

Understanding the social determinants of TB and HIV in South Asia

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Abstract and objective

South Asian population suffer a particularly wide range of infectious diseases among which TB and HIV appear to produce most profound influence across various dimensions of social life, healthcare and the economy. Although the countries in this region have a relatively lower prevalence of HIV/AIDS compared to other developing regions until now, the future looks rather bleak in terms of preparedness for emerging healthcare realities. Tuberculosis on the other hand, has always been a major public health problem plaguing the healthcare system and the economy for decades. Moreover, the emergence of the drug resistant (MDR-TB & XDR-TB) strains are making the existing intervention and prevention strategies less effective and posing ever-growing threats to the underdeveloped healthcare infrastructure. Understanding the underlying social-determinants of these diseases can prove crucial to design more comprehensive intervention approaches. This article aims to clarify why the healthcare system in South Asia needs to adopt a social-determinants-of-health (SDOH) approach as a long-term strategy for more efficient prevention and control of TB and HIV infection.

Method and data sources

This article is literature based. For this review, PubMed, Medline, World Health Organization, CIA factbook, Global disease Burden, World Bank and Google databases were searched for original and review articles using the following search terms- South Asia, infectious diseases, tuberculosis, HIV, neglected tropical diseases, social determinants of health. Reference lists were also checked manually for articles relevant to this study.

Key terms: Social determinants of health; South Asia; tuberculosis; HIV/AIDS; Food insecurity; Poverty.

Introduction

Social-economic determinants are critical shapers of individuals' health behaviors, access

to healthcare resources, degree of exposure to certain diseases and environmental factors. Undeniably, it is unlikely for even the most advanced healthcare systems to be able to take into account these various determinants mostly because some of them fall outside the scope and capacity of health system itself. With a view to address this shortcoming, The Commission on Social Determinants of Health (CSDH) was established by WHO in March 2005 to support countries and global health partners to help address the social factors leading to illness and health inequality ^[1,2]. The commission aimed to draw attention of the research sector, governments and the academia to the social determinants of health and in creating better social conditions for health, particularly among the most vulnerable segments of the society ^[55]. Studies have shown that a major share of health problems is attributable to the integrated and overlapping socio-economic factors e.g. income stability, household food security, education status, wealth, deprivation ^[4,18,40,74]. The major social determinants that make countries vulnerable to infectious disease epidemics include poverty, illiteracy, gender inequality and rapid urbanization. All of these factors are pervasive across South Asia and remained largely unaddressed till today. Even though chronic non-communicable diseases (NCDs) are rapidly emerging in this region, infectious diseases still contribute to a significant portion of all disease burden^[63], among which tuberculosis(TB) and HIV/AIDS appear to be the most important ones. The underlying causes of these diseases are diverse and run deep into economic and social systems. Studies have suggested that TB patients were concentrated in areas with high population density, poor environmental and sanitation conditions ^[59-60], and that treating HIV and AIDS is an action not only against the disease, but more about addressing the social and economic roots. Studies have found that incidence rates are clearly higher in areas with average and lower socioeconomic levels and concluded that TB-HIV co-infection is a disease of social complexity, and the methods of elimination are limited not merely to health, but also on improving housing, transportation and nutrition ^[57]. Though the rates of HIV and AIDS are still low compared to other developing regions, South Asia remains a high risk zone owing to inadequate concern regarding the social determinants. HIV have contributed to the rapid rise in the incidence and prevalence of tuberculosis, and TB/HIV co-infection has been found to reduce the effectiveness of DOTS(Directly Observed Treatment, Short-course) programs in South Asia ^[54,61,62]. HIV

significantly reduces the immune response to TB and increases vulnerability to TB infection. Thus the co-existence of TB/HIV leaves individuals at greater risk than any of the two diseases alone ^[33] since the patients already infected by TB faces a greater risk of being infected by HIV, and vice versa. The incidence of TB/HIV co-morbidity is very likely to increase in the near future since South Asian countries have very high rates of tuberculosis infection (**Figure 1**). This increase will further reduce the efficacy and success of both the anti-retroviral therapy (ART) and DOTS. Studies found that incidence rates are clearly higher in areas with average and lower socioeconomic levels and have concluded that TB-HIV co-infection is a disease of social complexity. Experience from Brazil demonstrates that the methods of elimination of certain risk factors are limited not merely to health, but also on improving housing, transportation and nutrition ^[57].

TB epidemic in South Asia

Tuberculosis is highly prevalent among all South Asian countries (**Figure 1**). Once thought to be under control in some countries, TB has bounced back in full force along with the emergence of multi-drug resistant (MDR) and extensively drug resistant (XDR) varieties. Prevalence of TB is greatly influenced by individuals' income status, and has strong impacts on economic productivity as well ^[58]. It is also one of the major diseases of poverty affecting the most vulnerable groups of the world's population and more than 90 percent of the global tuberculosis cases and deaths occur in the developing world ^[20-23]. The co-existence of TB and HIV along with the increasing rate of the MDR and XDR type tuberculosis are creating enormous pressure on healthcare systems ^[31]. South Asian countries are struggling to control tuberculosis through the implementation of WHO's DOTS (directly observed therapy short course) strategy [24]. Poor healthcare infrastructure, staff shortages, inadequate funding, lack of awareness about the strategy among private practitioners remain the main constraints to the success of DOTS program in South Asia [24,25]. In 2007, Bangladesh ranked sixth in the world with an incidence of 353,000 [28]. The National Tuberculosis Control Programme of Bangladesh first adopted the DOTS strategy in 1993 and since then program rapidly expanded to almost all areas of the country reaching 100 percent coverage in 2006 [30]. Though India had a National

Tuberculosis Program in place since 1960, TB remains a major public health problem in the country accounting for around one-fifth of all tuberculosis cases reported globally. India is also facing a converging dual epidemics of TB and HIV and the National AIDS Control Organization has taken a decision to routinely offer HIV testing to all diagnosed TB patients in the high-prevalence states [34]. In 1995, the National Tuberculosis Control Program of Nepal adopted the DOTS strategy and since then the private health care providers are encouraging tuberculosis suspect patients to seek care from this program [26]. Nepal lies between two high TB burden countries, India and China, which together account for one-third of the world's TB cases[27].The DOTS centers in Nepal provides free-of-charge treatments that include two months of intensive treatment under direct observation and six months treatment in continuation phase. Tuberculosis is also a huge public health issue in Pakistan and it ranks fifth among high tuberculosis burden countries in the world. Though the DOTS strategy was implemented in Pakistan in 2001, the detection and treatment programs in the country suffer many constraints owing to complex emergency situations including humanitarian crises and conflicts [63]. Prevalence of MDR and XDR strains are also high in Pakistan. It is true that improved diagnosis and treatment through the DOTS strategy have saved millions of lives, however, their impact on TB incidence has been unsatisfactory and the prevalence remains overwhelmingly high in most South Asian countries.

HIV/AIDS trajectory in South Asia

South Asian countries have relatively low estimated national HIV prevalence rates, but prevalence is growing rapidly among groups at high risk such as sex workers and their clients, men having sex with men (MSM), and injecting drug users and their partners. Today, more than six million people in South Asia are living with HIV/AIDS and four out of every five of them live in India. The first AIDS case in India was detected in 1986 and currently India has highest HIV prevalence in South Asia followed by Pakistan and Nepal. However, in recent years the high prevalence states in India showed a declining trend in adult HIV prevalence. In 2011, the estimated annual new HIV infections was 116 million, which is 57 percent lower compared to the figure in 2000. By the end of 2012, around

2.39 million of the Indian population were reported to be living with HIV, making it home to world's third largest HIV infected population [2]. **Figure 2** illustrates the trend in HIV prevalence in four South Asian countries and reveals that Bangladesh has relatively low prevalence of AIDS in South Asia. Despite that, the country remains extremely vulnerable to the HIV epidemic due chiefly to widespread poverty, overpopulation, gender and health inequality, social stigmatization and high rates of commercial sex. In Bangladesh, the first case of HIV/AIDS was detected in 1989. UNAIDS estimates that about 12,000 Bangladeshis were living with HIV at the end of 2007 and currently there are around 380 NGO's and AIDS Service Organizations currently involved in AIDS related programs in the country [3]. By the middle of 2008, more than 1750 cases of AIDS and over 11,000 cases of HIV infection were officially reported in Nepal. The first AIDS case in Nepal was reported in 1988 and as of 2011, national estimates indicated that about 49,000 adults and children are affected with HIV. The first AIDS case in Pakistan was reported in 1987 [6] and the number of reported cases of HIV/AIDS has been continuously increasing since then. HIV prevalence almost doubled in the period between 2005 and 2008 from 11 to 21 percent, and today Pakistan has the second highest prevalence of HIV in South Asia. Pakistan's National AIDS Control Program (NCP) is one of the pioneering institutions providing free treatment to any person found to be suffering from AIDS through its 20 AIDS Treatment Centers all over the country [6]. Sri Lanka's HIV epidemic is considered low-level with an estimated 4632 people living with HIV in 2012, and in total 283 AIDS-related deaths are reported to date since the detection of the first case in 1987 [10]. Sri Lanka has a very efficient blood screening process and according to local specialists, there have been no incidents of HIV infection via blood transfusion in the country since 2000, while in other South Asian nations, reused syringes and unsafe blood transfusions remain major routes of infection.

Understanding the major social determinants of TB and HIV in South Asia

Growing awareness of the importance of social determinants of health in other areas, particularly HIV/AIDS, has stimulated interest in the role of these determinants for other communicable diseases such as TB [64]. The determinants are expected to vary

substantially in degree and nature, among and within countries due to structural differences in social and economic systems. In the context of South Asia, the key determinants appear to be those surrounding various types of inequalities, poverty, food insecurity, malnutrition, religious and cultural issues. This section aims to clarify the links between the determinants and diseases by gathering information past researches.

Poverty, food insecurity and malnutrition

Globally, the year 2010 witnessed more TB cases of than ever before, and a relentless clustering among disadvantaged groups suffering from abject poverty and food insecurity [64]. South Asia is one the worst performing regions in the world in its effort to improve food security and reduce poverty (**Figure 3**), which to considerable extent accounts for the exceptionally high prevalence of TB. It has the highest number of undernourished children and the second highest rate of people suffering from chronic hunger (~336 million). Prevalence of TB in different economic groups vary inversely with their economic levels even within the same country. Studies in India [65] and Bangladesh [66] showed that prevalence of TB was respectively 3 and 6 times higher among the households with lowest socioeconomic status compared to the ones with highest socioeconomic status. Malnutrition is also an important factor in the high mortality and morbidity from TB in population vulnerable to food shortage; and high prevalence of TB further aggravates the situation of malnutrition and HIV [67]. Evidence suggests that there is a potentially destructive cyclical relationship between food insecurity and HIV. According to UNAIDS, undernutrition and food insecurity enhances the burden of AIDS which in turn contributes to greater impoverishment and economic insecurity. Food insecurity is commonly associated with elevated stress and mood disorder, which leads to increased drug abuse and heightens the risk of HIV transmission.

Inequality

In spite of advance care and treatment HIV endemic is still a high matter of concern in developing countries. One of its major reason can be identified is structural inequality in the society. And this structural inequality refers to all those segment of society who face

any kind of discrimination due to their disadvantaged position in the society due to gender, poverty, racial and ethnic inequality. As we all generally know that the prevalence of HIV/ is highest amongst the poorest group of society who are most marginalized and most vulnerable to any kind of adversity. The phenomenon HIV endemic can therefore be termed as a social endemic as it is related to many issues of social inequality. Though the worst types of discrimination and human rights violations against people living with HIV and AIDS (or suspected to be at risk for HIV infection), which occurred regularly during the early years of the epidemic, seem to have declined[68], but gender inequalities and communication inequalities add fuel to continue the epidemic throughout the world. Since its early ages of emergence/discovery women account for 38.0 million of adults living with HIV/AIDS globally. This trend is even more pronounced in sub-Saharan Africa, where 76 per cent of the young people (aged 15-24 years) living with HIV are female [69]. The reason of this alarming trend is that women possess less opportunity than men to know about HIV, how it is transmitted and what are the preventive methods. Even if what little they know remain/go useless due to the discrimination and violence they face. Violence against women increases their vulnerability to HIV. It is both a cause and consequence of high HIV prevalence among women. The prevention of this one of the most warning global health problems must address the critical role of socially constructed gender stereotypes that gender relations plays in our social familial and reproductive behavior. There are more areas of significant inequalities in issues of using mass media among different social classes. Education and wealth are strongly and positively associated with awareness of HIV/AIDS and knowledge about prevention and transmission of AIDS and negatively associated with HIV/AIDS-related stigma. Mass media may be helpful in reducing social disparities in HIV/AIDS outcomes [70].

Religion and culture

Religion has a strong influence on the diet and health behaviour of south Asian population. The causes of AIDS is essentially viral, but it often raises issues that touch peoples' tradition, moral, cultural matters. In many places in South Asia, especially in the economically backwards areas, people believe that diseases are the manifestation of god's wrath to their wrongdoings, and are curable solely by prayer. Suggesting to take

medication might be taken as an attack on their faith. Arguably, religious people tend to have a strong feeling of guilt and condemnation, and prefer listening to their preachers than to anyone else. Religious institutions can play a critical role in such instances and provide a valuable tool to minimize the gap between the healthcare providers and their followers, especially the female members. There are families where female patients often avoid seeing a male physician and keep the disease hidden. This situation is particularly bad for the health outcome of their children and the elderly members of the family. Besides that, being a physician is also seen as a controversial career path for women in some societies. These issues are purely social that passes down through generations. Social workers can be more effective than health practitioners to deal with such complications, because people will communicate with less hesitation and have more confidence in them. Leveraging community-based awareness building programs can also prove to be instrumental in increasing awareness about diseases especially about controversial ones (e.g. HIV/AIDS) among illiterate people who otherwise are misguided by rumors.

Frameworks for action

The concept of SDOH is relatively new to healthcare system in South Asia. Thus the main barrier to address the social-determinants of TB and HIV is the scarcity of knowledge and understanding of the pathways through which these determinants affect various aspects of health. More epidemiological researches are required to explore the determinants and their complex nexus to health and diseases. At the same time, policies must focus on addressing the at-hand challenges of widespread poverty, hunger, malnutrition and inequalities. Though the prevalence of HIV/AIDS is still under control, the situation is likely to worsen in near future as the rate of TB is still high. Unlike AIDS, TB is largely preventable by altering health behaviour, and the cost of prevention is much lower than that of AIDS. Therefore, national health policies should highlight health behaviour changing programs that are adapted for religious and cultural preferences of the targeted populations. Policies must equally focus on reducing the rate of hunger and malnutrition and increasing funding on healthcare development. Increasing investment on

healthcare development is hard choice for governments in developing countries, and the private sector is also unlikely to intervene in areas where there is little or no chance for economic return. This limitation can partially be overcome by creating more social enterprises and welfare organizations. Besides food security and malnutrition, developing poverty reduction strategies is another imperative to combat TB and AIDS in South Asia. A study based on the data from Demographic Health Survey (DHS, 2006) in India concluded that TB control strategies should be targeted to the poorest populations that are most at risk, and should address the most important determinants of disease such as malnutrition and living conditions [68]. In addition, since the problems are fundamentally interdisciplinary in nature, solutions should therefore come from joint collaboration among mass media, sociologists, anthropologists and epidemiologists. Successful implementation of such measures would require strong political will and financial and logistical support.

A food security approach to HIV

From the aforementioned information about the linkages between food insecurity and AIDS it is clear that food insecurity is both a determinant and consequence of HIV/AIDS. Integration of income generation and food security related targets into HIV/AIDS treatment programs is essential to curb the spread of HIV/AIDS in South Asia. Regional disparities in food availability and accessibility must be resolved by promoting a more efficient and diverse food and agricultural system. Special focus should be given on tackling gender inequality issues at the same time since women commonly suffer discrimination in food, education and health rights. A study conducted among university students in Africa observed that women are more prone to engaging in risky sexual behaviors based on hunger than men, and suggested that intervention techniques addressing gender-based inequities will play an important role in improving the health and well-being of HIV/AIDS patients and preventing transmission of HIV [69]. The *gender dimensions* of food security must be given a special priority. Women plays a pivotal role in maintaining household food security especially for the children and elderly members who require special care. In rural areas, female-headed small-scale farms face hardships to access to land, credit, information and technologies, which results in lower

productivity and increased food vulnerability. Such issues must also be included in a broader national food security agenda.

Conclusion:

This paper provides some insight on the current situation of TB and HIV/AIDS and their underlying social determinants. Growing evidences suggest that progress in control of TB and HIV/AIDS will require increasing attention not only on their clinical aspects, but also on the social determinants such as income and food security, equality access to healthcare, religious and cultural preferences that influence health behaviour. It also highlights the fact that South Asian countries need to develop a multidisciplinary healthcare framework which will recognize these determinants as an integral part of the long-term TB and HIV prevention strategies.

Abbreviations:

BRAC- Bangladesh Rural Advancement Committee

CSDH- Commission on Social Determinants of Health

DOTS- Directly Observed Treatment, Short-course.

LIC- Low income countries

LMIC- Low-and-middle income countries

MDR- Multi drug resistant

NTDs- Neglected tropical diseases

NTP- National Tuberculosis Programme

SDOH- Social determinants of health

XDR- Extensively drug resistant

Competing interests: None

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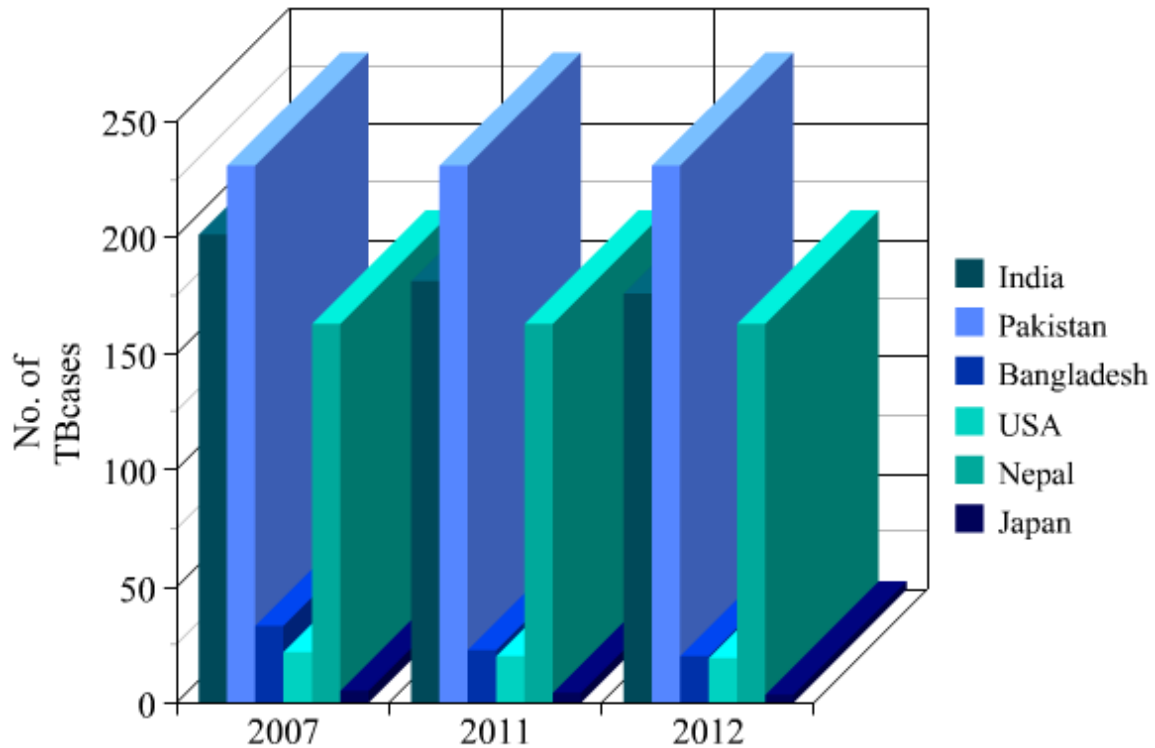
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List of tables and figures:

Figure 1: Incidence of TB per 1000 population

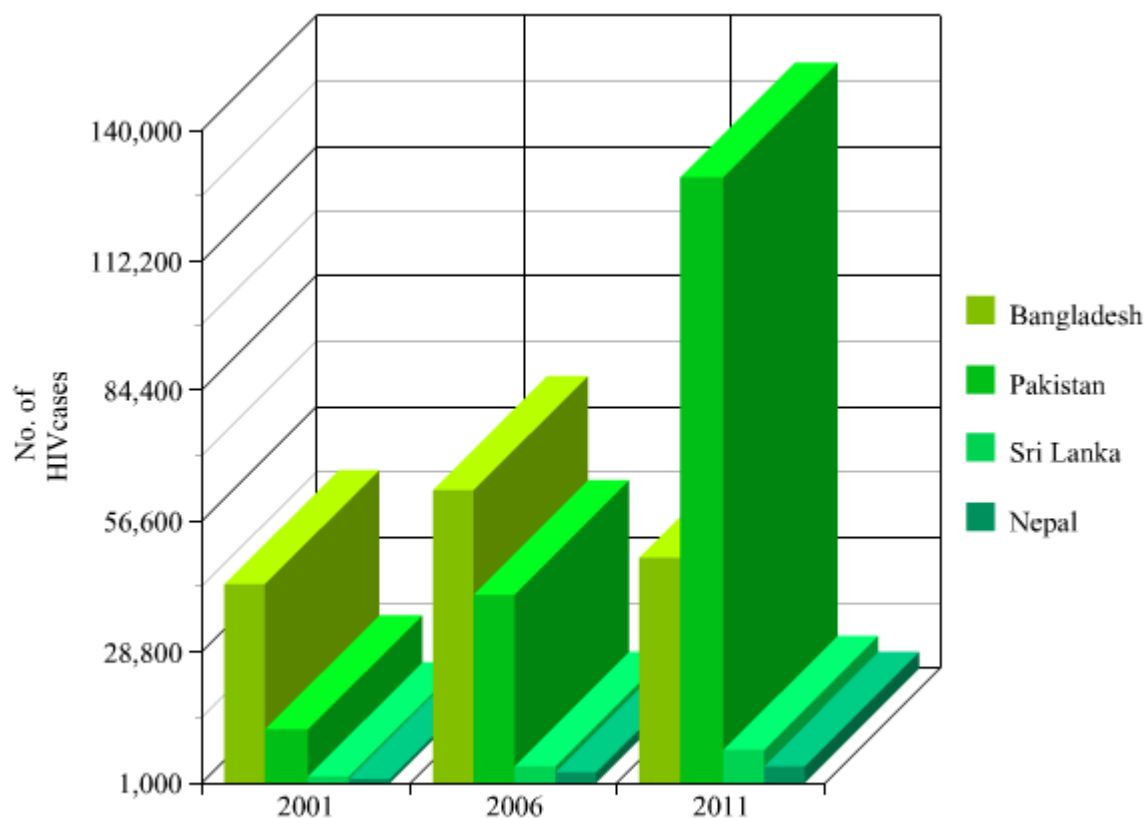


Source: Adapted from World health statistics & Global Disease Burden

Source: World Health statistics, Global Disease Burden

Figure 1 illustrates that incidence of TB is remarkably lower in the developed countries like USA and Japan than in the third world countries like in South Asia. India and Bangladesh have one of the highest incidence rates of TB in the world.

Figure 2: Prevalence of HIV among adults aged 15-59

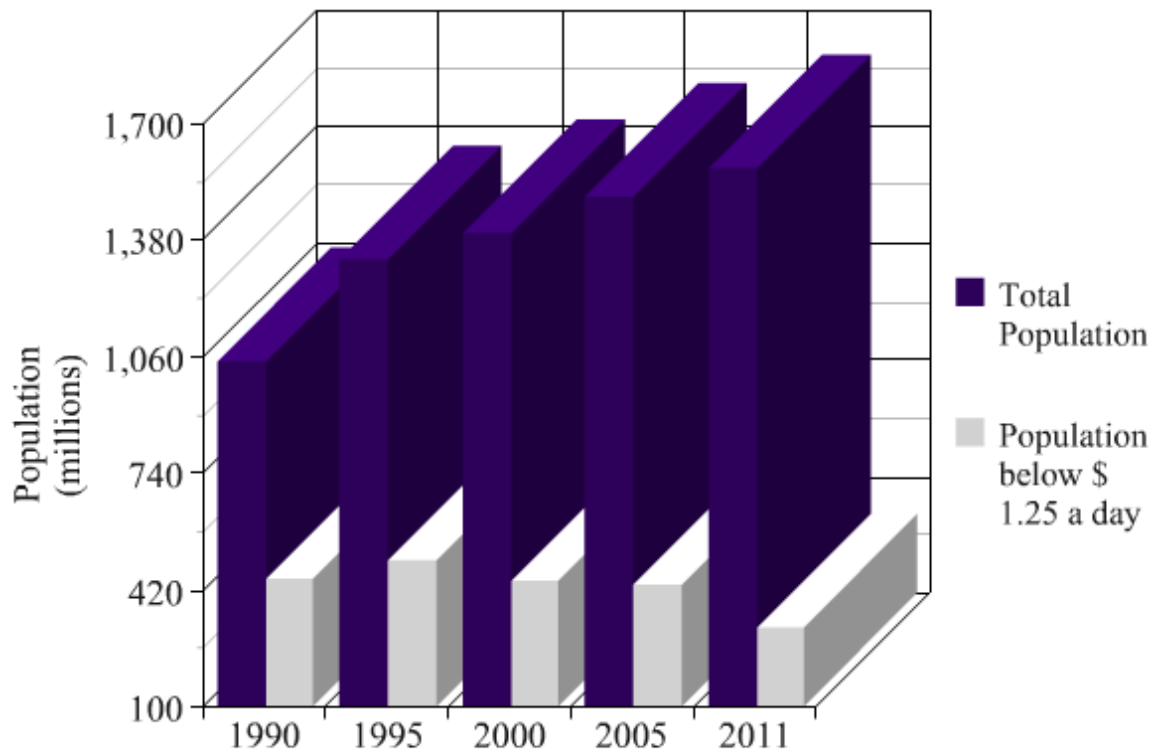


Source: Adapted from World health statistics

Source: Adapted from World Health Statistics.

Figure 2 shows that Pakistan had a total of 130,000 cases of HIV in 2011 which is the highest in the history of the country. Bangladesh and Sri Lanka have relatively lower incidence of HIV comparing to Pakistan and Nepal.

Figure 3: Situation of poverty in South Asia



Source: Adapted from World Bank poverty database and Global Poverty Statistics

Source: World Bank poverty database, Global Poverty Statistics.

Figure 3 shows the trend of total population and population living below poverty line in South Asia. Though the incidence of poverty is decreasing slowly since 1995, it still remains very high.

Table 1: Comparison of total number of deaths attributable to selected risk factors

Risk factor	LMICs		High-income countries	
	Total no. of deaths	Percent	Total no. of deaths	Percent
Childhood underweight	3,630	7.5	0	0
Poor sanitation, unclean water	1,563	3.2	4	<0.1
Smoking	3,340	6.9	1,462	18.5
Unsafe sex	2,819	5.8	32	0.4
Contaminated injections	407	0.8	4	<0.1

Source: Global disease burden, 2001

Table 1: Comparison of total number of deaths attributable to risk factors between high and low-and-middle income countries (LMICs) in 2001. It is clear that in LMICs, people are more at risk of dying from the causes which are influenced by lower socio-economic status and lack of awareness about these Diseases.

Table 2: Total number and percentages of deaths in low-and-middle income countries (LMICs) caused by five major infectious diseases

Causes of Deaths	LMICs		High-income countries	
	Total no. of deaths	Percent	Total no. of deaths	Percent
Tuberculosis	1,590	3.3	16	0.2
HIV/AIDS	2,552	5.3	22	0.3
Diarrhea	1,777	3.7	6	<.1
Measles	762	1.6	1	<.1
Malaria	1,207	2.5	0	0

Source: Global disease burden, 2001

Table 2 shows the total number and percentages of deaths in low-and-middle income countries (LMICs) caused by five major infectious diseases. The burden of death from these diseases is significantly lower in high-income countries than in LMICs.