

economically-productive life, often with no residual morbidity or disability, tuberculosis ranks among the most cost effective of all diseases to treat (Murray *et al.*, 1990). Indeed, it has been estimated that each year of life saved by effective anti-tuberculosis chemotherapy costs 90 US cents (about 60 UK pence).

The Impact of Control Measures

Effective therapy has, unfortunately, been the exception rather than the rule due to poor supervision of the patients. Although it might be argued that inefficient treatment services are better than none at all, poor therapy may actually be counterproductive for two reasons. First, repeated relapses of the disease prolongs the period of infectivity and facilitates spread of infection and, secondly, it favours the generation of drug- and multidrug-resistance.

In view of encouraging experiences in several countries, notably China (China Tuberculosis Control Collaboration, 1996) and Bangladesh (Chowdhury *et al.*, 1997) the WHO (World Health Organization, 1997a) has stressed that all anti-tuberculosis therapy should be administered under direct observation within the DOTS (Directly Observed Therapy, Short Course) strategy (Chapter 5). Owing to a number of restrictive factors, notably underfunding, only 10% of all cases of tuberculosis receive such therapy (World Health Organization, 1997a). The coverage of DOTS is summarised by the WHO region in Table 4, although within each of these regions the country-to-country variation in coverage varies enormously from almost total coverage to none at all.

Somewhat surprisingly, although a high percentage of patients in the Netherlands, Portugal, Slovenia and the Czech Republic receive DOTS, this strategy does not appear to be used to a significant extent in the European region, including most member states of the European Union. Coker and Miller (1997) have stated that DOTS cannot be implemented effectively in Britain owing to a national shortage of clinical nurse specialists and an unwillingness or inability of district nurses to take on this service.

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.