

Tuberculosis is a growing global epidemic that is becoming even more dangerous with the emergence of HIV/AIDS and multi-drug resistant strains of the TB virus. It is a leading public health problem worldwide, but is most felt in the developing world. Of the 1.7 billion people estimated to be infected with tuberculosis, 1.3 billion live in developing countries. In 1993, concerned with the rising cases of deaths and infection rates, the World Health Organization (WHO) declared tuberculosis as a global emergency.

During the first Stop TB Forum held in Washington, DC in 2001, governments and organizations met to draft a global response to TB. Dubbed as the Global Plan to Stop TB, its principal aim is to expand the Direct Observed Treatment Short Course (DOTS) approach so that all people with TB may have access to effective diagnosis and treatment. It also seeks to improve the existing tools in TB diagnosis, drug treatment and vaccine. For its first phase, the plan expects to reach a 70 percent detection rate and an 85 percent cure rate by 2005.

A year away from the target, this issue on tuberculosis comes as a timely review of the extent by which the objectives of the plan have been reached. Is DOTS truly the magic bullet to solve TB? If not, what are the barriers to fully implementing DOTS and integrating it to local national TB programs? How responsive are these programs to the everyday social and cultural realities of communities and families afflicted with TB? Are there any alternative approaches?

In this issue, Health Alert presents the facts and the global status of TB, as well as current trends in treatment and care. Hoping to look at local health-seeking behavior and patterns that affect disease management and prevention, it draws on various experiences of countries in the Asia Pacific region such as India, Maldives and the Philippines. Factors contributing to the rise in TB cases are also identified, specifically looking into the symbiotic relationships between TB, HIV, poverty, poor nutrition, migration, and gender.**HA**

RACING AGAINST TUBERCULOSIS

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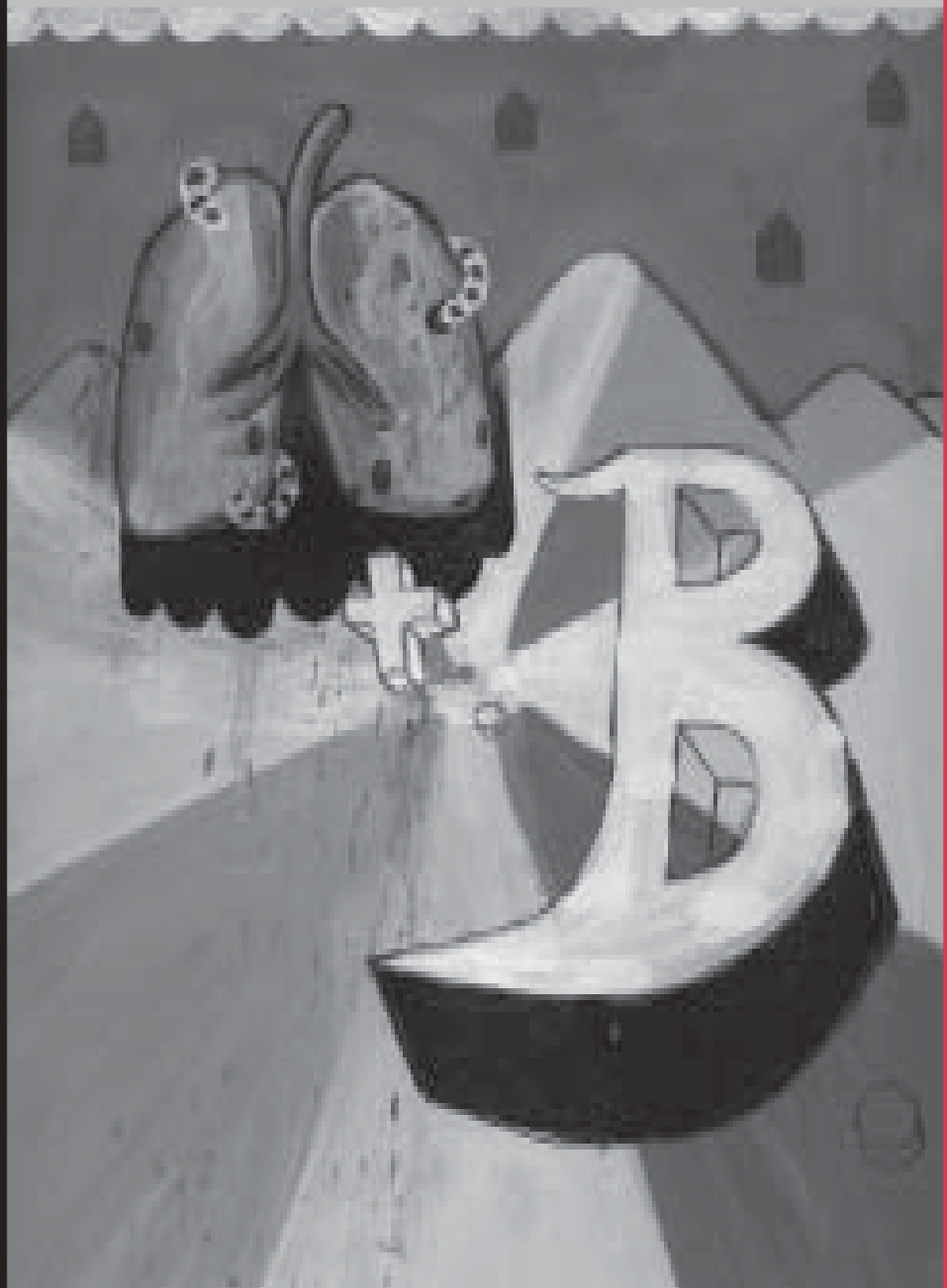
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TUBERCULOSIS: FACTS, CHALLENGES AND COURSES OF ACTION

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Approximately a third of the world's population is affected by TB, particularly affecting people in developing countries where 99 percent of TB deaths occur. In the Western Pacific region alone, around 360,000 people die of TB every year. Moreover, South East Asia accounts for 40 percent of the world's TB cases. Bangladesh, India, Indonesia, Myanmar and Thailand account for 95 percent of the 700,000 TB deaths every year.

The resurgence of tuberculosis and other infectious diseases in the last decade has been closely linked with environmental and social changes that compromised people's immune systems and the social structures that are used to defend against diseases.

A responsive anti-TB strategy must be addressed in the overall context of social,

TB and Poverty

Poverty plays a major role in the spread of tuberculosis; studies show that there is a strong association between TB and poverty. Tuberculosis is an infection caused by the bacillus *Mycobacterium tuberculosis* that attacks the lungs. It is a contagious disease and is spread through the air. A person exposed to the TB bacillus may fight off primary TB infection with a healthy immune system. However, poor living conditions characterized by congestion, poor ventilation, poor nutrition, lack of safe drinking water, and limited health care compromise the body's ability to fight infections. This makes poor people among those most at risk of TB. People living in poverty have limited access to adequate health care; moreover, many of them who are found positive for TB cannot afford treatment.

In China, for instance, a major reason for treatment delay is financial incapacity, with 45 percent of TB patients delaying their treatment due to limited financial resources. On the other hand, some may turn to self-medication in order to save on costly medical fees. A survey in the Philippines shows that 32 percent of patients self-medicate after experiencing symptoms of TB, with an alarming 42 percent not seeking professional help at all.

The socio-economic impact of TB on poor households and nations is devastating. TB infection is highest among people aged 15-54 years old – the most economically productive age group. This means that TB infection results in losses to individual income and overall national productivity. Studies have shown that, on average, a TB patient loses three to four months of work, with lost earnings amounting to 20 to 30 percent of a family's annual income.

Globally, the annual economic cost of TB is estimated at US\$ 12 billion. Many TB patients, unable to work and earn money, sell their land or livestock to pay for much-needed medical treatment and TB drugs. Because of high medical

costs, patients are left with even less money for food or education. Families find themselves forced to take children out of school to help out at home or find work. In India, around 300,000 children from TB-afflicted households leave school every year.

Risk Factors for TB

People living under certain conditions put them at greater risk for contracting and dying of TB. Risk factors for TB include poverty, migration, gender and HIV/AIDS. Poverty pushes people to live in overcrowded conditions that increase risk of TB transmission.

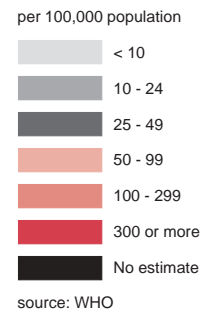
Migrants who come from developing countries to find work and better living conditions in their host countries are also pushed into poverty if they are not able to find suitable work. Moreover, discrimination, maladjustment, or being illegal immigrants prevents them from availing themselves of health services. In Paris, for example, immigrants are 12 times more likely to get infected than native French nationals.

Another risk factor for TB is gender. In many developing countries, women are the last to receive medical attention. When women contract illnesses, many families opt to keep the "problem" within the home rather than confront the disease. In India, for example, TB is still attenuated with stigma and discrimination, especially among women. Women with TB are often returned to their families, if not left unattended by her husband's families. In India alone, more than 100,000 women are thrown out annually on account of tuberculosis.

At the greatest risk for TB are people with HIV/AIDS. People with HIV are many times more likely to be infected by TB. TB is the leading cause of death among people with HIV/AIDS, accounting for 11 percent of AIDS deaths worldwide. In Africa, HIV is the single most important factor for increased TB incidence in the last decade.



Estimated TB incidence rates, 2001



economic, and cultural context of community health and medicine.

Direct Observed Treatment Short course (DOTS)

The WHO recommends DOTS as the most efficient and inexpensive strategy to control TB. It involves effective diagnosis by microscopy, a standardized drug regimen, intermittent therapy, and direct observation of the patient by a trained health worker. Indeed, reports have shown that since 1991, when DOTS was first introduced, incidence rates in high burden countries have gone down.

But despite decreases in incidence and increases in cure rates, TB continues to pose a grave threat to developing countries in the Asia Pacific region. Critics have pointed out that DOTS will only be as efficient as the general health services of the country where it is being implemented. When public health systems fail to provide even basic health care to its constituents, the long-term sustainability of DOTS becomes threatened. Uninterrupted drug supply, a pool of qualified health personnel, and government commitment are crucial elements to the success of the program. DOTS is a technological application that has proven to be effective when fully implemented. An adequate public health infrastructure must be in place to operationalize DOTS.

Integration with the private sector is also essential for DOTS to work in developing countries. In most developing countries, patients tend to seek treatment from private doctors where services are perceived to be better but costlier. These private doctors then prescribe regimens and medications that may have implications on the quality of care that TB patients receive. Moreover, TB patients may fail to avail themselves of the government's free DOTS program because their doctors neglect to inform them.

A responsive anti-TB strategy must be addressed within the social, economic, and cultural context of community health and medicine. Its success depends critically on the state of the public health system that will implement the DOTS program.**HA**

KEY TERMS

Immune system

the tissues and cells of the body that protect the body from the invasion of certain diseases. A healthy immune system produces antibodies to fight off disease and infection.

TB preventive therapy (TB prophylaxis)

treatment or action taken to protect someone who has been exposed to tuberculosis.

DOTS

Directly Observed Treatment, Short course – a treatment strategy for TB. It aims to ensure high levels of adherence to and completion of TB treatment.

TB infection

people who have been exposed to TB germs become infected with TB. However, TB infection does not always develop into active TB.

Active TB

active pulmonary TB is infectious and the lungs of a person with active TB develop cavities full of TB germs.

DOTS-plus

a pilot project to treat multi-drug resistant (MDR) TB with second-line TB drugs.

Treatment supporter

health worker or trained community volunteer who provides encouragement and support for the person taking TB treatment.

TB, POVERTY AND POLITICS

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Despite the availability of effective drugs and the widespread use of BCG vaccine, tuberculosis remains a global health challenge. After decades of decline in the incidence of tuberculosis in the developed world, the number of TB cases has dramatically increased in the past decade. In 1993, the World Health Organization declared TB to be a global emergency. Currently, TB is the single biggest infectious killer of both youth and adults, causing between 2-3 million deaths and around 8 million new cases diagnosed each year. The global incidence of TB is growing at approximately 0.4% per year.

The Philippines is included among the 22 countries identified by the World Health Organization as having a high burden of this disease. There were an estimated 229,000 cases of tuberculosis in the Philippines in 2001 or 297 cases per 100,000 population of which 103,000 or 133 per 100,000 population were smear positive.

Though India registered the highest number of total cases of tuberculosis, the Philippines has a higher rate of cases per 100,000 population. In 1997, TB ranked 5th as the leading cause of mortality in the Philippines, and in 1998, it ranked 6th among the top 10 causes of morbidity (Lorenzo 2002). The annual risk of infection in the Philippines was 2.3% in 1997, virtually unchanged since 1981 (2.5%).

An important factor in the epidemiology of tuberculosis is the socioeconomic status of the population. High tuberculosis rates have always occurred among the socioeconomically deprived (WHO 2003). The relation of tuberculosis with poor socioeconomic conditions is clearly illustrated by the decrease in the rates of tuberculosis with improvement in the general socioeconomic status of the people in England and Wales following the industrial revolution, before the discovery of anti-tuberculosis medicines. Related to the socioeconomic factor are other environmental factors that include overcrowding, poor nutrition and lack of access to adequate health care.

Issues in the Prevention and Control of Tuberculosis

Tuberculosis prevention and control measures have been implemented for decades, with millions of dollars spent. Great advances in the diagnosis and treatment of the disease have been achieved in the past decades. Yet, tuberculosis remains a global problem. The following issues have contributed to this present dismal state of global tuberculosis.



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Poverty and underdevelopment

Many epidemiologic studies in the past have already proven the direct relationship of tuberculosis with poverty and underdevelopment. Tuberculosis occurs principally in the poorest and most underdeveloped countries of the world. Within societies, it occurs in the most socioeconomically deprived sectors, where factors contributing to its spread exist in overcrowding, malnutrition and lack of access to health care services. Currently, the incidence of tuberculosis continues to decline in Western and Central Europe and in other industrialized countries, while remaining unchanged in Southeast Asia and the Western Pacific Regions.

The International Monetary Fund and the World Bank through the USAID, continue to pour money and push governments into undertaking TB control programs that rely heavily on the use of expensive drugs, while at the same time pushing to the point of coercion, the adoption of political and economic policies that lead to the further underdevelopment of these countries, redounding to the interest of their major sponsors, principally the USA. We can deduce from the WHO document "Investing in Health" that the WHO works closely with these international financing agencies, does not oppose these policies, and instead pushes programs that aim only to alleviate the ill health brought about by poverty (WHO 2003). National TB Control Programs (NTP) are doomed to fail if the socioeconomic situations of the populations targeted by these programs are not improved.

Low Health Budget

The low budget for health is spent mostly for the maintenance of government hospitals and curative services, leaving a very meager sum for public health programs. The NTP therefore suffers from a chronic lack of budget. City and Rural Health Units often run out of supply of antituberculosis medicines and many patients have to wait months to start their medications, or are forced to interrupt treatment for long periods of time. This is compounded by the high cost of antituberculosis medicine, especially Rifampicin, which patients (who are mostly from the lowest socioeconomic strata) are not able to buy. Other aspects of the program are likewise compromised, including the lack of medical technologists for microscopic work and lack in quality diagnostic equipment.

Case Finding

In the NTP in DOTS program, case finding is done passively in health stations among patients consulting with signs and symptoms of TB and not through active case finding except in areas with cure rates of 85% or higher (DOH 2001), the rationale being that patients who seek consult will most likely adhere to the prescribed dose and length of treatment. This will make for a higher percentage of

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treatment success among reported cases. The WHO itself advocates this type of case finding. An important factor maybe financial as well, since, as already discussed above, supply of medicines is limited. Most TB symptomatic patients do not consult a health provider (DOH 1999). This implies that with passive case finding, the majority of TB patients are left untreated. There cannot be true control if we allow patients who do not seek consult but may have active and infectious TB go untreated, especially if they comprise the majority.

Lack of an Effective Vaccine

The past decades have shown that vaccination plays an important role in the control of communicable diseases. The eradication of small pox from the world was achieved because of an effective vaccine. The same is true for polio in many parts of the world, including the Philippines. This is not the case however, for tuberculosis and BCG. A meta-analysis of published BCG vaccination trials suggested that BCG is only 50% effective in preventing pulmonary tuberculosis in adults and children. The protective effect for dissemination and meningial tuberculosis appears to be slightly higher, at 50-80% of cases. BCG vaccination has therefore worked well in some situations but poorly in others. Clearly, BCG vaccination had little effect on the ultimate control of tuberculosis throughout the world because more than 5 billion doses have been administered but tuberculosis remains endemic in most regions. BCG vaccination does not substantially influence the chain of transmission because those cases of contagious pulmonary tuberculosis in adults that can be prevented by BCG vaccination constitute a rather small fraction of the sources of infection of a population. The best use of BCG vaccination appears to be in the prevention of life-threatening forms of tuberculosis in infants and young children. For this reason alone, the routine administration of BCG vaccines to newborns and young children is warranted. However, it appears that we cannot hope to eradicate or even control the occurrence of tuberculosis using this vaccine and a new one needs to be developed.

Lack of Health Education on TB

The most probable reason why the majority of patients who have tuberculosis do not seek consult is the lack of proper knowledge regarding the disease. This is even worsened by the social stigma attached to tuberculosis. There are still many who believe that TB is incurable and consulting a doctor will be futile, and will only expose the patient to the danger of being ostracized. Lack of understanding of TB may likewise contribute to the non-adherence of patients to the prescribed length of treatment. Once they feel better, they stop medication, thinking that they are cured. Another factor is the fear of many people of the side effects

of medicines, especially with prolonged intake. The National TB Program is not strong on the aspect of health education and the cultural dimensions of the disease. In areas where there are active and well-trained barangay health workers, the situation is better because these health workers are usually well versed in tuberculosis and even do active case finding. This does not ensure however that they do regular health education on TB for their communities. Moreover, in the majority of our communities, the health workers are not active, nor well trained.

Multi-drug resistant Tuberculosis

There are two major types of drug resistance. Primary resistance occurs when an individual is infected with drug-resistant *M. tuberculosis*. Secondary resistance occurs when drug-resistant organisms emerge as the dominant population during treatment. Poor adherence to prescribed treatment regimens has been identified as the main cause for the emergence of secondary resistance to one or more of the primary drugs currently being used for tuberculosis. This may be due to a recalcitrant patient who does not adhere to treatment or a private practitioner who is either ignorant of the current recommendations on TB treatment or simply refuses to adhere to them. In children, drug resistance is difficult to assess, but most drug resistance in this population is deemed to be primary.

When drug resistance occurs, treatment becomes individualized and new or additional drugs are introduced. Streptomycin and Ethambutol are the usual second line drugs added to the regimen. Since streptomycin is only available in the injectable form, treatment adherence becomes even more difficult. More importantly, the treatment becomes more expensive, and control more difficult.

No Public Health Program for Childhood Tuberculosis

Tuberculosis in children deserves special attention and should be controlled since children represent a reservoir of future adult TB cases. Further, young children are more prone to develop the more severe complications of TB, especially among those who are malnourished. These same patients are those who are not able to afford the high cost of antituberculosis medicines and need government support. However, since children with TB rarely spread the disease, they are not considered a priority target for control, especially when the budget is limited. **HA**

WAGING WAR ON TUBERCULOSIS: THE PHILIPPINE EXPERIENCE

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The San Juan de Dios Tuberculosis (TB) Clinic is a small spare building in the midst of the bustling Quiapo district of Manila. In this small spartan room stacked with records and x-ray plates, Dr. Glorioso V. Saturay has documented treatments of over 20,000 indigent patients afflicted with tuberculosis. Sadly, this doctor notes, the situation of tuberculosis has not changed in the Philippines in the last fifteen years since he started as a volunteer doctor at the clinic – if anything it is worse today.

Quoting World Health Organization reports, the Philippines ranked 8th among the countries with TB problems globally. In the Western Pacific Region, the Philippines ranked second only to China in terms of its burden of disease.

From the daily stream of 30-50 patients who line up to see him at the Clinic, Dr. Saturay puts together his own disturbing account of his daily battle with tuberculosis.

The Philippines, notes Dr. Saturay, will not easily rid itself of TB in the near future. While tuberculosis has gained global attention because of the rise in HIV-AIDS related cases, in the Philippines one of the biggest allies in the spread of TB is poverty. The whole health care system he notes, puts the poor at risk. The people who consult his TB Clinic, are so poor that they would rather sell the medicines given to them to buy food for their children. The rise in multi-drug resistant TB stems from poor compliance to medicines that can amount to a day's earnings for the typical low wage earner. What other charity programs sometimes do not understand in giving out their medicines is that it is dire poverty that limits compliance with their programs. Some programs ask their patients to go to their center weekly to get drugs when they have hardly enough money to pay their fare, much less the daily needs of their families.

"Part of the reason that TB is here to stay," notes Dr. Saturay, "is that TB is actually a lucrative business." Pulmonologists charge patients with fees anywhere from \$5.00 to \$10.00 for each consultation. X-ray and laboratory facilities tie up with these doctors to offer perks for referrals at the patient's unknowing expense. Multinationals make money from selling anti-TB drugs with cutthroat competition that effectively eliminates any local pharmaceutical endeavors. Drug prices for the TB drugs in the Philippines can go as high as three to eight times the cost of these drugs in India.

The problem of cutting the escalating costs of TB boils down to a lack of political will on the part of government,

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adds Dr. Saturay. Many patients seen in the government clinics will be referred to other centers for x-rays and sputum tests at the patient's expense. Even in some of the government accredited centers for tuberculosis, drug supplies are uncertain. Some of the government accredited TB control centers will have very good reporting rates but hardly any cure rate to show for. The government should cover all costs for diagnosis, medication, and monitoring of TB cases if the country wants to rid itself of TB.

Dr. Saturay's TB clinic, run by the Hospitaller Brothers of San Juan de Dios from Rome, does not have enough funds to implement the World Health Organization's (WHO) recommended Directly Observed Treatment Short-course (DOTS). According to Dr. Saturay, the Clinic's cure rate of 80%, however, is higher than the cure rates of other programs which have DOTS funding. Some of his patients, he claims, have come from a string of physicians who do not care to explain what their disease is all about. "It's a lonely job," says Dr. Saturay. "I listen to the people's stories. I find what their jobs are, what they eat, where they live, where their children sleep – sometimes my patients just break down in desperation telling me their problems and stories. I tell my patients that I will always take care of them – even if they get better. Sometimes all I have to offer for them is an ear to listen." For Dr. Saturay, gaining a patient's trust is the only way to cure.

Just a street away from the TB Clinic, rows of hawkers peddle a medley of herbal preparations for tuberculosis. The atmosphere is no less than chaotic as each stall owner peddles hope for an alleged sure-cure. The collection of leaves, concoctions, and tonics are a tempting lure for patients who cannot afford TB medications. In the midst of such chaos, this quiet, unassuming man goes daily to his post, trying to convince the community that there is real hope for a cure.**HA**

TUBERCULOSIS IN INDIA

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WHO/JAD DAVENPORT



TB is the most common opportunistic infection HIV-positive people present themselves with at healthcare facilities. More than 2.3 million people living with HIV in India are estimated to be infected with tuberculosis.

Tuberculosis remains the leading cause of infectious death in India, killing close to 500,000 people each year. There is an additional burden of two million new TB infections each year, far more than any other country, and accounts for nearly a third of the global burden of TB.

The Revised National Tuberculosis Control Program (RNTCP), designed by the Government of India in 1993 and launched in 1997, introduced DOTS (Directly Observed Treatment Short course). As DOTS' population coverage increased from 30 percent in 2000 to 45 percent at the end of 2001, the number of smear-positive cases notified under DOTS nearly doubled. However, the number of smear-positive patients notified nationally (DOTS and non-DOTS together) changed little.

This suggests that if India is to reach the target of 70 percent of cases detected under DOTS, the RNTCP must, in addition to extending geographic coverage, continue to increase the proportion of cases being detected by the DOTS program within designated DOTS districts. The treatment success rate for patients registered in 2000 was 84 percent.

The current plan for the RNTCP covers the period 2001-2004 and aims to expand DOTS coverage to more than 80 percent of the country by 2004. By the end of 2002, about 550 million people, or 55 percent of the total population, had access to DOTS under the RNTCP, up from the 45 percent officially reported in 2001. The World Bank has provided a US\$ 142.5 million loan to the Government of India, and DFID, DANIDA, GFATM (Global Fund for AIDS, Tuberculosis and Malaria) and GDF (Global Development Fund) all support DOTS expansion. The financial situation of RNTCP will therefore remain robust in 2003.

Despite robust financing, the reality of TB control is not so rosy. A key problem continues to be access – access to drugs, information, treatment, and healthcare. TB patients still continue to develop complications and die. Some doctors inadequately treat, or even maltreat, TB patients. Many people, and even some doctors and healthcare providers are not aware of the DOTS program.

TB is the most common opportunistic infection HIV-positive people present themselves with at healthcare facilities. More than 2.3 million people living with HIV in India are estimated to be infected with tuberculosis. TB leads to a rise in HIV replication, which directly impacts disease progression and even survival. This indeed is a critical issue, and physicians debate on when to start treating TB and HIV and whether TB and HIV treatment can go together.

Dr. Mauro Schechter recommends that if TB patients are already on ART (Anti-Retroviral Treatment), then continue

ART along with treating TB. If HIV positive TB patients are not on ART then putting them on ART depends upon their CD4 count. If CD4 count is less than 100, then start ART alongside TB treatment. If CD4 is between 100-200, then wait for two months before putting them on ART and start TB treatment immediately. If CD4 is more than 200 then complete DOTS and cure TB before putting them on ART.

In a random interview of doctors, healthcare providers, and TB patients seeking treatment for complications at three medical colleges in India (Kanpur, Lucknow and Tirunelveli), some interesting observations were found:

- Respondents are not adequately informed about DOTS programs running in their own institutions. Respondents include resident doctors, nurses and other paramedical staff.
- Patients mostly buy their own drugs, and, in Lucknow, those who need financial support to buy drugs seek support from NGOs.
- Most of the leading private pulmonary physicians and TB experts in the cities are the same ones working in Government TB and Chest Hospitals. This is important because more than 80 percent of patients initially approach private health facilities and not the government healthcare facilities. Malpractice among government doctors using the government TB facility to boost their own private practice further jeopardizes TB control in these cities.
- In Uttar Pradesh, most of the TB patients exhaust their savings and money by the time they reach a tertiary TB hospital and get proper treatment.

There is a compelling urgency to expand awareness programs to update doctors, healthcare providers, and paramedical staff on the DOTS program. Moreover, practitioners of alternative medicine (e.g. *ayurveda*, homeopathy, *unani*) who treat TB patients must also be acquainted with the DOTS program and convinced to send patients to the nearest TB center. The biggest challenge will be to encourage private practitioners, traditional healers, and faith-based healers to adopt the program, and to seek their cooperation in increasing awareness and access to TB drugs and treatment.**HA**

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THE MALDIVES MODEL

A vast archipelago of 1190 islands and small population of 400,000, the Maldives has proven that a stable health infrastructure, extensive and efficient monitoring, effective treatment and proper care, and a fully-committed government are necessary components in combating tuberculosis.

Only 201 islands are inhabited in the Maldives. The population density in each island is quite manageable with island populations that range from 3000 to smaller ones consisting of 150 persons. There is little inter-island migration, except for those coming from the outlying islands to Male, the country's capital. However, with the influx of Maldivians seeking employment and education in the capital, Male is becoming congested that causes a strain in the public health system. Yet, despite this, the geographic structure of Maldives has made tuberculosis control relatively easy in the Maldives. Officials from the Department of Public Health cite active community participation and higher literacy rates of its constituents as key factors for the success of TB control.

TB began to be common in the Maldives as early as 1900's known as Rajah Bali or the "country disease," referring to tuberculosis of the spine that affected young children until the early 1970s. Kessum Bali, on the other hand referred to the "coughing disease" that remained a feared killer in the communities until very recently. Each year about 200 cases are detected, and the majority receive public health treatment. High TB prevalence in the 1970s led the government to launch TB control program in 1976, with an objective to control the spread of TB by reducing the source of infection and boost immunity of susceptible groups through case detection and proper case management and treatment.

In 1994, Maldives adopted and implemented WHO's DOTS strategy to fight the growing epidemic which has yielded impressive and consistent cure rates of more than 89%. Under this program every Maldivian citizen is screened for communicable disease with sputum screening for those exhibiting symptoms of TB. At the Chest Clinic on Male, records of TB patients are kept and are closely monitored. Here, TB patients are closely monitored by direct observation, where patients are asked to consume the pills in front of the health worker. All patients in Male must report daily to the Chest Clinic between 8 am and 2 pm. If a patient is too ill to come to the clinic or misses an appointment for any other reason, the family health worker goes to the patient's home. The small size of the capital island makes this a viable prospect compared to other countries like Nepal



WHO/PRO

patients trek for as long as four hours to collect and consume their medication. TB patients are confident that should they fail to go to the clinic, health workers will come and give them needed medication.

The success of Maldives's National TB Program has been ensured by the active participation of Island Chiefs in its implementation at the community level. At present, the Ministry of Atolls Administration appointed Island Chiefs is trained to distribute the treatment tablets. Assisted by a family health worker, he is given a prepared treatment schedule with biweekly dates for 3 years. Once the Chief gives the medicine to the patient, he signs the treatment schedule. The Chief's daily duties begin at sunrise, as he walks up and down the beach after a night's fishing to count the catch as the fishermen lay it out on the beach after a night's fishing. The Island Chief usually takes this opportunity to see ensure that fishermen who have TB swallow their medication in front of him, killing two birds with one stone. This approach in community-based observation strategy has been proven successful in the Maldives with almost nil defaulter rate.

The Department of Public Health (DPH) continues to conduct awareness programs for TB. Although, no longer viewed as a deadly disease, there have been cases reported where families of patients have refused to treat them as a regular part of the family. Feelings of isolation and hopelessness are always present to some extent. In lieu of this, the DPH holds regular workshops for community health workers so that they can explain TB to those who need it in their island communities.

The DPH is ramping up their services to further improve their existing information system on patients' health record. A computer network that will connect regional hospital and health centers is expected to take place soon. Already, with only an efficient telephone network, the DPH is able to monitor the airport, the harbor and supply section. Each medical officer has a pager, and if it is switched off, they can be reached by radio set, by telephone or if all else fails, by cellular phones. Soon, they hope to launch www.tb.coral.solution.org to connect all islands online.

The DOTS success story in Maldives is solid. Only 121 cases recorded at present—less than one patient per island, high literate population, no gender bias, and a willing, able and trained medical work force ably supported by the Government.**HA**

SOURCE:

Aruni, John. 1998. *The Maldives Model*.
TB Do or Die. Katmandu, Nepal: Panos
Institute South Asia and WHO

Treating TB and HIV



WHO

Approximately one-third of the world's population is infected with TB and 36 million people are infected with HIV. Worldwide, there are about 12 million people infected with both HIV and TB. Of those, approximately 70 percent live in sub-Saharan Africa. TB is the most common opportunistic infection and the most frequent cause of death in people living with HIV in Africa.

People infected with HIV are more likely to develop active TB after they have been exposed to TB germs because they have weakened immune systems. People who are infected with both TB and HIV are 25–30 times more likely to develop active TB than people only infected with TB. TB deaths are expected to double to four million people a year by 2010 as HIV makes people more vulnerable to active TB. WHO estimates say that one-third of TB deaths are people with HIV.

TB and HIV

In people with healthy immune systems, only 10 percent of those who are infected with TB ever become ill with active TB. HIV, by damaging the immune system, increases the risk of progression from TB infection to active TB. This means that over half the people with both TB and HIV will become ill with active TB before they die. In addition, in a person with HIV, the presence of TB infection may allow HIV to multiply more rapidly. This could mean a more rapid progression from HIV infection to AIDS.

It is important to understand that although HIV increases the risk of developing TB, not all HIV-positive people have TB and not all people with TB are HIV positive. People with TB or HIV may face stigma, fear or discrimination and have shared needs for counseling, care and support.

How TB and HIV are spread

TB is spread through coughing: a person who is ill with active TB coughs TB germs into the air and other people can breathe them into their lungs. Most people with TB who are on appropriate treatment are not infectious and therefore can work, socialize and live with people without infecting them. HIV is spread through sexual intercourse, blood transfusion, from mother to infant during pregnancy, and through breastfeeding.

Symptoms of TB

The symptoms of TB are the same in people who have HIV and people who do not. Symptoms include cough for more than three weeks, loss of appetite or weight, night sweats, tiredness, chest pain and coughing blood. People with these symptoms should go to the nearest clinic and give a sputum sample to be checked for TB. Depending on the results, a chest x-ray and sputum culture may also be done.

People with TB who also have HIV, but still have healthy

immune systems, will present a similar clinical picture as people who are not infected with HIV.

In people who have had HIV for a longer period of time and whose immune systems have been weakened, diagnosis can be more difficult. There is a higher likelihood of smear-negative pulmonary TB and extrapulmonary TB, for example TB in the lymph glands, bones, spine, kidneys, liver, intestines and skin. Chest x-ray findings in people with pulmonary TB who are also infected with HIV may not be typical (i.e. diffuse pulmonary infiltrates rather than cavitary lesions in the upper lobes). This means that TB infection may not be diagnosed straight away. This can delay treatment and increase the possibility that TB will be spread to others.

TB can be cured as effectively in HIV-positive as in HIV-negative people using the Directly Observed Treatment, Short course (DOTS) strategy. However, people who are HIV positive should not be treated using thiacetazone, because of possible side effects. An important aspect of DOTS is the support and encouragement given to the person with TB by their treatment supporter, who also observes treatment. Good nutrition and adequate rest are beneficial in the management of TB in people with or without HIV.

Prevention of TB in people with HIV/AIDS

People in high HIV-prevalence areas with TB should be offered HIV counseling and testing by a trained counselor if possible. Similarly, health workers need basic training in HIV-related counseling wherever possible. If people with TB know that they are HIV positive, it will help them to make appropriate choices and will help health care workers to provide improved care. People with HIV who have not developed TB may benefit from preventive treatment with cotrimoxazole and isoniazid. Counseling people on safer sex may also help to decrease the spread of HIV. TB preventive therapy can also decrease the risk of HIV-positive people becoming ill with TB.**HA**

Children with TB



Children with TB may have a low-grade fever, stop growing or lose weight. In the case of extrapulmonary TB, symptoms will depend on the site of the disease. A tuberculin skin test will usually show positive, although not always, and particularly not in children with HIV/AIDS. Most chest x-rays of children with TB will show enlargement of the hilar or mediastinal lymph nodes rather than parenchymal involvement as in adult TB.

Progression to disease is less frequent in young children than in adults, but when young children get TB they are more likely to develop severe forms. Children who have HIV or another immunocompromising condition or who live in resource-poor settings have a higher risk of developing TB disease. An estimated 1.3 million children under 15 in sub-Saharan Africa have HIV. There has been a rapid increase in child mortality, especially in families affected by HIV/AIDS, and it is believed that this increase in mortality is largely TB and HIV-related. Some studies in Africa have indicated that for every 100,000 children aged five, 70–80% are infected with TB and HIV. In order to prevent TB in children it is important to diagnose and treat adults. WHO recommends that once an adult has been diagnosed with TB, children who have been in contact with this adult should be identified and treated under the same program.

The choice of treatment supporter for a child is just as important as for an adult. The treatment supporter might be a health worker or someone who spends a lot of time with the child, such as an aunt, uncle, cousin or grandparent. Or the treatment supporter, especially for older children, might be a role model, someone the child respects. Health workers need to educate the supporter along with the mother or primary health care giver so that common problems and ways to deal with them can be discussed in advance. Standard TB drugs are inexpensive and well tolerated by children but can be difficult to swallow. To make this easier, medicines in tablet form, such as isoniazid, can be crushed and mixed in a small amount of fruit juice or breast milk.**HA**

Multi-drug resistant TB (MDR-TB)

WHAT IS IT?

Multi-drug resistant TB (MDR-TB) is caused by strains of TB bacteria that are resistant to at least the two most powerful first-line drugs, isoniazid and rifampicin, used to treat TB. Standard short course treatment cures fewer than half of the people with MDR-TB.

In South Africa, it is estimated that there are about 2,000 new cases of MDR-TB each year. Although people infected with HIV are not more prone to infection with MDR-TB than other people, they do progress more quickly from infection to active TB. In addition, some studies have shown a higher mortality rate in people with HIV who are co-infected with MDR-TB.

HOW DOES IT OCCUR?

Resistance occurs because some TB bacilli are naturally resistant to some drugs. If a single drug is used to treat a person with a large number of TB bacilli, only those bacilli sensitive to that drug are killed, allowing resistant bacilli to multiply. Using several drugs during the intensive phase means that the number of TB bacilli is greatly reduced before treatment moves to the continuation phase and fewer drugs are used.

There are two specific types of drug resistance:

1. **Acquired resistance** develops as a result of the wrong drug treatment (drugs used in wrong combinations or for an inadequate amount of time). Using a single drug to treat TB is the most common cause of acquired resistance. It can also develop if a person does not complete their course of treatment, for example because there is an irregular or inadequate drug supply or they stop taking the treatment before they are cured.

2. **Primary resistance** occurs when an individual is infected by someone who has drug resistant TB. This term can be used inappropriately because resistance may be a result of a previous treatment with TB that the patient has not mentioned.

HOW TO PREVENT IT?

The most important way to prevent MDR-TB is to ensure that people with drug-susceptible TB are given the correct treatment regimens and that they continue treatment until cured. Studies have shown that MDR-TB can be cured by a combination of reserve second-line drugs (amikacin, capreomycin, ciprofloxacin, cycloserine, ethionamide, kanamycin, levofloxacin, ofloxacin, para aminosalicylic acid or prothionamide). However, these drugs cause more serious side effects, have to be taken for a long period of time to prevent relapse (up to two years), and are very expensive (and therefore not available in many developing countries). WHO and its international partners have developed a special mechanism to provide low-cost second-line drugs to projects that demonstrate that they can manage people with MDR-TB effectively.**HA**

With thanks to Dr Harry Hausler, Dr Rajesh Gupta, Scientist, and Dr Marcos Espinal, Medical Officer, World Health Organization, TBS/STB/ CDS, 20 Avenue Appia, CH-1211 Geneva 27, Switzerland Fax: +41 22 791 4268

New Approaches to TB Treatment

Fixed-dose combination tablets include two or more drugs within the same tablet. The use of two-drug combinations is widespread and there is increasing use of rifampicin, isoniazid and pyrazinamide combinations. WHO and the International Union Against Tuberculosis and Lung Disease (IUATLD) now recommend the use of fixed-dose combinations. These could help to:

- increase compliance – having fewer pills to swallow makes treatment easier and reduces the likelihood that people will split doses or only take some of the pills they have been given
- make prescribing simpler
- make management of the drug supply simpler (fewer drugs to order)
- reduce the emergence of drug resistant TB by ensuring that more than one drug is used to treat TB and reducing the occurrence of incorrect drug selection.

The use of 'blister packs' (similar packaging to that used for contraceptive pills), with or without fixed-dose combination tablets, also encourages people to follow their treatment regimen.

However, there are poor quality (ineffective) fixed-drug combinations available. WHO and the IUATLD are working on ways to ensure that only good quality fixed-drug combinations are used in TB programs. Also, fixed-drug combinations are currently more expensive than the sum of the single drugs. This is likely to change as production of fixed-drug combinations increases.

Directly Observed Treatment, Short course (DOTS)

Whether people use a single-dose combination of drugs or a fixed-dose combination, one of the most important aspects of TB treatment is ensuring that people complete their course of treatment. If they do not complete treatment, although they may feel better, their TB may not be cured, and they may become ill again and continue to spread TB in the community.

WHO and the IUATLD recommend the DOTS strategy for treating TB. DOTS involves five key features:

- political commitment
- case detection using sputum smear microscopy among people with symptoms of TB
- support for people taking treatment, including direct observation of treatment
- a regular and reliable supply of free drugs
- monitoring and evaluation of the program and using the information gathered to improve the DOTS program **HA**



WHO/WPRO

DOTS: Beyond the Hype

MICHAEL L. TAN
Health Action Information Network

Much has been said about what DOTS can do for tuberculosis control but there is the danger that we overlook its limitations, and that it should be recognized as only one component of an effective tuberculosis program. Some of the limitations of DOTS that we need to address are discussed below:

First, who is reached by DOTS? This very basic question could not have been better discussed than by Paras Pokharel, a Nepali professor of community medicine, in a letter published by the British Medical Journal (October 12, 2003).

"What we forgot is whom we are treating? The people adhering to DOTS are same who would have been taken short course therapy at home by her/him self. We forgot to track people whom normal Health Care System is unable to cover for example: Mobile group, poor pocket of villages which is very far. Marginalized population whom DOTS become more expensive because of travel, food and wages in the day to visit for DOTS center located in a certain health institutions in developing countries."

Professor Pokharel notes that more than 50 percent of TB cases will probably never be reported to the health care system because of stigma attached to DOTS, because they won't queue at DOTS centers to get their medicines (preferring instead to buy TB drugs, unregulated, from private pharmacies; or seek treatment with private practitioners, with inappropriate prescriptions.)

Second, there have been concerns raised about how DOTS may be too rigid, without enough room to respond to complicated TB cases, such as military tuberculosis, tuberculosis meningitis and drug-resistant TB.

Third, the whole concept of a centralized treatment program, often around hospitals, has been criticized. Besides the added problems of people going to these centers and spending for travel and food and losing a day or two of wages, as described in Professor Pokharel's letter, there is also a more basic question about involving families and communities in TB control. DOTS reinforces the idea that health care comes only from hospitals and doctors, rather than from a more comprehensive community-based approach.

DOTS itself is commendable, but could be improved, perhaps integrated into community-based programs where local health workers could play a greater role not just in case-finding but in administering the medicines and monitoring for patient "adherence" (the more politically correct term for "compliance").

We should also be careful not to raise people's expectations about DOTS eradicating TB. History has shown, repeatedly and in different countries around the world, that TB control involves more than medicines. Unless governments deal with other factors that facilitate the spread of TB from congested living and working conditions to the high prices of medicines this white plague will continue to be a scourge for millions of people worldwide. **HA**



RESOURCE LIST

PRINTED RESOURCES

HIV Testing: a practical approach Attawell, K and Long, S, London: Healthlink Worldwide, 1999. Available from: Healthlink Worldwide, Cityside, 40 Adler Street, London E1 1EE, UK E-mail: info@healthlink.org.uk Price: free to developing countries, £7.50 to others

Under the Mupundu Tree volunteers in home care programmes for people with HIV/AIDS and TB in Zambia's Copperbelt Blinkhoff, P and others, London: Action Aid, 1999. No. 14 in the Strategies for Hope series. Available from: Teaching-aids At Low Cost (TALC), PO Box 49, St. Albans, Herts AL1 5TX, UK, E-mail: talc@talcuk.org Price: free to organisations in sub-Saharan Africa, £3.50 to others.

Interventions to reduce tuberculosis mortality and transmission in low- and middle-income countries by MW Borgdorff, et al. Bulletin of the WHO, 2002, 80 (3): 217-227 Available from: WHO, CH-1211, Geneva 27, Switzerland E-mail: publications@who.int

WHO Bulletin Volume 80(6), 2002. The whole issue focuses on TB featuring experiences from China, India, and Bangladesh. (Address above)

Stop TB Crisis in the Western Pacific Region an information packet providing an overview of the TB situation in the region highlighting high-burden countries and their progress in a snap.

A good advocacy tool. Available from WHO Regional Office for the Western Pacific, U.N. Ave., PO Box 2932, 1000 Manila, Philippines. stoptb@who.org.ph. www.who.org.ph

Guidelines for workplace TB control activities The contribution of workplace TB control activities to TB control in the community by BO Alli et al. Comprehensive approach to workplace TB control in low- and middle-income countries covering practical steps in establishing and running TB control programmes and activities. Available from CDS Information Resource Centre, World Health Organization, 1211 Geneva 27, Switzerland. cdsdocs@who.int. PDF also available.

Clinical Tuberculosis Crofton, J and others, London: Macmillan, 1992. A practical, comprehensive guide to diagnosing all forms of TB in both adults and children. This updated edition includes a section on HIV infection to TB and an outline of the WHO DOTS programme. Available in English, French, Spanish and Portuguese from: TALC (address above). Price: £3.50

Treatment of Tuberculosis guidelines for national programmes Maher, D and others Geneva: WHO, 1997. Available from: TALC (address above).

Tuberculosis control handbook Geneva WHO, 1998. A practical guide to the full range of activities – from epidemiological surveillance and political commitment to case management and the procurement of drugs – needed to control tuberculosis. Available from: WHO, CH-1211 Geneva 27, Switzerland E-mail: bookorders@who.int Price: Sw.fr. 25/US \$22.50, Sw.fr. 17.50 in developing countries

SEARO publications on HIV/AIDS, tuberculosis contains a listing of technical and advocacy materials to assist national AIDS and tuberculosis programmes in planning and implementing rational and effective strategies. Available from HIV/STI Initiative and Stop TB Programme, WHO Regional Office for South-East Asia, World Health House, I.P. Estate, Mahatma Gandhi Road, New Delhi – 110 002, India. narainj@whosea.org

VIDEO

Under the Mupundu Tree A video about volunteers in home care for people with HIV/AIDS and TB in Zambia's Copperbelt. This 35-minute video would be useful for health and development workers in many countries where volunteers are involved in community-based efforts to cope with the impact of HIV/AIDS and TB. Available in English, French and Swahili. Price: £25 for educational and charitable organizations, £35 to others, from TALC (address above).

CD-ROM

Tuberculosis Case Management CD-ROM This CD-ROM can be used to train health workers in the latest ways to diagnose and treat TB using the DOTS approach. Available from: Quality Assurance Project Center for Human Services, 7200 Wisconsin Avenue, Suite 600, Bethesda, MD 20814-4811, USA Website: www.qaproject.org Price: free to developing countries, US\$42.50 to others

ELECTRONIC MATERIALS

www.stoptb.org Information from the World Health Organization's Stop TB programme, including information on DOTS-plus projects. You can subscribe to the Stop TB e-mail mailing list at this site. Through the mailing list, Stop TB sends out weekly news and academic updates, as well as weekly web-alerts. Each month, a communiqué from the Stop TB Partnership is being issued.

www.tuberculosis.net Website with information on TB and frequently asked questions about TB. Also has training material for trainers to use with health workers (who have had some medical training).

TB-Educate Provides opportunity to ask questions, share comments, and exchange information with other subscribers about tuberculosis education and training issues. Not meant to be a forum on medical/clinical issues. To join, send a blank email to tb-educate-subscribe@cdcnpin.org or visit <http://lists.cdcnpin.org/mailman/listinfo/tb-educate>.

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