CHAPTER - II
REVIEW OF LITERATURE

In this chapter, the major studies undertaken at national and international level which are pertinent to the objectives of this study have been reviewed. Since, nature and impact of both, TB and HIV/AIDS morbidities are presumed to be severe and economically catastrophic hence, we present a mix of findings for both the prominent diseases. It would also be pertinent to mention here that TB is an opportunistic infection of HIV/AIDS and with the increase in HIV/AIDS epidemic, the gains made in curbing TB have also been adversely affected. Therefore, along with TB, review of research studies capturing economic impact of HIV/AIDS has also been presented in this chapter. The review of these studies reflected the work done so far in this area and provided basis for the setting up appropriate objectives and methodology for this study. A brief of selected studies are presented in the following sections in chronological order.

2.1 Tuberculosis, Poverty and Effect on Household:

Sawert (1997) reveals that in Uganda 70% of the costs to patients in rural Uganda are from lost work time. For the families of those that die from the disease, there is the further loss of about 15 years of income because of the premature death of the TB sufferer. While TB is on the increase, economic difficulties in some countries are putting pressure on health budgets. Indeed, the cost per patient is very high—US$ 250000 per patient in developed countries and an estimated US$ 1000 to US$ 10000 in developing countries.

Croft and Croft (1998) in a study in Bangladesh found that money needed for treatment was raised in eight cases by selling land or livestock and in three cases by taking out a loan. The study emphasized that these costs were incurred before the patients began receiving short course chemotherapy at the Danish Bangladesh Leprosy Mission (DBLM) clinic. The DBLM clinic provides all services and medicines free of charge (drugs are given free by the Government of Bangladesh to the DBLM), and the only expenditure on the part of the patient is transport costs to and from the local clinic. The study reported that the transportation costs, (US$ 0.25-1.25) were a relatively large
amount of money for the family of patients. The average total loss of income and expenditure thus represented nearly 4 months of family income.

Kamolratanakul et al. (1999) in their study in Bangkok, Thailand assessed illness-related costs particularly for affected patients with incomes below the poverty line. The average delay from onset of illness until diagnosis of TB was 61–76 days, with only minor differences between the various household income levels. The amount of out-of-pocket expenditures was highest at private hospitals and private clinics. After diagnosis of tuberculosis at a government hospital, out-of-pocket expenditure occurred most frequently for travel to the hospital (more than 80% of patients in all income groups) and food during hospital visits. Expenditures were most frequently financed from household savings or transfer payments from community members and relatives.

The study reported that patient households took out bank loans, and also sold part of their property. The study concluded that for households with incomes below the poverty line, the economic consequences of tuberculosis can be devastating. In this group, out-of-pocket expenditure for the diagnosis and treatment of the disease amounts to more than 15% of annual income. In addition, the expenditure has to be met from incomes that are often additionally reduced by the illness. For households with incomes below the poverty line, significantly increased expenditure was reported for medical treatment, transportation and food, while expenditure for clothing and tobacco/alcohol was significantly reduced. Other expenditure items show no significant changes. While patients are generally able to cope with the increased financial demands through reductions in expenditure for items that are not vitally important, it is a disturbing fact that some of the ‘absolutely poor’ patients have to sell some of their property, and some have taken loans, which are frequently offered at exorbitant rates.

Rajeswari et al. (1999) in a study in South India interviewed 304 patients (government health care 202, non-governmental Organisation 77, private practitioner 25), 120 of whom were females. Mean direct cost was found to be Rs. 2052, indirect cost Rs. 3934, and total cost was Rs. 5986 ($171 US). The mean total direct cost in the three different types of health facility (GH, NGO, PVT) were Rs. 1345, Rs. 1700 and Rs. 8848, respectively (median Rs. 708, Rs. 945 and Rs. 6000, respectively). The mean costs incurred by rural and urban patients were Rs. 1338 and Rs. 2775, respectively (median
The mean number of work days lost was 83 and mean debts totaled Rs. 2079. The average debt incurred as a result of the disease was Rs. 1405 for rural and Rs. 2762 for urban patients. Both rural and urban female patients faced rejection by their families. The study found that school going children of some families discontinued their studies; and some even took up employment to support their family. The study concluded that the total costs, and particularly indirect costs due to TB, were relatively high. The average period of loss of wages was 3 months. Care giving activities of female patients decreased significantly, and a fifth of schoolchildren discontinued their studies.

Taylor et al. (2000) assessed causes and costs of hospitalisation of TB patients across ten sites in the United States. The study found that for all TB-related hospitalizations, the median Length of Stay (LOS) was 11 days, the median cost per day of hospitalisation was $644, and the median cost per hospitalisation episode was $7545. For nine of the 10 sites, the median LOS varied from 9 to 13 days; the median LOS was 17 days, for participants from New York. After adjustment for variations in the cost of living among the sites, the median cost per day varied from $490 in Georgia to $927 in Los Angeles; the median cost per episode at these 10 sites varied from $6441 in Georgia to $12 968 in New York, and the mean cost per case ranged from $4038 in San Francisco to $13 007 in New York.

A WHO (2000) report revealed that even when the TB patients enter the “free” government sector, patients often have to make informal payments when receiving treatment. Apart from this, the study also found that in Uganda, 80% of wage earners had stopped work because of the disease and another 95% of subsistence farmers reported that production had decreased due to their reduced capacity to work. The average time lost from normal activities was 9.5 months (range week to three years); the average income lost from inability to work was US $ 161 or 89% of GDP per capita. In South Africa, lost earnings were even higher, US $ 272 or 16% of GDP per capita. Whereas, in Thailand, income reductions were much smaller: average income fell by 5% for poor households, 2.3% for households with income between poverty and the national average and 3.3% for households with income above average. The study found that the substantial non-treatment costs of TB are borne by the patients and their families. These are often
greater than the costs of treatment to the health sector. The largest indirect cost of TB for a patient is income lost by being too sick to work.

Lienhardt et al. (2001) in a study of 152 TB patients in Gambia found that, delay to treatment was independent of sex, but was shorter in young TB patients. The median delay was longer in rural than in urban areas and in those who did not attend school. Patients who reported haemoptysis as one of their initial symptoms had shorter delays to treatment. For some subjects, the delay between onset of symptoms and treatment exceeded 16 weeks. These patients were more likely to be older, to live in a rural area, not to have gone to school and to have a lower income than those experiencing a shorter delay. The median (IQR) total delay in treatment varied with the patient’s area of residence: 8 weeks (4–12) for urban patients and 12 (8.5–17) for rural. There was no relation between duration of delay to treatment and cure rate, but longer delay did increase the risk of death. The median total delay to treatment was 8.6 weeks. The median delay was shorter for patients aged under the age of 25 years than for patients aged over 44.

Wyss et al. (2001) assessed the costs of tuberculosis at household level in Tanzania. With treatment periods of 8 to 12 months, extrapolated average costs of a period of illness to patients and their families were found to be US $2 for examination and laboratory costs, between US $17 and US $50 for consultation and drugs, less than US $1 for hospitalisation and between US $13 and US $20 for transport. The study revealed high costs due to inability to work, ranging from US $154 to US $1384. The study concluded that for patients and their families, tuberculosis implies three main types of cost: drugs, transportation and, most importantly, financial loss due to inability to work. They represent around two thirds of total cost and are a high economic burden on households, particularly for those with a low-income.

Indian Council for Medical Research (ICMR) (2002), revealed that TB is the single largest infectious cause of death among adults in the world, accounting for nearly two million deaths per year. The economic impact of TB comes from the size of the problem and from the fact that in developing countries the majority of those affected are in the economically active segment of the population. TB has historically been associated with high levels of poverty, as TB has traditionally been a disease of the poor. Poor
individuals, poor communities and poor countries have the highest rates of TB. TB impoverishes families, undermines economic development, impedes human development and traps the worlds poorest and the most marginalized in a vicious cycle of disease and poverty. Ninety five percent of new TB cases every year occur in developing countries. Seventy five percent of TB deaths occur in the traditionally most productive age group. One single TB case in a family leads to the loss of 2-3 months of income. TB is the single biggest killer of young women – one million per year in the developing world where women are the breadwinners. As far as socio-economic impact of TB on patients and family is concerned, it was expressed that workers with TB, lose an average of 83 workdays because of the disease. Lost work time and lost income from TB morbidity are 3-4 months and about 20% of annual household income and the potential cost of lost productivity due to TB is in the order of 4 to 7% of GDP. Sixty seven percent of rural and 75% of urban patients borrow money (14% of their income) for treatment. Eleven percent of children discontinue schooling and 8% take up employment to support family on account of TB of their parents. They also projected that every year, TB costs India more than Rs. 13,000 crores. In addition, every year, TB patients spend more than Rs. 645 crores on private TB care. Patients suffering from TB incur a total loss of Rs. 3,469 ($99) on expenses for diagnosis and treatment. TB may cause 300,000 children to become orphans and 100,000 women to be rejected by their families. The life expectancy reported in India is 62 years but the reported average age at death due to TB was 45 years for males and 39 years for females.

Rajeswari et al. (2002) in a study in South India assessed factors associated with patient and health system delays in the diagnosis of TB. The study found that among 531 participants, the median patient, health system and total delays were 20, 23 and 60 days, respectively. Twenty-nine per cent of patients delayed care seeking for >1 month, of whom 40% attributed the delay to their lack of awareness about TB. Men postponed care seeking for longer periods than women. In multivariate analysis, the patient delay was greater if the patient had initially consulted a government provider, resided at a distance >2 km from a health facility and was an alcoholic. Health system delay was >7 days among 69% of patients. Factors associated with health system delay were: first consultation with a private provider, a shorter duration of cough, alcoholism and patient’s
residence >2 km from a health facility. The total delay resulted largely from a long patient delay when government providers were consulted first and a long health system delay when private providers were consulted first. Among patients who delayed care-seeking, lack of awareness about TB (40%) and poor socioeconomic conditions (36%) were the most common reasons cited for delaying care seeking. A few patients mentioned loss of wages or domestic pre-occupation (i.e., priority given to domestic matters than health related matters) as reasons for delay in care seeking. The study concluded that patients’ costs could be appreciably reduced by curtailing health system delays.

The International Journal of Tuberculosis and Lung Disease (IUATLD) (2002) stated that “although health is widely understood to be both a central goal and an important outcome of development, the importance of investing in health to promote economic development and poverty reduction has been much less appreciated”. It further states that “the linkages of health to poverty reduction and to long-term economic growth are powerful, much stronger than is generally understood”. The causal correlation between poverty and economy is unquestionable. Improved economy reduces the burden of many diseases, while good health promotes economic development. TB is related to poverty in different well documented ways:

i. The risk of becoming infected by a case of TB is higher among poor people, due to higher contact rates in crowded homes and environments.

ii. The risk of developing active TB after infection is enhanced in persons with reduced individual immunity and resistance produced by sub-optimal nutrition and sub-optimal working conditions.

iii. The chance of being diagnosed and the chance of receiving proper treatment are related to the strength and quality of the TB programme and to the general infrastructure of the health services.

Nhlema et al. (2003) in a systematic analysis of TB and poverty stated that the burden of TB disproportionately affects the poor. They found that globally the highest burden of TB is found in poor countries. Seventeen of the twenty-two countries that account for 80 percent of the world’s TB burden are classified as low income. Within countries the prevalence of TB is higher among the poor, and other vulnerable groups such as the homeless. Studies in both high income and low-income countries (USA,
United Kingdom, Germany, Norway, Vietnam, Mexico and Philippines) reveal significantly higher rates of TB in poor populations. TB has a severe impact on the impoverishment of patients and their households. The major factors which lead to impoverishment are: the inability to work due to illness and the direct and indirect costs of accessing diagnosis and treatment. The pathway to TB care is characterized by many, and repeated visits to different care providers, which are associated with both provider and patient delays. Poor and vulnerable people have longer pathways to care than other social groups. The direct and indirect costs of accessing care are generally higher before diagnosis than after diagnosis. Although the aggregate real costs are higher for non-poor patients, the relative costs for the poor are much higher. This is because they have little disposable income due to the nature of their livelihood activities, such as daily wage labour and petty trading. These costs add to the economic burden of households and lead to wider impacts such as children replacing the activities of their ill parents, and an inability to support school fees.

Peabody et al. (2003) found that TB has devastating socio-economic impact on a high-burden country like the Philippines. The study revealed that over 500 000 disability-adjusted life years (DALYs) are lost due to illness and premature mortality from TB in the Philippines annually. This is equal to 9% of all years of life lost (YLL) in the Philippines. The combined economic losses due to premature mortality and morbidity total PhP8 billion (approximately US$145 million). Clinically, only 28% of patients with incident active TB are diagnosed and successfully treated, while 20% of patients will die without ever being diagnosed and 6% more will die after they are diagnosed because they do not receive adequate care. The costs of treating all expected cases requires between PhP475–1625 million (approximately US$8–29 million) annually. The study concluded that the high burden of disease, large economic losses due to mortality and morbidity from TB and the poor clinical outcomes all suggest that there is an urgent need for an increased investment in TB control. The costs of providing this treatment appear to be significantly lower than the current economic losses.

Eastwood and Hill (2004) in a study in the Gambia found that patients often initially consulted traditional healers and pharmacies. Women used traditional healers
more, probably because of stronger traditional beliefs, time constraints and increased confidentiality. Most patients acknowledged problems affording the transport costs to access treatment. Health workers and patients highlighted negative perceptions of TB. Lack of knowledge about TB and stigma were widely reported, and were worst in female patients. The study concluded that TB is a stigmatized disease in the Gambia, particularly in women, and its management is associated with access problems. Health education is required to provide basic knowledge about the disease and to reduce stigma, and further decentralization of tuberculosis services is needed to improve access.

Khe et al. (2004) in a study in rural northern Vietnam found that the differences between cough prevalence’s were found for all socio-economic indicators, but were less clear for expenditure. Lower economic groups reported higher prevalence’s than higher groups, and prevalence’s were higher among the elderly. Male was similar to female prevalence. The illness gap between the poor and rich was wider for men. The overall prevalence of prolonged cough was estimated at 1.5%, with a prevalence of 4.1% among persons aged over 65 years. The logistic regression showed that being male, elderly and belonging to a lower socio-economic group increases the risk of having prolonged cough. Separate analyses for cough cases with smoking and cough cases without smoking showed similar patterns, with sharper increase in risk for smoker cases over economic classes.

Macq et al. (2004) in a study assessing the cost of medical care and people’s health-seeking behaviour before being suspected of tuberculosis in Nicaragua found that of 252 TB suspects interviewed, 52% used more than one type of care giver and 35% used private practitioners. Between the first visit to a care provider and sputum microscopy, 18% (17/92) of the interviewees in Carazo, 21% in El Viejo (14/68), and 29% (20/67) in Matagalpa spent more than 1 month of the median per capita income in Nicaragua on medical care (drugs, consultation fees, laboratory test and X-rays). The median medical costs incurred by TB suspects before they reached the laboratory for sputum microscopy were lower for those TB suspects who used public health services exclusively than for those who used other types of providers. The study found that the mean proportions of medical expenditure on consultation fees, laboratory analyses, X-rays and treatment show that treatment costs accounted for between 52% and 89% of
total medical expenditure. Concerning the time interval between the first visit to a care
provider and the first sputum examination, more than 3 months elapsed between the first
contacts with a care provider. The time before being sent to the laboratory for sputum
examination was shorter for those who used FLGHS only than for the others.

Russell (2004) reviewed studies that have measured the economic costs and
consequences of illness for households, focusing on malaria, tuberculosis (TB), and
HIV/AIDS and found that in resource-poor settings illness imposed high and regressive
cost burdens on patients and their families. Direct and indirect costs of illness for malaria
were less than 10% of the household income, but still significant when combined with the
costs of other illnesses. The costs of TB and HIV/AIDS were catastrophic for households
(more than 10% of the income). Further, the study showed that households incurred much
higher direct costs for TB than for malaria. With the exception of the Malawi, mean
household spending on TB ranged from about $50 to more than US $100 over the
treatment period (usually from 6 to 12 months), imposing cost burdens of 8–20% of
annual income in already impoverished settings. The proportions spent on medical and
non-medical items varied due to demand factors such as preferences for special foods and
supply factors such as service availability, distance, and user fee policy. Spending on TB
treatment also revealed the importance of transport and special food costs. The most
extreme case was in Zambia where spending on non-medical items was dominant (78%),
mainly on transport (27%) and special foods (44%). The foods were not usually part of
patients’ diets due to their expense, but as therapy for TB. TB patients spent on an
average $21.00 per month (44% of a month’s income) on meat, eggs, vegetables,
oranges, and orange-flavored soft drinks. These are hidden costs of illness but critical to
household ability to pay for treatment. Thus the study concluded that the direct costs
were regressive, imposing a greater burden on poor families than better-off families.
Although the poor in general spend less on treatment than other income groups (due to
lack of access, inability to pay, greater use of public services), but their spending is a
higher proportion of income. Table 2.1 given below depicts a summary of direct and
indirect household costs with other statistics in different countries.
Table - 2.1
TB Studies: Summary of Direct, Indirect, and Total Household Costs*

<table>
<thead>
<tr>
<th>Country</th>
<th>Direct HH costs (% annual HH income)</th>
<th>Indirect HH costs</th>
<th>Total HH cost</th>
<th>Sample size (HH s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thailand (urban/rural)</td>
<td>$131 (8.6%)</td>
<td>$53 (2.3%)</td>
<td>$184 (10.9%)</td>
<td>673</td>
</tr>
<tr>
<td>India (urban/rural)</td>
<td>$60 (13%)</td>
<td>$117 (26%)</td>
<td>$177 (40%)</td>
<td>304</td>
</tr>
<tr>
<td>Zambia (urban/rural)</td>
<td>$49 (8.3%)</td>
<td>$28 (4.8%)</td>
<td>$77 (13.1%)</td>
<td>202</td>
</tr>
<tr>
<td>Tanzania (urban)</td>
<td>$52 (9.3%)</td>
<td>$447 (80%)</td>
<td>$499 (89.3%)</td>
<td>191</td>
</tr>
</tbody>
</table>

*All prices are converted to 1999 US$. In the Thai study, the cost analysis was stratified by socio-economic group, so the figure used is the indirect cost of TB for the middle-income (but still poor) group. The indirect cost figure from the Tanzanian study is a middle or average estimate involving productivity losses for eight months. Costs as a % of income are estimates based on the studies’ estimates of income. HH = household.

Sanou et al. (2004) in Burkina Faso found that attending the health centre was the last resort for patients with symptoms indicative of TB. When on treatment, patients faced a number of barriers in adhering to care. These related to the centralized nature of direct observation and the problems faced whilst at the treatment unit. Patients experience three sets of inextricably linked barriers to successfully treating TB: attending the health centre initially, attending the health centre repeatedly and experiences whilst at the health centre. These barriers are further complicated by geography, poverty and gender. The challenge ahead lies in moving beyond documenting barriers from patients’ perspectives to addressing them in resource-poor contexts.

Costac et al. (2005) in Salvador, Brazil presented average cost of treatment for the public health authorities and also for household. It revealed that the average cost of treating one new case of tuberculosis was approximately US$ 103. The cost of treating one multi resistant patient was 27 higher than this. The cost to the public services consisted of 65% on hospitalisation, 32% on treatment, and only 3% on prevention. The families committed around 33% of their income on expenses related to TB. Regarding cost to the families, the study found that the average cost to the family varied according to the type of treatment needed. For the family of a patient who was diagnosed with TB for the first time and was treated as a new outpatient (six months of treatment) the cost was US$266. For the family of a patient with multi resistant TB (one year of treatment), the estimated cost was US$333 and, for the family of a hospitalised patient (average of 18
days), the cost was US$96. The average cost to a family for a hospitalized patient was calculated only for the number of days of hospitalisation. When this patient left hospital and proceeded with outpatient treatment, it was assumed that the family would have an increase in its costs, which could be considered to be close to the estimate for outpatient treatment (US$266).

Lambert et al. (2005) in a study in urban areas of South America revealed that almost all (>90%) of the patients interviewed claimed to have incurred some medical expenditure, with those who contacted a private doctor during the course of their illness generally spending much more than those who only used the public sector. Expenditure on medicines was however, almost exclusively for non-TB medicines, with only four (2.8%) of the interviewees reporting that they had bought anti-TB drugs before entering the NTP. Although the median expenditure for the male interviewees was higher than that for the female (US $ 17 v. US $ 11), the difference was not statistically significant. The median total delay to TB treatment was worryingly long (12.6 weeks overall, with the largest component being at the service-provider level), longer for the female patients than for the male, and longer for those consulting private doctors than the other patients.

Muniyandi et al. (2005) in a study undertaken in India assessed costs to TB patients under DOTS and found that the pre-treatment and during treatment direct costs were Rs 340 and Rs 100 respectively; more than 50% of patients did not incur any indirect costs in both pre treatment and during treatment periods and overall total costs were Rs 1398. About 12% of patients lost more than 60 workdays and after completing treatment, 88% returned to work. The study reported that the median pre–treatment direct medical cost for doctor’s consultation was Rs 10 (range Rs 0–5500) and no expenditure for investigations and medicines in more than 50% of patients (range 0-4000). The median direct non–medical cost for travel was Rs 34 (range Rs 0–1932). More than half the patients did not incur any cost either for accommodation (range Rs 0–4200) or for special food (range Rs 0–1200). During treatment none of the patients incurred any medical cost during treatment. More than half the patients did not incur costs for transportation (range Rs 0–372) during treatment. The median cost of special food was Rs 100 (range Rs 0–2000).
The study also found that fifty four percent of working patients did not lose workdays on account of illness. It was observed that 26% of patients lost less than 30 days of work. During treatment total workdays lost exceeded 60 days in 12% of patients. At the end of treatment, 88% of patients returned to work. As far as total costs were concerned, pre–treatment total costs (direct and indirect) was Rs 600, costs during treatment was Rs 316 and total cost to patients was Rs 1398 (US$ 30). Of the total of 455 patients, 324 (71%) had borrowed money on account of TB and 50% of patients had borrowed more than Rs 2000 to meet their expenses.

Jackson et al. (2006) in rural China found that although smear-positive patients received a number of free items for treatment, costs were still incurred by individuals. During treatment, some patients prefer to consult private clinics or hospitals for drug side effects or injections, believing them to be better than TB medicines, thereby incurring extra costs. For 144 patients, total out-of-pocket payment averaged 1940 yuan for total direct medical costs, and 832 yuan for total non-medical costs. Patient income loss averaged 4559 yuan. Average total cost incurred by patients (for direct medical, direct non-medical and indirect cost) was 7367 yuan (US $921). Most patients had little capacity to pay for treatment. In respect of coping strategies of TB households the study found that 66% borrowed from relatives and friends, 8.3% borrowed from banks, and 45% sold productive assets, e.g., tractors, draft animals. The study concluded that patients badly need financial help because of income loss and debts due to TB illness. There are negative externalities with risks of transmission to others, especially those who are already poor. More government intervention is warranted, particularly now that more financial assistance is affordable in the present situation of China’s economic growth. As poverty is both an important cause and a devastating consequence of TB, control of this disease will help alleviate poverty in China.

Ouédraogo et al. (2006) found that before obtaining a diagnosis, 24.5% of patients had visited a public health unit, 31% had visited a private health unit, 31% had treated themselves and 6% had visited a traditional healer. The average delay to diagnosis was 4 months. Only 24.5% of patients had undergone smear microscopy compared to 44.2% who had undergone chest X-ray. The main reasons for their choice of health provider were proximity (44%), the quality of the service (23%) and the seriousness of the
symptoms (20%). After this first consultation, 49% of patients experienced no improvement in their symptoms. The second health provider to be consulted was neither further up in the health service system nor a better qualified professional. Some patients consulted a nurse in a community health centre even after visiting a physician.

Sarmiento et al. (2006) in Harlem, New York found that the average total delay between symptom onset and a patient’s diagnosis of TB was 18 weeks among 39 patients. The average delay to diagnosis attributed to patient delay and health care system delay were 10.5 and 7.5 weeks, respectively. Patients on an average visited 1.6 sources of care prior to receiving a TB diagnosis. Foreign born patients in particular were found to have more complex paths to diagnosis. The most common reason for delaying care seeking reported by patients was that they ‘didn’t think it was serious’ (29.1%). Reasons for delay were categorized into four groups: economic, social, structural, and other factors. The most common responses for delay in care seeking were ‘didn’t think it was serious’ (29.1%), ‘afraid of having something serious’ (10.9%), ‘long waiting times for care’ (9.1%) and ‘cost of medical care’ (9.1%). Of the patients who reported reasons for delaying care seeking, 39.3% provided multiple reasons for delay.

A UNAIDS (2006) report revealed that in Sub-Saharan Africa, the region of the world that has been worst affected by the global AIDS epidemic, HIV and AIDS, the most obvious effect of this crisis has been illness and death, but the impact of the epidemic has certainly not been confined to the health sector; households, education, and economies have been significantly affected, along with other sections of society.

A report of RNTCP, India (2007) stated that, as per WHO estimates in 2004, 370,000 persons in India died of tuberculosis (mortality rate 30 per 100,000 persons), which was estimated at over 500,000 annually prior to 2000. It is not just the death figures that are startling, TB causes huge economic loss with about 17 crore workdays lost due to the disease. The annual economic cost of tuberculosis to the Indian economy is at least US$ 3 billion (more than Rs 13,000 crore).

Selvam et al. (2007) revealed that of 601 patients interviewed, 65% contacted a provider within 28 days. The first contact was governmental for 47% and non-governmental for 53%. The main reasons given for approaching private providers first were faith in the provider and physical proximity, while the main reason for approaching
a governmental facility first was advice given in the community. Of the 601 patients, 195 were diagnosed at their first contact, 257 at their second contact and 126 at the third action; 23 patients had to contact the providers on more than three occasions before obtaining a diagnosis. The median patient delay observed was similar, irrespective of the provider contacted; this was not influenced by age, sex, literacy and occupational status, but was influenced by mode of transport, smoking and access to the health facility. In multivariate analysis, patient delay was significantly associated with smoking and mode of travel, and provider delay with first consultation with a private provider and distance more than 5 km from the health facility.

A WHO (2008) report stated the following facts about the cost of tuberculosis:
a) Poverty increases the risk of tuberculosis; TB impoverishes its victims;
b) Eighty percent of victims are aged between 15 and 49 and are in the most economically productive years of their lives;
c) More than 90% of TB cases and deaths occur in low and middle-income countries;
d) The estimated cost to poor households is US$ 12 billion per year;
e) TB carries an indirect cost to society, the family and the community;
f) In order to reach the DOTS expansion targets of diagnosing 70% new cases and treating 85% of them by the year 2005, the world’s governments need to spend US$ 1.8 billion per year;
g) At its creation in July 2001, the GF for AIDS, TB and Malaria (GFATM) raised US$ 1.7 billion for all three diseases;
h) The WB ranked the DOTS strategy as one of the “most cost-effective of all health interventions”; and
i) The Global Drug Facility, part of the STOP TB partner’s Forum, reduced the cost of essential drugs to US$ 10 for a complete six-month course.
2.2 HIV/AIDS and Effect on Households:

Tapia-Conyer et al. (1990) measured the impact of AIDS on income, expenditures and family environment at the household (HH) level, to guide the development of the community intervention programs. The results revealed that in 55% of the HHs the income decreased 18% on average. The patients were the main source of income in 60% of the HHs. In only 11%, the main source of income was derived from other family member. 52% of the HHs expenditures are related to the patient's treatment and well-being, which increased over time. Finally, the study concluded that:

(i) The existence of an AIDS patient among a family has an overwhelming impact, first on the structure of the source of income, secondly, on the income per se and third, on the increase of expenditures.

(ii) Within the family's expenditures food, laboratory studies, drugs and transportation are the main expenses.

(iii) The study points out the secondary consequences of the disease in terms of the opportunity costs on the family's health, productivity and emotional condition.

Topouzis (1994) assessed the socio-economic impact of HIV/AIDS on young widows, focusing on how the nuclear family breaks down and how the extended family network is strained to breaking point as traditional coping mechanisms collapse. The impact of HIV/AIDS on the nuclear family ranges from break down to disintegration, depending on whether one or both parents have died. The study found that having already depleted meager resources and savings toward costly treatment for husbands suffering from AIDS and/or for funerals, widows suddenly find themselves deprived of labour, cash income and access to credit, inputs and support services. The coping mechanisms may emerge like; the working day may be lengthened, land area under cultivation may be reduced, cash crops may be substituted by less labour-intensive food crops and planting, weeding may be delayed leading to poor harvests or the loss of an agricultural season and shambas may be neglected and/or abandoned. The extended family network is also often unable to withstand the strain of the impact of the HIV/AIDS epidemic.

Loss of access to labour in the shamba may result in declining agricultural productivity which in combination with loss of cash income often leads to a deterioration of the quality of household diet and a reduction in the number of meals. Declining
agricultural productivity and loss of income often force widows to modify the family diet, and in particular to: limit the household diet to one or two staple foods, reduce the number of meals, sell part of their produce to buy essential goods and medicine and resources for essential medical care and treatment may be depleted.

According to TASO Tororo, one in five children of AIDS-affected households in the district remains in school. AIDS afflicted families are often forced to take their children out of school either because they have no money for school fees or else because they need the children's labour. The AIDS stigma sometimes pressures children to drop out of-school.

The socio-economic impact of HIV/AIDS is beginning to have an effect on the value system of the family as traditional norms and customs are breaking down under the pressures triggered by the HIV/AIDS epidemic.

Bollinger (1999) studied the economic impact of AIDS in Ethiopia and revealed that AIDS has the potential to create severe economic impacts in many African countries. It is different from most other diseases because it strikes people in the most productive age groups and is essentially 100 percent fatal. The effects will vary according to the severity of the AIDS epidemic and the structure of the national economies. The two major economic effects are a reduction in the labor supply and increased costs. A study of 25 AIDS-afflicted rural families found that the average cost of treatment, funeral and mourning expenses amounted to several times the average household income. Net farm income varies from 270 to 620 birr, depending on the region. Many times these expenses were paid for by selling productive assets, especially livestock. Unlike other countries, where cooperation among households assists families with AIDS patients in coping with its impact, the vast majority of households (over 86%) in this survey, reported not extending any support to other households. This probably reflects the fact that the households are too poor to be able to extend any material support. They also shared that women who are widowed as a result of AIDS may often have to resort to commercial sex work in order to support their families, further increasing their risk of HIV infection, if they are not already infected.
Bollinger and Stover (1999) give a fairly representative overview of the economic impacts likely to be experienced by households that encounter HIV/AIDS. The study found that these households manifest themselves in loss of income, from less labour-time, or from lower remittances of the person with HIV/AIDS (who is frequently the main breadwinner); increase in household expenditures for medical expenses; decrease in household savings; other members of the household, usually daughters and wives, may miss school or work in order to take care of the sick person; death resulting in permanent loss of an income, funeral and mourning costs, and the removal of children from school in order to save on educational expenses and increase household labour capacity, with the effect of a severe loss of future earning potential.

Kongsin et al. (2000) studied the economic impact of HIV/AIDS on households in rural Thailand and analysed household coping strategies. The study found that to cope with the situation, households used various strategies. Each strategy had an impact on welfare of the households at different degree level. These strategies include reduction of household consumption, reallocation of labour, dissaving, withdrawing children from school, depending on an extended family system and the community to support and help them cope. The income of the households declined by 70.7 percent. Accordingly, the total income per capita and total consumption per capita descended by 68.4% and 43.5% respectively. To ensure that households maintained consumption level, their first coping strategy was to utilise their savings. When savings have decreased, households took out loans. Household incurred a per capita loan of 28.4% and per capita debt of 118% with respect to total household income per capita. The study concluded that simulation has shown the high level of dissaving and percentage of the total health care expenditure with respect to income per capita, which indicated the possibility of HIV/AIDS household entering into poverty was high and actions should be taken to avoid it.

Nampanya-Serpell (2000) in a study focusing on the economic impact of the AIDS pandemic at household level in Zambia investigated risk and protective factors in rural and urban communities associated with the impact of premature death of the breadwinner on the livelihood of their surviving spouses, dependent children, as well as the wider circle of their extended family. The study found that loss of the breadwinners had an immense economic and financial impact on widows, their children and other
dependants from the extended family. In Zambia, where at the beginning of the HIV/AIDS epidemic in the mid-80s and early 90s, the majority of AIDS-related deaths in the adult population occurred among men in the age group 20-45 years.

A WHO - The Stop TB initiative series (2000) document reported that the economic impact of TB come from the size of the problem and from the fact that in developing countries the majority of those affected are in the economically active segment of the population. Women who suffer from TB are often less likely to be detected and treated than men. Although tuberculosis is commonly thought to be a disease of the poor, this is not exclusive the case. Although the poor are more likely to suffer from the disease, a significant proportion of those infected are literate, have considerable education and earn good incomes. The substantial non-treatment costs of TB are borne by the patients and their families. These are often greater than the costs of treatment to the health sector. The largest indirect cost of TB for a patient is income lost by being too sick to work. Studies suggest that on an average three to four months of work time are lost, resulting in average lost potential earnings of 20 % to 30% of annual household incomes. For the families of those that die from the diseases, there is the further loss of about 15 years of income because of the premature death of the TB sufferer. When a woman suffers from TB, additional losses may result. The household loses the activities that the woman routinely performs in the household: cooking, cleaning, childcare, and managing the activities of the household. In some societies, TB patients are seen as unfit for marriage or unmarriageable. They also stated that households have developed a number of strategies for coping with the costs of illness and death that result in actual losses being less than the potential losses. In particular, the sale of assets can reduce the economic prospects of the household. Reducing the food intake of children or removing them from school can seriously undermine their health, their education, and their future prospects.

Oni et al. (2002) in a study undertaken in rural households in Limpopo province revealed that HIV/AIDS “affected households” had an average annual income of about R 13, 314 while unaffected households had an average annual income of about R 20,606. The study presented that aggregate annual income for affected households was approximately 35 percent lower than that received by unaffected households. The
differences in annual household income are statistically significant. Affected households spent more on transportation, medical care and funeral expenses; but less on education and other cost of living items when compared with unaffected households. The amount of the households spent on medical care was estimated at approximately R212 per month for the affected and R206 per month for unaffected. They study also stated that more specially, health care expenditure by HIV/AIDS households was slightly higher than those by unaffected households. However, these differences are not statistically significant. (South African Journal of Economics Volume 70, Issue 7, pages 551–562, September 2002). The impact of HIV/AIDS on various households had prompted many households to adopt specific survival strategies to cope with some of the HIV/AIDS related problems. Some households engaged in diversification of their income sources, borrowing, sale of their household assets such as cattle, goats and chicken, withdrawal of their children from schools. Another coping strategy used by some households involves sending their children away to live with distant relatives. Other coping strategies identified include reducing household farm activities and farm sizes, and joining church support groups in the villages.

Bachmann and Booysen (2003) in a cohort study in South Africa compared households with HIV-infected member, and unaffected neighboring households, in one rural and one urban area. The results of the study revealed that members of affected households, compared to members of unaffected households, were independently more likely to be continuously ill, and to die, mainly due to infectious diseases. Affected households were poorer than unaffected households at baseline. Over six months income decreased more rapidly in affected than in unaffected households. The study also stated that the baseline morbidity was independently associated with lower income and expenditure at baseline but not with changes over six months.

Berthelsen (2003) whilst addressing “AIDS: devastating economic impact” stated that while the world has focused on the human tragedy of AIDS, the cold fact is that economically it is far more damaging than had been thought earlier, and could result in the outright collapse of some economies if it is not checked, according to two new studies. A World Bank study, says that if AIDS were to continue unchecked, it could wreck a society in three generations. A similar study, prepared by researchers for the
United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) on Southeast Asia's AIDS problems, states that globally, HIV/AIDS is estimated to reverse annual economic growth by as many as two percentage points in the worst-affected countries. As its prevalence increases in any given society, its effect on economic growth worsens. "Applied to ESCAP countries, such as Indonesia, Malaysia or Thailand, such scenarios imply losses of billions of dollars," their report states. Malaysia, Thailand and Indonesia, however, have considerably advanced anti-AIDS programs compared to parts of India, China, Burma and most of Africa.

Sunday Times in South Africa, wrote that - It is estimated that, on an average, HIV-related care can absorb one-third of a household’s monthly income. An article in Sunday Times (2003) (South Africa) stated that the financial burden of death can also be considerable, with some families in South Africa spending three times their total household monthly income on a funeral.

Booysen et al. (2004) in a study in South Africa found that morbidity and mortality represent a considerable economic burden to affected households. The most frequent response was borrowing, followed by the utilization of savings, and the sale of assets. Affected households and in particular those who have experienced illness or death more frequently were more likely to have borrowed money in two or more projects. A relatively larger percentage of affected households utilized savings or sold assets compared to non-affected households, particularly households that have experienced a greater burden of morbidity and mortality. Asset holdings, moreover, declined over time in affected households that have experienced morbidity or mortality in each period. The study found that in the long run, these financial strategies could potentially force households deeper into poverty as household wealth decline and as more basic needs are crowded out in favour of debt repayments in the absence of improvements in household income. Affected households on an average saved approximately 40% less than non-affected households on a monthly basis. Furthermore, the decline in household savings over time has been relatively more pronounced in affected households. Affected households were relatively worse off than non-affected households and experienced illness or death infrequently. This was the case regardless of whether income, expenditure or food expenditure was employed as measure of household welfare. Affected households
were also more likely than non-affected households to have slipped into poverty, while a relatively larger proportion of affected households, and in particular affected households that faced a greater burden of illness or death, were classified as chronically poor. Hence, cumulative burdens of morbidity and mortality may push households deeper into poverty.

Canning (2004) assessed the impact of HIV/AIDS on individuals’ health care utilization and spending in the Oyo and Plateau states of Nigeria and income foregone from work time lost. Data was from a 2004 survey of nearly 1,500 households, including 482 individuals living with HIV/AIDS. The study found that the matched control group has very different health and economic outcomes than a random sample of the population indicating that our HIV sample would not have had "average" outcomes even if they had not acquired HIV. HIV is associated with significantly increased morbidity, health care utilization, public health facility use, lost work time and increased time devoted to caregiving relative to outcomes in the control group. Direct health care costs and indirect income loss per HIV positive individual were 16,569 Naira, about 32% of annual income per capita in affected households. About 40% of these costs are income losses associated with sickness and care-giving. 15% of the cost of HIV is accounted for by public subsidies on health. The largest single economic cost, representing 45% of the total economic burden of HIV, are out of pocket expenses, mainly for health care.

A WHO, The Stop TB Initiative (2004) document on socio-economic impact of TB on women, and families reveals that there were more deaths among women with TB than all causes of maternal mortality combined, over 900 million women are infected with TB worldwide; one million will die and 2.5 million will get sick this year from the disease, mainly between the ages of 15 and 44. There are many barriers for women to access health services. They often need permission from their family to leave the house and go to a clinic. Many women do not control their own income and lack the money needed to travel to clinics or pay for treatment. Women often carry the triple burden of housework, family care and their own sickness while in many place, the stigma attached to TB leads to isolation, abandonment and divorce. Sharing the impact of TB on families (based on studies from India), the report reveals that 75% of urban and 67% of rural families went into debts due to TB, 11% of children were withdrawn from school and 8% entered work. In India, around 300,000 children leave school every year due to TB. Each
year, more than 100,000 women are rejected by their families. Coming to economic impact, TB patient losses on an average, 3 to 4 months of work time. 20% to 30% of annual household income is lost due to lost earnings. About 15 years of income are lost from premature death. The report also mentions that in South Africa, lost earnings due to TB are estimated at 16% of GDP per capita.

Tekola (2008) investigated whether the household-level economic impact of an adult AIDS death is different from that of death from another cause. The data come from cross-sectional post-mortem interviews (verbal autopsies) with relatives or primary care givers of deceased adults randomly selected from deaths recorded in an ongoing burial surveillance in Addis Ababa. The study results indicate that households experiencing an HIV/AIDS death are poorer than those experiencing a non-HIV/AIDS death. In addition, poorer households experience a greater decline in socio-economic status following death of a household member. AIDS mortality has more detrimental effects on the household economic status than deaths due to other causes. While the difference between AIDS and non-AIDS mortality in terms of direct costs is minimal, the indirect cost of an AIDS death per household exceeds that of non-AIDS death by 58%. In conclusion, poor households are more likely to experience an AIDS death and in turn are more vulnerable to the socio-economic impact of death. Therefore, it is justifiable to target HIV-impact mitigation programs on poorer households.

A WHO Report (2008), states that National TB Programme (NTP) budgets in 21 of the 22 High Burden Countries (HBCs) increased during the period 2002-2008, often by substantial amounts. The total combined budget for the 22 HBCs in 2008 is US$ 1.9 billion, almost four times the US$ 509 million budgeted for in 2002, but just US$ 16 million higher than in 2007. India’s budget was US$ 67 million for 2008. NTP budgets include only part of the resources needed for TB control. In particular, they do not include the costs associated with general health-services staff and infrastructure, which are used when TB patients are hospitalized or make outpatient clinic visits for DOT and monitoring. For the 22 HBCs combined, the total cost of TB control is projected to be almost US$ 2.3 billion in 2008, compared with US$ 0.6 billion in 2002. Total costs for 86 countries that submitted complete financial data to WHO, which accounts for 91% of TB cases globally and which were also included in the Global Plan (2008). Overall country
reports indicate planned costs of US$ 3.1 billion in 2008, up from US$ 2.3 billion in 2007. The GF is the single most important source of external financing in HBCs, with 11 countries relying on it to fund more than 25% of their NTP budgets. After seven rounds of proposals, the total value of approved proposals in the HBCs is US$ 1.4 billion and the amount in the phase 1 grant agreements total US$ 547 million. By the end of 2007, US$ 502 million had been disbursed. In seven funding rounds, the GF approved proposals worth a total of US$ 2.5 billion for TB control in 108 countries, out of total commitments for HIV, TB and malaria of around US$ 10 billion.

Economic Commission for Africa, (Commission on HIV/AIDS and Governance) in Africa revealed that it is at the level of the family and community that the fullest impacts of the HIV pandemic is unraveling. One such ramification is AIDS related poverty among households. Across the African continent, the most vulnerable people are the most economically active. As these people die, families are struggling to cope not just emotionally, but also economically. Poverty is increasing as bread-winners die and scarce savings are utilized in the period of ill health. As savings dwindle, families begin to fragment economically. One implication of this fragmentation of families is the rising numbers of orphan children on our continent. Recent estimates put the figure of orphans in Africa in the range of thirteen to fifteen million children. For the future, three factors are particularly important. First, AIDS selectively destroys human capital, that is, people’s accumulated life experiences, their human and job skills, and their knowledge and insights built up over a period of years. Second, AIDS weakens or even wrecks the mechanisms that generate human capital formation. Third, the chance that the children themselves will contract the disease in adulthood makes investment in their education less attractive, even when both parents themselves remain uninfected.

The process is insidious, since the efforts are felt only over the long-term, as the poor education of children today translates into low adult productivity a generation later. This raises important social and fiscal implications for economic policy. This first is the threat of worsening inequality. If the children left orphaned are not given the care and education enjoyed by those whose parents remain uninfected, there will be increasing inequality among the next generation of adults and the families they form. Social customs of adoption and fostering, however well established, may not be able to cope with the
sale of the problem generated by a sharp increase in adult mortality, thereby shifting the onus into the government. The government itself, however, is likely to experience fiscal problems and so be unable to fully finance this additional risk. Second, by killing mainly adults, AIDS seriously weakens a country’s tax base, and reduces its ability to finance public expenditures, including those aimed at accumulating human capital, such as education and health services not related to AIDS. In this way, the damaging impact of HIV/AIDS on economic growth in the longer run is intensified. As a result, national finances will come under increasing pressure. Slower economic growth means slower growth of the tax base, at the same time as government face growing demands to treat the sick and care for orphans. Consequently, it is reasonable to hypothesize that HIV/AIDS may pose the greatest current challenge to sustained economic development in Africa.

Based on the review of literature given above, we can conclude that the economic impact of major morbidities like tuberculosis and HIV/AIDS are enormous for the affected households. These morbidities result not only in direct medical cost in the form of consultation fee, diagnosis and medicines but also in indirect medical expenses like expenses on travel and other misc. expenses. The other important aspect is wage loss not only for the patient, who is affected but also for the attendants who accompany the patients for treatment. In addition, the expenses incurred on supplementation i.e. meat, curd, fruits, paneer etc. are also a big expense. Thus, we can conclude that the morbidities with long duration and lengthy treatment inflict devastating affect on the households. In addition to this, mortality due to the morbidity, further worsens the situation and deepens the already devastated families into vicious cycle of poverty. Hence, there is need to understand the economic impact of these morbidities at the micro level.

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