

# FRAMEWORK FOR TUBERCULOSIS CONTROL IN LARGE CITIES OF LATIN AMERICA AND THE CARIBBEAN

Regional Tuberculosis Program

Pan American Health Organization (PAHO/WHO)



**Pan American  
Health  
Organization**



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**Framework for Tuberculosis Control in Large Cities in Latin America and the Caribbean**

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## Acronyms and Abbreviations

ACSM	Advocacy, communication, and social mobilization
CSO	Civil society organization
DM	Diabetes mellitus
DOT	Directly observed treatment
DOTS	Directly observed treatment, short-course (first component of the Stop TB Strategy)
ECLAC	Economic Commission for Latin America and the Caribbean
GDP	Gross domestic product
GIS	Geographic information system
HIV	Human immunodeficiency virus
HR	Human resources
LAC	Latin America and the Caribbean
MDG	Millennium Development Goals
NGO	Nongovernmental organization
PPM	Public-private mix
TB	Tuberculosis
TB/HIV	Tuberculosis/HIV coinfection
TCP	Tuberculosis control program

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## I. Introduction

Tuberculosis (TB) continues to be one of the main public health problems in Latin America and the Caribbean (LAC). Among infectious diseases in the Region, *M. tuberculosis* is one of the leading single causes of death. According to WHO estimates for Latin America and the Caribbean (LAC), in 2012 there were 263,700 new cases of TB with an incidence rate of 43 per 100,000 population. In the same year, 208,000 new cases were reported (34 cases per 100,000 population) (1), for a case detection rate<sup>1</sup> of 79%, with large variations among countries.

The Millennium Development Goal (MDG) targets for TB in 2015, as well as the targets set by the Stop TB Partnership (2), were reached in advance in the Hemisphere—an achievement partly attributable to the successful implementation of DOTS (directly observed treatment, short-course) strategies, the Stop TB Strategy, and the political commitment of the countries, reflected in the increase in national financial resources for TB control. However, in 2012, 56,000 TB cases went unreported and there were 18,000 deaths from TB, excluding those involving HIV coinfection (WHO estimates). This gap in the reporting of TB cases and related deaths can be explained by the fact that certain segments of the population are excluded or have problems accessing health services for various reasons: economic, organizational, limited coverage, private health services that do not report cases to TB control programs (TCPs), and ignorance of TB warning signs and risk factors among poor populations in general and city-dwellers in particular.

One of the challenges to TB control in LAC that PAHO has identified is rapid urban development that has brought with it the even quicker rise of slums with increasing numbers of people living in poverty and extreme poverty.

## II. Context

It is widely recognized that the TB burden is greater in urban areas than in rural zones, both in developed and developing countries. To a large extent, this is attributable to the living conditions of people in slums (3, 4, 5, 6, 7, 8).

Among the world's developing countries, the highest urbanization rates are found in LAC. Eighty percent of the population of LAC lives in cities, a percentage that doubled between 1950 and 2010. According to United Nations projections, 89% of the population of LAC will be urban in 2050 (4, 5).

The growth of urban areas in LAC countries, like in the rest of the world, has been attributed to the idea that industrialization attracts migrants from rural areas and small cities, and even across borders in the search for better quality of life, better job opportunities, higher wages, and access to different social services. Other population groups, meanwhile, are forced to migrate to cities in response to political and/or social instability (9). However, the expectation of better living conditions in cities is very far from reality, as people living in the slums of LAC countries face challenges (4, 5):

- The Americas is the **most urbanized** region in the world. In 2010, 82.1% of the population of North America and 79.4% of LAC were living in urban areas. It is expected that by 2025, nine of the 30 biggest cities in the world will be in the Americas: São Paulo (Brazil), Mexico City (Mexico), New York (United States), Buenos Aires (Argentina), Los Angeles (United States), Rio

<sup>1</sup> Case detection rate is the percentage of TB cases reported in a given year with respect to the WHO estimate for the same year.

de Janeiro (Brazil), Bogotá (Colombia), Lima (Peru), and Chicago (United States). While the relative incidence of urban poverty in the Region fell from 41% in 1990 to 29% in 2007, the absolute number of urban poor, paradoxically, rose from 122 to 127 million. Everything indicates that, in the coming years, cities will continue to be home to populations living in different degrees of poverty and vulnerability.

- On the whole, the cities of LAC are the most inequitable in the world (4, 5, 10). Economic activity is concentrated in the cities and 60-70% of gross domestic product (GDP) is produced there. However, one out of every four urban dwellers is poor due to rising inequity: a large number of big cities, including Belo Horizonte (Brazil), Lima (Peru), and Bogotá (Colombia) have a Gini coefficient (measure of inequality)<sup>2</sup> higher than 0.6.
- 27% of the population lives in slums (117 million people), with major variations both among and within countries (4). Brazil and Mexico account for 54% of the urban population of LAC, with 45 and 12 million inhabitants, respectively, living in informal settlements. In Belize, Guatemala, and Peru, over 50% of the urban population lives in slums (4, 5).
- The accelerated growth of slums involves an invasion of agricultural and other areas geographically unsuitable for human settlement. This leads to environmental and ecological changes that cause greater vulnerability to natural disasters and environmental pollution, negatively impacting the health and economy of the people living there.
- Despite improvements in the provision of drinking water, sewerage, and electricity in LAC countries, a large part of the urban population remains without these services. In particular, there are critical shortages of drinking water in poor areas of big cities. Sewerage coverage is very precarious in these areas, standing at under 50% in 10 LAC countries in 2010 (4, 5).
- In big cities, slums are the areas with the highest population density. In general, dwellings do not meet the minimum recommended building standards and there is high risk of pollution, slippage, and/or collapse. It is estimated, for example, that 70% of the dwellings in the São Paulo area do not comply with the building code (11). Furthermore, several families often live in a single dwelling, resulting in serious overcrowding and precarious water, sanitation, and basic electricity services. Housing conditions are an indicator of socioeconomic health and well-being because sub-standard, overcrowded dwellings are linked to poverty, specific ethnic groups, and greater susceptibility to diseases, including TB (12).
- In general, cities do not have the economic capacity to create enough jobs to keep pace with population growth, which results in high rates of unemployment and informal work. For example, in 2007 the unemployment rate topped 10% in São Paulo, Buenos Aires, Bogotá, San José (Costa Rica), Porto Alegre (Brazil), Montevideo (Uruguay), Quito (Ecuador), and La Paz (Bolivia). In 2007, informal work in urban areas was estimated at 57% (4, 5).
- The world's highest crime rates are found in several LAC cities, including Ciudad Juárez (Mexico), San Pedro Sula (Honduras), Caracas (Venezuela), Chihuahua (Mexico), Guatemala City (Guatemala), Mazatlán (Mexico), Culiacán (Mexico), and Medellín (Colombia). Violence and organized crime take a high toll on all cities and on countries in general, hindering social

<sup>2</sup> The Gini coefficient measures inequalities, especially in terms of income. It is expressed on a scale of 0 to 1, where 0 represents perfect equality and 1 indicates perfect inequality.



development and the quality of life of their inhabitants, generating more poverty and therefore greater vulnerability to different diseases (13).

The epidemiological situation of TB in large cities is no different in other regions of the world. In the European Union, where many countries are advancing toward TB elimination, there is a documented concentration of TB cases in big cities and their metropolitan areas, especially among high-risk groups living there. Some big cities in countries with a low incidence of TB (<20 cases per 100,000 population) have incidence rates that more than double the national rate. TB incidence in Birmingham is four times higher than the national rate; in London and Rotterdam it is three times higher; in Copenhagen, Paris, Milan, and Turin it is 2.8 times higher; and in Rome, it is 2.5 times the national rate. Factors associated with high case-reporting in big European cities are a large proportion of immigrants from high-incidence countries and TB outbreaks among homeless people and drug and alcohol users (6, 7, 8).

### III. Justification

Specific measures for TB prevention, diagnosis, and treatment are implemented in LAC in accordance with the Stop TB Strategy (14). These measures have helped reduce incidence and mortality rates in most countries; however, there is little documentation on experiences with TB control in big cities. This document proposes a strategic methodology for TB control with stages and activities that facilitate comprehensive health care with an interprogrammatic and intersectoral approach coordinated with different actors and sectors. These stages and activities include addressing the main social determinants of health that foster and exacerbate endemic TB infection, especially in populations living in urban slums (15, 16).

### IV. Main barriers to TB control in large cities

In the big cities of LAC, TB control is conditioned by sociopolitical, environmental, economic, and structural features of the health system, and by barriers related to behaviors and lifestyles of the different populations. The following are among the most significant barriers documented in LAC:

1. **Fragmentation and multiplicity of health providers.** The health-care structure in LAC countries and cities is fragmented, with multiple providers and a lack of mechanisms to coordinate them. The main providers include: (i) public sector providers which—like national tuberculosis programs (NTPs)—are dependent on health ministries; (ii) services dependent on municipalities; (iii) social security providers; (iv) providers in the prison system dependent on justice or defense ministries; (v) not-for-profit health-care providers (NGOs, churches, foundations, private insurance, etc.); and (vi) for-profit health-care providers (private, traditional, pharmacies, and others). The fragmentation and lack of coordination contributes to the fact that most providers—both public and private—fail to comply with national TB regulations (17).

Large cities typically have tertiary-level health services such as national institutes, national reference hospitals dependent on ministries of health, hospitals dependent on social security networks, university hospitals, and private hospitals. In general, these entities follow clinical protocols rather than the country's national standards. They do not coordinate their work with each other or with the secondary or primary care levels. This situation results in few or no referrals to secondary- or primary-level services located near patients' homes, which, in turn, leads to insufficient monitoring of TB treatment, high dropout rates, and unscreened patients.

This situation is accompanied by a high risk of in-hospital transmission due to the presence of TB patients in hospital areas (18, 19).

2. **Multiple health authorities.** One barrier to be addressed is the existence of health services that respond hierarchically to different authorities (ministry of health, social security institute, municipality, state government, etc.) whose policies and priorities sometimes differ from national priorities. TCPs generally have little influence on these health sectors and no relationship with the corresponding authorities. Coordination among these different authorities will make it possible for them to include TB control in their health agendas and for their service networks to comply with national TB control standards (3).
3. **Lack of comprehensive health services** in marginalized populations who are vulnerable not only to TB, but also to diabetes mellitus (DM), HIV infection, malnutrition, obesity, alcoholism, illegal drug use, and childhood illness, among other problems that are treated under public health programs implemented at different levels of care (not always at all levels of care, as is the case with TB). This generates high costs and long time frames both for the health system and patients.
4. **Diverse patient populations.** Large urban areas are home to different ethnic (racial, religious, and linguistic) populations that not only have their own beliefs, habits, and customs, but also frequently settle in poor, marginalized areas. These ethnically diverse groups, like other populations vulnerable to TB, suffer inequity, discrimination, and limited access to health services. Health services and TB prevention, diagnosis, and treatment activities are usually inadequate to the needs of these populations (20; 21).
5. **Poverty and marginalization** among slum dwellers, which impedes access to health care, and specifically, to TB diagnosis and treatment. There is evidence that sick people living in the streets, minorities who speak different languages, and indigenous people suffer discrimination by health workers when seeking health care, which discourages them from continuing to do so. It is known that illegal immigrants have difficulty accessing TB diagnosis and treatment, with high risk of abandonment and treatment failure (20).
6. The lack of an **intersectoral approach** to improving basic living and health conditions for people living in slums in large cities, including access to basic services (water, sanitation, and electricity, etc.), safe and healthy housing and living environments, and health services appropriate to their needs. Improvements in living conditions and a resulting reduction in infections and tuberculosis can be achieved through the engagement of different sectors, including the ministries of justice, housing, education, environment, and economy.
7. **Violence in large cities** of LAC, secondary to the social pathologies that lead slum populations to crime, drug addiction, and alcoholism. This not only reduces quality of life, especially for women and children, but also hinders the regular operation of health services, which become less accessible, either in terms of location (far from marginalized areas) or schedule—or else they simply do not exist. This phenomenon is spreading quickly in several LAC countries and constitutes a problem for TB control in big city slums (5; 13). The Region's big cities concentrate large prison populations, with varying degrees of overcrowding in penitentiaries. These centers, considered TB reservoirs, are a threat to the general population, since prisoners, visitors, and prison workers are all exposed to the disease (22).

## V. Stages in the framework for TB control in large cities

In addition to implementing the Stop TB Strategy (14), efficient TB control in large cities requires activities that include the different health authorities, the various sectors of central, local, and municipal governments, all health providers, and communities in the large cities (3). The main purpose of implementing the framework is to reduce TB incidence and mortality, and the suffering of populations with high vulnerability to TB in large cities. To accomplish this, the framework has the following stages:

1. Strengthen political commitment at the national and local levels, and coordinate the different health authorities
2. Conduct epidemiological mapping of the TB situation in cities and identify at-risk populations
3. Survey and map the health system and existing health-care providers
4. Adapt health care to the needs of the populations at risk
5. Take an interprogrammatic approach to TB control to guarantee comprehensive patient care
6. Take an intersectoral approach to TB control and include TB in social protection programs
7. Promote civil society engagement in TB prevention and control activities
8. Establish a routine monitoring and evaluation system

These are essential, sequential stages that identify TB prevention, diagnosis, and treatment activities in urban populations aimed at meeting the targets established by each country for the reduction of TB incidence and mortality.

### 1. Strengthen political commitment at the national and local levels, and coordinate the different health authorities

Tuberculosis control programs (TCPs) should engage in advocacy at the highest levels: central (ministers of health), regional (governors), and local (city mayors and municipal councils), with a view to putting TB on health agendas where issues such as the disease control budget and legislation are central to discussions.

Experiences of successful TB control initiatives in urban areas show the importance of the ministries of health and local governments (regional, departmental, and/or municipal), and the value of coordinated participation by the different authorities. There is a recognized need to incorporate TB control into local health agendas, including the application of regulatory measures to increase the quality of care and involvement of the different actors and health-care providers in the cities (3; 23).

TB control in urban settings requires that TCPs be strengthened at the national, subnational, and local levels, especially the teams in charge of TB control in cities. It is also necessary to strengthen routine prevention, diagnosis, and treatment activities, which should be appropriate to cities, respecting and following national and international standards for TB care (24; 25).

The following activities are suggested with a view to ensuring political commitment and coordinating the different authorities:

- 1.1. Create a TB working group in the targeted cities, coordinated by the national and local TCP. This group should bring together representatives of scientific and academic associations, technical

and financial partners, the private sector, and NGOs, as well as community leaders and/or civil society representatives, among others.

- 1.2. Define the functions of the working group: (i) advocacy aimed at obtaining political commitment from national and local authorities to guarantee trained human resources for the teams that lead the TCPs in cities, as well as the necessary financial resources; (ii) strengthening regulatory aspects such as prohibiting the free, indiscriminate sale of anti-TB drugs in private pharmacies; ensuring that national standards are followed by the different health-care providers, especially hospitals; (iii) proposing or giving recognition and awards to leaders in TB control (3).
- 1.3. Establish or strengthen levels and mechanisms for coordination between the ministry of health/TCP and the different health authorities in the cities.
- 1.4. Establish a joint work agenda between the TCP and the local health authorities to address the difficulties involved in TB control in the city, for example: compliance with standards; compulsory notification of every patient with TB by all public and private providers and laboratories; ensuring diagnostic quality by strengthening the laboratory network and offering quality control services to private laboratories; and ensuring implementation of TB control activities, especially in hospitals (24).

## 2. Conduct epidemiological mapping of the TB situation in cities and identify at-risk populations

Large cities are homes to hundreds of thousands if not millions of people, making it impossible to standardize work throughout an entire city. For this reason, it is imperative to conduct epidemiological mapping of TB (new cases of TB and incidence rate, deaths from TB and mortality rate) at the sub-municipal level (according to geographic/political boundaries or the structure of health systems). For practical purposes, we will call these sub-municipal levels “*units of analysis*.” Analyses will also include the social, economic, and health variables that make it possible to conduct epidemiological mapping of the city and of the social determinants of health, and that identify the urban areas primarily affected by TB. In cities or countries with insufficient epidemiological data, identifying the poorest, most densely populated areas will be an alternative priority. The mapping process should identify the specific characteristics of the communities in the units of analysis, such as the presence of minority populations and ethnic diversity (20; 26), TB risk factors prevalent in these populations (HIV/AIDS, diabetes mellitus, alcoholism, drug addiction, smoking, etc.) (15), and specific living conditions that predispose people to high TB risk, such as prisons, shelters, and homelessness. (27). This information will be the basis for designing interventions based on priorities and the specific characteristics of the populations. In coordination with the health authorities, the TCP should:

- 2.1 Conduct epidemiological mapping and map the social determinants of health in order to identify priority units of analysis for intervention.
- 2.2 Reorganize and/or strengthen the TCP team at the sub-municipal level, especially in units of analysis with high TB rates, where intervention is required.
- 2.3 Prepare an intervention plan for the units of analysis, based on existing epidemiological and operational achievements and challenges in TB control, and on the characteristics of their populations.

### 3. Survey and map the health system and existing health-care providers

In the developing countries of LAC there is usually little information on the make-up of the urban health systems. In general, information comes from the public sector and the social security system, but not from the non-government (private nonprofit and for-profit) sectors, creating the need for an inventory and mapping of existing providers in the units of analysis. Information such as the links between different providers, the populations they serve, and the role they play in TB control (diagnosis, treatment, referral of patients with respiratory symptoms, etc.) is of interest for interventions. Mapping makes it possible to determine the number and composition of the different providers, the populations served, and areas that are unprotected or are served by NGOs or faith-based organizations and other social support networks often found in slums (3). In addition to basic care facilities, mapping should include large hospitals and tertiary health facilities where most urban medical consultations are held, usually including the poorest populations (18; 28; 29). The next step is to understand how the different providers are coordinated; how the municipal and Ministry of Health service networks operate; the linkages between these networks and those operated by the social security system, penitentiaries, and private health-care providers; and the mechanisms for referrals and counter-referrals between the public services and other sectors. Mapping should also identify TB diagnosis and treatment practices in each sector, and TB drug management in health facilities and private pharmacies (30). Geographic information systems (GIS), used to geo-reference health providers, health-care networks and TB cases, are useful for data storage and study, for planning programmatic activities, and for epidemiological surveillance (31).

The following activities are involved in surveying and mapping health providers:

- 3.1 Prepare an inventory and map the location of health providers at all levels of care, including basic care. Identify the existing health-care networks and social support networks, and the links among them.
- 3.2 Study public and private sector coverage in slums and identify populations without access to health care or with poor access.
- 3.3 Review and evaluate TB diagnosis and treatment practices in the different health sectors, including the lag times both for drug-sensitive and drug-resistant TB, in order to identify needs related to training, updating national standards, and compliance with national and international standards for tuberculosis care (23).
- 3.4 Monitor large hospitals—especially public hospitals—in order to determine their TB control activities and infection control measures, and how they manage the TB-related social determinants of health such as TB/HIV (32), diabetes mellitus (33), alcoholism, smoking, and malnutrition, and to identify ways to include and train staff in the use of national TB control guidelines and operational protocols for interprogrammatic work, among others.

### 4. Adapt health care to the needs of the populations at risk

In cities, the main objective of any intervention is to provide prompt, quality health care to every TB patient. To accomplish this, it is necessary to identify the neediest populations and the barriers they face in terms of access to health facilities. The main barriers are: (i) financial: including consultation costs, purchase of anti-TB drugs and TB treatment accessories (antitussive, antipyretic drugs, etc. ), and the cost of repeat visits, including loss of working

hours; (ii) supply gap: nonexistence of health facilities, especially in slums; consultation schedules that do not meet the needs of the population; (iii) organizational: resulting from the fragmentation and segmentation of services, e.g. poorly organized diagnostic activities and TB treatments (transportation of sputum samples to the laboratory network, timely delivery of results to health workers and patients, nonexistence of anti-TB drugs to start or continue treatment), and poorly established referral and cross-referral processes; and iv) cultural and linguistic: services inappropriate to ethnic diversity and to the needs of women and children (gender inequity), among others. Addressing these barriers requires the engagement of public and private providers, including pharmacies; social, charitable, and faith-based organizations; and health workers in different industries and in places where special populations congregate, such as homeless shelters. When the access barriers have been identified and slum populations have been characterized, health care should be adapted and organized accordingly.

The following activities should be carried out to accomplish this:

- 4.1 Study the main barriers against access to health care in the target populations, taking into account ethnic and gender diversity.
- 4.2 Prepare an action plan to address the identified barriers, favoring the decentralization and organization of TB diagnosis and treatment close to where patients live; activities to strengthen the laboratory network (organization of transportation of samples and laboratory results). Treatment should involve all health services accessible to the poor and to the community in order to guarantee directly observed treatment (DOT), referral and counter-referral mechanisms within the health system, etc.
- 4.3 Adapt health care to the needs of the population, e.g. hours open to the public, preferred types of care (according to cultural norms, language, etc.).
- 4.4 Introduce community-based health-care strategies (community health workers, community volunteers) for TB diagnosis and treatment where no health services exist (23; 34; 35).
- 4.5 Carry out advocacy, communication, and social mobilization (ACSM) activities aimed at community education, early consultation for respiratory symptoms, and improved health care.
- 4.6 Develop a TB health education plan for all patients, taking into account the characteristics of the different vulnerable populations (36).
- 4.7 Identify and offer incentives to TB patients through food baskets, reimbursement of transportation costs, financial support for job training, participation in programs to set up micro-businesses, etc. (37).

## **5. Take an interprogrammatic approach to TB control to guarantee comprehensive patient care**

Interprogrammatic work for the comprehensive care of TB patients is a necessary part of a TCP because slum populations are vulnerable to TB and other diseases. The comprehensive approach can be introduced in health facilities through operational protocols, including: for TB/HIV coinfection, in accordance with the “WHO Policy on Collaborative TB/HIV activities” (32), and the integration of TB and HIV services (38; 39); for diabetes mellitus (DM), in accordance with the “Collaborative Framework for Care and Control of TB and Diabetes” (33) and its operational use to actively diagnose TB among people with diabetes, and to diagnose diabetes

among TB patients; coordinated work with mental health programs for the cessation of alcohol and illegal drug use; with anti-smoking, health promotion, and other programs (40). Different programs (TB, health promotion, DM, social service, etc.) are often provided in the same health facilities, often by the same personnel. Accordingly, comprehensive care will reduce costs for patients and for health services and can help improve the quality of health care. The following activities are recommended:

- 5.1 Develop operational protocols to integrate TB and HIV care which define the duties and responsibilities of each program, as well as operational protocols for TB/DM management; and establish levels of coordination with health promotion, mental health, and anti-smoking programs, and others.
- 5.2 Train health workers in the use of the interprogrammatic operational protocols and diagnostic algorithms included in the national TCPs.
- 5.3 Conduct operational studies of: the gaps in TB control in cities; TB-related mortality; and the impact of interprogrammatic work on the quality of care, on costs, and on TB case-finding; gender and TB, etc.

## **6. Take an intersectoral approach to TB control and include TB in social protection programs**

Social protection is a basic right of all individuals. It is considered an instrument for the promotion of human well-being and social consensus, favoring social peace, equitable growth, social stability, and economic performance. Social protection guarantees basic social services and benefits that include income security (for unemployed people, older persons, disabled people, pregnant women, and children), and access to health care and essential social services (education, housing, and basic sanitation). Social protection floors represent minimum levels of income security established at the national level. These take the form of several types of social transfer and include access to essential social services (41).

The current approach to social protection is characterized by combating poverty in the short and long term and strengthening human capital in order to prevent the intergenerational transmission of poverty. This is accomplished using different tools: i) cash transfers to increase earnings; ii) making transfers conditional on the use of certain social services; and iii) targeting poor and extremely poor households. These are attempts to tackle poverty and combine noncontributory social protection with social promotion (to promote health, nutrition, child schooling, etc.) and to carry out interventions on an intersectoral basis (42; 43; 44). The beneficiary populations of these social protection programs converge with those affected by TB, benefitting TB patients and their families.

ECLAC recognizes that achieving substantial improvements in public health and social protection requires policy interventions that go beyond the health sector—including housing, food security, infrastructure, drinking water, and sanitation, among others—as well as transformations in the organization, financing, and provision of priority health services, according to the realities and capacities of each country (45).



LAC countries have well-defined TB control activities designed to diagnose and treat patients according to the Stop TB Strategy, resulting in reductions in TB incidence and mortality. However, *M. tuberculosis* transmission in the community and the susceptibility of infected populations to developing the disease largely goes beyond the competencies of the health sector. Accordingly, organizational and structural factors in urban slums can be addressed through participation and coordination between the TCP and other ministries (housing, education, environment, justice, etc.), as well as with city authorities (sanitation, drinking water supply, roadways, urban cleaning and waste collection, development and maintenance of green spaces, and other areas that involve improving people's quality of life).

Within this framework, TB will be addressed as a component of social protection through conditional cash transfer and health insurance programs, through access to social services with an intersectoral approach, and through improved housing under specific programs that already exist in the countries.

In order to include TB in social protection programs and to take a multisectoral approach to TB control, the following should be considered:

- 6.1 Make a list of the existing social protection programs in the country and cities (conditional cash transfer programs, comprehensive health plans, and other social programs), their facilities, and registration requirements.
- 6.2 Identify opportunities to register patients and their families in social protection programs.
- 6.3 Use community-based organizations to involve the community and persons affected by TB and, in coordination with the TCP, carry out advocacy for the inclusion of TB patients and their families in social protection programs.
- 6.4 Identify opportunities for coordination with other sectors of the central and local governments (intersectoral meetings and boards), where officials responsible for TB and community leaders can help put a discussion of TB on the agenda, identifying it as a social disease caused by underdevelopment and poverty (46).
- 6.5 Include TB control in the development plans of different sectors.
- 6.6 Establish a multisectoral committee that specifically addresses TB with the support of regional or national networks working in housing, transportation, employment, education, and other sectors.

## 7. Promote civil society engagement in TB prevention and control activities

In LAC countries there is broad community engagement in TB prevention and control activities, especially in terms of raising community awareness, support for detection activities, and supervision of treatment. More recently, communities have also been engaging in the promotion of intersectoral activities aimed at action on the social determinants of health for persons affected by tuberculosis and the most vulnerable communities. However, coordinated efforts with the health authorities do not exist in all countries, thereby wasting great potential to synergistically meet the needs of persons affected by tuberculosis. In the areas of greatest vulnerability in the large cities, there are civil society organizations (CSOs) working independently or in minimal coordination, many with great potential to conduct TB prevention and control activities. These organizations—some created by former TB or HIV patients—are



made up of community members or parent/teacher associations, engaging in activities that range from community mobilization to the provision of services and technical assistance (47).

The potential for CSOs to engage in TB control activities lies in where these organizations are located, their understanding of the local context, and their ability to reach highly vulnerable social groups. Recognition of their role and their formal engagement in the task of correcting programmatic shortcomings in the communities will make it possible to expand the scope of TB prevention and treatment activities (48). CSOs can participate in a wide spectrum of community activities coordinated with TB control programs and certain NGOs that work locally: these include prevention, detection, diagnosis, patient care, and adherence to treatment, all of which have a positive impact on the outcomes of drug-sensitive and drug-resistant TB, and TB associated with HIV and other comorbidities (44).

The following activities are proposed to promote the engagement of CSOs and to coordinate their work in TB prevention and control activities and in other intersectoral activities:

- 7.1 Conduct a situation analysis to identify the needs and specific tasks that would require community activities to be integrated into TB prevention and control programs.
- 7.2 Prepare an inventory and mapping of the location of civil society organizations, NGOs working in health and in poverty reduction, and social support networks that provide services in the geographic area identified.
- 7.3 Identify which CSOs and NGOs are already working on tuberculosis and which are interested and have the capacity to do so.
- 7.4 Promote their inclusion on intersectoral boards for TB prevention and control in order to generate synergy with other government and nongovernment actors.
- 7.5 Identify opportunities for strengthening CSOs to optimize their actions and their capacity to coordinate with other actors.

## 8. Establish a routine monitoring and evaluation system

There are many anecdotal experiences with TB control in large urban areas, generally involving specific interventions. This framework is presented as a proposal that includes stages and activities to be used to prepare a work plan for TB control in large cities. TB control targets should therefore be clearly identified in accordance with each country's strategic plan for TB, with the operational plan for cities, and with the identified social determinants that involve different health programs and different sectors.

Record-keeping and information systems are well established and in use in all the countries of the Americas; however, not all of them include variables related to risk factors, access to health care, and the socioeconomic condition (social gradient) of patients—variables that are collected and therefore available in cities. This information can be accessed in many national systems, but is almost never used by TCPs. Implementation of the framework should strengthen the record-keeping and information system in cities, as well as its analytic use.

The personnel in charge of TCPs in cities should:

- 8.1 Prepare a monitoring and evaluation plan in accordance with national standards, including variables and indicators for each stage of the framework. This will make it possible to document the contribution of each stage and to evaluate the impact of the interventions, creating evidence to support the expansion of activities to other cities.
- 8.2 Implement and adapt the record-keeping and information system so that all providers of TB diagnosis and treatment services report and evaluate TB cases.
- 8.3 Hold periodic meetings to monitor the implementation of the different stages and activities, with the participation of all actors.
- 8.4 Hold meetings to analyze information with a view to improving or introducing new initiatives to meet the projected TB control targets.
- 8.5 Establish a network or committee (TB observatory) made up of different entities interested in collecting and studying TB-related information that strengthens the evidence on the causes of TB.
- 8.6 Disseminate operational and epidemiological achievements to ensure the sustainability of activities undertaken with increased national and local funding, while also guaranteeing the continued involvement of other sectors.
- 8.7 Plan the subsequent expansion of activities to other “units of analysis” in the same city or other cities.

## VI. Final notes

This “Framework for TB Control in Large Cities” is based on specific experiences of TB control in cities, the work of TCPs in vulnerable populations in LAC, scientific publications on the factors facilitating the epidemic (social determinants of health and TB), and a proposal prepared by WHO (3). The implementation of this framework will be the first time in the world that a systematic approach has been taken to TB control in cities. As a result, during its implementation and evaluation process it is expected that changes or adjustments will have to be made to the stages and activities, depending on the evidence produced.

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## VIII. Annex 1. Detailed activities in the framework

### 1. Strengthen political commitment at the national and local levels, and coordinate the different health authorities

Activities to implement:

- 1.5. Create a TB working group for cities, under the coordination of the national and local TB control programs (TCPs). This group should bring together representatives of scientific and academic associations, technical and financial partners, the private sector, and NGOs, as well as community leaders and/or civil society representatives, faith-based agencies, etc.
  - 1.5.1. Define the functions of the working group:
    - 1.5.1.1. Prepare advocacy tools, in economic terms, aimed at obtaining political commitment from national and local (city) authorities: (i) years life lost; (ii) costs of diagnosis and treatment; (iii) impoverishment due to direct and indirect expenditures and morbidity; (iv) financial loss due to morbidity and mortality, etc.
    - 1.5.1.2. Engage in direct advocacy with local health authorities to strengthen the NTP in the city by providing trained human resources (municipal and sub-municipal levels) and financial resources in accordance with the cities' TB control plan, etc.
    - 1.5.1.3. Propose regulatory aspects such as prohibiting the free and indiscriminate sale of anti-TB drugs in private pharmacies; monitor compliance with national standards by the different providers, especially hospitals; establish compulsory reporting of every TB case diagnosed in the public and private sectors, including private laboratories.
    - 1.5.1.4. Promote the work of health professionals, community workers, academics, and others, through public recognition, awarding of prizes, etc.
- 1.6. Establish levels and mechanisms for coordination between and among the different health authorities and the NTP, including the following methodological steps:
  - 1.6.1. Study the National Health Plan and identify the component(s) of the plan that refer (explicitly or implicitly) to TB control.
  - 1.6.2. Study the country's Strategic Plan for TB control and its inclusion in the National Health Plan.
  - 1.6.3. Identify all health authorities in the country: ministry of health; different health insurance plans; local health authorities; state, provincial, or municipal health authorities; health authorities under the ministries of justice or defense (prisons), and others.
  - 1.6.4. Review health plans in the health sectors to which the different authorities belong, with emphasis on the prevention and control of communicable diseases (if TB is specifically mentioned), and identify opportunities to raise the profile of TB in health plans and introduce concrete activities.
  - 1.6.5. Convene and hold coordination meetings with all identified authorities to discuss the challenges of TB control in cities, the possible role and contribution of each health authority, and possible agreements to improve control.
  - 1.6.6. Establish a joint work agenda between the NTP and health authorities to address the detected difficulties facing TB control in the city (compliance with standards, compulsory reporting of TB cases by all providers and laboratories, strengthening of

the laboratory network--inclusion of laboratories from different services in the national TB laboratory network, and ensure implementation of TB control activities, especially in hospitals).

- 1.6.7. Propose a draft document containing agreements, to be signed later.
- 1.6.8. Hold periodic meetings (1 or 2 per year) with the different health authorities for the monitoring and evaluation of the agreed activities.

## **2. Conduct epidemiological mapping of the TB situation in cities and identify at-risk populations**

Activities to implement:

- 2.1. Carry out epidemiological mapping and identify the priority “units of analysis” for intervention:
  - 2.1.1. Identify units of analysis in the cities in order to collect information on each of them.
  - 2.1.2. Collect and study general information on health care, TB-related epidemiological and operational information, and socioeconomic data on each unit of analysis.
  - 2.1.3. Identify, for intervention, the unit(s) of analysis with highest incidence or burden of TB.
  - 2.1.4. Identify, within the units of analysis, the areas with the highest population density (slums).
  - 2.1.5. Identify slum populations, with special emphasis on ethnic minorities (migrants, indigenous people, afro-descendant populations, etc. ) and populations with high prevalence of TB risk factors, such as HIV-positive persons, diabetics, users of legal and illegal drugs, malnourished people, and people living in special conditions (prisoners, people living in shelters, homeless people, etc.).
- 2.2. Reorganize and strengthen the staff in the city’s TB control program team and the intermediate levels of the health network.

## **3. Survey and map the health system and existing health-care providers**

Activities to implement:

- 3.1. Prepare an inventory and map the location of formal and informal health-care providers. Identify the existing health networks and the links among them, and the role they play in TB control: diagnosis, treatment, monitoring, referral, etc.
- 3.2. Study, based on the mapping, public and private coverage in slums and identify populations without access to health care or with poor access.
  - 3.2.1. Identify (formal and other) health providers in slums and those that should be included in the services network.
  - 3.2.2. Identify slums that do not have health services.
- 3.3. Review TB diagnosis and treatment practices in the different health sectors:
  - 3.3.1. Prepare a matrix of the different DOTS activities (PPM initiative) implemented by providers who should be included in TB activities (usually in slums).
  - 3.3.2. Prepare a plan to address the need to include the different providers in the matrix (PPM training/updating on national and international standards/regulations for TB care, operational protocols for interprogrammatic work by the different health providers, information system, etc.).



- 3.4. Conduct a survey of public and private hospitals to identify TB control activities (prevention, detection, and treatment), infection control measures, management of the social determinants of TB (e.g. HIV, DM, alcoholism, smoking, malnutrition, etc.); and prepare the PPM matrix and a training plan.

#### **4. Adapt health care to the needs of the populations at risk**

Main activities to implement:

- 4.1. Study the main barriers against access to health care in the target populations.
  - 4.1.1. Discuss methodologies for local-level intervention: qualitative research with key people (experts in health systems and primary health care, community leaders, representatives of community organizations) to identify the barriers against access to health care; qualitative studies (focus groups) of representative samples of TB patients, or other methodologies.
- 4.2. Prepare a plan to address the different barriers, including:
  - 4.2.1.1. Strengthening the laboratory network to favor decentralized diagnosis (organization of transportation of samples and laboratory results), the incorporation of new diagnostic methodologies, and the inclusion of all laboratories in the quality assurance system.
  - 4.2.1.2. Decentralizing TB treatment; strengthening patient referral and counter-referral processes and information systems; adapting referral and counter-referral tools; and establishing mechanisms for monitoring transferred patients.
  - 4.2.1.3. Preparing directories of existing health facilities with TB control activities that are at the disposal of the entire health system.
  - 4.2.1.4. Introducing different forms of directly observed treatment (DOT) supervision, involving community health workers, religious leaders, health services in factories, etc.
- 4.3. Adapt health care to the needs of the population:
  - 4.3.1. Prepare a plan to adapt health care to the characteristics and needs of the populations (adjusting the hours open to the public to the needs of the population, respecting the cultural preferences of the population and adapting health care accordingly, ensuring gender equity in health care, etc.).
- 4.4. Introduce community-based health-care strategies (community health workers, community volunteers) for TB diagnosis and treatment where no health services exist.
  - 4.4.1. Identify poor populations without access to health facilities, based on results of mapping health providers.
  - 4.4.2. Hold meetings of different health sector representatives (experts in health services and primary health care), different authorities (ministries of health, city and state governments), civil society representatives, community leaders, and institutions that work with these populations (faith-based organizations, ministry of education, and others) to define methods and strategies for TB control in light of the shortage of health services.
  - 4.4.3. Discuss community participation and how the community is organized for the early diagnosis of TB and for DOT, its linkage and coordination with the health system, and the roles and responsibilities of the TB control programs; and prepare a joint inter-institutional plan with the community.
- 4.5. Develop a plan for advocacy, communication, and social mobilization aimed at community education, early consultation for respiratory symptoms, and improved health care.

- 4.6. Develop a TB health education plan for all patients, taking into account the characteristics of the different vulnerable populations.
- 4.7. Identify patients and offer them incentives for consultations for respiratory symptoms (free consultation services for patients with respiratory symptoms) and for continuing TB treatment, using food baskets, reimbursement of transportation costs, financial support for job training, etc.

## **5. Take an interprogrammatic approach to TB control to guarantee comprehensive patient care**

Interprogrammatic work for the comprehensive care of TB patients is a necessary part of NTPs because slum populations are vulnerable to TB and other diseases. The comprehensive approach can be introduced in health facilities through operational protocols and the integration of TB and HIV services; and through coordinated work with mental health programs for the cessation of alcohol and illegal drug use, and with anti-smoking, health promotion, and other programs.

The recommended activities are:

- 5.1. Develop operational protocols to integrate TB and HIV services which define the duties and responsibilities of each program, as well as operational protocols for the management of associated TB/DM and TB/tobacco use; and establish levels of coordination with health promotion and mental health programs.
  - 5.1.1. Implement the 12 WHO TB/HIV collaborative activities.
  - 5.1.2. Adapt and implement the protocol prepared by PAHO for integrated TB and HIV services.
  - 5.1.3. Prepare operational protocols for joint management of TB/DM with the programs for DM and other comorbidities.
  - 5.1.4. Coordinate and define responsibilities for the care of patients with TB and other comorbidities with programs for chronic noncommunicable diseases, DM, tobacco, mental health, nutrition, etc.
- 5.2. Prepare and train health workers in the use of the diagnostic algorithms included in the NTPs and in the operational protocols for interprogrammatic management of TB/HIV, TB/DM, and other comorbidities.
- 5.3. Conduct operational studies of: the gaps in TB control in cities; TB-related mortality; the impact of interprogrammatic work on the quality of care, on costs, and on TB case-finding; gender equity in TB care; as well as other studies prescribed by the NTP for each stage of the framework.

## **6. Take an intersectoral approach to TB control and include TB in social protection programs**

To include TB in social protection programs and take a multisectoral approach to TB control the following action should be taken:

- 6.1. Make a list of the existing social protection programs in the country (conditional cash transfers, social security plans for expanded coverage) and in cities, including their facilities and registration requirements.

- 6.2. Identify opportunities register patients and their families in social protection programs.
- 6.3. Prepare advocacy material for the inclusion of TB patients and their family members in social protection programs.
- 6.4. Use community-based organizations to involve the community and persons affected by TB and, in coordination with the NTP, carry out advocacy for the inclusion of TB patients and their families in social protection programs.
- 6.5. Identify opportunities for coordination at the central and local government levels for coordination between the health sector and other sectors:
  - 6.5.1. Identify levels of intersectoral coordination at the municipal level (intersectoral meetings, intersectoral boards, etc.).
  - 6.5.2. Identify the sectors convened or regularly in attendance at intersectoral meetings and study the actors involved (the sector they represent, the objectives and interests of the sector, social interactions, financial and social risks of TB, benefits and added value of possible TB interventions, sectoral interventions and costs of TB control, etc.).
  - 6.5.3. Participate in intersectoral meetings.
- 6.6. Include TB control in development and/or action plans of different sectors.
  - 6.6.1. Study the development and/or action plans of each sector.
  - 6.6.2. Identify the activities that could benefit TB control or propose specific TB-related activities in accordance with the objectives of the plans.
  - 6.6.3. Submit proposals for intersectoral work at local meetings held periodically.
  - 6.6.4. Present the results of interventions semiannually at special meetings convened by the ministry of health and the NTP.
- 6.7. Establish a multisectoral committee that specifically addresses TB with the support of regional or national networks working in housing, transportation, employment, and other sectors.
  - 6.7.1. Identify government or nongovernmental agencies (government commissions or committees, NGOs, foundations, research institutes, etc.) that work on social, economic, and structural subjects, and that are interested in studying TB and social and economic development.
  - 6.7.2. Prepare a joint work agenda and subjects for study and research.
  - 6.7.3. Hold periodic meetings for discussion and preparation of reports.

## **7. Promote civil society engagement in TB prevention and control activities**

In order to promote the engagement of CSOs and to coordinate their work in TB prevention and control activities and in other intersectoral activities in cities, NTPs should:

- 7.1 Conduct a situation analysis to identify the needs and specific tasks that would require community activities to be integrated into TB prevention and control programs.
- 7.2 Prepare an inventory and mapping of the location of civil society organizations, NGOs working in health and in poverty reduction, and social support networks that provide services in the geographic area identified.
  - 7.2.1 Consult the lists of CSOs and NGOs that working in health and/or poverty reduction and that are registered in national and/or local community participation secretariats and departments.

- 7.2.2 Use social networks to identify CSOs and NGOs that work in health and/or poverty reduction.
- 7.3 Identify which CSOs and NGOs are already working on tuberculosis and which are interested and have the capacity to do so.
  - 7.3.1 Identify Stop TB community working groups or committees already established at the national or subnational level.
  - 7.3.2 Explore which of the CSOs and NGOs identified as being interested in health have the interest or capacity to work in TB prevention and control.
- 7.4 Promote the inclusion of CSOs and NGOs (interested in or capable of working on TB) on intersectoral boards for TB prevention and control in order to generate synergy with other government and nongovernment actors.
- 7.5 Identify opportunities for strengthening CSOs to optimize their actions and their capacity to coordinate with other actors.

## **8. Establish a routine monitoring and evaluation system**

In cities, the NTP should:

- 8.1 Prepare a monitoring and evaluation plan in accordance with national standards, including variables and indicators for each stage of the framework. This will make it possible to document the contribution of each stage and to evaluate the impact of the interventions, creating evidence to support the expansion of activities to other cities.
  - 8.1.1 Identify process and outcome indicators for each stage at the national and local levels, once the situation analysis has been completed and the NTP activities have been identified.
  - 8.1.2 Identify impact indicators for annual or semiannual measurement of the undertaken activities.
  - 8.1.3 Hold periodic evaluation meetings to which members of the multisectoral TB committee can be invited; and prepare an annual report on achievements and outcomes.
- 8.2 Implement and adapt the record-keeping and information system so that all providers of TB diagnosis and treatment services report and evaluate TB cases.
  - 8.2.1 Invite national and local NTP experts and advisors to discuss the need to review the NTP information system.
  - 8.2.2 Review the national TB information system and identify the need to include socioeconomic variables (ethnic group, educational level, socioeconomic gradient, as well as risk factors—DM, tobacco, alcoholism, illegal drug use, concomitant diseases, etc.—, and factors of vulnerability).
  - 8.2.3 Ensure that these variables are included in cities, for later expansion at the national level.
- 8.3 Hold periodic meetings to monitor the implementation of the different stages and activities, with the participation of all actors.
  - 8.3.1 Periodically convene the working group and expert committee of the NTP and the intersectoral committee to monitor the implementation of the different stages.
- 8.4 Hold meetings to analyze information with a view to improving or introducing new initiatives to meet the projected TB control targets.

- 8.4.1 Periodically convene the working group and expert committee of the NTP and the intersectoral committee to monitor the implementation of the different stages.
- 8.5 Establish a network or committee (TB observatory) made up of different entities interested in collecting TB-related information that strengthens the evidence on the causes of TB.
  - 8.5.1 Identify government institutions, NGOs, universities, and groups of researchers, and invite them to participate in the committee.
  - 8.5.2 Prepare objectives, expected outcomes, and the committee's working methods.
  - 8.5.3 Prepare a work plan.
  - 8.5.4 Prepare periodic meeting reports or committee reports.
- 8.6 Disseminate operational and epidemiological achievements to ensure the sustainability of activities undertaken with increased national and local funding, while also guaranteeing the continued involvement of other sectors.
- 8.7 Plan the subsequent expansion of activities to other "units of analysis" in the same city or other cities.

**IX. Annex 2. Monitoring and evaluation indicators**

**MONITORING AND EVALUATION INDICATORS**

STAGES	CALCULATION OF PROCESS INDICATORS	CALCULATION OF OUTCOME INDICATORS	CALCULATION OF IMPACT INDICATORS	VERIFICATION SOURCE
<b>1. Strengthen political commitment at the national and local levels, and coordinate the different health authorities.</b>				
<ul style="list-style-type: none"> <li>• TB working group for cities is functional</li> </ul>	YES/NO			Reports of the NTP
<ul style="list-style-type: none"> <li>• Advocacy document produced</li> </ul>	1 document			Document printed or online
<ul style="list-style-type: none"> <li>• City's NTP strengthened with sufficient human resources</li> </ul>	<p><b>N:</b> No. of human resources recruited by the NTP</p> <p><b>D:</b> No. of human resources planned by the NTP</p>			HR Form of the NTP
<ul style="list-style-type: none"> <li>• NTP has financial resources from the NTP, cities, and others</li> </ul>		<p><b>N:</b> Available financial resources within a given time period</p> <p><b>D:</b> Financial</p>		Annual Operating Plan of the NTP

		resources planned for the same time period		
<ul style="list-style-type: none"> <li>Regulations issued to improve TB control</li> </ul>	<p><b>N:</b> No. of regulations issued</p> <p><b>D:</b> No. of regulations planned by the NTP</p>			National or local regulations and bulletins
<ul style="list-style-type: none"> <li>Health professionals receive incentive or public recognition for their work</li> </ul>	YES/NO			Recognition ceremonies, actions, etc.
<ul style="list-style-type: none"> <li>Study of health plans completed and proposal made for coordination among health authorities</li> </ul>	1 document			NTP annual operating document or plan
<ul style="list-style-type: none"> <li>Meetings (coordination, work, and M&amp;E) held by the different health authorities</li> </ul>	<p><b>N:</b> No. of meetings held per year</p> <p><b>D:</b> No. of meetings planned per year</p>			Minutes of meetings
<ul style="list-style-type: none"> <li>Joint work agenda of the NTP and health authorities in implementation</li> </ul>	1 agenda			Meeting agenda, minutes

<ul style="list-style-type: none"> <li>• Agreements between health authorities signed</li> </ul>	1 signed document			Document
<b>2. Conduct epidemiological mapping of the TB situation in cities and identify at-risk populations.</b>				
<ul style="list-style-type: none"> <li>• Units of analysis identified for intervention</li> </ul>	<p><b>N:</b> No. of units of analysis identified</p> <p><b>D:</b> Total no. of units of analysis in the city</p>			Study Epidemiological map
<ul style="list-style-type: none"> <li>• Areas of intervention identified within the units of analysis (slums)</li> </ul>	1 document on the TB situation in the city, and study of priority areas for intervention			Study
<ul style="list-style-type: none"> <li>• Characteristics of the communities that live in slums identified</li> </ul>	1 document characterizing the populations			Study
<ul style="list-style-type: none"> <li>• Plan prepared for intervention in the units of analysis</li> </ul>	1 prepared plan			Intervention plan Annual Operating Plan (AOP)



3. Survey and map the health system and existing health-care providers.				
<ul style="list-style-type: none"> <li>Mapping done of the location of health providers</li> </ul>	1 document and map of providers			Studies and maps of providers
<ul style="list-style-type: none"> <li>Populations with no or little access to health care identified</li> </ul>	1 document and map of providers			Study
<ul style="list-style-type: none"> <li>Health services that should be integrated into TB control identified</li> </ul>	1 document and map of providers			Study
<ul style="list-style-type: none"> <li>Health services incorporated into TB control identified</li> </ul>	<p><b>N:</b> No. of health services incorporated into TB control</p> <p><b>D:</b> No. of health services identified for incorporation into TB control</p>			Annual Operating Plan of the NTP
<ul style="list-style-type: none"> <li>TB control activities carried out by hospitals are known</li> </ul>	1 document: survey and results			Hospital survey document
<ul style="list-style-type: none"> <li>City hospitals follow NTP standards</li> </ul>	<p><b>N:</b> No. of hospitals that follow NTP standards</p> <p><b>D:</b> Total no. of hospitals identified (no monitoring of NTP standards)</p>			Annual Operating Plan of the NTP

4. Adapt health care to the needs of the populations at risk.				
<ul style="list-style-type: none"> <li>Adapt health care to the needs of the populations at risk.</li> </ul>	<p><b>N:</b> No. of health services with interventions</p> <p><b>D:</b> No. of health services identified for adaptation of care</p>		<p><i>Mortality Rate</i></p> <p><b>N:</b> No. of patients who died from TB within a given time period</p> <p><b>D:</b> Population in the same time period (expressed per 100,000 population)</p> <p><i>Case-fatality Rate</i></p> <p><b>N:</b> No. of patients who died from TB within a given time period</p> <p><b>D:</b> No. of new cases plus relapses of TB in the same time</p>	<p>National vital statistics register (mortality)</p> <p>Vital statistics register (mortality)</p>

			period (expressed per 100)	NTP information system  National information system
<ul style="list-style-type: none"> <li>Main access barriers to health care identified in the target populations</li> </ul>	1 document			
<ul style="list-style-type: none"> <li>Laboratory network strengthened in the units of analysis</li> </ul>	<p><b>N:</b> No. of laboratories incorporated into the network</p> <p><b>D:</b> No. of laboratories identified for integration</p>	<p><b>N:</b> No. of laboratories involved in quality control</p> <p><b>D:</b> No. of laboratories identified</p> <p><b>N:</b> No. of new TB cases with DST in a given time period</p> <p><b>D:</b> No. of new TB cases reported in the same period</p> <p><b>N:</b> No. of previously</p>		<p>Laboratories' operating plans</p> <p>NTP operating plan</p>

		<p>treated TB cases with DST in a given time period</p> <p><b>D:</b> No. of previously treated TB cases reported in the same period</p>		
<ul style="list-style-type: none"> <li>Decentralized DOT near patients' residences</li> </ul>	<p><b>N:</b> No. of TB cases with DOT in a given time period</p> <p><b>D:</b> No. of TB cases reported in the same time period</p>	<p><b>N:</b> No. of new TB cases successfully treated in a given time period</p> <p><b>D:</b> No. of new TB cases that initiated treatment in the same time period</p>	<p><i>Prevalence of MDR-TB</i></p> <p><b>N:</b> No. of cases of MDR-TB diagnosed in a given time period</p> <p><b>D:</b> No. of new cases plus previously treated cases reported in the same time period (expressed per 100)</p>	<p>NTP epidemiological report</p>
<ul style="list-style-type: none"> <li>Patient referral and counter-referral process strengthened</li> </ul>	<p><b>N:</b> No. of referred TB cases of a health services to</p>	<p><b>N:</b> No. of new TB cases that abandons</p>		<p>NTP epidemiological</p>

	<p>another health services in a given time period</p> <p><b>D:</b> No. of TB cases reported in the same time period</p>	<p>the treatment in a given time period</p> <p><b>D:</b> No. of new TB cases that initiate treatment in the same time period</p>		<p>report</p> <p>Directory of health services</p>
<ul style="list-style-type: none"> <li>City record-keeping and information system strengthened</li> </ul>	<p><b>N:</b> No. of health services that report TB cases in accordance with NTP standards</p> <p><b>D:</b> No. of health services that report TB cases</p>			<p>NTP epidemiological report</p>
<ul style="list-style-type: none"> <li>Directories of health facilities prepared and distributed</li> </ul>	<p><b>N:</b> No. of health services that have directories</p> <p><b>D:</b> No. of health services that report TB cases</p>			<p>Health directory</p> <p>NTP epidemiological report</p>
<ul style="list-style-type: none"> <li>Community-based health care strategies in areas without health services in implementation</li> </ul>	<p>1 strategy document</p>			<p>NTP epidemiological report</p>
<ul style="list-style-type: none"> <li>Community participates actively in TB diagnosis and treatment</li> </ul>	<p><b>N:</b> No. of TB cases with DOT implemented by the community in a given time period</p>			<p>NTP epidemiological report</p>

	<b>D:</b> No. of TB cases reported in the same time period			
• Advocacy, communication, and social mobilization plan in implementation	1 document/plan			Advocacy materials
• Educational material prepared for TB patients	YES/NO			Educational materials
• Health education activities prepared for TB patients	YES/NO			Educational materials
• TB patients receive incentives to successfully complete treatment	<b>N:</b> No. of TB cases with DOT that receive incentives in a given time period <b>D:</b> No. of TB cases reported in the same time period			Special report NTP epidemiological report
<b>5. Take an interprogrammatic approach to TB control to guarantee comprehensive patient care.</b>				
• TB/HIV collaboration activities implemented	YES/NO	<b>N:</b> No. of reported TB cases with HIV test in a given time period <b>D:</b> No. of TB cases reported in the same		NTP epidemiological report
• Health services offer integrated TB/HIV care	<b>N:</b> No. of health services with integrated TB/HIV programs			NTP epidemiological report

	<p><b>D:</b> No. of health services to be included</p>	<p>time period</p> <p><b>N:</b> No. of reported TB/HIV cases that initiated ARV treatment in a given time period</p> <p><b>D:</b> No. of TB/HIV cases reported in the same time period</p>		
<ul style="list-style-type: none"> <li>• TB and DM diagnosed and treated in integrated health services and according to established protocols</li> </ul>	<p><b>N:</b> No. of health services with TB programs that systematically test for DM</p> <p><b>D:</b> No. of health services with TB programs</p>	<p><b>N:</b> No. of reported TB cases with fasting blood glucose test in a given time period</p> <p><b>D:</b> No. of TB cases reported in the same time period</p> <p><b>N:</b> No. of DM cases tested for TB in a given time period</p> <p><b>D:</b> No. of DM cases diagnosed and in</p>		<p>NTP epidemiological report</p>

		DM monitoring in the same time period		
<ul style="list-style-type: none"> <li>Coordinated NTP/tobacco work established</li> </ul>	<p><b>N:</b> No. of health services with TB programs that refer patients to tobacco program</p> <p><b>D:</b> No. of health services with TB programs</p>			NTP epidemiological report
<ul style="list-style-type: none"> <li>Coordinated NTP/mental health work established</li> </ul>	<p><b>N:</b> No. of health services with TB programs that coordinate and refer TB cases to mental health services</p> <p><b>D:</b> No. of health services with TB programs</p>			NTP epidemiological report
<ul style="list-style-type: none"> <li>Coordinated NTP/nutrition work established</li> </ul>	<p><b>N:</b> No. of health services with TB programs that coordinate and refer TB cases to nutrition services</p> <p><b>D:</b> No. of health services with TB programs</p>			NTP epidemiological report
<ul style="list-style-type: none"> <li>Health workers trained in the integrated management of TB/HIV and TB/DM.</li> </ul>	<p><b>N:</b> No. of human resources trained in TB/HIV and</p>			Training reports



	TB/DM <b>D:</b> No. of health workers who work on TB, HIV, and DM control			
<ul style="list-style-type: none"> <li>Studies conducted of operational investigation of gaps in TB control, TB-related mortality, comprehensive care (interprogrammatic work), and gender/TB</li> </ul>	<b>N:</b> No. of operational investigations carried out in a given time period  <b>D:</b> No. of planned investigations in the same time period			Publications
<b>6. Take an intersectoral approach to TB control and include TB in social protection programs.</b>				
<ul style="list-style-type: none"> <li>Existing social protection programs in the country identified</li> </ul>	1 document			Document
<ul style="list-style-type: none"> <li>Advocacy materials prepared for the inclusion of TB patients and their family members in social protection programs</li> </ul>	1 document and advocacy material			Advocacy material
<ul style="list-style-type: none"> <li>TB patients included in social protection programs</li> </ul>		<b>N:</b> No. of TB cases included in social protection programs in a given time period  <b>D:</b> No. of TB cases reported in the same time period		NTP epidemiological report
<ul style="list-style-type: none"> <li>Intersectoral meetings with NTP participation</li> </ul>	<b>N:</b> No. of meetings held in			Minutes of

	a year <b>D:</b> No. of meetings planned per year			meetings
• Intersectoral work plan implemented to strengthen joint TB control with all sectors	1 document/plan			Plan NTP epidemiological report
• Periodic reports on results of intersectoral activities prepared and disseminated	1 document/semiannual or annual report			Reports Minutes of meetings
• Multisectoral TB committee formed and analyzing housing, transportation, employment, and other TB-related subjects	<b>N:</b> No. of meetings held per year <b>D:</b> No. of meetings planned per year			Minutes of meetings
<b>7. Promote civil society engagement in TB prevention and control activities.</b>				
• Identification of needs and specific tasks of NTP requiring community activities identified	1 document			Study
• Mapping of CSOs and NGOs that work in health and in poverty reduction, and of social support networks that provide services in the identified geographic area	1 document			Mapping document
• Inclusion of CSOs and NGOs working in TB on intersectoral boards for TB prevention and	<b>N:</b> No. of CSOs and NGOs included on intersectoral			Progress

control	TB boards <b>D:</b> No. of CSOs and NGOs identified for inclusion			reports
<ul style="list-style-type: none"> <li>Strengthening CSOs to participate in intersectoral activities supporting persons affected by TB</li> </ul>	<b>N:</b> No. of CSOs strengthened <b>D:</b> No. of CSOs identified			Progress reports
<b>8. Establish a routine monitoring and evaluation system.</b>				
<ul style="list-style-type: none"> <li>Monitoring and evaluation plan established for TB control in cities</li> </ul>	1 document/plan			NTP operating plan
<ul style="list-style-type: none"> <li>Meetings on monitoring and evaluation of TB control measures in cities</li> </ul>	<b>N:</b> No. of meetings held per year <b>D:</b> No. of meetings planned per year			Minutes of meetings
<ul style="list-style-type: none"> <li>TB analysis committee (observatory) formed to study environmental and other variables (to generate evidence on the causes of TB)</li> </ul>	<b>N:</b> No. of meetings held per year <b>D:</b> No. of meetings planned per year	1 published study		Published document Minutes of meetings
<ul style="list-style-type: none"> <li>Report on achievements in TB control in cities</li> </ul>	1 document			Report NTP epidemiological report

**N:** numerator

**D:** denominator

\* The territorial scope of indicators can be cities or “units of analysis”



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