

## MALARIA AND TUBERCULOSIS: THE PRESENT CHALLENGE

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Infectious diseases are responsible for 30 per cent of all the deaths in the developing world. AIDS commandeers the headlines in the medical as well as the lay press; few medical journals or newspapers would feel properly dressed without an AIDS related topic in their pages. Abstracts submitted to scientific meetings are almost guaranteed acceptance if the magic letters HIV are included in the title. And yet AIDS is far from being the commonest cause of death from infectious disease world wide. Acute respiratory infections, predominantly affecting children under 5 years, kill 4.3 million per year and diarrhoea kills 2.9 million.<sup>1</sup> In 1990 tuberculosis killed 2.5 million people and, fuelled by the high prevalence of HIV/TB co-infection, is predicted to kill 3.5 million people in the year 2000.<sup>2</sup> Malaria kills between 1 and 2 million per year, mostly children aged under 5; the numbers are not diminishing and the emergence of drug resistance is compromising treatment options.<sup>3</sup> In 1990, 0.5 million deaths were attributed to AIDS, a preventable but, as yet, incurable disease.<sup>1</sup>

Against this background of mortality due to infectious diseases, the breakdown of world foreign aid spending in 1990 makes interesting reading.<sup>4</sup> Annual aid allocation is inversely proportional to disease mortality numbers. AIDS tops the list at \$185 million with malaria (\$47 million), tuberculosis (\$16 million) and acute respiratory infections (\$12.5 million) faring progressively less well. If governments donated 0.2 per cent of their foreign aid budgets to establish tuberculosis control programmes, for example, this would result in an additional \$100 million being available annually to address the problem of TB at its source. It is not simply a matter of the availability of money, as the richest country in the world discovered recently when tuberculosis ran riot in New York City;<sup>5</sup> the money has to be put to proper use, as it has now been in New York City, where a gratifying decrease in tuberculosis notifications (including multi-drug resistant cases) is presently observed.<sup>6</sup> The New York City epidemic was iatrogenic<sup>7</sup> and serves as a frightening model of what could happen if such mismanagement occurred world wide.

The current malaria pandemic is also seen as partly iatrogenic; malaria control interventions have left large areas of the world worse off than before.<sup>8</sup> The total world disease potential for half these people has been eliminated by antimalarial campaigns; for 33 per cent who live in areas where endemic malaria was much reduced or even eliminated but where transmission is now recurring, the situation is unstable or deteriorating; and for 9 per cent, mostly in tropical Africa, where endemic malaria remains unchanged, morbidity and mortality from malaria are increasing and control programmes have barely progressed, if at all, beyond the planning stage.<sup>9</sup> No one pretends that the solution is simple; mosquitoes are no respecters of national boundaries, and no programme is likely to approach success without the sustained support of national governments and appropriately directed and applied foreign aid.

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As an example, following the inauguration of the WHO malaria control programme in 1956, the US government planned an intensive effort to eradicate malaria by investing vast sums in spraying houses with pesticides. There was initial extraordinary success. In Sri Lanka the annual incidence of new malaria cases fell from 1 million in the early 1950s to 18 in 1963. Though by 1963 resistance to DDT and anti-malarials had been established, the US Congresses' five years commitment to the cause had been honoured and the troops departed leaving WHO to pick up the pieces. Sri Lanka now has 25,000 cases of malaria per year. Control programmes have yet to be developed; adequate donor aid will only be forthcoming to national governments committed to implementing and monitoring control programmes which have attainable and sustainable worthwhile objectives. There are parallels to treating an individual patient with tuberculosis; if the correct drugs are prescribed and the patient takes them for the correct duration then all will be well. It is not enough simply to prescribe the drugs; the physician has to ensure that the patient takes them, a process which may involve many other interventions ranging through developing health care services, health education, social and economic aid to bribery. Force feeding of medication is not usually an option and the outcome of incomplete and therefore bad treatment is usually worse for society than no treatment at all.

Tuberculosis gives rise to even more concern than malaria, if only because self-interest recognises that tuberculosis, unlike malaria, is a disease of all nations. In the decade of the 1990s it is estimated that there will be 88 million new cases of tuberculosis world wide of whom 8 million will be associated with HIV infection.<sup>2</sup> Tuberculosis incidence rates are increasing world wide; most European countries have already noticed an arrest of the previous decline in notification rates and, in many European countries, tuberculosis notification rates are increasing, particularly in Eastern Europe. In Europe the increased rates are partly due to an increasingly elderly population with their attendant increase in reactivation disease<sup>10</sup> but also in many countries to disease in immigrants and refugee populations from high prevalence areas<sup>11</sup> and/or HIV associated disease.<sup>12</sup> In the developing world tuberculosis rates are rising steeply, particularly in sub-Saharan Africa and Asia where co-infection with tuberculosis and HIV is proving to be the most important contributory factor. Co-infected individuals have a 10 per cent per annum chance of developing active tuberculosis.<sup>13</sup>

The prevention of tuberculosis is best effected by the treatment of established infectious cases, thereby preventing transmission of disease. Over 35 years ago Professor John Crofton observed 'there is little doubt that tuberculosis could be eliminated quite quickly if everyone were prepared to take sufficient trouble... every death from TB and every new notification is a failure which ought to have been prevented'.<sup>14</sup>

Cure of individual patients with tuberculosis has been achievable in the developed world since that time, although the consequences of a breakdown in tuberculosis services are exemplified by the recent events in New York City referred to above. In the developing world control of tuberculosis can be achieved where the government is willing, donor aid, particularly provision of drugs, is available and the infrastructure necessary to implement and conduct a National Tuberculosis Programme is established. It has been achieved, for example in Tanzania where 80 per cent cure rates with rifampicin-based short course chemotherapy, without the emergence of drug-resistant disease, have been

obtained. The extent of the tuberculosis problem in Africa can be gauged by the fact that Tanzania has nevertheless experienced a 300 per cent increase in TB notifications in the last decade in spite of achieving this cure rate. HIV infection is responsible for and underlies between 30 per cent and 50 per cent of cases in Tanzania.<sup>15</sup> One can only speculate on the extent of the tuberculosis epidemic in neighbouring African countries with no or only poorly functioning Tuberculosis Programmes.

WHO is actively promoting the establishment of National Tuberculosis Programmes utilising 'DOTS' (directly observed therapy-short course) and acting as a 'broker' between donor nations and interested governments.<sup>6</sup> Indonesia's newly constituted National Tuberculosis Programme, for example, has recently received funds from the Australian government. In China's National Tuberculosis Programme the World Bank, which views tuberculosis treatment as 'the most cost effective of all health care interventions', is leading the way together with WHO. In China drugs are now provided free and doctors are encouraged to participate in the programme, being paid \$1 for diagnosing each case and \$5 for supervising treatment to successful completion; gratifyingly the tuberculosis cure rate has risen from 52 per cent in 1980 to 91 per cent in 1994.<sup>6</sup> Numerous other non-governmental organisations from many countries, most notably the International Union against Tuberculosis and Lung Disease (IUATLD), work alongside WHO in these programmes. Sadly the UK does not figure prominently among these organisations and has defaulted on its annual contributions to the IUATLD for many years.

The counterpoint to the introduction of DOTS by WHO must be the concern that if, as in New York, therapy is not implemented according to WHO recommendations, multiple drug resistant organisms, which are already prevalent and increasing in countries where therapeutic discipline is lax, may proliferate. Where resources are poor, if drug resistance becomes commonplace then the patient with drug resistant tuberculosis is effectively denied treatment. The mortality rate will be high, of the order of 80 per cent, but the patient will live long enough to transmit his intractable disease to many others before he dies. This is a scenario which must be avoided. Professor Don Enarson of the IUATLD has observed, echoing Professor John Crofton's words, 'If we put our minds to it we can control tuberculosis even in the midst of poverty, war and HIV. This engagement is to the mutual benefit of all partners. It only remains to put this knowledge into practice by global solidarity and a charitable spirit.'<sup>16</sup>

The same holds true for malaria, diarrhoea and acute respiratory infections. More overseas aid, more co-operation, less disease, fewer deaths. There is a solution.

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