

## COMMUNICABLE DISEASES: IS THERE HOPE FOR AVOIDABLE DEATHS?

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### *Abstract*

In spite of the belief that we, humans are winning the combat against communicable diseases, life threatening microbes continue to cause suffering and death. They also impose an enormous financial burden on societies. Malaria, TB and HIV/AIDS have become the epicenter of world attention due to the huge economic costs they are associated with. In this paper, I will argue that these costs are avoidable. This paper makes an analysis on the literature of the impact of diseases on economies; I also try to give an insight on why developing countries fail to capitalize on health benefits, and to conclude, I will highlight possible intervention strategies.

### I. INTRODUCTION

“The desire for a healthier and better world in which to live our lives and raise our children is common to all people and all generations. However, throughout history, human populations have experienced major epidemic of infectious diseases, often resulting in large numbers of deaths, panic, disrupting of trade and political instability” (World Health Organization, 2000). Over the second half of the twentieth century, enormous health gains were brought about by medical research achievements in vaccination programs, antibiotics and improvements of life conditions. However, developing counties benefited unequally from these health gains (Mills and Shillcut, 2004).

The World Health Organization (WHO) (2006) ascertains that the inequalities have been worsened by the advent of HIV/AIDS, especially in Sub-Saharan Africa. In conjunction with other communicable diseases, there is an increasing trend of preventable deaths in developing countries. This has resulted in the widening gap in life expectancy between the developed and developing countries, thereby reversing some of the major gains achieved in human health over 50 years (WHO, 1998).

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The 1998 World Health Report *ascertains* that while average life expectancy has been increasing throughout the 20<sup>th</sup> century, 3 out of 4 people in the least developed countries are dying before the age of 50. Mortality from communicable diseases accounts for 80% of the difference in life expectancy between people in rich and poor countries (translating to two thirds of total DALYs<sup>1</sup>). Reduction of these premature deaths is one of the greatest challenges facing humanity. Whilst life expectancy is a common proxy for determining health gains, evidence linking it to economic growth indicators, such as income, is ambiguous. Some schools of thought indicate that life expectancy has no correlation to income levels, yet other economists have found a direct linkage between life expectancy and per capita GDP.

Drawing on the deliberations of the Copenhagen Consensus, this paper is a brief review of recent literature on communicable diseases. Section I has set the scene by introducing the issues surrounding global health and the existing issues related to the topic. Since health is an important welfare measure, it is well documented that health outcomes are correlated with inequalities in other dimensions and are often reproduced overtime. As to be further discussed in subsequent sections, Deaton (1997) indicates that poor health can directly influence an individual's opportunities like his/her earning capacity, performance at school, ability to care for children, as well as participate in community activities.

According to the pioneers of the Millennium Development Goals (MDG), diseases and environmental degradation do not respect national boundaries; hence, such issues as epidemic diseases are a threat to people and economies.

In Section 3, I highlight possible intervention strategies. This section suggests a tentative answer to the following question: Where should the world invest an extra \$50 billion dollars over the next four years? Some of the goals of the MDGs are to achieve a substantial reduction in child mortality, maternal health and combat HIV/AIDS, malaria and other diseases by 2015<sup>2</sup>, "Although there are constraints to achieving these goals, especially in the developing countries, maybe there is hope for combating deaths from preventable diseases" (Ibid).

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<sup>1</sup> The disability adjusted life years (DALY) is frequently used in global health gap measure that quantifies the disease burden. This approach extends the concept of potential years of life lost due to premature death (YLL) to include equivalent years of healthy life lost by virtue of being in poor health or disabled.

<sup>2</sup> [http://www.undp.org/ye/info\\_detail.php?n\\_no=29](http://www.undp.org/ye/info_detail.php?n_no=29)

## II. CHARACTERIZATION OF MAJOR EPIDEMICS

Communicable diseases<sup>3</sup> are the world's biggest killers of children, and are also a significant variable for the causes of death for adults in the developing countries (Table 1).

The biggest, infectious killers in the world are "The Big Three (AIDS, Malaria and Tuberculosis)" and acute respiratory infectious. Together with malnutrition as a common contributor for the spread of the diseases, the above-mentioned claims more than 14 million people per year (WHO 2003).

### *Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome*

The rate of spread of Human Immunodeficiency Virus (HIV) and the challenge of millions of people living with Acquired Immune Deficiency Syndrome (AIDS) is one of the major problems facing the world today. The Sub-Saharan Africa (SSA), is the most affected region – where it is estimated that 29.4 million people are living with HIV/AIDS (CTA, 2004). Life expectancy at birth, in most of SSA countries, has declined sharply due to HIV/AIDS. For instance, UNAIDS (2004) estimated that by 2005-2010 life expectancy at birth in the countries with the highest HIV/AIDS prevalence rates will decline by an average of 17 years. Given that the pandemic is primarily concentrated among adults who are at their productive and reproductive peak, the associated monetary and social costs are a major cause for concern. Mills and Shillcut (2004) highlighted that the distribution of HIV/AIDS is geographically diverse, and that it can be classified according to three stages<sup>4</sup>: nascent, concentrated and generalized.

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<sup>3</sup> Communicable diseases are infectious diseases or illnesses that arise from transmission of an infectious agent or its toxic product from an infected animal, person or insect to a susceptible host, directly or indirectly. A few examples are malaria, TB, hepatitis A, B and, influenza, measles, rabies, STDs, tetanus, acute respiratory infections, HIV/AIDS, maternal prenatal diseases, common cold.

<sup>4</sup> The epidemic exists in its nascent stage where less than 5% of individuals in high risk groups are infected and less than 1% of the overall population is affected (areas such as China, Indonesia, several Asian Republics, and parts of North Africa). The epidemic is in its concentrated stage where over 5% of the risk groups, but not the general populations, are infected (much of Latin America, several Asian Republics, and SSA). Lastly, generalized form, which means over 5% of the overall population is affected (Southern and Eastern Africa and few countries in West Africa (Mills and Shillcut) 2004).

### ***Malaria***

With the exception of Tuberculosis (TB), Malaria is by far the world's most destructive tropical disease; killing more people than any other communicable disease. In the last decade, the number of Malaria cases rose at an alarming rate, particularly in Africa. The WHO estimates that there are between 300 to 500 million new cases annually, resulting in 1.1 million deaths, of which 86% occur in the Sub-Saharan Africa. Although, any person is at risk, regardless of age, the group of children under five years are the most affected by this disease. While Sub-Saharan Africa is the most affected region, malaria remains a considerable problem in densely populated parts of Asia, Latin America and the Middle East.

The literature on Malaria varies significantly. Mills and Shillcut argue that major reductions in Malaria cases and even the eradication of the disease in some parts of the world gave reason for optimism in the mid twentieth century. This optimism led to a reduction of support on programs, medicines and insecticides, all this resulting in the re-emergence of malaria in countries that were previously eradicated. Conversely, Corrina and Menchini (2005) argue that this re-incidence in malaria is due to changes in health spending, public health and the structure stability of the household. Others proposed that the increasing cases are a result of climate change, increasing population movements, emergence of multi-drug resistant strains, and deterioration of health systems.

### ***Tuberculosis***

Tuberculosis (TB) is a major cause of chronic illness in many parts of the world, accounting for 25% of all avoidable deaths in developing countries. Tuberculosis is caused by *Mycobacterium tuberculosis*. The predominant mode of person-to-person transmission is through inhalation of bacilli released during coughing by infected persons. About one third of the world's population is infected and each year there are nine million new cases; 95% of TB cases reside in developing countries; of these, 75% are within the economically productive age group (WHO, 2004).

Poor living conditions, areas with many displaced people, as well as HIV/AIDS prevalent places, individuals can transform from carriers themselves to infected, with the potential to infect others. UNAIDS and WHO estimates that one third of all individuals living with HIV will eventually contract TB.

### III. THE ECONOMIC IMPACT OF HEALTH

The following section will present a conceptual framework (Figure 1) for assessing the impact the diseases have, *in general*, on economic growth. Although impacts can be assessed at a micro economical level, resultant impacts further translate to macro-level<sup>5</sup> impacts.

An individual's health status will affect his or her labor supply and labor productivity. For instance, health affects the number of hours or days that an individual could dedicate to his or her work or even the very decision of participating in the labor force. Similarly, the choice of early retirement from the labor force may, at least, partly be driven by an individual's poor or declining health status. These choices are likely to contribute to the overall individual labor supply. Such decisions impact an individual and the work place, as employees are faced with the need to constantly recruit, train and provide exit packages. This results in increased pressure on pension funds and medical insurance. Apart from this, aggregate loss in national productivity will have a significant impact on the macro economy. It has been documented that there exists an inverse relationship between loss in productivity and per capita income. Cuddington (1993) reported similar conclusions in an HIV/AIDS study of Tanzania. Assuming a non-Aids scenario between 1990 and 2025, he documented that the country's per capita GDP could increase 10%.

Human capital has long been recognized as a contributor to economic wealth. Most theoretical and empirical research has considered education as the only relevant contributor to human capital. (Suhrcke et al, 2005). Good health, however, is an equal determinant of growth in human capital. The state of health of an individual or a population is likely to impact the levels of income and the distribution of income between saving and consumption and the willingness to undertake investment. Conversely, increased illness and susceptibility to diseases reduce investment in education. As illustrated in Figure 1, with illness, investments in physical capital suffer as well. Households may respond to the risk of high financial expenditure for serious illness by reducing their levels of investment. For

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<sup>5</sup> Micro impacts review the link between disease/ill health at household level or individual level, whilst macro impacts assess the influence of diseases at national levels (Mills and Shillcut, 2004). Although necessary towards understanding impact at a smaller unit, Mills and Shillcut emphasized that microeconomic studies are likely to underestimate the true economic impact, of a disease, as the costs imposed by the disease on households do not explicitly bring out the benefits of disease control, yet macro studies raise concerns as to the extent to which other influences on economic growth are adequately allowed for.

instance, a household may invest in assets with higher liquidity, which has lower returns.

The death of a wage-earning family member, is most likely to drive a family into penury due to the costs associated with a funeral, the loss of regular income, and the risk of losing one's property (Subbararo and Coury, 2004). The loss of parents reveals a major problem of increasing dependents, especially orphans. In Sub-Saharan Africa, there are 43 million orphaned children, 10% of whom have lost both parents (UNICEF, 2004). Micro studies and analysis at household level surveys suggest that, relative to other children, fostered children are under enrolled in schools, work longer hours doing house-chores and have lower immunization coverage. Economies are faced with an increasing need to mobilize resources to ensure that care and education is given to the disadvantaged children. Higher dependency ratios may also be a product of an increase in family size to guard against high child mortality risks.

Child illnesses impact the ability of the child to grow into a physically and mentally well-developed individual. For instance, attacks from malaria may result in a child with an impaired cognitive capacity. Differences in cognitive development initiatives can be central to more equal opportunities later in life. Children with ill health and nutrition tend to achieve low educational attainment and high school absenteeism relative to healthy children. Human capital theory indicates this will impact their education and future productivity.

#### **IV. CHANGING THE TRENDS**

The world's poorest countries face enormous hurdles in order to achieve the Millennium Development Goals (MDGs). Achieving sustainable results in the management and control of communicable diseases requires a strategy that incorporates a primary health care system that assists in the prevention, diagnosis and treatment of diseases, as well as overall health promotion and education. A very crucial issue is addressing sustainability of livelihoods. The way of life is instrumental in perpetuating or reducing incidence of diseases.

To begin with, combating strategies of communicable diseases should be region/country or area specific, as well as taking into cognizance the epidemic stages and conditions of the diseases. The world has the financial and technological resources to provide essential health services to anyone in need. However, the state of health systems, in most developing countries, prevents these effective interventions from reaching those in greatest need. More attention and a greater share of resources need to be invested in building and strengthening the development of an infrastructure

of primary health care systems consisting of community-based services, health centers and local hospitals. Additionally, a well-trained and motivated staff should back a good system. This is a major problem in developing countries, where many health workers are joining a brain drain of qualified professionals who are migrating to better paid jobs in developed countries. Recently, WHO (2006) reported that there is a shortage of four million health workers in 57 developing countries;<sup>6</sup> the lack of skilled workers is hampering efforts to combat diseases such as HIV/AIDS, malaria and TB. The critical issue of skilled staff workers could be addressed by apportioning some of the global funds toward encouraging governments to map out a long term plan of investing more in the health sector (e.g. increasing the direct investment to train and pay health workers).

It is difficult to entice urban educated doctors to work in poor rural areas. Worse still, expanding rural health infrastructure and providing incentives to doctors to work in the remote areas can be costly. A cost-effective way of addressing this issue would be to fund the establishment of trained community health workers to provide services. Skirble (2006) ascertains, until systems are in place to deliver essential health services on a large scale, attempts to address individual diseases will be at the expense of neglecting other equally important diseases. With the development of a strong primary health care system it will be easier to treat other communicable diseases, such as food borne, vector borne diseases, respiratory infectious diseases, and influenza, that continue to kill and disable millions of children and adults around the world, but are not receiving so much global attention as HIV/AIDS or Malaria (Johns Hopkins and IFRC health guidelines).

Investment in education is another way to help reduce deaths from preventable diseases. Specific education focused on making communities aware of their health risks, how to administer precautionary measures and, above all, to enable them to strive for healthy lifestyles. As the old adage says, “prevention is better than cure”, the first step in economies in the nascent stages of an epidemic, such as HIV/AIDS, would be to strengthen awareness and preventive measures to the communities. This can be done through mass media campaigns, out-reach programs targeted at high-risk

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<sup>6</sup> Sub-Saharan Africa, which has 24% of the global disease burden, has only 3% of the health care workforce worldwide and accounts for less than 1% of global health care spending. In contrast, the Americas, which has only 10% of the global disease burden, has 37% of the health care workforce and more than half of global health care spending (Kaisernetwork.org, Reuters 4/16).

groups<sup>7</sup> and incorporating HIV/AIDS in school curriculum. In a cost-benefit analysis study undertaken by Brown (cited in Mills and Shillcut, 2004), due to Thailand's 100% condom use prevention strategy, the number of new HIV/AIDS cases fell five times between 1991-1993, and the number of new sexually transmitted diseases fell ten times between 1991-1995. Thus, prevention strategies are an important component in averting new disease cases.

However, for communities where there is a high incidence of disease, an appropriate balance needs to be struck between treatment and prevention. A study by Xu et al (2003) predicts that anti-retroviral treatment alone will be able to save a large number of lives in the short run, but in the long run a combined response of treatment and prevention is the most effective strategy. This strategy, however, is not as effective against other diseases such as Malaria. It is well documented that, for years, communities and governments have invested in malarial prevention and treatments. Emergence of drug resistant strains is the main reason for ineffectiveness of preventative measures. For such diseases as Malaria, one would propose more attention to be given to research and development of new improved anti-malarial insecticides and drugs.

Preventative strategies must take into account the growing trend of risk factors correlated to these diseases. Despite global medical advances, some 10 million children die each year of preventable diseases (WHO, 2006). Why do developing countries seem to be lagging behind in achieving health gains? A possible response could be the ease with which the equilibrium between population, infectious diseases and the environment is disrupted (Figure 2). The environment in which people live influences their health. Most developing countries are characterized by poor living standards, manifested in poor sanitation conditions, lack of clean water and poor housing. As a coping strategy, people in poverty are bound to engage in risky activities, which increase their susceptibility to diseases.

Environmental factors are conducive to spread and perpetuation of communicable diseases. Addressing these risk factors entail creation of income generating activities for the poor, improving standards of living through betterment of their economic status, and ensuring access to essential health services. In a Demographic Health Survey undertaken by Deaton (1997), household's economic status was a proxy for the opportunities to achieve good health. In the study, he finds that the poor are considerably less likely, than the non-poor, to have access to high

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<sup>7</sup> In HIV/AIDS circles, high risk groups denote the transmitters of the HIV/AIDS virus and these are commercial sex workers, injection drug users, the military, homosexual and bisexual men and people already affected by sexually transmitted diseases (Mills and Shillcut, 2004).

impact health services, such as skilled delivery care, antenatal care and complementary feeding.

With the appropriate primary health care infrastructure and personnel in place, the question of drug availability should not be overlooked. In spite of the evidence of a much higher disease burden, poor people in developing countries do not often get the treatments they need. For instance, with regards to HIV/AIDS, although antiretroviral medicines have dramatically extended life for some, there still is no cure, no vaccine, and no short cut to accessing effective health care for the millions affected who live with poverty, stigma and little care or support (National Geographic magazine, 2005). Thus, the economic problem is a lack of effective demand for health products needed by developing countries; the most affected are poor who are insignificant parts of the commercial drug market (WHO, 2006). This means that the market fails to stimulate the development and supply of these goods, or their adaptation to the circumstances of developing countries. The World Bank proposed two approaches to maintain balance between expanding access to drugs in developing countries, while preserving incentives for pharmaceutical innovation. One would be to empower drug development research initiatives, through country level public sector institutions, or in partnership with the private sector. Another would be to develop an open-source approach to early stage disease research. This harnesses the expertise to diagnose early stages of diseases, but also saves economies time and money in investing in diseases, when they develop into epidemics.

The question of intellectual property rights surrounding drug companies needs to be discussed. In a survey done by the WHO (2003), it found intellectual property right protections can increase the cost of medications, thereby hampering access to needed drugs. Whilst patenting has its pros, it must be done as a means, not an end. Therefore, there is need to continue advocacy for international drug companies to review drug supply on a case-by-case basis. For example, the WHO should strengthen its dialogue for drug companies to ease patent protection and enforcement in developing countries to ensure wider access to drugs because their relevance in the promotion of the needed innovation depends on the context and circumstance (WHO 2006). A major leeway would be to enable local capacity of private firms to develop and ensure a continual supply of affordable drugs. In this regard, WHO also has a role to play in reducing the stringent rules surrounding the licensing process of drugs, which have been noted to be a disincentive (Mills and Shillcut, 2004).

Another important aspect that needs attention and is closely related to the living standards of populations is malnutrition. In most parts of Africa, especially Sub-Saharan Africa, malnutrition is on the rise (Haddard and

Gillespie, 2001). Malnutrition and diseases are complements to each other; consequently, the success of communicable disease reduction in developing countries depends, in part, on paying more attention to nutrition. Contrary to popular perceptions, under nutrition is not simply a result of food insecurity: many children in food-secure environments and from non-poor families are underweight or stunted because of inappropriate infant feeding and care practices, poor access to health services, or poor sanitation. In many countries where malnutrition is widespread, food production is not the limiting factor. The most important factors are first, inadequate knowledge about the benefits of exclusive breastfeeding and complementary feeding practices and the role of micronutrients; and, second, the lack of time women have available for appropriate infant care practices and their own care during pregnancy. Ensuring basic education for everyone, especially women, is an essential component of the education intervention strategy. As Summers (1994) ascertains,

“.....more educated women have healthier children. In Africa, the child of a woman who has not been to school has a one-in-five chance of dying before reaching the age of five, yet a child whose mother attended five years of school has a mortality risk that is 40% less”.

Evidence supports the view that investing in early childhood has a large impact on children's health and readiness to learn later in life-often greater than investments in formal education. Following Haddard and Gillespie (2001), countries need to take the lead in repositioning nutrition much higher in their development agenda. When countries request help in nutrition, development partners must respond, first, by helping countries develop a shared vision and consensus on what needs to be done, how, and by whom; and then, by providing financial and other assistance. They argued that much of the failure to scale up action in nutrition results from a lack of sustained government commitment, leading to low demand for assistance in nutrition.

Considering the level of poverty and the costs of prevention, as well as management, of communicable diseases, the most affected countries are unable to cope with the burden of diseases. Emphasis should thus be made on channelling more resources to the developing countries.

## V. CONCLUSIONS

One of the Millennium Development Goals is to eradicate HIV/AIDS, Malaria and other diseases by 2015. This paper, emphasis has been made on the

need to give more attention to solve the disease problem in developing countries, as it has been shown that these are the reason for not achieving some of the MDG by 2015.

Whilst the pharmaceutical industry has a say in the accessibility and availability of drugs to low income countries, the paper has also highlighted that, the lack of clinics, hospitals and medical staff are the primary reasons people cannot access treatment in developing countries. Thus, the establishment of a sustainable primary health care system is a major step toward addressing the issue of communicable diseases.

Although the question of how health can be improved has not been answered exhaustively, the paper has provided some basic principles, which make up the backbone for any economy to win the fight against communicable diseases. Globally, many of the risk factors for communicable diseases are due to environmental factors (Figure 2), and can be prevented. The review of literature has shown that, coupled with a national and local level government commitment, a holistic intervention strategy should address educational needs, primary health care and livelihood sustainability.

With the increased use of a new combination of drugs and greater international commitment to financing disease control, there is reason to believe that the burden of diseases can be substantially reduced. The literature review supports the premise that curbing deaths from preventable diseases can be beneficial for economic outcomes at the individual and national level. This is possible because health provides the capacity to learn and grow intellectually, physically and emotionally, which turns into a circle of well- developed human capital, better individuals and larger economic growth through higher levels of productivity.

## APPENDIX

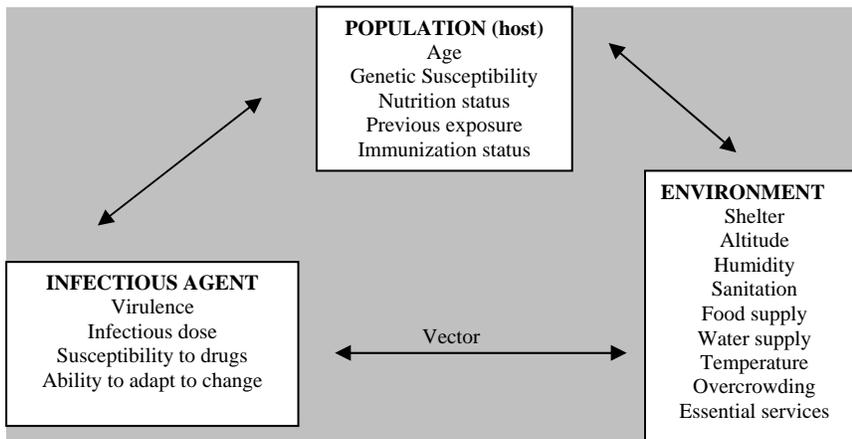
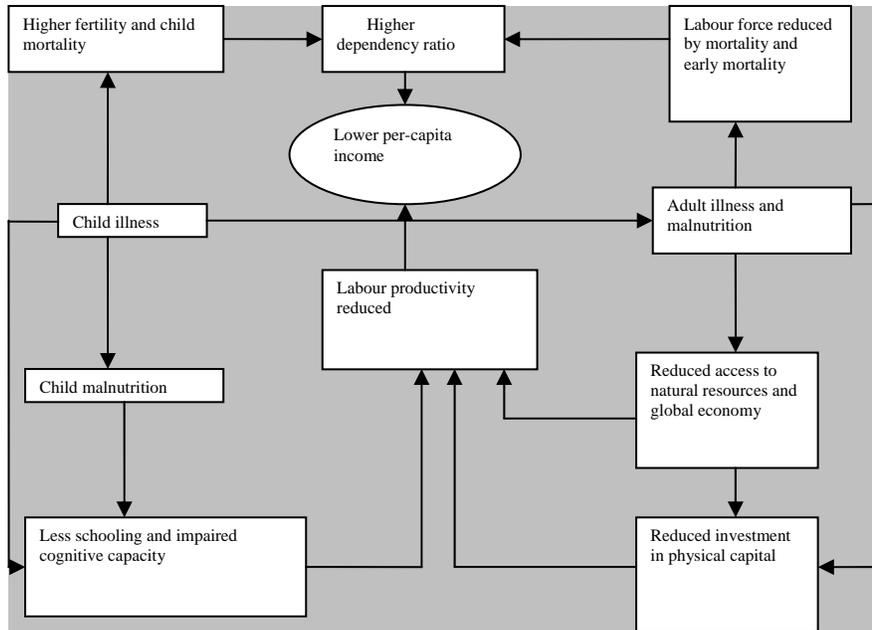
**Table 1: Main causes of mortality due to infectious diseases, 2001 (in millions).**

Disease	Death per year	% in developing countries
Respiratory infections	3.9	90.90%
AIDS	3	92.10%
Diarrheal diseases	1.9	97.70%
Tuberculosis	1.9	83.60%
Malaria	1.1	nearly 100%
(Source: WHO, 2003)		

**Figure 1: A Conceptual Framework for analyzing the impact of diseases on the economy.**

(Source: Roger et al, 2001, in Mills and Shillcut, 2004)

**Figure 2: Equilibrium between the Population, Infectious Agent and the Environment**



(Source: <http://www.ifrc.org/docs/pubs/health/chapter7.pdf>)

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