Poor*

The poor often confront other barriers to access. In some countries, for example, it may be difficult for poor women to travel from their home to visit health facilities. Poor ethnic minority groups (such as Indians in many Latin American countries) may face discrimination from providers and may additionally be disadvantaged by not being able to speak the same language as health providers. In addition, few of the poor have health insurance, so they are most often required to pay out of pocket for their health services (Wagstaff, 2001).

### **Lack of Education and Information**

The poor are usually poorly educated (often illiterate), and their lack of education reinforces their poor health status. The poor are often particularly ill informed about the kinds of practices that maintain good health and avoid illness, and their ignorance about modern health care makes them susceptible to traditional treatments and self-treatment that are often ill-advised (Glewwe, 1999). Income-related inequalities in knowledge about HIV/AIDS in many countries illustrate this point (Wagstaff, 2001). Lack of education can also make it more difficult for the poor to interact effectively with trained health providers.

### **Poor Nutritional Status**

The poor (especially children and pregnant and nursing women) often do not have enough to eat, and the quality of their diet, in terms of adequate levels of protein, vitamins, and other micronutrients, is often poor. There is some evidence (although mixed) that food prices and distance to a food market influence child survival and nutritional status (Wagstaff, 2001). The economic constraints faced by the poor in obtaining a nutritionally adequate diet are often exacerbated by a lack of information about nutritional needs and how they can be met most economically by available foods. These nutritional deficiencies lower resistance to

many types of diseases and, in the case of reproductive-age women, increase the risk of pregnancy-related complications and children with low birth weight.

### **Limited Access to Safe Water and Sanitation**

The poor, and particularly the rural poor, often do not have access to safe water (and in some cases even to an adequate supply of water) and sanitation facilities. This increases their exposure to disease (particularly in the case of young children) and raises the level of investment required to maintain their health stock (Vaz and Jha, 2001; Wagstaff, 2001).

### **Poor Housing Conditions**

The poor often live in sub-standard housing, and this exposes them additionally to the risk of many types of illnesses. For example, they often share a very limited living area, increasing the risk of tuberculosis and other infectious diseases. The temporary nature of the building materials often used to construct the dwellings of the poor exposes them to the elements, including rain and cold. The poor also often share living space with livestock, exposing themselves to additional health risks, and frequently cook indoors over open wood fires, exposing themselves to dangerous levels of indoor air pollution (von Schirnding et al., 2001).

### **Environmental Problems**

In addition to problems of indoor air pollution, the poor (and especially the urban poor) often live in areas that are exposed to dangerous levels of air and water pollution. The poor also often live in areas where they are exposed to a variety of endemic diseases, such as malaria and dengue fever.

### **Market Failures**

Market failures in insurance and credit markets, as well as information asymmetries between health providers and clients, also limit the ability of the poor to invest optimally in their health. Market failures in insurance markets include adverse selection and moral hazard. Their effect is to prevent private markets for health insurance from developing to serve the poor. Providing group insurance to employees of large firms, instead of to individuals, is one approach used by health insurers (including most social insurance schemes in developing countries) to control adverse selection. However, most of the poor are self-employed or employed in the informal sector, so they do not usually have access to health insurance (Preker et al., 2001). The inability to use human capital as loan collateral, together with limited ownership of non-human capital by the poor, limits the ability of the poor to borrow to finance investments in their health. Asymmetries in information between health providers and clients (exacerbated by lack of education among the poor) often lead the poor to invest in

ineffective (and frequently dangerous) private health care, thereby reducing the rate of return to health investments (Mills et al., 2002).

## RECOMMENDATIONS

***Recommendation #1: Adjust health sector priorities in individual countries (if necessary) so they better reflect the contribution that improved health can make to pro-poor economic growth.***

The information presented in this paper suggests that health sector priorities that contribute most to pro-poor economic growth (1) increase the supply and productivity of labor and land, (2) complement human capital investments, and (3) reduce the dependency burden. In some cases, the health disorders that limit progress in these areas are already effectively targeted by interventions supported by public health systems (for example, HIV prevention and treatment; the prevention, detection, and treatment of sexually transmitted diseases; maternal health interventions; tuberculosis detection and treatment; malaria prevention and treatment; and micronutrient supplements). The main concern is that current public health systems place a very strong emphasis (at least in official policy statements) on programs targeted to children under age 5. Such an emphasis can be justified on many grounds, including targeting. However, when the emphasis shifts from relatively narrow public health objectives (that is, getting the largest health impact per dollar spent) to a broader objective, such as poverty reduction, focusing health resources on children under age 5 is less clearly a priority.

Adjusting health sector priorities to reflect the potential contributions of improved health to pro-poor growth may mean giving more attention to health disorders that cause disabilities and less attention to health disorders that result in mortality. However, the appropriate balance needs to be carefully struck on an individual country basis because there can be important differences among countries in the social impact of adult mortality.

Some health disorders have probably received too little attention in the past. For example, mental health disorders (and particularly unipolar depression) are important causes of disability among both working-age adults and school-age children. Treating some mental disorders (such as, depression and schizophrenia) may be cost-effective from the standpoint of poverty reduction, even though it may not be cost-effective from a narrower public health perspective—that is, in terms of cost per disability-adjusted life year gained (Shah and Jenkins, 2000; Whiteford et al., 2001; Institute of Medicine, 2001; WHO, 2001).

The prevention of injuries, which are an important cause of death and disability among both working-age adults and school-age children, may also provide opportunities for cost-effective poverty reduction investments. Unfortunately, there is little information on the cost-effectiveness of injury prevention interventions in developing countries. However, in the case of road injuries (which are a rapidly increasing cause of injuries in most developing countries), many of the injuries involve public transportation. More effective regulation of public transportation (for example, stricter licensing requirements for drivers and safety checks of vehicles) is likely to be a cost-effective approach to reducing injuries. Other

possibly cost-effective approaches to reducing road accidents include regulations requiring the use of helmets by motorcycle and bicycle riders and stricter measures designed to reduce the consumption of alcohol and drugs by persons operating motor vehicles.

***Recommendation #2: Give higher priority to health investments that prevent poverty directly.***

Investments that reduce the prevalence of long-term disabilities among working-age adults—that is, investments that reduce a household’s effective dependency burden—can directly contribute to poverty reduction. In addition to cost-effective investments to improve mental health and reduce injuries, such investments might include those designed to prevent and/or treat blindness and other visual impairments (such as cataracts), adult hearing loss, and osteoarthritis. The knowledge base in this area is currently weak, and its expansion should be another research priority.

Investments that reduce a poor or near-poor household’s vulnerability to the risk of catastrophic health care costs can also reduce poverty. The easiest way to do this in the short run may be by increasing the share of public funding allocated to public hospitals. This recommendation contrasts with the conventional public health prescription that the hospital sector should be starved while the bulk of public funding is allocated to primary (and particularly preventive) health care. Another practical way to reduce vulnerability to the risk of catastrophic health care costs (and to improve access to needed care) is to expand opportunities for rural saving and access to affordable rural credit (such as through rural microcredit and savings schemes). Another approach that has been successfully piloted in Cambodia is the use of publicly financed equity funds to pay for the hospital costs of the poor (van Damme and Meesen, 2001; De Loof and Bonnet, 2001; Knowles, 2001). Community health insurance (as well as other community health financing schemes) is another approach that has been used in many countries (with varying success) to reduce vulnerability to the risk of catastrophic health care costs (Preker et al., 2001).

***Recommendation #3: Make efficient investments that are complementary to health investments made by poor and near poor households.***

Complementary investments include investments in education, food security, rural infrastructure (particularly roads and water and sanitation), access to improved housing, and improved environmental conditions. Absence of these complementary investments increases the cost of health investments to the poor. Economic evaluation of the benefits and costs of these investments should include health benefits, although in most cases the health benefits alone will be insufficient to justify the investment. Many of these complementary investments already figure prominently in developing country poverty reduction strategies (for example, formal education, rural roads, and water and sanitation). However, in education, more attention should probably be given to adult basic education and literacy training because (1) their effects are immediate, and (2) they are self-targeted to the poor. In the environmental area, more attention ought to be given to policies that promote efficient alternatives to the indoor use of biomass- and coal-burning stoves (von Schirnding et al., 2001).

***Recommendation #4: Make efficient investments that remove or reduce barriers to health investments made by poor and near poor households.***

Investments that are likely to help in removing or reducing barriers to effective health investments by the poor and near poor include:

- Better health education for the poor and near poor (such as through adult basic education and literacy programs);
- More effective regulation of private health care (for example, control of unlicensed drug vendors, regulation of the sale of potentially harmful prescription drugs without a prescription, and reducing the prescription and/or direct sale of unnecessary and/or excessively expensive drugs by private providers);
- Adoption of transparent fee and exemption policies in public health facilities (for example, use of a simple fee schedule that is prominently displayed in a hospital, adequate funding of exemptions, and use of formal targeting mechanisms for exemptions);
- Targeted demand-side subsidies (such as vouchers and subsidized health insurance) to improve access by the poor to key health services (see Recommendation #1);
- Targeted subsidies for health care-related transportation costs, including reimbursement of costs from home village to primary care facilities and subsidized ambulance (or public transportation) costs from primary care facilities to referral providers;
- Use of pro-poor formulas for the geographic allocation of public health resources; and
- Contracting out the operation (or the management) of public health facilities to NGOs or commercial providers.

Unfortunately, there is relatively little evidence (or the evidence is limited to one or only a few countries) establishing the effectiveness of policies, such as those listed above, that are designed to improve access and utilization of health services by the poor and near poor (Wagstaff, 2001). This suggests that initiatives such as those listed above should be implemented on a national level only after careful evaluation has established their effectiveness.

## REFERENCES

- Abel-Smith, B. and P. Rawall. 1992. "Can the poor afford 'free' health services? A case study of Tanzania." *Health Policy and Planning* 7(4): 329-341.
- Barro, Robert. 2000. "Inequality and Growth in a Panel of Countries." *Journal of Economic Growth* 5:5-32.
- Barro, Robert and X. Sala-I-Martin. 1995. *Economic Growth*. New York: McGraw-Hill.
- Basta, Samir, Ms. Soekirman, D. Karyadi, and N. Scrimshaw. 1979. "Iron Deficiency Anemia and Productivity of Adult Males in Indonesia." *American Journal of Clinical Nutrition* 32(4): 916-25.
- Behrman, Jere R. 1996. "The Impact of Health and Nutrition on Education." *World Bank Research Observer* 11(1):23-37.
- Behrman, Jere R. and Mark R. Rosenzweig. 2002. "The Returns to Increasing Body Weight." Mimeo. Philadelphia: University of Pennsylvania.
- Belli, Paolo and Olivier Appaix. 2002. "Exploring the economic benefits of investing in child health." Draft report (September). Washington, D.C.: The World Bank.
- Bhargava, A., D. Jamison, and C. Murray. 2001. "Modeling the Effects of Health on Economic Growth." *Journal of Health Economics* 20:423-440.
- Bir, Anupa and Richard G. Frank. 2001. "Mental Illness and the Labor Market in Developing Nations." CMH Working Paper Series (Working Paper No. WG1:6). Geneva: World Health Organization.
- Birdsall, Nancy, Allen Kelley, and Steven Sinding, eds. 2001. *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. New York: Oxford University Press.
- Bloom, David and Jeffrey Sachs. 1998. "Geography, Demography, and Economic Growth in Africa." *Brookings Papers on Economic Activity* 2:207-295.
- Bloom, David, E., D. Canning, and B. Graham. 2001. "Health, Longevity and Life-Cycle Savings." Commission on Macroeconomics and Health Working Paper Series (WG1:9). Geneva: WHO.
- Castro-Leal, F., J. Dayton, L. Demry, and K. Mehra. 2000. "Public spending on health care in Africa: do the poor benefit?" *Bulletin of the World Health Organization* 78(1):66-74.
- Commission on Macroeconomics and Health. 2001. *Macroeconomics and Health: Investing in Health for Economic Development*. Geneva: World Health Organization.

- Deaton, Angus. 2001. "Counting the World's Poor: Problems and Possible Solutions." *The World Bank Research Observer* 16(2):125-47.
- De Loof, F., F. Bonnet et al. 2001. "Takeo referral hospital 1997-2000: pioneering a hospital financing scheme in the Kingdom of Cambodia." Phnom Penh, Swiss Red Cross.
- Delcheva, E., D. Balabanova, and M. McKee. 1997. "Under the counter payments for health care: Evidence from Bulgaria." *Health Policy* 42:89-100.
- Dickson, Rumona, S. Awasthi, P. Williamson, C. Demellweek, and P. Garner. 2000. "Effect of treatment for intestinal helminth infection on growth and cognitive performance in children: systematic review of randomized trials." *British Medical Journal* 320 (June 24):1697-1701.
- Diop, Francois, Abdo Yazbeck, and Ricardo Bitran. 1995. "The impact of alternative cost recovery schemes on access and equity in Niger." *Health Policy and Planning* 10(3):223-240.
- Dow, William, P. Gertler, R. Schoeni, J. Strauss, and D. Thomas. 1997. "Health Care Prices, Health and Labor Outcomes: Experimental Evidence." Labor and Population Program Working Paper Series 97-01, RAND, Santa Monica, California (January).
- Eastwood, Robert and Michael Lipton. 1999. "The Impact of Human Fertility on Poverty." *Journal of Development Studies* 31(1):1-30.
- Eastwood, Robert and Michael Lipton. 2000. "Pro-poor Growth and Pro-growth Poverty Reduction: Meaning, Evidence, and Policy Implications." *Asian Development Review*, 18(2):22-58.
- Ensor, T. and L. Savelyeva. 1998. "Informal payments for health care in the former Soviet Union: Some evidence from Kazakhstan." *Health Policy and Planning* 13(1):41-49.
- Fenwick, A. and B.M. Figenschou. 1972. "The Effect of *Schistosoma Mansoni* on the Productivity of Cane Cutters on a Sugar Estate in Tanzania." *Bulletin of the World Health Organization* 47(5):567-72.
- Filmer, Deon, Jeffrey S. Hammer, and Lant H. Pritchett. 2000. "Weak Links in the Chain: A Diagnosis of Health Policy in Poor Countries." *The World Bank Research Observer* 15(2):199-224.
- FOCUS on Young Adults. 2001. "Advancing Young Adult Reproductive Health: Actions for the Next Decade End of Program Report to USAID." Pathfinder International, Washington, D.C.

- Gallup, John Luke and Jeffrey D. Sachs. 2001. "The Economic Burden of Malaria." Commission on Macroeconomics and Health Working Paper Series (WG1:10), Geneva: WHO.
- Gilson, L., S. Russell, and K. Buse. 1995. "The political economy of user fees with targeting: Developing equitable health financing policy." *Journal of International Development* 7(3):369-401.
- Glewwe, Paul. 1999. "Why does mother's schooling raise child's health in developing countries?" *Journal of Human Resources* 34(1):124-59.
- Glewwe, Paul. 2002. "Schools and Skills in Developing Countries: Education Policies and Socioeconomic Outcomes." *Journal of Economic Literature* 40(2):436-82.
- Goudge, Jane, Nondumiso Khumalo, and Lucy Gilson. 2002. "Policy options to improve access to health care." Mimeo. Center for Health Policy, School of Public Health, University of Witwatersrand, South Africa (November).
- Gwatkin, Davidson R. 2000. "The Current State of Knowledge about Targeting Health Programs to Reach the Poor." Mimeo. Washington, D.C.: The World Bank (February).
- Gwatkin, Davidson R. and Michel Guillot. 2000. "The Burden of Disease among the Global Poor." Human Development Network. Washington, D.C.: The World Bank.
- Institute of Medicine. 2001. *Neurological, Psychiatric, and Developmental Disorders: Meeting the Challenges in the Developing World*. Washington, D.C.: National Academy of Sciences.
- Keller, Sheryl and J. Brad Schwartz. 2001. "Final Evaluation Report: Contracting for Health Services Pilot Project (CHSPP): A Component of the Basic Health Services Project." ADB Loan No. 1447-CAM, Phnom Penh (November).
- Killingsworth, J. et al. 1999. "Unofficial fees in Bangladesh: Price, equity, and institutional issues." *Health Policy and Planning* 14(2):152-163.
- Knowles, James C. 1995. "Price Uncertainty and the Demand for Health Care in Developing Countries." *Health Policy and Planning* 10(3).
- Knowles, James C. 2001. "An Economic Evaluation of the Health Services for the Urban Poor Component." Report to Options (UK), London (September).
- Knowles, James C. and Jere R. Behrman. 2003a. "The Economic Returns to Investing in Youth in Developing Countries: A Review of the Literature." Mimeo. Bangkok/Philadelphia, Pennsylvania: University of Pennsylvania, for World Bank Human Development Network.

Knowles, James C. and Jere R. Behrman. 2003b. "Assessing the Economic Returns to Investing in Youth in Developing Countries." Mimeo. Bangkok/Philadelphia, Pennsylvania: University of Pennsylvania, for World Bank Human Development Network.

Litvack, J. and C. Bodard. 1993. "User fees plus quality equal improved access to health care: results of a field experiment in Cameroon." *Social Science and Medicine* 37:367-383.

Mathers, C., C. Stein, D. Ma Fat, C. Rao, M. Inoue, N. Tomijima, C. Bernard, A. Lopez, and C. Murray. 2002. "Global Burden of Disease 2000: Version 2 methods and results." Global Programme on Evidence for Health Policy Discussion Paper No. 50, Geneva: World Health Organization.

Merrick, Thomas W. 2002. "Population and Poverty: New Views on an Old Controversy." *International Family Planning Perspectives* 28(1):41-46.

Miguel, Edward and Michael Kremer. 2001. "Worms: Education and Health Externalities in Kenya." Harvard University and University of California-Berkeley, NBER Working Paper #8481.

Mills, Anne, R. Brugha, K. Hanson, and B. McPake. 2002. "What can be done about the private health sector in low-income countries?" *Bulletin of the World Health Organization* 80(4):325-30.

Murray, C.J.L. and A.D. Lopez, eds. 1996. *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries and Risk Factors in 1990 and Projected to 2020*. Cambridge, Massachusetts: Harvard University Press (Global Burden of Disease and Injury Series, Executive Summary and Vol. 1).

Nokes, C., C. van den Bosch, and D.A.P. Bundy. 1998. "The Effects of Iron Deficiency Anemia on Mental and Motor Performance, Educational Achievement, and Behavior in Children: A Report of the International Nutritional Anemia Consultative Group." Washington, D.C.: USAID.

Osmani, Siddiqur Rahman. 2000. "Growth Strategies and Poverty Reduction." *Asian Development Review* 18(2):85-130.

Oxfam. 2000. "Health and Landlessness." Draft (15 October). Oxfam GB Cambodia Land Study Project. Phnom Pehn: OXFAM GB.

Pollitt, Ernesto. 1997. "Iron Deficiency and Educational Deficiency." *Nutritional Review* 55(4): 133-40.

Preker, A., G. Carrin, D. Dror, M. Jakab, W. Hsiao, and D. Arhin-Tenkorang. 2001. "A Synthesis Report on the Role of Communities in Resource Mobilization and Risk Sharing." CMH Working Paper Series (Paper No. WG3:4), Geneva: World Health Organization.

Shah, A. and R. Jenkins. 2000. "Mental health economic studies from developing countries reviewed in the context of those from developed countries." *Acta Psychiatrica Scandinavica* 101(2):87-103.

Strauss J. and D. Thomas. 1998. "Health, nutrition and economic development." *Journal of Economic Literature*, 36:766-817.

Thomas, Duncan. 2001. "Health, Nutrition, and Economic Prosperity: A Microeconomic Perspective." CMH Working Paper Series (Paper No. WG1:7), Geneva: WHO.

Thomas, Duncan and John Strauss. 1997. "Health and Wages: Evidence on Men and Women in Urban Brazil." *Journal of Econometrics* 77(1):159-86.

Van Damme, W. and B. Meessen. 2001. "Sotnikum New Deal, the first year." Phnom Penh, MSF Holland/Belgium.

Vaz, L. and P. Jha. 2001. "Note on the Health Impact of Water and Sanitation Services." CMH Working Paper Series (Paper No. WG5:23).

Von Schirnding, N. Bruce, K. Smith, G. Ballard-Tremmer, M. Ezzati, and K. Lvovsky. 2001. "Addressing the Impact of Household Energy and Indoor Air Pollution on the Health of the Poor—Implications for Policy Action and Intervention Measures." CMH Working Paper Series (Paper No. WG5:12), Geneva: World Health Organization.

Wagstaff, Adam. 2001. "Poverty and Health." CMH Working Paper Series, Paper No. WG1:5, Washington, D.C.: The World Bank.

Wagstaff, Adam. 2002. *Inequalities in Health in Developing Countries: Swimming Against the Tide?* Washington, D.C.: The World Bank.

Whiteford, Harvey, M. Teeson, R. Scheurer, and D. Jamison. 2001. "Responding to the Burden of Mental Illness." CMH Working Paper Series (Paper No. WG1:12), Geneva: World Health Organization.

Wilkinson, D., J. Holloway et al. 2001. "The impact of user fees on access, equity and health provider practices in Cambodia." Phnom Penh, Health Economics Task Force, MoH/WHO Health Sector Reform Phase III Project.

Wolgemuth, June, M. Latham, A. Hall, A. Chesher, and D. Crompton. 1982. "Worker Productivity and the Nutritional Status of Kenyan Road Construction Laborers." *American Journal of Clinical Nutrition* 36(7):68-78.

World Bank. 2002. "Review of World Bank supported projects in adult basic education and literacy, 1997-2002." Washington, D.C.: The World Bank.

World Health Organization (WHO). 2001. "World Health Report 2001: Mental Health: New Understandings, New Hopes." Geneva.

World Health Organization (WHO). 2002. "World Health Report 2002: Reducing risks, promoting healthy life." Geneva.

Yaqub, S. 1999. "How equitable is public spending on health and education? Background paper for WDR 2000/1." Washington, D.C.: The World Bank.

**ANNEX A**

**ESTIMATES OF THE GLOBAL BURDEN OF DISEASE IN 2001**

## ESTIMATES OF THE GLOBAL BURDEN OF DISEASE IN 2001

Recently updated estimates of the Global Burden of Disease in 2001 (WHO, 2002) indicate that the 10 leading causes of years lived with disabilities (YLDs) worldwide include several types of mental illness (unipolar depressive disorders, bipolar disorders, alcohol use disorders, and schizophrenia), adult hearing loss, other unintentional injuries, other digestive diseases, osteoarthritis, (all) maternal health disorders, and (all) perinatal disorders. This list of leading causes of disability differs markedly from the leading causes of mortality worldwide.

However, there are important differences in the leading causes of disability by age, gender, region, and income. Age differences are particularly important in the context of labor supply and productivity effects, which are mainly confined to the age group 15-59. For this age group, there are some differences in the leading causes of disability as compared with those for all ages listed above. Apart from several changes in rankings among the 10 leading causes, chronic obstructive pulmonary disease is added to the list for the age group 15-59, whereas (all) perinatal conditions is dropped from the list.

There are also some important differences by gender. Restricting attention to the 15-59 year age group, Group I disorders (which include communicable diseases and pregnancy-related health disorders) account for 21.3 percent of YLDs among women, compared with only 11.7 percent of YLDs among men. There is relatively little difference in the importance of Group II disorders (noncommunicable diseases) between men and women (74 and 72 percent, respectively). However, Group III disorders (injuries) are more important causes of disability among men (14.3 percent of YLDs, versus 6.7 percent among women).

The rankings of leading causes of disability discussed above refer to the entire world. Unfortunately, the most recent estimates are not presented separately for developed and developing countries. From previous work, however, it is known that the relative importance of Group I (communicable and maternal) disorders is much greater among poorer groups (Gwatkin and Guillot, 2000). Such differences are reflected in the rankings for the Africa and South/East Asia WHO regions (two regions consisting mainly of low- and middle-income developing countries and that together contain most of the world's poor) that are presented in the table below.

**Table A-1: 10 Leading Causes of Years Lived with Disabilities (YLDs) Among Working-Age Adults (15-59) in Two WHO Regions, 2001**

Cause	Ranking	% of YLDs	Ranking	% of YLDs
HIV/AIDS	1	12.3		1.2
Sexually transmitted diseases excluding HIV <sup>a</sup>	10	3.3	9	2.5
All maternal disorders <sup>b</sup>	2	9.1	4	5.7
Unipolar depressive disorders	3	7.3	1	17.9
Bipolar disorder	6	3.4	6	3.6
Schizophrenia	7	3.4	5	4.1
Cataracts		2.4	10	2.2
Adult hearing loss	5	3.9	2	7.6
Other digestive diseases	8	3.3	7	2.8
Osteoarthritis		2.2	8	2.8
Other unintentional injuries	4	4.6	3	6.0
Violence	9	3.3		0.6

Source: WHO, 2002.

<sup>a</sup> Includes syphilis, Chlamydia, gonorrhea, and other sexually transmitted diseases.

<sup>b</sup> Includes maternal hemorrhage, maternal sepsis, pregnancy-related hypertensive disorders, obstructed labor, abortion, and other maternal conditions.

There are also several important differences in the leading causes of disability by gender within these two regions, even apart from the fact that men are not exposed to the risk of maternal disorders. For example, alcohol and drug use disorders, lymphatic filariasis, unintentional injuries, and violence are relatively important causes of disability among African males. Among African women, sexually transmitted diseases other than HIV, unipolar depressive disorders, and trachoma are relatively important causes of disability. In the South and East Asia WHO region, most of the same gender differences are also observed (the exception is that trachoma is not an important cause of disability among either men or women). In addition, road accidents and falls are important causes of disability among males, while panic disorder is a relatively important cause of disability among women.

The leading causes of disability differ among school-age children (5-14) from those among working-age adults (compare Tables A-1 and A-2). One difference is the relatively important role of parasites and iron deficiency anemia as causes of disability among school-age children (accounting for 19.1 percent of YLDs in Africa and 12.6 percent of YLDs in the South and East Asia region). Asthma and injuries (both intentional and unintentional) are also more important causes of disability among school-age children.

**Table A-2: 10 Leading Causes of Years Lived with Disabilities (YLDs) Among School-Age Children (5-14) in Two WHO Regions, 2001**

Cause	Africa WHO Region		South-East Asia WHO Region	
	Ranking	% of YLDs	Ranking	% of YLDs
Diarrheal diseases	9	2.9		2.0
Tropical cluster diseases <sup>a</sup>	1	12.9	5	5.3
Intestinal nematode infection <sup>b</sup>		2.5	7	4.1
Iron deficiency anemia	5	3.7	9	3.2
Unipolar depression disorders	3	6.9	1	11.6
Schizophrenia		0.5	10	3.1
Obsessive-compulsive disorder	7	3.4		0.2
Migraine		2.3	3	7.4
Asthma	2	7.4	4	5.4
Road traffic accidents	4	5.9	6	5.0
Falls	10	2.7	2	8.7
Fires		2.4	8	3.9
Violence	6	3.5		1.1
War	8	3.0		0.4

Source: WHO, 2002.

<sup>a</sup> Includes trypanosomiasis, Chagas disease, schistosomiasis, leishmaniasis, lymphatic filariasis, and onchocerciasis.

<sup>b</sup> Includes ascariasis, trichuriasis, hookworm disease, other intestinal infections, and other infectious diseases.

The leading causes of mortality among working-age adults (15-59) in 2001 are presented in Table A-3 for the same two WHO regions (Africa and South/East Asia). These are different from the leading causes of death in the general population, which largely reflect causes of death among children under 5 and in the elderly population. There are also some important gender differences in the leading causes of mortality among working-age adults. Whereas only women are exposed to the risk of death from maternal disorders, the risk of death from tuberculosis and most types of injuries is higher among males in Africa (but not in South/East Asia).

**Table A-3: 10 Leading Causes of Mortality Among Working-Age Adults (15-59) in Two WHO Regions, 2001**

Cause	Africa WHO Region		South-East Asia WHO Region	
	Ranking	% of Deaths	Ranking	% of Deaths
Tuberculosis	2	6.1	1	10.8
HIV/AIDS	1	46.2	3	9.0
Diarrheal diseases	8	2.2	10	3.2
Other infectious diseases	5	2.9		2.4
Lower respiratory infections	4	3.9		1.4
All maternal disorders <sup>a</sup>	3	6.0	9	3.3
Ischaemic heart disease	9	2.1	2	10.8
Cerebrovascular disease		2.0	6	3.8
Chronic obstructive pulmonary disease		0.5	7	3.8
Road traffic accidents	6	2.9	4	5.4
Other unintentional injuries		1.2	8	3.6
Violence	10	2.1		1.2
Self-inflicted injuries		0.5	5	4.4
War	7	2.7		0.4

Source: WHO, 2002.

<sup>a</sup> Includes maternal hemorrhage, maternal sepsis, pregnancy-related hypertensive disorders, obstructed labor, abortion, and other maternal conditions.