DOTS: a breakthrough in TB control

There exists a proven, inexpensive treatment strategy that has the potential to prevent millions of deaths over the next ten years. Diverse countries such as Bangladesh, China, Peru, and the United Republic of Tanzania are reaping its benefits. The World Bank ranks it alongside immunization as one of the most cost-effective public health interventions.

DOTS—short for Directly Observed Treatment, Short-course—is the strategy recommended by WHO for the detection and treatment of tuberculosis (TB). Hailed by some as the biggest health breakthrough of the decade, DOTS remains the most effective way of preventing the spread of the disease. Today, it is also the last line of defence against an alarming increase in multidrug-resistant tuberculosis—a form of the disease that is equally infectious and extremely difficult to cure.

The strength of the strategy lies in its five critical components which work in tandem—detection of infectious cases through sputum smear microscopy, a dependable supply of powerful anti-TB medicines, observation of patients taking their medication for at least the first two months of treatment, a reliable management and record-keeping system to track treatment progress, and political and financial commitment.

Inconsistent or partial treatment is one of the major causes of multidrug resistance. The elements of DOTS, used together, are designed to prevent development of resistance to any one of the essential drugs.

An important element of the strategy is direct observation of patients taking the appropriate combination of drugs on a regular basis until they are cured. Observers can be health workers, locally recruited health promoters or volunteers. Peru’s national TB programme illustrates that community volunteers are a valuable resource in case detection and treatment. Dr Guillermo Suarez, who heads Peru’s tuberculosis control programme, says volunteer health promoters are crucial to the success of DOTS. For every new patient identified and cured, an estimated 15 cases a year are prevented—among family members, friends, and workmates.

“There is no strategy or public health policy that could function without community support,” he says. “They support our work for two reasons—they are the ones who benefit from the results and there is a long tradition of community work.”

In China, which in 1990 accounted for almost a quarter of the world’s TB cases, the launch of a one-year DOTS pilot project raised cure rates from below 50% to over 90%. Today, with a US$ 58 million loan from the World Bank, China has expanded the original scheme to reach over 500 million people.

Although the effectiveness of DOTS in curing patients is unquestionable, DOTS is still a strategy waiting to be used extensively. Only about 15% of all TB patients were treated by DOTS in 1996. A recent assessment showed that 89 out of 212 countries had adopted the DOTS strategy by the end of 1997. Of those 89, only 62 had implemented DOTS countrywide.
Now, more than ever, it is imperative that DOTS reaches more of the world. Every year, tuberculosis kills up to 3 million people, and 8 million people develop the disease. An estimated two billion people—a third of the world’s population—are already infected with the TB bacillus, although only about one in ten go on to develop the disease. In India, one of the worst-affected countries, over 2 million people a year develop active tuberculosis and up to half a million people die from the disease. Globally, it is estimated that more people are dying of tuberculosis today than in the first half of this century when it claimed the lives of one in seven in Europe and the United States.

In 1993, WHO declared the worsening epidemic a global health emergency. The re-emergence of the disease on a global scale has been fuelled by a false sense of security, rising poverty, economic recession, and a massive increase in refugee movements and economic migration. Meanwhile, the emergence of AIDS in the 1980s helped push the incidence of tuberculosis even higher, as tuberculosis is the most significant opportunistic infection among people with AIDS and the only one which can be spread through the air to others. Persons infected with tuberculosis are 30 times more likely to develop an active form of the disease if they are infected with HIV as well. In African countries such as Malawi, up to 50% of people with AIDS are also infected with tuberculosis. In Asia, where nearly one in two people are infected with tuberculosis, the rate of TB/HIV co-infection will rise as HIV infection rates increase.

During 1997, two alarming reports bolstered the case for global implementation of the DOTS strategy, raising the spectre of a tuberculosis epidemic that could otherwise spiral out of control. In September, officials from the US Centers for Disease Control and Prevention (CDC) announced that they had identified a new highly contagious strain of the TB bacillus in an outbreak involving about 200 patients in Tennessee. The new strain grew 1000 times faster in laboratory cultures than normal tuberculosis bacteria and by the time patients with this strain had been diagnosed, they had already infected over 70% of the people they had been in contact with. By then, eight of the area’s 13 health care workers had also been infected. Fortunately, it was a treatable form of the disease.

A month later, a major report on anti-tuberculosis drug resistance revealed the existence of tuberculosis “hot zones” around the world where the disease is resistant to the commonly prescribed drugs. Unless checked, the report warned, this could ignite a wave of tuberculosis that is extremely difficult to cure. Already, multidrug resistance is tantamount to a death sentence in the developing world. Elsewhere, in the industrialized countries, it can cause a 100-fold hike in treatment costs—raising them up to US$ 250 000 a patient. Even then, successful treatment cannot be guaranteed. The study was conducted by WHO and the International Union Against Tuberculosis and Lung Disease, with support from USAID and the Australian Agency for International Development. The hot zones identified were: Argentina, Côte d’Ivoire, Dominican Republic, Estonia, India, Latvia, and the Russian Federation. Worst affected was Latvia, where 22% of TB patients had multidrug resistance.

“No one can afford to ignore the growing incidence of drug-resistant TB,” said J. Brian Atwood of USAID. “An epidemic of drug-resistant TB will have global implications that all countries must immediately recognize.”

The problem is that tuberculosis is an airborne disease which is virtually impossible to avoid. It is transmitted by bacteria sprayed into the air by coughing or sneezing. Today large-scale population movements and a massive increase in airline travel have helped to bring tuberculosis out of oblivion to everyone’s doorstep.

Dr Arata Kochi, Director of WHO’s Global Tuberculosis Programme, says it is alarming that many countries still do not have effective TB control programmes in place despite warnings of the global spread of drug-resistant tuberculosis. “We have the medicine and know-how to control TB,” he says. “Unfortunately we don’t have the magic potion to wake up the world’s governments to the seriousness of the TB crisis and get them to take action.”