Introduction

The health, social , and economic burden of tuberculosis.

The World Health Organization (WHO) declared tuberculosis (TB) a global emergency in recognition of the growing importance of TB as a public health problem. About one-third of the world's population is infected with Mycobacterium tuberculosis. Worldwide in 2002, there were about 8.8 million new cases of TB disease with 1.8 million deaths. M. tuberculosis kills more people than any other single infectious disease agent. Deaths from TB account for 25% of all avoidable deaths in developing countries. About 95% of TB cases and 98% of TB deaths occur in developing countries.seventy five percent Of cases in developing countries, are in the economically productive age group (15-50 years old) *(WHO, 2004a)*.

Once infected with M. tuberculosis, a person stays infected for life and may develop symptoms of TB disease at any time. However, among infected persons without HIV infection, only 1 in 10 (10%) will develop TB disease; most (90%) will remain healthy. The most important trigger for TB disease is weakening of the immune system. In this course, the terms "TB patients" and "TB cases" refer to patients in whom TB disease has been diagnosed.

Without treatment, 50% of patients with pulmonary TB will die within 5 years. And 25% will remain sick with chronic infectious TB. The other 25% will spontaneously recover and be healthy (due to strong immune defenses) but could become sick again at any time *(WHO, 2004a)*.

The consequences of tuberculosis on society are immense. Worldwide, one person out of three is infected with tuberculosis – that is, 2 billion people in total. Global estimates of the burden of tuberculosis-related disease and death for 1997 indicated that 8 million people developed active tuberculosis every year and nearly 2 million died *(Dye, 1999)*.

Tuberculosis accounts for 2.5% of the global burden of disease *(WHO, 2000a)* and is the commonest cause of death in young women, killing more women than all causes of maternal mortality combined. As illustrated in Figure (1) , Tuberculosis currently holds seventh place in the global ranking of causes of death, and, unless intensive efforts are made, is likely to maintain that position through to 2020 despite a substantial projected decline in disease burden from other infectious diseases *(Murray and Lopez, 1996)*.

Infection with HIV increases the risk of tuberculosis disease . Countries with a high prevalence of HIV, particularly those in sub-Saharan Africa, have witnessed a sharp increase in tuberculosis, with reported incidence rates increasing two- to fourfolds in the 1990s *(Raviglione 1997)*

Drug resistance is an increasing problem in many countries, arising as a result of poor treatment organization. Poorly conceptualized control programmes, irregular drug supplies, and uncontrolled use of tuberculosis drugs in the private sector lead to drug resistance, which can be prevented with effective use of DOTS. WHO and the IUATLD carried out a global survey of drug resistance from 1994 to 1997 in 35 countries *(WHO, 1997a).*

Overall, among people with newly diagnosed tuberculosis, there was resistance to at least one drug in 9.9% of cases, and multidrug resistance (resistance to at least isoniazid and rifampicin) in 1.4%. A report on the second round of global surveillance, published in 2000, revealed a similar picture (any drug resistance in 10.7% of new cases, multidrug resistance in 1%). These reports confirm that the strongest risk factor for drug resistance is previous tuberculosis treatment; 23.3% of such cases had resistance to at least one drug, and 9.3% had multidrug-resistant tuberculosis *(WHO, 2000a)*.

Treatment regimens recommended by WHO, with failure rates 15 times higher in patients with multidrug-resistant tuberculosis than in those with drug-susceptible disease *(Espinal et al., 2000).*

Although the "direct" costs of diagnosis and treatment are significant for poor families, the greatest economic loss occurs as a result of "indirect" costs, such as loss of employment, travel to health facilities, sale of assets to pay for treatment-related costs, funeral expenses, and particularly lost productivity from illness and premature death. A study from Uganda found that 95% of subsistence farmers with tuberculosis reported a loss in production, and 80% of wage-earners had stopped work *(Saunderson, 1995)*.

A review of studies investigating the economic impact of tuberculosis showed that, on average, 3–4 months of work time are lost if an adult has tuberculosis, resulting in the loss of 20–30% of annual household income, and an average of 15 years of income is lost if the patient dies from the disease *(WHO, 2000b).*
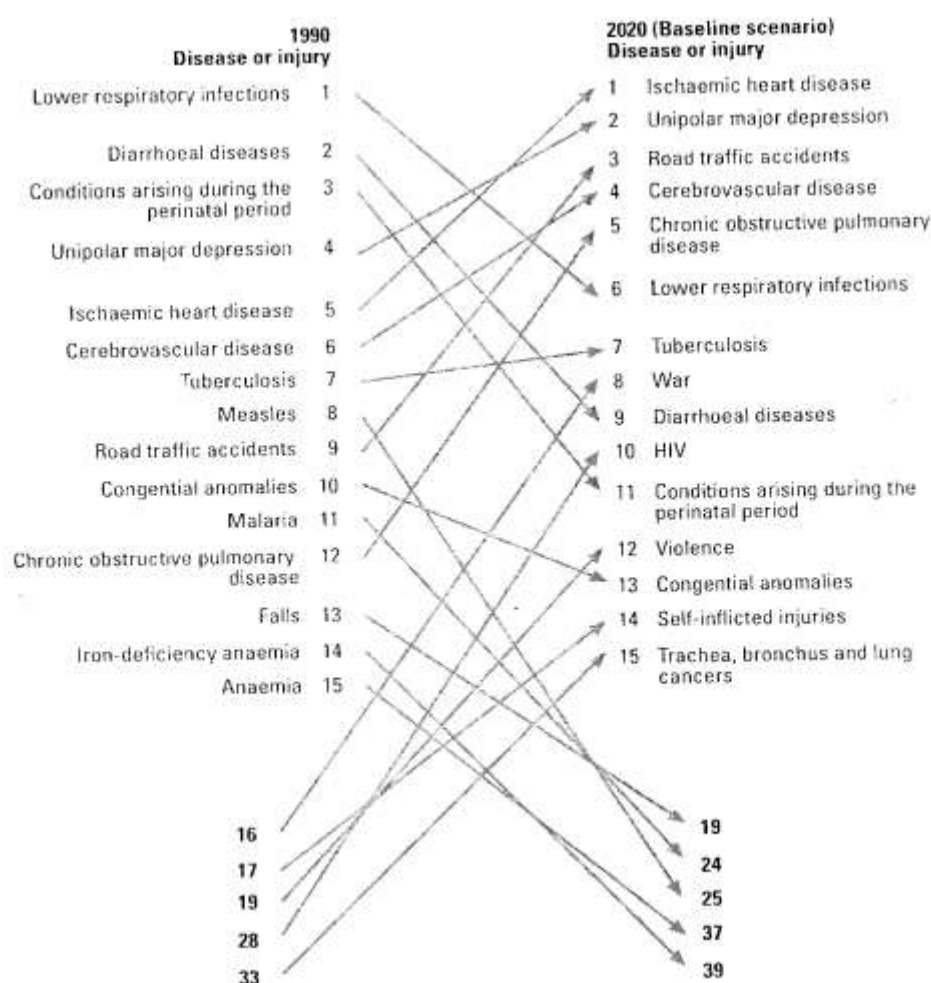
1990
Disease or injury

Lower respiratory infections 1
Diarrhoeal diseases 2
Conditions arising during the perinatal period 3
Unipolar major depression 4
Ischaemic heart disease 5
Cerebrovascular disease 6
Tuberculosis 7
Measles 8
Road traffic accidents 9
Congential anomalies 10
Malaria 11
Chronic obstructive pulmonary disease 12
Falls 13
Iron-deficiency anaemia 14
Anaemia 15

16
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2020 (Baseline scenario)
Disease or injury

1 Ischaemic heart disease
2 Unipolar major depression
3 Road traffic accidents
4 Cerebrovascular disease
5 Chronic obstructive pulmonary disease
6 Lower respiratory infections
7 Tuberculosis
8 War
9 Diarrhoeal diseases
10 HIV
11 Conditions arising during the perinatal period
12 Violence
13 Congential anomalies
14 Self-inflicted injuries
15 Trachea, bronchus and lung cancers

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Figure (1): Change in rank order for the 15 leading causes of death, world, 1990-2020 *(Murray and, Lopez, 1996)*.

Table (1): Estimated household loss of tuberculosis *(WHO, 2000b).*

Cost to patient	Bangladesh (11)	India (12)	South Africa (13)	Uganda (14)
Direct costs (US$)	130	41	99	68
Lost work	57%	NA	NA	91%
Time loss	14 months	3 months	4 months	10 months
Lost income (US$)	115	89	272	161
Indirect cost as percentage of annual household income	15	14	NA	NA
Total cost as percentage of annual household income	31	20	NA	NA

The DOTS Strategy

DOTS is the brand name of the internationally recommended strategy for TB control in response to this global emergency. DOTS has five key components:

- Sustained political commitment to increase human and financial resources and make TB control a nationwide priority integral to the national health system.

- Access to quality-assured TB sputum microscopy for case detection among persons presenting with, or found through screening to have, symptoms of TB (most importantly, prolonged cough).

- Standardized short-course chemotherapy for all cases of TB under proper case management conditions including direct observation of treatment.

- Uninterrupted supply of quality assured drugs.

- Recording and reporting system enabling outcome assessment of all patients and assessment of programme performance.

(Mona-Elsaid , 2002).

In Egypt, TB control program faced many problems including: Refusal of TB patients to be hospitalized, high defaulter rate, increasing resistance against antituberculous drugs and insufficient and deficient education to both community and health staff. Implementation of DOTS has started in demonstration areas by the end of 1997 to overcome the before mentioned control problems. Nowadays its application is expending *(Badawy , 1999)*.