Elimination of tuberculosis from Europe and the World

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In this issue a report is published from the workshop organized jointly by the European Region of the International Union Against Tuberculosis and Lung Disease, and the World Health Organization (WHO) [1]. The name was challenging: "The last fight against tuberculosis until elimination". The main targets were to disseminate current advanced knowledge on tuberculosis control in low-prevalence countries, with special reference to the human immunodeficiency virus (HIV) pandemic and to review current concepts and approaches in order to update a document on the elimination phase of tuberculosis in Europe. Nearly all European countries participated and invaluable contributions were supplied from Canada, Japan and the United States.

The rate of tuberculosis has steadily declined in technically advanced countries and some of them are approaching the situation where "elimination programmes" can be initiated [2–5]. These are different from the tuberculosis control programmes, which the great majority of countries at present follow but some still lack. Even in Europe the differences in tuberculosis incidence between countries are around tenfold. In 1988, Denmark, Holland, Iceland, Norway and Sweden had about six new cases per 100,000 inhabitants, whilst Portugal, Romania and Yugoslavia had around 60 per 100,000 [6]. Consequently, they cannot implement the same programme. The figures have to be compared with caution, because the quality of data is not uniform and compatible. Nearly all European countries collect yearly information on notified tuberculosis cases, but it is deplorable that this basic data, essential for programme managers to be able to monitor results and allocate resources at national and international level, is in some cases inaccurate or even non-existent. These flaws were discussed at the workshop and some operational definitions were suggested. The work has been continuing at recent WHO meetings, and it is hoped that the concepts and definitions will be better specified and notification systems improved.

The tuberculosis control programmes in Europe have been successful in improving the situation among children and young adults, and this has perhaps led to the erroneous belief that time will do the rest. However,

the programme once effective no longer has the same impact, since most of the new cases of tuberculosis originate at present from the relatively large elderly age groups infected long ago. About 80% of the infected persons in industrialized countries are over 50 yrs of age [7]. The diagnostic difficulties of tuberculosis in the elderly are evident, and this may result in hidden transmission and premature death.

Elimination also faces other new obstacles which were unknown when the tuberculosis control programmes were formulated in Europe. Ethnic minorities, immigrants and displaced people are now the high-risk groups [8]. Migrants seem to retain the disease model of their country of origin, and because most of them come from high-prevalence countries they have, for many years, a higher risk of contracting tuberculosis than the people indigenous to the host country [9]. Patients on immunosuppressive therapy, diabetics etc., also have to be recognized as risk groups. If the majority of cases arise from minority populations, however, elimination programmes can be focused cost-effectively.

That time will not do the rest has been clearly demonstrated in the USA, where the favourable trend of tuberculosis from the last century has been reversed by human immunodeficiency virus (HIV) infection and they have now about 15,000 "extra" cases of tuberculosis, mainly among blacks and Hispanics [10, 11]. HIV- infection is by now the most potent trigger for the progression of tuberculous infection into disease. In European countries the genuine HIV-infected individuals characteristically belong to the age group where tuberculosis infection is rare and, therefore, the expected rate of HIV-related tuberculosis is at present low; but future trends will depend on the development of the world situation.

European countries have adequate resources for treatment and reasonable systems for monitoring the trends, but there is, nevertheless, room for improvement. Crucial information on programme conditions in terms of treatment results, relapse rates, absconders, deaths, drug resistance, ethnic origin etc. are rarely available. Even data on the incidence of smear-positive infectious cases and the rate of bacteriological confirmation are not always included in the national statistics. The annual risk of tuberculosis infection has been a reliable indicator but it is also becoming less informative and more difficult to measure at the low level, 0.01%, which some countries have reached [7].

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In elimination programmes a maintenance of high-standard services and updated information are crucial, but these have very much been neglected in recent years in Europe. The activities need to be reorganized and the programmes updated and adapted to the changing needs of the countries and individual patients.

As Europe unifies, she needs to take into account that the global tuberculosis situation is gloomy and that this health problem has not been adequately addressed [12]. About one third of the world population is infected with tubercle bacilli; 8 million new cases appear yearly, 95% of them in the developing world; around 3 million people die yearly, most of them at economically productive ages. Tuberculosis is the largest cause of death from a single pathogen. The highest incidence is in the WHO Africa Region (272 per 100,000), whereas the average incidence in Europe at present is (27 per 100,000) [13].

More than 3 million people are infected dually with tubercle bacilli and HIV and currently 3.9% of all cases of tuberculosis world-wide are HIV-related [14]. In Africa the acquired immune deficiency syndrome (AIDS) epidemic is already having a devastating effect on tuberculosis control programmes [15]. In Africa about 171 million people have been infected with tubercle bacilli, but the number is around 1,000 millions in south-east Asia and the western Pacific, where about 5 million new cases of tuberculosis occur yearly [13]. If HIV spreads to the latter regions, the global tuberculosis situation may take a drastic turn for the worse.

The WHO has set new tuberculosis programme targets for the year 2,000 [16]; firstly, to cure 85% of all sputum smear-positive cases (this target will be 95% in the industrialized countries); secondly, to detect 70% of all existing cases of tuberculosis.

The research on tuberculosis, especially into clinical aspects, has not recently been provided with enough resources, although, taking the global aspects into account, progress in research is urgently needed and the tools are already available. New ideas in preventive chemotherapy [17], immunotherapy [18, 19] and genetic engineering were discussed during the workshop. Environmental mycobacteria were recognized to be a new problem, with no hope of eradication. An increased sensitivity to these organisms has been clearly demonstrated in meticulous studies in Holland [20]. They also frequently cause disease in HIV-infected persons and it is essential to develop more active drugs against them.

Both elimination programmes and control programmes have two crucial requirements: a high cure rate and a high detection rate, in that order. It has been said that the first country to eliminate tuberculosis will be that which regards it as a serious problem right to the end. The elimination of tuberculosis globally is a dream which even in Europe will need intensive work for several generations to come: so near and yet so far!

References

1. Report of a IUATLD and WHO working group. Tuberculosis elimination of the countries of Europe and other industrialized Countries. *Eur Respir J*, 1991, 4, 1300–1307.
2. Horne NW. – Eradication of tuberculosis in Europe - so near and yet so far. *Bull Int Union Tuberc Lung Dis*, 1984, 59, 207–209.
3. Styblo K. – Tuberculosis control and surveillance. *In:* Recent Advances in Respiratory Medicine. D.C. Flenley, T.L. Petty eds, Churchill Livingstone, Edinburgh, 1986, pp. 77–108.
4. Sbarbaro JA. – "Elimination": of tuberculosis or tuberculosis control programmes. *Bull Int Union Tuberc Lung Dis*, 1990, 65(2–3), 47–48.
5. Communicable Diseases Centre Update. – Tuberculosis elimination - United States. *MMWR*, 1990, 39, 153–156.
6. Tala E. – Five years trend of tuberculosis in Europe - IUATLD Europe Region and WHO Study. *Am Rev Respir Dis*, 1990, 141, A254.
7. Kochi A. – The global tuberculosis situation and new control strategy of the World Health Organization. *Tubercle*, 1991, 72, 1–6.
8. Tala E. – Migration, ethnic minorities and tuberculosis. *Eur Respir J*, 1989, 2, 492–493.
9. Enarson DA, Fanning EA, Allen EA. – Case-finding in the elimination phase of tuberculosis: high risk groups in epidemiology and clinical practice. *Bull Int Union Tuberc Lung Dis*, 1990, 65, 73–74.
10. Rieder HL, Cauthen CM, Comstock GW, Snider D Jr. – Epidemiology of tuberculosis in the United States. *Epidemiol Rev*, 1989, 11, 29–30.
11. Murray JF. – Tuberculosis and human immunodeficiency infection during the 1990's. *Bull Int Union Tuberc Lung Dis*, 1991, 66, 21–25.
12. Murray GDL, Styblo K, Rouillon A. – Tuberculosis in developing countries: burden intervention and cost. *Bull Int Union Tuberc Lung Dis*, 1990, 65, 6–24.
13. Sudre P, ten Dam G, Chan C, Kochi A. – Tuberculosis in the present time: a global overview of the tuberculosis situation. WHO Tuberculosis Unit, Geneva, (in press).
14. Festenstein F, Grange JM. – Tuberculosis and the acquired immune deficiency syndrome. *J Appl Bact*, 1991, 71, 19–30.
15. Styblo K. – The impact of HIV-infection on the global epidemiology of tuberculosis. *Bull Int Union Tuberc Lung Dis*, 1991, 66, 27–32.
16. Tuberculosis Control Programme. – Report of the first meeting of the coordination advisory and review group. WHO Geneva, 2–3 May, 1991, (in press).
17. Lecoeur HF, Truffot-Pernot C, Grosset JH. – Experimental short-course preventive therapy of tuberculosis with rifampicin and pyrazinamide. *Am Rev Respir Dis*, 1989, 140, 1189–1193.
18. Stanford JL, Bahr GM, Rook GAW, Shaaban MA, *et al.* – Immunotherapy with *M. vaccae* as an adjunct to chemotherapy in the treatment of pulmonary tuberculosis. *Tubercle*, 1990, 71, 87–93.
19. Grange JM. – Immunotherapy of tuberculosis. *Tubercle*, 1990, 71, 237–239.
20. Bleiker MA, Misljenovic O, Styblo K. – Study into the risk of tuberculous infection in school children in the city of Delft (The Netherlands) in the period 1966–1985. Selected Papers, 1987, 23, 19–24.