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TUBERCULOSIS AND POVERTY

"Rats and cockroaches live by competition under the laws of supply and demands, it is the privilege of human beings to live under the laws of justice and mercy"

....Wendell Berry

Tuberculosis (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. But how the poverty may directly cause TB still remains unclear, as poverty is multifaceted. The theme for the World Tuberculosis Day 2002 is "Stop TB, fight poverty". The theme suggests that tackling TB, one of the several illnesses that affect the poor, is one way of achieving greater global prosperity. TB control is one of the five highly cost effective interventions recommended by World Development Report in 1993[1]. This write-up attempts to examine the link between tuberculosis and poverty.

Since 19th century many studies carried out in India and elsewhere have suggested that poverty, homelessness, substance abuse, physiological stress, poor nutritional status and crowded living conditions are inextricably linked and all these increase the risk of TB[2-7]. 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[8].

TB Increases Poverty

- 95% of new TB cases every year occur in developing countries.
- 75% 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
- An estimated 4-7% loss in GDP is due to TB in several Asian countries.

This issue commemorates the World Tuberculosis Day (March 24, 2002)

What is Poverty?

Commonly poverty is established on the basis of income and consumption.

Although income focuses on an important dimension of poverty, it gives only a partial picture of the many ways human lives can be blighted. Poverty reflects poor health and education, deprivation in knowledge and communication, inability to exercise human and political rights and the absence of dignity, confidence and self-respect[9]. Thus choices most basic to human development are denied to lead a long healthy creative life and to enjoy a decent standard of living, freedom, dignity, self-respect and the respect for others.

Definition of Poverty

Income perspective: A person is poor if and only if his/her income level is below the defined poverty line. Cut off poverty line is defined in terms of having enough income for a specified amount of food.

Basic needs perspective: Deprivation of material requirement for minimally acceptable fulfillment of human needs including food, education, employment and participation in community activities.

Capability perspective: Absence of some basic capabilities to partake in the activities of the community.

Poverty line: A poverty line set at an income of $1 a day per person has been used by the World Bank since 1985 for international comparison. This poverty line is based on objective and subjective assessments of needs. World Bank always uses poverty line(s) based on norms for that society.

South Asia has the largest number of people affected by human poverty. It has the largest number of people (515 million) in income poverty. Together, South Asia, East Asia, South-East Asia and Pacific region have more than 950 million of the 1.3 billion people in the world who are income poor. Extreme poverty declined slowly in developing countries during the 1990s. The proportion of the developing world's population living in extreme economic poverty was defined as persons living on an income of less than 1$ per day[10]. It has been estimated that in 1998, 1.2 billion people world-wide had consumption levels below $1 a day.

Tools for Measuring Poverty

Poverty is a multidimensional phenomenon, encompassing inability to satisfy basic needs, lack of control over resources, lack of education and skills, poor health, malnutrition, lack of shelter, poor access to water and sanitation, vulnerability to shocks, voices and crime, lack of political freedom and voice. So when we want to measure poverty, a number of indicators such as Human Poverty Indices and Human Development Indices are used. Human Development Indices are based on among other things the longevity, knowledge/literacy, decent living standard, *etc*. whereas the Human Poverty Indices are based on personal security and environment, health, housing, and knowledge/ literacy and participation in the activities of the community.

Measures Used to Define Poverty

- Being disabled (chronically sick and lacking land, livestock).
- Inability to send children to school.
- Having more mouths to feed and few hands to help.
- Lacking able family members who can feed their families in a crisis.
- Having bad housing.
- Being 'poor in people', lacking social support.
- Having to put children to employment.
- Being single parent.
- Having food security for only a few months each year.
- Being dependent on common property resources.

TB Scenario in India

India accounts for nearly 30% of TB cases in the world; the burden of suffering caused by TB is enormous and likely to increase as India's population grows and the HIV epidemic progresses. Nearly 38% of people of all ages

are infected with the disease, while infection among males above 40 years of age runs as high as 70%. More adults (in economically productive age group of 15-55 years) in India die from tuberculosis (one every minute) than from any other infectious disease. Two million people in India develop the disease annually[11,12].

Poverty Scenario in India

Since 1950s, India's growth rate has risen, poverty has declined, social indicators such as literacy and school enrolments have risen, morbidity and mortality have declined, and the gender gap has narrowed[13]. Per capita income of people in India has increased from Rs.1127/year in 1950-51 to Rs.2573/year in 1995-96, and the percentage of people living below poverty line has declined from 45 in 1951-52 to 35 in 1993-94[14]. Despite this progress, India's poverty situation remains a serious concern since every third person in India still lives in conditions of absolute poverty.

How Poverty Causes Tuberculosis

Exactly how poverty may cause TB still remains unclear[7]. Poverty probably results in poor nutrition, which is likely to render the immune system more vulnerable to invading organisms such as *Mycobacterium tuberculosis*. Protein undernutrition is associated with alterations in immune functions mediated by T cells, and animal studies have shown that BCG vaccination is less effective in protein deficient animals than normally nourished controls. The mechanism by which protein malnourishment impairs immunity is unclear but seems to be rapidly reversible with the adoption of a normal diet. Poverty resulting in overcrowded living conditions is likely to increase the risk of disease transmission.

Demographic Profile of TB Patients

Demographic profile of TB patients when compared with that of general population clearly shows the poor socio-economic background of TB patients. Tuberculosis is found more among males, more in rural areas, more among residents of *Katcha* houses, more among illiterates, more among people aged 45 and above, and more among agricultural and production workers[2,15].

Economic Assets of TB patients

Economic assets, which provide a basis for generating income and production such as land, livestock, housing, labour and financial capital, are often missing or scarcely accessible for TB patients. Fig1 lists the economic assets among 896 TB patients registered in the year 2000 for treatment under the Revised National TB Control Programme in South India (TRC : Unpublished observation).

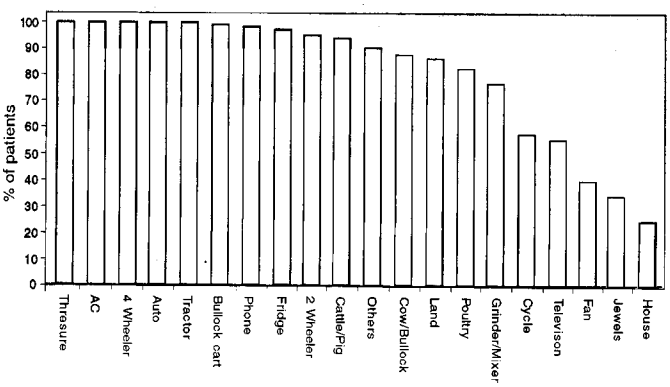

Fig.1. Percentage of TB patients not having economic assets.

Socio-Economic Impact of TB on Patients and Family

Studies carried out at the Tuberculosis Research Centre (TRC), Chennai[16] and other parts of the country[2] have attempted to measure the economic impact of TB on patients and the family. These studies clearly indicate the income loss on account of work days lost, money spent on diagnosis and debts on account of treatment for TB. TB related debts were observed in 67% of rural and 75% of urban patients. The adverse effects of TB were greatest for poor people, mainly because their income depends exclusively on physical labour and they had no savings to cushion the blow (Fig 2). In addition, a good number of patients face the threat of rejection from the family members on account of his/her illness.

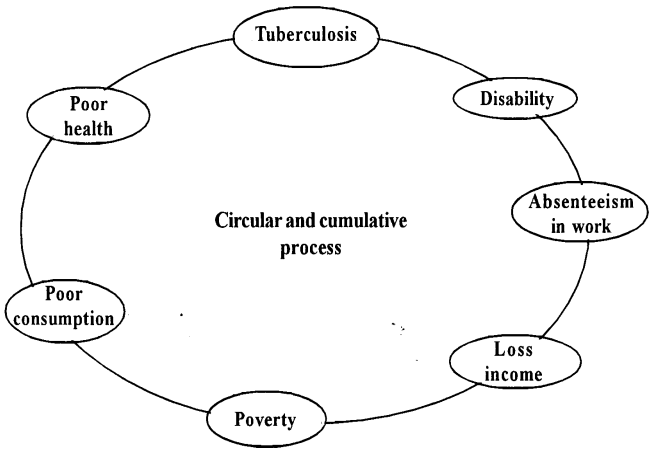

Fig.2. Vicious cycle of tuberculosis and poverty.

Socio -economic Impact of TB on Patients and Family[16,17]

- 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.
- 67% of rural and 75% of urban patients borrow money (14% of their income) for treatment.
- 15% of rural and 11% of urban patients feel being unaccepted and ill treated by family members on account of their TB.
- 11% of children discontinue schooling and 8% take up employment to support family on account of TB of their parents.
- Direct cost for female patients is 22% more than for males.

Projected Economic Impact for India

Based on some studies[11,18], the projected economic burden caused by tuberculosis in India has been estimated to be as follows: 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.

Action Taking Behaviour of TB patients

In India patients with symptoms of TB seek care on their own, from both public and private health care providers. In the TB control programme the case finding is passive, *ie*. the programme expects the patients to take action for their illness. The action taking behaviour of TB patients are usually influenced by a number of socio-economic factors. In a study carried out at TRC, Chennai, among the various factors studied, poverty of TB patients was identified as one of the important risk factors contributing for the delay in the diagnosis of TB (Fig.3). (TRC: Unpublished observation).

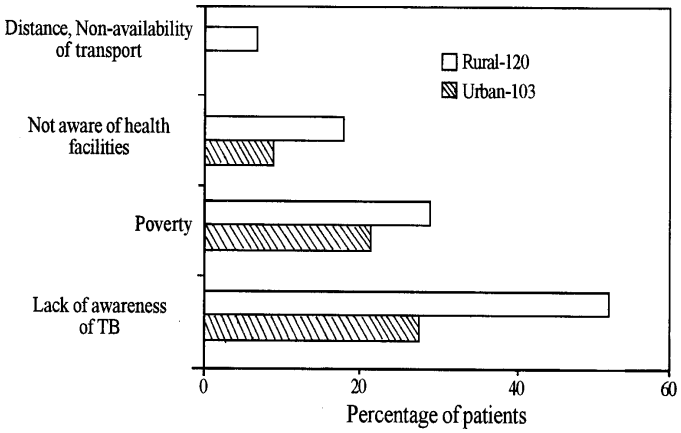

Fig.3. Reasons attributed by TB patients for delay in the diagnosis of TB in rural and urban India.

Linkages between TB and Poverty

In India TB is found to be present among all strata of society, although the prevalence is highest among the poor. Increased morbidity due to poverty was shown by a number of workers in TB. The table clearly shows an increased prevalence of infection and disease (1½ times more) in the low income group. 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[19,20].

Table. Prevalence of TB infection in different economic groups in India.

Income (P.M.)/ economic status (year 1974)	Tuber-culin infection prevalence rate (0-20 Yrs)	Radiological prevalence rate of disease		Bacteriolo-gical pre-valence rate of disease
		TBP	TBHA	
Rs.200/- Low income group	25%	1.9%	2.9%	0 %
Rs.201-1000 Middle income group	17%	1.3%	2.5%	0.2%
Rs.1001 and above High income group	11%	0 %	0 %	0 %

TBP : Tuberculosis Pulmonary TBHA : Tuberculosis Hilar Adenitis

TB Control Programme and Poverty Reduction

TB is curable. Directly Observed Treatment Short course (DOTS) is an effective treatment strategy to cure TB. The current TB control programme in India based on DOTS considerably lowers the indirect cost of TB treatment to patients. When DOTS is provided free of cost, household assets are not sold, loans and reductions in food are greatly

reduced, and quality of life improves (Fig. 4). Introducing DOTS may initially increase cost to the health services (depending upon the programme it is replacing) because of greater number of cases detected. DOTS can halve the current potential national economic loss from TB. A simulation showed that TB would cost Indonesia $US 13 billion over 20 years under the current policy. It was estimated that every dollar invested in the DOTS programme would lead to a return of $US 55 to the country. The advantage of the DOTS strategy is a higher probability of treatment success and reduced probability of relapse. DOTS costs only US $3-7 for every healthy year of life gained and gets people back to school, work and their families early[11,12,21].

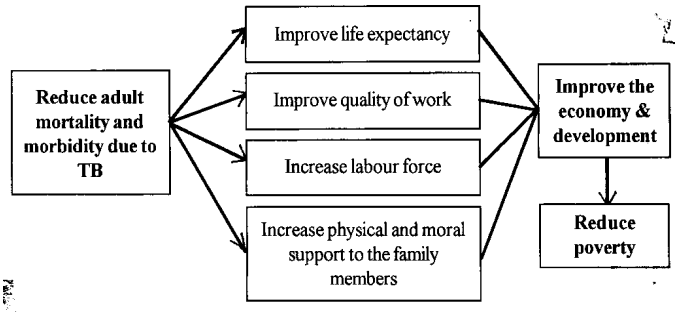

Fig.4. Impact of TB control.

Improved health status after DOTS implementation contributes to economic growth in different ways given as below:

- It reduces production losses caused by worker illness.
- It permits the use of natural resources that had been totally or nearly inaccessible because of disease.
- It increases the enrolment of children in schools and makes them better able to learn.
- It frees resources for alternative uses that would otherwise have to be spent on treating tuberculosis.

Conclusions

In the developing countries, the communicable diseases like TB hit the poor much harder than they hit the rich, though the people of all income groups are affected. An episode of illness may reduce a poor household to penury, especially when they have to sell their productive assets in order to cover health care expenses and poverty is thrust on to the next generation[16]. Thus an urgent need to take action to control TB was felt globally and this was spelt out clearly in the Amsterdam Declaration to Stop TB. The following six action points were suggested for twenty of the world's highest TB burdend countries[22].

(i) Act now to avoid a more serious and dangerous epidemic in the future.

(ii) Make TB control programmes comprehensive and accountable: piecemeal approaches make the problem worse.

(iii) Commit adequate resources, including the necessary political and social will.

(iv) Pledge commitment to research into new diagnostics, including a more rapid test for multi drug resistant (MDR)-TB, new drugs to reduce the length of treatment and a TB vaccine.

(v) Eliminate the poor social and economic conditions that allow TB to survive and thrive.

(vi) Work together through global partnerships

The Technical Advisory Group (TAG) to Stop TB in the Western Pacific Region recognizes the links between TB, poverty and development. The TAG believes that an evidence base related to the benefits of DOTS for the poor may stimulate further investment in TB as a poverty reduction strategy[23].

India is spending only 0.9% of the GDP on the health sector as against an average of 2.2% by other developing countries. Funds for improving health services should be increased urgently. A determined attack against TB, therefore, inherently constitutes a poverty reduction effort, in which the benefit will accrue disproportionately to the poor.

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