



TB Control



at a glance

Why tackle tuberculosis?

Tuberculosis (TB), a public health threat for thousands of years, remains a top killer worldwide despite the discovery 50 years ago of drugs that can cure this infectious disease. 8.5 million new TB cases developed in 2002 and over 2 million men and women died, most 15-45 years old. 95% of cases and 98% of deaths occurred in the developing world. Africa faces the highest TB rates (per population), but Asia carries the greatest absolute burden and the epidemic is worsening in other regions as well. As seen in the former Soviet republics, economic and social crises can quickly exacerbate the TB epidemic.

One third of the world's population is infected by *Mycobacterium tuberculosis (M.tb)*. By coughing and sneezing, persons with infectious TB spread TB through the air to people nearby, especially in crowded or poorly ventilated settings. In general, 90% of infected individuals harbor the bacteria but never develop disease. 10% fall ill, either soon after infection, or later in life as their immune systems become impaired or when burdened by physical or emotional stress. Without any treatment, half of those who fall ill will die. People with pulmonary TB¹ can have a range of symptoms, the most frequent of which are productive cough, fever and night sweats. Due to cultural, access and knowledge constraints, patients may delay seeking care and providers may fail to detect or treat the disease quickly, increasing the likelihood of transmitting disease, developing complications and death.

As with HIV/AIDS and malaria, the social and economic burden from TB on ill people, and on their families and communities, is enormous. Poor people are especially vulnerable to TB because of their underlying health status, living conditions, and their limited access to treatment. People who suffer from malnutrition or diseases such as HIV/AIDS or diabetes are at greater risk given their impaired ability to fight off infection and illness. Over 12 million persons are dually infected with *M.tb* and HIV worldwide. More HIV-infected persons die due to TB

than to any other opportunistic infection. Up to 60% of TB patients are HIV-positive in some Sub-Saharan African countries and the proportion is rising in Asia.

Poor prescribing, inadequate drug supply, erratic pill-taking and self-medication all have contributed to the emergence of **drug-resistant TB**. Recent standardized national surveys have documented multi-drug resistant TB (MDR-TB) strains across the globe. Patients with MDR-TB face more complex, high-cost and toxic treatment, and a higher risk of death.

As TB crosses all borders and market failures reduce the probability of effective treatment, TB treatment and control carries significant positive externalities. Increased international cooperation is urgently needed to reverse the epidemic, and move towards elimination of this ancient killer.

What to do about tuberculosis: DOTS

The World Health Organization recommends the **DOTS** Strategy as the foundation for TB control worldwide. Over 155 countries have adopted it. It aims to reduce morbidity, mortality and transmission. DOTS includes five core interventions (see table below). Large-scale implementation in low-income countries (e.g., China, India, Tanzania, Nicaragua, Vietnam, Kenya and Peru) has shown DOTS to be highly cost-effective (US\$3-7/DALY saved), and adaptable within primary care systems. Some countries facing high levels of drug-resistant disease or HIV/AIDS will need to supplement this strategy, as will low-burden countries aiming to eliminate the disease as a public health threat. The table lists specific strategies in each setting. High-burden countries are working with partners to increase financing to enable scale-up of these interventions and sharing of best practices.

¹ About half of pulmonary cases present with infectious disease identifiable in sputum examined under a microscope. About 10-12% of all TB cases present with disease in other body organs (so-called extra-pulmonary disease).

This table summarizes the core elements of the DOTS strategy and related interventions for TB control, their intended beneficiaries, and performance indicators

Objectives	Core Interventions	Beneficiaries/ Target Groups	Indicators
<p>Core DOTS interventions (all countries)</p> <p>Reduce morbidity, mortality and disease transmission such that TB no longer poses a threat to the public's health</p>	<p>A cohesive and cost-effective package of interventions specified below that is accessible through primary health care services</p> <p>This is the minimum that must be provided, with other supplementary activities possible (see other sections below)</p>	<p>Persons ill with disease, especially the poor who are at high risk and face the greatest barriers to care</p> <p>The overall population through reduced risk of exposure and burden</p>	<p>Targets:</p> <p>By the year 2005: under DOTS successfully treat at least 85% of new infectious cases detected, and detect at least 70% of infectious cases existing in the community</p> <p>2015 Millennium Development Goal: halve the prevalence of infectious TB as well as TB-attributable mortality, and begin to reduce incidence</p>
<ol style="list-style-type: none"> Mobilize resources and capacity to pursue TB control within general health system development and with community involvement Provide timely diagnosis of at least sputum-smear positive (infectious) TB patients (those most at risk of death and transmitting disease) Provide treatment to cure at least infectious cases Ensure no patient goes without medicines and reduce risk of drug resistance Track the epidemic, motivate providers and hold them accountable for their patients' care 	<ol style="list-style-type: none"> Government commitment to sustained TB control activities Case detection by sputum-smear microscopy among symptomatic patients self-reporting to health services Standardized treatment regimen of 6-8 months for at least all confirmed sputum smear positive cases, with proper case management, including direct observation, for at least the initial 2 months A system for regular, uninterrupted supply of all essential anti-TB drugs A standardized recording and reporting system that allows assessment of individual patient treatment results, as well as overall coverage and quality of the control program 	<p>Same as above</p> <p>The approach taken to pursue 2 and 3 will vary depending on available infrastructure and the target group (e.g., urban or rural population; persons in congregate settings or living under particularly strained conditions, such as prisoners or refugees)</p>	<ol style="list-style-type: none"> Existence of central TB unit, national TB control manual, and resources for core functions (training, supervision, drugs, etc.) % of smear-positive cases among all detected cases (over 50% in high burden countries) % of detected TB cases treated under DOTS strategy % of administrative units reporting stock-outs of TB drugs within a year % of administrative units reporting regularly on case detection and treatment

Objectives

Core Interventions

Strategy to harmonize/mainstream TB prevention and care into HIV/AIDS program operations and HIV/AIDS prevention and care in TB program operations

Reduce the burden of TB and HIV/AIDS in the community, and increase quality of life and life expectancy, in the population dually infected and affected by TB and HIV/AIDS.

1. Conduct surveillance of HIV in patients with TB
2. Offer routine HIV testing and counselling to TB patients when HIV prevalence is 5% or higher
3. Conduct active case-finding for TB disease among PLWHA in VCT centres, clinics and hospitals; and populations at high-risk of TB and HIV
4. Organize a continuum of prevention and care for PLWHA and PLWTB, including involvement of community health care workers
5. Provide education and communication to communities and patients on TB, HIV and their link

Persons dually infected with HIV and TB, and those with AIDS and/or active TB

The overall community

1. # and % of TB patients infected with HIV
2. # and % of TB patients being counselled and HIV tested
3. # and % of VCT clients screened for TB disease, and % diagnosed with active TB
4. # and % of HIV+ VCT clients started and completed preventive TB treatment
5. # and % of TB patients started on preventive treatment for Opportunistic Infections.
6. # of HIV+ TB patients also treated with ART

Indicators

Beneficiaries/ Target Groups

“DOTS-Plus” Strategy for areas where drug-resistant disease is prevalent (strategy being piloted)

Identify populations where drug-resistant TB is already a major threat and ensure early diagnosis and treatment for patients suffering from multi-drug resistant disease, as part of overall DOTS programs

1. Create reference laboratory capacity for drug susceptibility testing
2. Conduct standardized surveillance for drug-resistance among new and retreated TB patients
3. Provide standardized or individualized treatment, using second-line drugs, for diagnosed drug-resistant cases

Drug-resistant patients in general population and groups with high risk of developing drug-resistance (may include marginalized populations and prisoners)

Overall population in all countries aiming to prevent spread of drug-resistance

Under development, may include:

1. Proportion of detected cases with access to drug susceptibility testing when Rx regimens fail
2. Existence of drug resistance surveillance studies and analysis of trends
3. Results of treatment of multi-drug resistant cases (those resistant to at least rifampicin and isoniazid)

Enhanced TB prevention and control efforts in low-prevalence countries (TB incidence under about 20-25/100,000)

Increase the speed of elimination of TB as a public health threat through interventions that increase early detection of disease, and prevent disease among infected persons

1. Identify high-risk groups for TB infection and disease
2. Expand access to culture for early detection and treatment of disease
3. Provide treatment to prevent development of disease among those infected, often linked to other social services required for high-risk groups
4. Investigate outbreaks and reduce associated risks of exposure to disease; Patients with disease;

TB-infected persons; persons at high risk of exposure to disease; the general population

Depends on: the populations at risk and their distribution (such as contacts of infectious cases – including health workers, persons living in congregate settings, family members of TB cases etc.); immigrants from high-burden countries; and resources available to expand interventions

Where to start

Throughout the developing world, successful TB control programs have emerged where committed policy-makers, public health leaders and communities: (1) develop well-defined strategic plans that (2) begin with demonstration areas and (3) expand as trained manpower and inputs (drugs, microscopes etc.) are available and documented good results are shared. Good treatment success rates (80% or more) and detection of a majority of estimated cases in demonstration areas is needed, before attempting expansion. Demonstrating good performance can help to mobilize support to scale up and to attract those who are ill. At the same time, nation-wide efforts need to be made to reduce harm from dangerous current practices (e.g., ensuring that no patient begins therapy without all needed drugs secured, and that ineffective and wasteful practices are stopped (see Lessons learned).

How to adapt DOTS to local conditions

DOTS is a basic template that is adapted depending on a range of variables, including:

- The level and distribution of TB, HIV/AIDS, multi-drug resistant disease, etc.
- Health system organization (including the degree of decentralization, nature of financing, administrative capacity at each level, logistical systems, etc.).
- Distribution of health infrastructure, staff, and unused capacity, e.g., laboratories, health centers, hospitals, community health workers, referral services and specialists, NGOs, private providers or other interested parties.

Lessons learned

- **DO** develop delivery strategies that put the patients and their needs first.
- **DO** pursue DOTS principles within the general framework of primary health care sector programs and/or poverty reduction strategies.
- **DO** harness all stakeholders: government health services, private sector, NGOs, employers, community groups, civic leaders, patients and their families.
- **DO** provide in-service training and regular supervision to motivate staff, validate results and ensure quality.

- **DO** expect reported incidence to rise with improved case detection before it gradually begins to fall.
- **DON'T** use technology improperly or inefficiently (especially radiology, specialized laboratory testing, reserve "second-line" TB drugs, or hospitalization).
- **DON'T** expand case detection if cure rates remain low. The first priority for public safety and program quality is to ensure effective treatment before generating more demand.
- **DO** promote coverage of BCG vaccine (Bacille Calmette-Guerin) within immunization programs in moderate and high TB burden countries, but not as a TB control tool. It is effective in preventing dangerous forms of childhood TB, but children rarely develop infectious disease.
- **DON'T** expect a reversal in the epidemic overnight – TB control requires a long-term agenda and commitment.

Key documents

- WHO, Global Tuberculosis Control, 2003 Report, Geneva. WHO/CDS/TB/2003.316
- WHO, An Expanded DOTS Framework for Effective Tuberculosis Control, 2002. WHO/CDS/TB/2002.297
- WHO, Tuberculosis Handbook, Geneva, 1998. WHO/TB/98.253
- International Union against TB and Lung Disease (IUATLD), Epidemiologic Basis of Tuberculosis Control, First Edition, Paris, IUATLD, 1999.
- <http://www.who.int/gtb> for additional references on TB/HIV and MDR-TB

Key web sites

- <http://www.worldbank.org/tuberculosis>
- <http://www.who.int/gtb>
- <http://www.iuatld.org>
- <http://www.cdc.gov>
- <http://www.stoptb.org> The Stop TB Initiative is an international partnership of high TB burden governments, international and national agencies, NGOs and researchers. Stop TB aims to facilitate rapid scale-up of DOTS, and the development of new tools and approaches to battle TB disease, drug resistance and HIV-associated TB.

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Expanded versions of the "at a glance" series, with e-linkages to resources and more information, are available on the World Bank Health-Nutrition-Population web site: www.worldbank.org/hnp