

Reports document worldwide epidemic

The worst year in history for tuberculosis

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20 June 1998

Last year 3 million people died and 7 million became sick from tuberculosis, according to the World Health Organization (WHO). Although this disease has been highly preventable and curable for 50 years, more people will die of tuberculosis in 1998 than in any year in history.

Tuberculosis is a bacterial infection that can live for years in its host, causes chronic debilitation and often leads to death. An airborne delivery mechanism spreads the illness from person to person. Active TB patients infect others at an average rate of 10 to 15 people each year.

One-third of the world's population is now infected with the TB bacillus, although up to now the majority of those infected have not developed active TB. Estimates of the number infected with drug-resistant TB run as high as 50 million people.

TB is the leading infectious killer of youth and young adults worldwide. In the developing countries 60 percent of its victims are young men and women of reproductive age. According to data from a recent conference cosponsored by WHO and leading Swedish health institutions, 900 million women and girls, mostly between the ages of 15 and 44, are infected around the world.

TB is the leading cause of death for women of childbearing years, responsible for 9 percent of all deaths for women aged 15 to 44. This far surpasses other major causes of death such as war, at 4 percent, and HIV and heart disease, 3 percent each.

Efforts to stanch the world epidemic face a multitude of political and economic roadblocks. Dr. Arata Kochi, director of WHO's Global Tuberculosis Program, stated: 'If we seem impatient in again calling for global action, it is because we have an effective solution to a disease which is needlessly claiming millions of lives.'

The United Nations agency noted this March: 'In some countries, there has been little improvement in TB control programmes since WHO declared tuberculosis a global emergency in 1993. Poorly managed programmes are causing drug-resistant strains of TB. HIV and TB form a lethal combination, each speeding the other's progress.'

WHO singled out the former Stalinist-ruled countries, where public health systems have virtually collapsed following the restoration of capitalism. The report notes 'a startling increase in the number of TB cases in Eastern Europe, after 40 years of steady decline.'

The figures are even more significant because they follow five years of intensive effort on the part of WHO to combat the spread of this disease. Directly Observed Treatment, Short Course (DOTS) is a strategy developed by WHO in 1993 to combat the spread of tuberculosis and of multidrug-resistant cases. Several antituberculosis agents are used at once to obtain a 'one-two knockout punch.' This is part of a five-elements program of TB prevention: political commitment, case detection, directly observed short-course treatment, regular drug supplies and microscopy services.

According to Global Tuberculosis Control, as of this year 96 countries have begun to use DOTS in contrast to only 19 in 1993. Treatment

success rates with DOTS in these countries reach 78 percent as compared to 45 percent in non-DOTS areas. WHO states that few health initiatives have expanded as quickly and as successfully, with 887,731 patients covered in 1996, an increase of 24 percent over the 704,920 recorded in 1995. The report notes that 10 of the 16 countries identified as trouble spots began to implement DOTS in 1996.

Yet this translates into only 10 percent of known cases being included in the formal program. WHO officials themselves state, 'The Committee notes with deep concern that even where progress has been good, questions of sustainability and expansion pose risks for the near future in places such as China and Bangladesh.'

The financial meltdown gripping Asia and now Russia will certainly have a negative impact on current and future efforts. As a whole, Asia accounts for 64 percent of the world's identified TB cases. Thailand and Vietnam are also areas of serious multidrug resistance. Indonesia is listed as one of the 16 countries identified as 'trouble spots' by WHO.

These 16 countries account for over half of the world's annual TB cases. WHO divides them into two categories. Brazil, Indonesia, Iran, Mexico, the Philippines, the Russian Federation, South Africa and Thailand 'have the financial means to tackle TB, but some have delayed too long in pressing for the successful implementation or expansion of DOTS,' according to WHO.

The eight countries designated both low-income and trouble spots are Afghanistan, Ethiopia, India, Myanmar, Nigeria, Pakistan, Sudan and Uganda. At least four of the eight countries have shown worsening treatment success rates. A lethal combination of HIV and TB is leading to sharp increases, particularly in Africa.

Rising levels of drug-resistant TB

When the first antituberculosis drug, streptomycin, was introduced in the 1940s it was less than completely satisfactory. Multidrug treatment regimens were discovered in the 1950s. Using two or more drugs to combat each case proved to virtually eliminate the resistance that arose from the bacteria's spontaneous mutations.

The danger, however, is that such complex treatments require effective monitoring and follow-through. If the regimen is not completed the patient may still remain infected, the bacteria will develop resistance to a wider spectrum of drugs and the strengthened bacteria will eventually infect others.

A survey of tuberculosis cases was compiled for the years 1994 to 1997 by WHO scientists and other researchers and released in the June issue of the *New England Journal of Medicine*. Every one of the 35 countries submitting data reported some level of resistance to antituberculosis drugs, confirming suspicions that a new health emergency has emerged. The 35 countries were not a random sampling of countries. For example, all of China and India, except for the Delhi region, were not included.

That reports on drug-resistant TB are so widespread they must be

summarized in such a survey is an indication of the depth of the emergency. According to a comment by doctors from the US Centers for Disease Control and Prevention (CDC), also published in the *NEJM*, 'from the 1950s through the 1980s the frequency of the transmission of drug-resistant organisms was thought to be low. Reports of outbreaks of drug-resistant tuberculosis were rare and virtually always deemed worthy of publication. In recent years, the situation has changed considerably. From 1990 through 1997, many outbreaks of multidrug-resistant tuberculosis have been reported to the Centers for Disease Control and Prevention.'

The CDC doctors point out that most, but not all, cases of drug-resistant TB involved people with HIV infection and many occurred in hospitals, correctional facilities and other institutions. Housing people with AIDS and those with tuberculosis together in the same indoor environment contributes to the increasing incidence of tuberculosis. Drug-resistant strains were able to spread and result in high mortality rates as a result of delays in recognizing that tuberculosis cases were multidrug resistant.

The *NEJM* study reported the prevalence of primary resistance to either isoniazid, rifampin, thambutol or streptomycin. This ranged from 2 percent in the Czech Republic to 40.6 percent in the Dominican Republic. The authors note that the higher figures in the Dominican Republic may be the result of weakness in the tuberculosis-control program. Or, they note, it could be due to migration between the Dominican Republic and New York City, where the prevalence of multidrug resistance was high in the early 1990s.

Among previously treated patients, resistance to any of the four drugs ranged from 5.3 percent in New Zealand to 100 percent in the Ivanovo province of Russia. Acquired multidrug resistance (multidrug resistance defined as resistance to at least isoniazid and rifampin) ranged from zero in Kenya to 54.4 percent in Latvia. The median prevalence of resistance to all four drugs was 4.4 percent.

The prevalence of multidrug-resistant tuberculosis was higher in the Baltic states than in any of the other countries surveyed. The authors note: 'Eastern Europe, and particularly the former Soviet Union, has witnessed a recent reversal of a previously declining rate of tuberculosis, probably because of an irregular supply of drugs and nonstandardized regimen; nosocomial [hospital caused] infections and outbreaks in prisons may be contributing factors.'

Multidrug resistance in Delhi is 13.3 percent, approaching the high levels in the Baltic countries. India accounts for one-third of the world's tuberculosis cases. The CDC commentators, Drs. Snider and Castro, also point out, 'most countries affected by the HIV pandemic and increases in tuberculosis also have poorly functioning tuberculosis-control programs and cannot afford the anti-tuberculosis-drug programs that are most effective at preventing multidrug-resistant disease as well as treating it.'

A political and social issue

As these facts suggest, the tuberculosis epidemic is not simply a health issue, or one which requires a response on the scientific and technical level. It is a social and political issue. As the recent statement by the 'Ad Hoc Committee on the Global TB epidemic' asserted, 'insufficient political will to control TB is the greatest single constraint to progress' in fighting the world epidemic.

In 1978 the 'Declaration of Alma Ata,' at a conference in the former Soviet Union sponsored by WHO and UNICEF, set a target of primary healthcare for all by the year 2000. In 1998, on the occasion of the fiftieth anniversary of WHO's founding, officials of the agency assessed the progress toward this goal:

'The foreign debt crisis of the 1980s made many countries reduce their support for health and social services. Dramatic political changes throughout the 1990s, often accompanied by civil unrest, seriously impaired health and economic development. In some countries, notably

the Newly Independent States (NIS), previous gains in life expectancy and health standards have been reversed.... Poverty and growing social inequities over the past twenty years continued to impede progress to HFA. Today, nearly 1.3 billion people live in absolute poverty, which is the major cause of undernourishment and ill-health.'

The agency goes on to cite the rapid growth of private health care in many middle-income countries as contributing, in some cases, to continuously rising costs, to inefficient care, and to unequal access to healthcare. And the same tendencies have begun to have their impact in the wealthiest countries as well.

A little reported study in the March 5 issue of the *NEJM* underscores the WHO warnings. Tuberculosis has reemerged as a significant health problem in the United States. While the purpose of the study was to examine whether additional virulence of TB strains is a factor in the spread of the disease--not solely environmental factors or the social characteristics of infected persons--the report gives a glimpse of the response of the US healthcare system to a major outbreak of tuberculosis.

In 1995, two counties with a combined population of 14,000, located in the southern US states of Kentucky and Tennessee, saw an outbreak of tuberculosis infection and illness. Each county averaged less than one case of tuberculosis per year from 1985 to 1993. Five secondary cases were reported from May 1995 to November 1995. At the same time research was undertaken, through examination of county records and contacts of a tuberculosis patient (called the 'index patient') who was believed to have infected the five new cases. Further investigation found that of 338 contacts of the 'index patient' 224 showed positive skin tests for TB.

The researchers, led by doctors from the Division of Tuberculosis Elimination at the National Center of HIV, STD and TB Prevention, note in their report that only aggressive preventive therapy, consisting of a six-month course of isoniazid for all infected persons, prevented a larger outbreak. They state that other cases are expected to turn up as well.

All of the infected were non-Hispanic whites. All but eight had no other potential risk factors, including HIV infection. The clothing factory where the 'index patient' worked was considered an environment conducive to the spread of TB, and 34 coworkers were found to be infected.

Significantly, the 'index patient' and the 'source patient' had their TB diagnosed only after routine tests of young children in their families turned up TB infection. The delay in diagnosing TB in these two carriers led to further infection. TB screening in the US is largely limited to known danger areas such as hospitals, some schools and daycare centers and care facilities for the elderly.

Both the 'source patient' and the 'index patient' had seen doctors who had failed to diagnose TB infections while treating them for apparently unrelated illnesses. The 'source patient' had seen an otolaryngologist in the months previous to his diagnosis, but no biopsy was taken of small polyps on his larynx. The 'index patient' was given medicine for pneumonia in late 1994 and was prescribed cough medicine in early 1995 for a recurrent cough.

Tuberculosis is expected to claim the lives of about 70 million people in the next 20 years. It is a disease largely of the poor, with HIV infection and malnutrition as major factors in determining who among those infected will develop active TB.

Proven treatment programs like DOTS require large amounts of high-quality drugs, with especially expensive therapies for drug-resistant strains. Drug companies are among the most lucrative of business enterprises, and they have shown no interest in making their products available to the hundreds of millions of human beings infected with the TB bacillus who are too poor to pay for drug treatment.

The struggle against TB also requires highly developed systems of monitoring and followup to insure patients complete their drug therapies. There is an inherent conflict between such medical regimens and the drive by HMOs and other for-profit health care providers to get patients out the

door as quickly as possible. The necessary care would be provided most effectively in a healthcare system which guaranteed universal access to medical services and which insured that the cost of treatment was no barrier to poor patients.

See Also:

'Deadly Feasts' - A valuable examination of the 'Mad Cow' epidemic
[3 June 1998]



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