

Table 4. Number and percentage of cases of tuberculosis patients receiving directly observed therapy, short course (DOTS). Data from the World Health Organization.

Region	Total cases (reported and estimated)	Patients receiving DOTS	
		Number	Percentage
Africa	1,285,300	301,113	23
Americas	488,900	67,035	14
Eastern Mediterranean	536,400	55,829	10
Europe	428,200	12,352	3
South-East Asia	3,057,500	46,798	2
Western Pacific	1,636,700	232,813	14
Total	7,433,000	715,940	9.6

## Natural Trends in the Epidemiology of Tuberculosis

An understanding of the natural behaviour of tuberculosis in the community is essential for the design and evaluation of control programmes. Tuberculosis has afflicted the human population since the dawn of recorded history and characteristic bone lesions have been found in Egyptian mummies and in skeletons of pre-Columbian Indians in South America (Clark *et al.*, 1987). From the limited historical evidence, it appears that the disease occurred sporadically until populations aggregated in towns and cities, with associated overcrowding and urban squalor. In many industrialised countries, tuberculosis was very common during the middle decades of the 19th century, after which it declined at an annual rate of 1–2%. At the peak of such epidemics, many young people were affected but as the incidence declined, the average age of patients increased. In developing countries, where the prevalence of tuberculosis is high, many more young people have the disease. In 1990, 77% of patients with tuberculosis in the developing world were under 50 years of age, compared to only 20% in most industrialised countries.

These observations have led to the frequently expressed notion that tuberculosis naturally occurs in waves, thereby implying the development of some form of herd immunity. There is, in fact, little evidence that such herd immunity develops and it is more likely that the decline is largely brought about by improvements in socio-economic factors, such as better working conditions and less overcrowding, which reduce the contagion parameter. If this is the case, there is no guarantee that the high incidence of tuberculosis seen in many of the poorer countries will decline significantly unless socio-economic conditions improve or unless more effective health measures are adopted — itself an important aspect of socio-economic development.

Likewise, hopes that the incidence of tuberculosis would continue to fall in developed nations until it eventually disappeared have not been realised. For the reasons outlined above, many developed countries have experienced an upsurge in the incidence of the disease since the 1980s. Effective chemotherapy was introduced in the developed countries at a time when the incidence of tuberculosis was rapidly declining and this appears to have led to over-optimistic expectations that ‘scientific’ interventions alone would lead to the elimination of tuberculosis. This, in turn, has led to an underestimation of the impact of changing socio-economic conditions on the natural history of the disease. In the centenary year of the discovery of the tubercle bacillus by Robert Koch, Waaler (1982) wrote that “without Koch’s discovery, the socio-economic character of tuberculosis would have been clearer, and a demand for redistribution of the wealth of the community would have become a much more important issue”.

## **The Impact of Poverty on Tuberculosis**

Poverty, malnutrition and overcrowding have long been recognised as being among the principal predisposing factors for tuberculosis. As discussed above, improved socio-economic conditions contributed more to the dramatic decline in the prevalence of this disease in the