

**FIVE YEAR NATIONAL STRATEGIC PLAN FOR TUBERCULOSIS
CONTROL 2011-15 (Draft)**

**National TB Control Programme
Directorate General of Health Services
Ministry of Health and Family Welfare**

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Abbreviations

ACSM	Advocacy, communication and social mobilization
ARI	Acute respiratory infection
BGMEA	Bangladesh garments manufacturers and exporters association
BMA	Bangladesh medical association
BPMPA	Bangladesh private medical practitioners association
BRAC	Bangladesh rural advancement committee
CDC	Chest disease clinic
DFP	Directorate of Family Planning
DGHS	Directorate General of Health Services
DOTS	Directly-observed treatment short course, internally recommended For treatment of tuberculosis
DOTS-Plus	Programmatic management of multi-drug resistant TB
DST	Drug sensitivity testing
ESP	Essential service package
EQA	External quality assessment
FDC	Fixed dose combination
FIND	Foundation for innovative diagnostics
GDF	Global drug facility
GFATM	Global fund to fight against AIDS, TB and Malaria
GLC	Green light committee
GLI	Global laboratory initiative
GoB	Government of Bangladesh
HFWC	Health and Family Welfare Center
HNPSP	Health, Nutrition and Population Sector Programme
HPSP	Health and Population Sector Programme
HRD	Human resources development
IC	Infection control
ICDDR,B	International center for diarrheal disease and research, Bangladesh
IDU	Injecting drug users
LTCA	Leprosy and Tuberculosis Control Assistant
MBDC	Mycobacterial Disease Control
MCWC	Maternal and child welfare center
MCH	Maternal and child health

MDG	Millennium Development Goal
MDR-TB	Multidrug-resistant tuberculosis
MIFA	Managing information for action
MO-MCH	Medical Officer, Maternal and child health
MoU	Memorandum of understanding
NATAB	National Anti-TB Association of Bangladesh
NASP	National AIDS and STI Programme
NCIHD	Nuffield center for international health development
NGO	Nongovernmental organization
NIDCH	National Institute of Diseases of Chest and Hospital
NTP	National Tuberculosis Control Programme
NTRL	National TB reference laboratory
PAL	Practical approach to lung health
PLWHA	People living with HIV AIDS
PHC	Primary health care
PPM	Public–private mix
PRSP	Poverty reduction strategy programme
SOP	Standard of procedure
SRL	Supranational TB reference laboratory
TB	Tuberculosis
TBCAP	Tuberculosis Control Assistance Programme
TOT	Training of trainers
UHC	Upazila Health Complex
UH&FPO	Upazila Health and Family Planning Officer
VCT	Voluntary counseling and testing
WHO	World Health Organization

Foreword

Executive summary

Bangladesh ranks sixth among the high TB burden countries. According to WHO¹ the annual estimated incidence for all cases is 223 per 100 000 population while for new smear-positive cases 100 per 100 000 population. The prevalence (all cases) is estimated to be 387 per 100 000. The estimated TB mortality is 45 per 100 000 population. The case-detection rate increased to 73% in 2007 (NTP). The treatment success rate was 92% for the cohort of patients registered in 2007 (NTP).

Though there is a separate line directorate for Mycobacterial Disease Control, TB services are integrated in the primary health care (PHC) system at the service delivery level. Bangladesh is an outstanding example of implementing TB control in partnership with NGOs. Some corporate health facilities and private hospitals are also formally linked to NTP. An increasing number of private practitioners render services in line with the International Standards for TB Care.

The country has adopted the Stop TB strategy² through its 2006-2010 strategic plan and targets to halve the TB death and prevalence by 2010 towards achieving the Millennium Development Goals set by 2015 and eliminate TB as a public health problem by 2050.

As of 2008, over 950 laboratories were performing smear microscopy in the country and more than 90% were covered under the EQA network. A National Tuberculosis Reference Laboratory was established in 2007. A pilot project to diagnose and treat 700 multi-drug resistant TB patients was approved by the Green Light Committee (GLC) was initiated in the National Institute of Diseases of Chest and Hospital in Dhaka in August 2008. A DOTS-Plus coordinating committee was established and operates regularly. NTP plans to expand programmatic management of drug resistant TB in Chittagong and Khulna. However an NGO manages MDR-TB patients in Rajshahi under agreement with NTP. A National Forum for TB/HIV has been formed. TB/HIV operational guidelines were developed. The latest available data showed a consistently low HIV prevalence level in TB patients. Initiatives by NGOs for HIV awareness and voluntary counseling and testing were available at city corporation areas and in some districts. HRD Plan 2011-2015 was recently developed and was endorsed by the MoH&FW. NTP is scaling up public and private partnership in the corporate sector and involvement of civil society and community. A strategic plan and operational guidelines for advocacy, communication and social mobilization (ACSM) have been developed. NTP established computerized data management soft ware at central level.

The NTP will strengthen capacity for increasing diagnosis of smear-negative, extra-pulmonary and childhood TB. Adequate services for chest X-ray examination at upazila and district level, including training of doctors in X-ray reading will be established. The quality of the National Tuberculosis Reference Laboratory (NTRL) needs improvement and will be sustained up to international standards with support from the Bangkok Supranational Reference Laboratory (SRL). Three additional culture facilities is proposed to be established and made functional by NTP. Further development of MDR-

¹ Source: Global Tuberculosis Control 2009

² Stop TB strategy: internationally recommended strategy for TB control, consisting of six components: high-quality DOTS expansion and enhancement; addressing TB/HIV, MDR-TB and other challenges; contributing to health systems strengthening; engaging all care providers; empowering people with TB, and communities; and enabling and promoting research

TB should be prevented by correct categorization of patients, regular adherence to treatment, strengthening follow-up sputum microscopy services to detect and by sensitizing different private health care providers on issues related to development of drug resistance. Laboratory capacity needs to be built to support MDR-TB management and the planned national drug-resistance survey. Capacity should be built for the programmatic management of MDR-TB.

Ongoing collaboration between NTP and the National AIDS and STI Programme (NASP) will be strengthened. A national HIV prevalence survey among TB patients will be carried out every two to three years.

All relevant staff will be trained in drug supply management. Adequate space for TB drugs will be ensured in the Government warehouse complex currently under construction.

Recently developed HRD Plan 2009-15 will be implemented.

Collaboration with industries and pharmacy holders through their respective associations will be expanded. A monitoring system to supervise and evaluate PPM activities by different partners will be established. Formal linkages between NGOs, NTP and public and private sector health care providers will be strengthened. A long-term TB ACSM strategy needs to be implemented to build ACSM capacity, mobilize support and achieve measurable and sustainable behavior change.

The preliminary result of the national TB prevalence survey is available. NTP plans for HIV prevalence among TB registered patients and TB drug resistance surveys to estimate trends of both TB/HIV co infection and MDR TB.

Strengthening of the health system for TB shall focus on ensuring basic infrastructure for TB control services, particularly X-ray facilities and transport and PAL initiatives.

1. Introduction

1.1 Geographic, demographic and socio-economic features

Bangladesh is situated in the north-eastern part of South Asia. It has an area of 147 570 sq. km and a population of over 143 million. The country's population is almost evenly distributed throughout its 64 districts except for the three Hill Tracts districts which are rather sparsely inhabited. Regionally, the eastern districts have a slightly higher density than the western ones. Administratively the country is divided in six divisions, 64 districts, 490 upazilas, 4,451 unions and over 68 000 villages. The average population for each administrative unit is approximately: 24 million (division), 1.8 million (district), 250 000 (upazilas), 25 000 (union) and 2000 (village). The number of households is about 20 million. On average, a household consists of 5.6 persons. The tribal people, who lead a simple life, are generally self-reliant, producing their own food and drinks and weaving their own clothes.

There are six metropolitan cities and 119 municipalities in the country. The level of urbanization is low at 20%. This leaves 80% of the country's total population of about 120 million to live in the rural areas which primarily depend on a poorly developed agriculture for livelihood. Thirty five percent of the population is younger than 15 years old. The capital city of Dhaka has an estimated population of over 10 million. The annual growth rate of the population has come down to 1.3% (2005) with the acceptance of family planning practices rising to 48.7%. The crude birth rate per 1000 is 25.6 and the death rate is 8.1. Life expectancy at birth is 62.6 years. The rate of child mortality per 1000 has come down to 76.8 and that of maternal mortality to 4.5. About 96.3% families in the country have now access to safe drinking water. The sex ratio is 106 males for every 100 females. The density of population per square kilometer is 800. The adult literacy rate is about 50%. It is a low income country with a gross national income per capita of around 470 US\$ per year.

1.2 Overall health system structure

The Government of Bangladesh (GoB) is committed to ensure that its citizens are provided with opportunities to realize their fullest potential. Reducing poverty and improving health are central to this objective. Better health is a direct outcome of economic development. At the same time, stronger economic growth is an important consequence of better health. Improvements in health translate into higher incomes, higher economic growth, and reduced levels of poverty. Priority objectives of HNPS are reducing the maternal mortality rate, the total fertility rate, malnutrition, infant and under-five mortality and the burden of TB and other diseases.

The MoH&FW health system is structured as a hierarchical pyramid with five layers: three at the primary, one at the secondary and one at the tertiary level. At the base are ward-level DGHS Health Assistants and DFP Family Welfare Assistants, serving a population of about 6,000 to 7,000 people, performing home visits and working from a Community Clinic (where operational), tasked with family planning, maternal and child health, including immunizations, communicable disease control, symptomatic curative care for common complaints, and upward referrals. The next level is the Union Health and Family Welfare Centre (HFWC), staffed by three paramedical, Sub-Assistant Community Medical Officer, Family Welfare Visitor, and Pharmacist, providing family planning, maternal and child health services and some curative care. On the family planning side, 250 posts of union-level Medical Officer (Family Welfare) have been

created to provide care for MCH referral cases and to supervise and per-form clinical contraceptive services. On the health side, a Medical Officer is posted to each of 1275-upgraded HFWCs under the Health Directorate (formerly called Union Sub-centers). At the next level is the Upazila Health Complex, which is the first-level referral centre for the population in the upazila and the administrative centre for upazila health and family planning services. Staffing norms foresee, on the health side, nine doctors, two Medical Assistants, a pharmacist, radiographer and an EPI technician and staff nurses, joined on the family planning side by an Upazila Family Planning Officer, Medical Officer (MO-MCH), Assistant Family Planning Officer, Senior Family Welfare Visitor and two Family Welfare Visitors. The UHC is responsible for inpatient and outpatient care, family planning and MCH services, including clinical contraception, and for disease control. On the health side, the fourth layer is the district hospital, which is a 50 to 250-bed facility. Heads of health and family planning services at upazila as well as district level both have technical as well as administrative responsibilities and combine responsibilities for clinical care with community and public health responsibilities. In 55 of 64 districts, Maternal and Child Welfare Centres (MCWCs) of the Family Planning Directorate are staffed and equipped to provide Comprehensive Emergency Obstetric Care and other clinical reproductive health services. The fifth tier of the public-sector health system is comprised of the medical college and other specialized hospitals, providing tertiary-level referral care.

The Health and Family Planning Management Structure in Bangladesh

<u>The Secretariat.</u> The Honourable Minister is the Chief Executive of the Ministry of Health and Family Welfare. The Secretary, who heads the Secretariat, is also the Principal Accounting Officer of the Ministry. The Secretariat is staffed by civil servants from within the Civil Service system
<u>Directorates:</u>
The Directorate General of Health Services: Supervises all health implementation activities
The Directorate of Family Planning: Supervises, besides family planning, a significant part of maternal and child health services
The Directorate of Drug Administration: Supervises national drug regulation and manufacture
The Directorate of Nursing Services: This directorate oversees nurses as a profession
The Directorates are (almost entirely) staffed by professionals and technicians. The Directorates are based in Dhaka and are housed separately from the Secretariat and from each other
<u>Six Regions (Divisions):</u> with Divisional Directors from both Health and Family Planning Directorates but without direct line-management role in service provision. Responsible for some support and HRD functions
<u>64 Districts:</u> Consist of separate management structures for Health and FP. District health management (Civil Surgeon) reports to the Health Directorate and is responsible for general health services and the district referral hospital. Family planning management (Deputy Director FP) reports to FP Directorate and is responsible for FP and related MCH and reproductive health services
<u>397 Rural Upazilas:</u> Upazila Health Complexes (with 31/50 hospital beds) serve as the first-level referral level facility and provide outpatient general health and MCH services plus inpatient care, with six beds reserved for family planning and MCH. While usually under the same roof, Upazila Health and Family Planning staff works under separate lines of command
<u>Unions and Wards:</u> Union-level Health and Family Welfare Centres (HFWCs) are established based on administrative sub-divisions, regardless of population sizes, while Community Clinics are intended to serve a population of about 6,000. Services provided at this level are mainly EPI, MCH & FP and limited curative care. Some HFWCs are staffed and equipped for normal deliveries and obstetric first aid and offer adolescent health services

Bangladesh has made significant progress in recent years in several health indicators. Infant, maternal and under-five mortality rates have all decreased while the life expectancy has substantially increased. Immunization coverage was sustained at over 90% through the expanded programme of immunization and national immunization days. Some of this progress, however, is uneven and there still exists inequalities between different groups and geographical regions. A major constraint identified towards reaching the Millennium Development Goals and other national health goals is the issue of shortages in the health workforce and the uneven skill mix.

The public sector is largely used for in-patient and preventive care while the private sector is used mainly for outpatient curative care, particularly in urban areas. The growth of NGOs in the health sector underscores the importance of effective regulation by the government to ensure standardized and transparent recruitment and promotion system for the health workforce and establish good governance of all health institutions and facilities. The PHC approach has been chosen by the Government as the main strategy to achieve the goals of "Health for All". This is now being branded as "Revitalized PHC".

1.3 History of tuberculosis control

Since 1965 TB services in Bangladesh were mainly curative and based in 44 TB clinics, 8 segregation hospitals and 4 TB hospitals. During the Second Health and Population Plan (1980-86) TB services were expanded to 124 upazila health complexes (UHC) under the "Strengthening TB/Leprosy Control Services" project and were operationally integrated with leprosy during the Third Health and Population Plan (1986-91) under the "Mycobacterial Disease Control" (MBDC) Directorate.

The NTP adopted the Directly Observed Treatment, Short Course (DOTS) strategy, from November 1993 during the Fourth Population and Health Plan (1992-98) under the project "Further Development of TB and Leprosy Control Services" considering low case detection and cure rates at 10% and 40% respectively as reported by a study conducted by The World Bank in 1990. NTP started its field implementation in November 1993 in four pilot thanas (later renamed upazilas) and progressively expanded to cover all 460 upazilas by June 1998.

Since July 1998 the health and population sector was reformed and services were available through sector wide approach named Health and Population Sector Programme (HPSP). NTP formulated a strategic plan within the context of HPSP. HPSP tried to horizontally integrate the NTP management into an Essential Services Package (ESP). The stated goals of the strategic plan of NTP therefore were "to improve health and family welfare among the most vulnerable women, children and poor of the country".

Within the broader context of the Bangladesh National Strategy for Economic Growth, Poverty Reduction and Social Development (Bangladesh Interim Poverty Reduction Strategy Paper (IPRSP, March 2003), the Government of Bangladesh revised its strategic approach and renamed HPSP as Health, Nutrition and Population Sector Programme (HNPSPP). Since 2003, NTP continues its activities under the directorate "Mycobacterial Disease Control", which functions under the Directorate-General of Health Services (DGHS) of the Ministry of Health and Family Welfare. Priority objectives of HNPSPP are reducing the maternal mortality rate, the total fertility rate, malnutrition, infant and under-five mortality and the burden of TB and other diseases.

Table 1: **Summary of achievements of NTP from 1965 to 2009**

Year	Achievements in TB control
1965	TB services through district based TB clinics and divisional based TB hospitals
1980-86	TB services were expanded to 124 upazila health complexes (UHC) under the “Strengthening TB/Leprosy Control Services” project
1986-91	TB services were operationally integrated with leprosy under the “Mycobacterial Disease Control” (MBDC) directorate
1992-98	The NTP adopted the Directly Observed Treatment, Short Course (DOTS) strategy, from November 1993 under the project “Further Development of TB and Leprosy Control Services”. NTP started its field implementation in November 1993 in four pilot thanas (later renamed upazilas) and progressively expanded to cover all 460 upazilas by June 1998. Memorandum of Understanding signed between NTP and NGOs in 1994. First external review conducted by government and WHO in 1997 and recognized DOTS as model in the Region
1998-2003	NTP to sector-wide approach under Health and Population Sector Programme (HPSP). Following the international Call for Action (Amsterdam Declaration 2000) Bangladesh organized a second programme review in July 2001 and formulated a strategic plan within the context of HPSP. HPSP tried to horizontally integrate the NTP management into an Essential Services Package (ESP). The stated goals of the strategic plan of NTP therefore were “to improve health and family welfare among the most vulnerable women, children and poor of the country”. TB service expanded to metropolitan cities
2003	The Government of Bangladesh revised its strategic approach and renamed HPSP as Health, Nutrition and Population Sector Programme (HNPSP). Since 2003, NTP continues its activities under the directorate “Mycobacterial Disease Control”, which functions under the Directorate-General of Health Services (DGHS) of the Ministry of Health and Family Welfare. Priority objectives of HNPSP are reducing the maternal mortality rate, the total fertility rate, malnutrition, infant and under-five mortality and the burden of TB and other diseases. Secure CIDA grants. Involvement of private practitioners through pilot project
2004	Secure GFATM TB Round 3 grants. Scale up TB services in metropolitan cities as urban DOTS. DOTS in corporate sectors
2005	Initiate public-private mix project. TB services launched in prisons. The National Strategic Plan for 2006-2010 was developed
2006	Secure GFATM TB Round 5 grants. Application to Green Light Committee (GLC) for approval of DOTS-Plus Project for treatment of 700 MDR-TB patients. GLC approved DOTS-Plus Project
2007	The National TB Reference Laboratory was established and made functional. Scale up of DOTS in corporate sectors

2008	Secure GFATM TB Round 8 grants. TB/HIV collaborative activities initiated. Initiated treatment of MDR-TB patients at NIDCH. Secure TB CAP funding
2009	GLC review was conducted. Comprehensive HRD TB plan was developed. The National Strategic Plan for 2011-2015 was drafted

1.4 Tuberculosis epidemiology

Globally, there were an estimated 9.27 million incident cases of TB (2007). There is an increase from 6.6 million cases in 1990. Most of the estimated number of cases in 2007 was in South-East Asia (34%) and Africa (30%), with small proportions of cases in the Eastern Mediterranean Region (6%), the European Region (5%), the Region of the Americas (4%) and Western Pacific (21%). Of the 9.27 million incident TB cases in 2007, an estimated 1.37 million (15%) were HIV-positive; 79% of these HIV-positive cases were in the African Region and 11% in the South-East Asia Region. There were an estimated 13.7 million prevalent cases of TB in 2007 (206 per 100 000 population), a decrease from 13.9 million cases (210 per 100 000 population) in 2006. Prevalence and mortality rates are falling globally and in all six WHO regions. An estimated 1.76 million deaths occurred during 2007. Approximately 1.3 million deaths during 2007 occurred among HIV negative incident cases of TB, while 456000 were among incident TB cases who were HIV-positive. Deaths among HIV positive incident TB cases equate to 33% of HIV-positive incident cases of TB and 23% of the estimated 2 million HIV deaths in 2007. The South-East Asia Region of WHO, with an estimated 4.88 million prevalent cases and an annual incidence of 3.17 million TB cases, carries one-third of the global burden of TB.

Bangladesh is one of the 22 TB high burden countries that account for 80% of all new TB cases arising each year, and the 27 countries that account for 85% of the global MDR-TB burden. The exact TB burden in Bangladesh is unknown. The NTP Bangladesh, in collaboration with the International Centre for Diarrhoeal Diseases and Research, Bangladesh (ICDDR'B), started a TB prevalence survey combined with an infection prevalence survey in 2007. The results of this survey, expected by the end of 2009, will provide more precise data on the current size of the TB burden and the level of TB transmission.

The latest WHO estimates (2007) of the TB incidence, prevalence and mortality are summarized in Table 2.

Table 2: *WHO estimates (2007)*

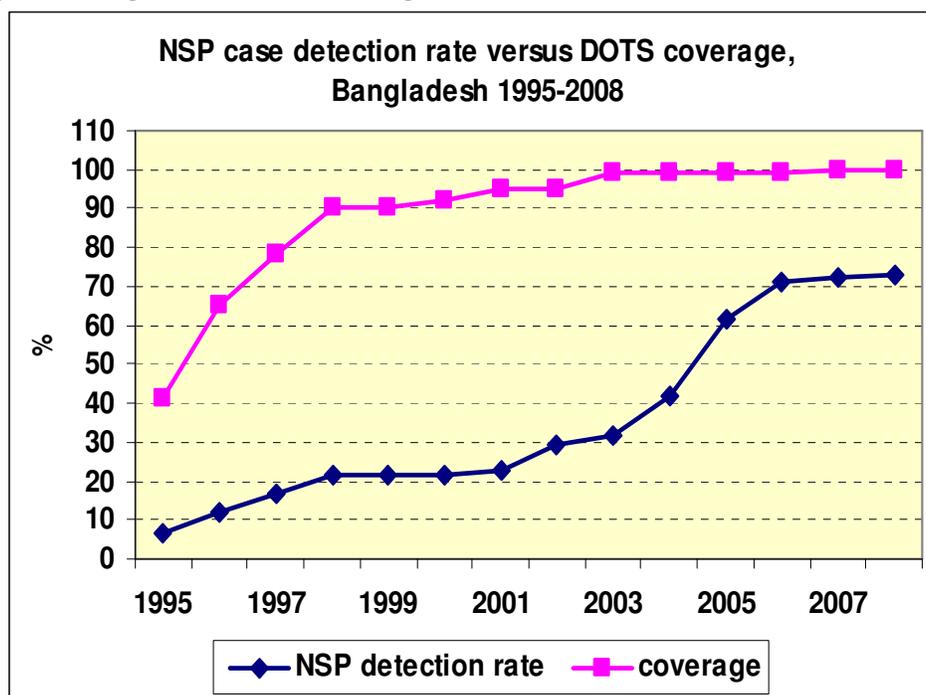
Indicators	Number of cases	Percentage or rate per 100 000 pop.
Incidence of all TB cases	353 103	223
Incidence of new smear-positive TB cases	158 797	100
Prevalence of all TB cases	613 652	387
TB mortality	70 901	45
Adult (15-49 yrs) TB cases HIV+	-	0.1%
MDR among new cases of TB	-	1.8%

Source: WHO Report 2009 – Global Tuberculosis Control

DOTS coverage and case detection

After the introduction of the DOTS strategy in 1993, the case-detection rate for new smear-positive cases increased gradually and reached 28% in 1998. Until 2001 only marginal progress was achieved in terms of further increasing the case-detection rate. This may be explained by the health sector reforms with virtually disappearance of TB as a separate national programme as well as uncertainties in funding. From 2001 onwards, case detection accelerated to reach 46% in 2004 and further increased to 61% in 2005 and 71% in 2006, thereby reaching the global target (Figure 1). DOTS coverage was reported 99% since 2002.

Figure 1: *Progress in DOTS coverage and case detection under DOTS, 1993-2008*



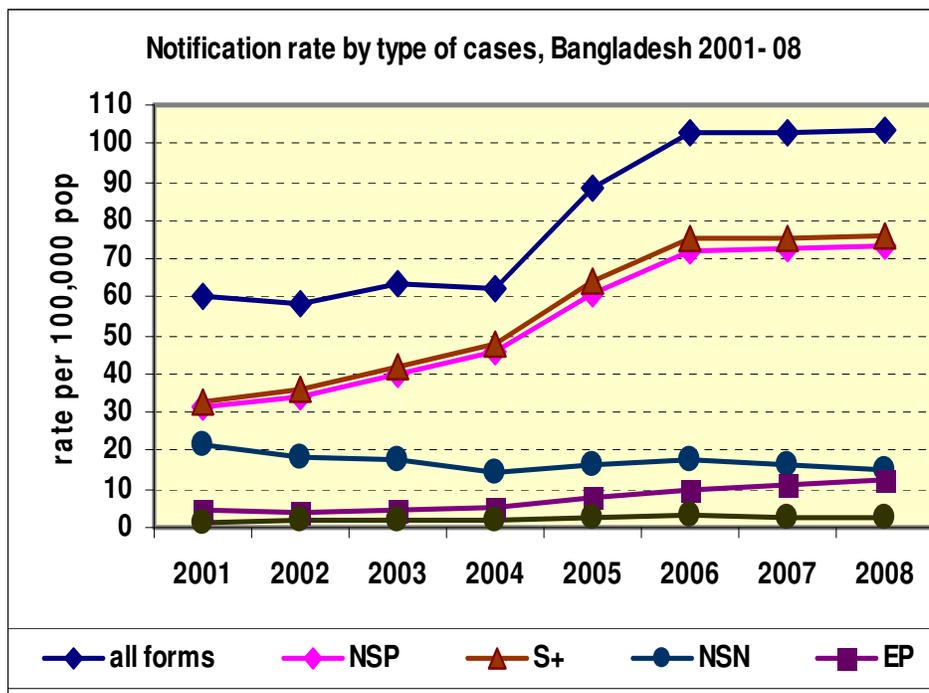
Source: NTP

Case notification

Figure 2 shows the trends in notifications of new smear-positive and all forms of TB. The new smear-positive notifications increased gradually until 2004, with a sharper increase thereafter until 2006. There appears to be a leveling off since, suggesting that much more effort is now needed to further increase detection.

Notification of all forms of TB showed a rather unstable profile till 2001, followed by a steady increase from 2004 onwards. This is probably attributable to the increasing involvement of medical colleges and private practitioners, through whom increasing numbers of smear negative and extra-pulmonary cases are notified.

Figure 2: *Notification rate by type of cases, 2001-08*

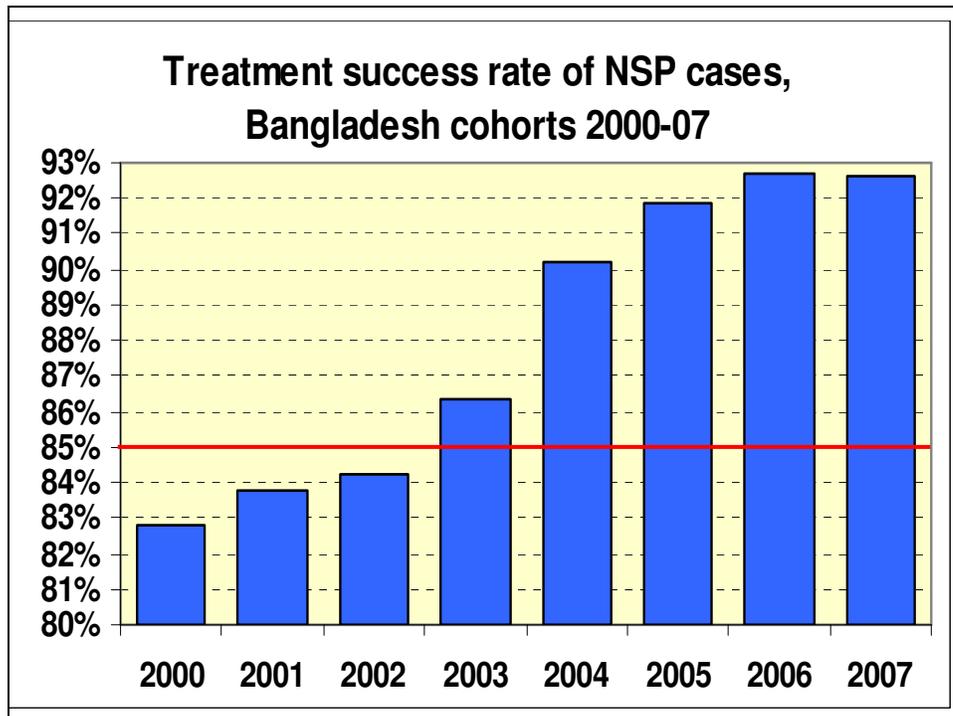


Source: NTP

Treatment outcomes

Figure 3 shows an increased trend in treatment success among new smear-positive cases enrolled for treatment. The treatment success rate reached the global target since 2003 and sustaining high rates onwards and reached to 92% in 2007.

Figure 3: *Treatment outcome among new smear-positive cases, 2000-2007*



Source: NTP

1.5 Current status of TB control in Bangladesh

Tuberculosis is a major public health problem in Bangladesh. The country ranks sixth on the list of the 22 high burden TB countries. The incidence of TB (all forms) is estimated at 223 per 100 000 population per year, the incidence of new smear-positive patients at 100 per 100 000 per year. The prevalence (all cases) is estimated to be 387 per 100 000. TB mortality is estimated at 45 per 100 000 population per year (Source: Global Report 2009). The case-detection rate increased to 73% in 2008 (NTP). The treatment success rate was 92% for the cohort of patients registered in 2007 (NTP). Bangladesh had reached the two international targets of 70% case detection and 85% treatment success in 2006. As of 2008, over 950 laboratories were performing smear microscopy in the country and more than 90% were covered under the EQA network. 3.5% of new and 20% of previously treated patients are estimated to suffer from multidrug-resistant tuberculosis (MDR-TB) (Source: Global Report 2008). A DR Survey is planned in 2009. It is estimated that HIV prevalence in the adult population (15-49 years) is low at 0.02% and the proportion of HIV positive individuals among TB cases is 0.1%.

Since 1993 the National TB Control Programme (NTP), in collaboration with nongovernmental organizations (NGOs), implements the DOTS strategy. By 2003,

DOTS services had been established in all 460 upazilas (or sub-districts), all 44 chest disease clinics (CDCs) and the six metropolitan cities. Since 2007 NTP implements most components of the new Stop TB strategy. In addition to the above-mentioned areas and facilities, TB control services are also implemented in the 12 chest disease hospitals, the National Institute of Diseases of Chest and Hospital (NIDCH), a leprosy hospital, district hospitals, urban health centers, public and private medical colleges, prisons, workplaces, military, defense and police hospitals and clinics.

In addition to the facility-based services, almost 28 000 health assistants and aligned staff, over 70 000 females community health volunteers (shastho shebikas), 17 000 village doctors as well as cured patients, community leaders and school teachers are involved in dissemination of information about TB, identification of TB suspects at the community level, referring TB suspects for sputum examination or collecting sputum and provision of daily Directly Observed Treatment (DOT). External Quality Assessment (EQA) of smear microscopy is in place in all laboratories linked to NTP through a network of 35 first-level control EQA centers and three second-level control centers.

A National TB Reference Laboratory (NTRL) was established in 2007, one divisional TB reference laboratory during 2008 (Division: level between district and centre. There are six divisions in the country) while three more divisional reference laboratories are in process of establishment.

Quality assurance of sputum culture and drug-susceptibility testing by a supranational reference laboratory has been established. Management of MDR-TB is initiated by NTP and undertaken by NIDCH and one of the NGO partners. Management of MDR-TB patients was initiated in August 2008.

About 70% of patients diagnosed under NTP are new-smear positive patients, 3% are relapses and 27% are smear-negative pulmonary and extra-pulmonary patients. Only 3% of the patients are children. These figures indicate a substantial under-diagnosis of smear-negative and extra-pulmonary patients as well as TB in children. Other categories of retreatment cases, though not routinely reported, appear also under-diagnosed.

The NTP plans to further expand the diagnostic and treatment facilities in remote areas, at work places, at all prisons, government, corporate and private hospitals. A further increase in the detection of new smear-positive patients, about 1% per year, is envisaged, while maintaining treatment success at 90% or above. Major emphasis is given to substantial increase in the detection and treatment of smear-negative and extra-pulmonary patients and child TB. The X-ray facilities at the CDCs and upazila health complexes (UHCs) will be functionalized and supplies will be provided. Medical Officers will be trained in reading X-ray films. Collaboration with pediatricians will be intensified and linkages with graduate private practitioners strengthened. It is expected that the number of diagnosed smear-negative and extra-pulmonary patients will increase from about 40 000 in 2006 to 75 000 in 2015 and child TB from about 3300 during 2006 to 12 000 in 2015.

The country has made remarkable progress in enhancing quality of laboratory services, establishing a national MDR-TB coordination committee and a training working group, scaling up of TB services in corporate sectors; and improving data management through computerization. However there are many challenges affecting the quality of DOTS; scale up of the management of MDR-TB, linkages with NASP, procurement and supply management system and supportive supervision.

1.6 Collaboration with NGOs and technical agencies

The NTP collaborates with a number of national and international health and development agencies to implement the Stop TB Strategy. To ensure best use of comparative advantages and to avoid fragmentation and duplication of efforts, regular coordination meetings are held under the NGO Steering Committee for TB. The role of the Steering Committee for TB is to assist in the overall TB programme implementation and in the monitoring and evaluation of the national strategic plan. Specific technical working groups have also been set up under NTP to coordinate strategies and activities on PPM and TB/HIV. In addition, a national MDR-TB management coordination committee has been established. Coordination is also ensured through the Country Coordination Mechanism set up for Global Fund collaboration. WHO provide technical assistance to NTP in the area of strengthening national laboratory network, capacity building, information exchange, resource mobilization, regular supplies of drugs and improving procurement and supply management, operational research, coordination, collaboration and partnerships, ACSM and monitoring and evaluation.

The table below shows operational aspects of TB services delivered by the government in collaboration with NGOs.

Table 3: *Areas of GO-NGO collaboration in TB DOTS in Bangladesh*

Area of collaboration	Government	NGOs
Implementation	<ul style="list-style-type: none"> National guidelines Overall coordination 	<ul style="list-style-type: none"> Specific areas
Case finding and Case holding	<ul style="list-style-type: none"> Equipment/supplies Referral centres 	<ul style="list-style-type: none"> Diagnosis, Treatment and Follow-up
Training	<ul style="list-style-type: none"> Training materials Training of Trainers (TOT) 	<ul style="list-style-type: none"> Local training
Drug supply	<ul style="list-style-type: none"> Central procurement Distribution 	<ul style="list-style-type: none"> Local storage Supply indent
Monitoring and Supervision	<ul style="list-style-type: none"> Registers/forms Overall monitoring and supervision 	<ul style="list-style-type: none"> Registration/reporting Local monitoring and supervision
Advocacy, Communication and Social Mobilization (ACSM)	<ul style="list-style-type: none"> National campaigns 	<ul style="list-style-type: none"> Local campaigns

1.7 Major challenges and opportunities for tuberculosis control

Major Challenges

There are insufficient functional facilities and capacity to diagnose smear-negative and extra-pulmonary TB. Of the patients reportedly since 2003 only 25-30% were diagnosed with smear-negative or extra-pulmonary TB, as compared to 50-55% expected to occur.

Major reasons for this include: during DOTS expansion (2003-2007), major priority was given to detection and treatment of smear-positive patients; functional X-ray facilities were available in only a few CDCs and UHCs. Another reason is that in the rural areas sputum collection and processing is largely done through community-based services while for the diagnosis of smear-negative or extra-pulmonary TB patients had to be referred to medical officers of CDCs, medical college hospitals and UHCs. Further, many patients diagnosed with smear-negative and extra-pulmonary TB at hospitals and also by private practitioners were not reported to NTP. As only about 3% of the reported TB cases are children, there is also substantial under-reporting of childhood TB.

Family planning field staffs of the community health services have so far not been systematically involved in the identification of TB suspects, referral for sputum examination or provision of DOT. As their work relates predominantly to women, their involvement in the DOTS services may have a positive effect on identification of female TB suspects and management of confirmed female patients.

The current capacity for hospitalization of patients on second-line treatment is limited. Laboratory capacity for culture and drug-susceptibility testing (DST) is still limited to the National Institute of Diseases of Chest and Hospital, Dhaka and Rajshahi Chest Disease Hospital. Insufficient administrative and environmental measures are in place to mitigate transmission of airborne infections.

Several pilot projects on involvement of graduate private practitioners in urban settings have been implemented since 2003 and have been monitored and evaluated. Scaling up, involving a gradual increasing number of them planned since 2006. As Bangladesh has over 25 000 graduate private practitioners, this is potentially a very important source of patients. There is insufficient collaboration in urban settings especially private hospitals and clinics, private practitioners, drug sellers and private laboratories. There are recognized gaps in necessary skills for planning, implementation and monitoring the delivery of TB services among health care providers outside the National TB Control Programme.

Inadequate human resource at different levels and capacity building is a challenge of the public health sector. Recruitment, retention and continuous capacity building and follow up of skills are required. Expansion of services and simultaneous human resource system strengthening is crucial.

The drug management systems are inadequate storage facilities at the central level and the insufficient expertise in drug management at the central and peripheral levels. Currently first and second-line anti-TB drugs are procured through Global Drug Facility (GDF) and Green Light Committee (GLC), through grants from Global Fund. There was also a decrease in level of Government funding for the procurement of anti-TB drugs. An interruption in the first-line anti-TB drug supply will be devastating for the TB patients and will lead to increased suffering of patients, an increase in the number of avoidable deaths and an increase in MDR-TB cases.

ACSM activities are limited between different partners. The current strategic plan is not well conversant to the culture of continuous programming rather than periodic activities.

Comprehensive chest disease management, including the PAL initiative, is still to be implemented as well as linkages with different providers in public and private sectors, including pathologists, surgeons and pediatricians.

Supervision by Government staff was hampered by transport and resource constraints. There are also concerns about the quality of supervision as feedback forms are not standardized neither are there reports on actions taken. There is limited coordination between government and NGOs in supervision of the programme.

Opportunities

TB is integrated in the primary health care component of the National Health Service. The health efforts are led by HNPSP initiated in 2003, which also has a role for the not-for-profit and private sector in health provision and finance. TB is also included in HNPSP and the Poverty Reduction Strategy Programme (PRSP). The NTP activities under the Mycobacterial Disease Control (MBDC) directorate are reflected in HNPSP along with the requirements. Since the government's priority to TB control in HNPSP is high, securing adequate resources may mitigate risks in long term. National Guidelines and training modules are available for priority areas of the Stop TB Strategy. Country Coordination Mechanism composed of members from MoH&FW, DGHS, NTP, other ministries, technical and developing agencies working in the country has unique opportunities to oversee strategies and activities of TB control.

There are opportunities for substantial strengthening of programmatic as well as financial management. The health infra structure and committed staff is an opportunity to strengthen health systems and foster TB control in more effective way. Diagnostic facilities and X-ray equipment at UHC level are inadequate in terms of quality and quantity. These facilities are used for TB and non-TB cases. During 2007 MoH&FW has provided X-ray equipment to CDCs and UHCs. About one third of these are not functional.

Efforts to mobilize external resources for TB control, and most importantly for a sustainable supply of anti-TB drugs and laboratory equipment and consumables, should be undertaken continuously.

The government has endorsed the MDGs related to TB and has adapted the Stop TB Strategy. In addition, the government supports the WHA resolutions on TB and the Beijing Call for Action for the 27 high MDR-TB burden countries. This could bridge adequate management of MDR-TB in the country.

While there is a large involvement of NGOs under HNPSP in strengthening the health service system, the involvement of the private sectors is much less. Many patients attend the private health care providers and linkage with this sector needs strengthening. Building upon the significant progress made to involve all care providers in TB control, opportunities exist to further expand and strengthen the several PPM models. The International Standards of Tuberculosis Care is a big step in the right direction to ensure adequate TB control measures by various health care providers.

Overall procurement and supply management at public facilities could be intensified using SOP involving district stores.

To raise awareness on TB, mass events and community level activities have been undertaken. In spite of delays in implementation of ACSM activities at the community

level could be made sustainable involving community leaders, cured TB patients, village doctors and voluntary organization.

2. Organization, role and function of staff involved in TB Control

The MBDC directorate consists of two wings: NTP and the National Leprosy Elimination Programme. The posts of Director, two Deputy Directors, two Assistant Directors and one Medical Officer (Epidemiology) are permanent while all other positions are functional. Only the permanent positions are funded from the revenue budget. The Director MBDC is also Line Director (TB-Leprosy), the latter project function is linked to HNPSP and non-permanent. The NTP is headed by the NTP Manager, who reports directly to the Line Director (TB-Leprosy). The NTP is responsible for policy, planning, management, training, supply, supervision and monitoring and implementation of TB services. The Director MBDC reports to the Director-General of Health Services. NTP coordinates all activities through the Directorate General of Health Services with the Ministry of Health and Family Welfare.

There are four positions for Deputy Programme Manager. They report to the Line Director but their activities are coordinated by the Programme Manager, NTP. The four Deputy Programme Managers are responsible for administration and finance; training; procurement and logistics; and coordination. The position of Deputy Programme Manager Coordination is currently vacant. Furthermore, there are currently five medical officers reporting to the Programme Manager and designated as focal points for laboratory, drug-resistance surveillance and management of MDR-TB; ACSM; TB/HIV; PPM and training; and procurement and logistics.

The central staffs are formally in charge of the central functions of NTP. The majority of them attended multiple international courses and meetings. There is, however, a significant turnover of senior staff and medical officers in recent years. Most of the medical officers are recently posted against the vacancies due to deputation for higher studies. There are few support staff at the central level and their competencies is not always up to the mark.

At the sub-national level, NTP is integrated into the general health services, under the Director (Health), the Civil Surgeon and the Upazila Health and Family Planning Officer (UH&FPO) responsible at divisional, district and upazila level, respectively. Their responsibilities include coordination and supervision of the NTP services. There are no TB-specific posts at divisional level.

At the district level, the Civil Surgeon is assisted by a Medical Officer (Disease Control) and in some districts by a Medical Officer full-time designated for TB (and leprosy) and/or a Programme Organizer (TB/leprosy). In general, the full-time programme staffs appear more competent in TB control than those officers who have multiple responsibilities. Programme Organizers assist in conducting mid-level training courses at district level. Forty four CDCs, located in district capitals and metropolitan cities, support NTP in two ways: they render diagnostic and treatment services for the immediate surroundings and serve as referral center for the entire district. They also serve as resource base for providing technical advice according to NTP guidelines. Junior Consultants in CDCs are qualified chest specialists; their expertise is being utilized for further strengthening NTP activities, particularly for training, supervision and

monitoring. A significant number of them participated to national and international trainings courses, congresses or meetings on TB Control. These consultants often take the lead in all the training activities at district level and support NGOs in implementation of TB services. They spent 20-30% of their time in administrative activities.

NGOs provide NTP services at upazila level in collaboration with the government. Some have their own hospital infrastructure.

The UH&FPO oversees the NTP activities within the upazila. One UHC-based medical officer is designated for disease control including TB. The Leprosy and TB Control Assistant (LTCA) assists the Medical Officer (Disease Control) in implementing the programme at the upazila. These LTCAs were centrally trained for three months; they have been frequently oriented by NTP. They assist in field-level courses in the upazila. Not all upazilas have established LTCA posts.

NTP activities have been boosted enormously following the involvement of NGOs, for over a decade in rural areas and for a few years also in metropolitan cities.

The metropolitan city corporations have also a limited number of health staff. They have not been systematically involved in TB control activities.

Additional support is provided through a network of GFATM national and divisional consultants and WHO staff. They include two international consultants programme and finance respectively, Medical Officer TB WHO, two national professional officers (NPOs) WHO (positions currently vacant), and administrative support staff. The national consultants play a significant role in directly implementing the programme. Except for the Medical Officer's positions, all NPO and consultant positions are funded by GFATM.

Table 4 summarizes the core staff at different levels and their role in TB control

Table 4: *Core function of staff at various levels*

Facility/level	Staff	Main role/task
District	Civil Surgeon	Coordination, planning and supervision
	Junior Consultant	Training, coordination, supervision, diagnosis and management of complicated cases and referral
	Medical Officer	Monitoring and evaluation
	Programme Organizer	Coordination, quarterly meetings
	NGO staff	Coordination, Reporting
Upazila	UH&FPO	Coordination, planning and supervision
	Medical Officer (Disease Control)	Diagnosis and treatment
	Medical Technologist (Laboratory)	Microscopy
	LTCA	Registration, treatment card initiation, recording and reporting
	NGO staff	Implementation, referral, DOT, link with community
Community	Health Assistant	Referral, DOT
	Community Health Worker/Volunteer	Referral, DOT
City Corporation	Medical Officer	Diagnosis and treatment
	Medical Technologist (Laboratory)	Microscopy
	Paramedic staff/ Counselor	Recording and reporting, referral

3. Goals, objectives and targets for tuberculosis control

VISION STATEMENT OF NATIONAL TB CONTROL PROGRAM

Tuberculosis is no more a public health problem in Bangladesh.

MISSION STATEMENT OF NTP

National Tuberculosis Program (NTP) aims to strengthen the effort of TB Control through effective partnerships, mobilizing resources and ensuring quality diagnostic and treatment services under DOTS strategy. NTP strives to make services equally available to all people in Bangladesh irrespective of age, sex, religion, ethnicity, social status and race.

GOALS OF NATIONAL TB CONTROL PROGRAM

The overall goal of TB control is to reduce morbidity, mortality and transmission of TB until it is no longer a public health problem.

OBJECTIVES OF NATIONAL TB CONTROL PROGRAM

- Reach and thereafter sustain the global targets of achieving at least 70% case detection and over 85% treatment success among TB cases under DOTS

- Reach the interim target of halving TB death and prevalence by 2010 towards achieving the Millennium Development Goals set by 2015
- Eliminate TB as a public health problem by 2050

The National TB Control Programme adopted WHO Global and Regional Stop TB Strategy in its 2006-2010 strategic plan and will continue in the current 2011-2015 plan.

The key strategies are-

- Pursue quality DOTS expansion and enhancement;
- Establishing Interventions to Address HIV-Associated TB (TB/HIV) and Drug-Resistant TB;
- Contributing to health system strengthening;
- Forging Partnership to Ensure Equitable Access to an Essential Standard of Care to all TB Patients;
- Engage people with TB, and affected communities;
- Promote Operational Research.

4. Strategies and interventions by the six key components of the Stop TB Strategy

STRATEGIC APPROACH # 1: Pursue high-quality DOTS expansion and enhancement

4.1 CASE FINDING

Objective: To increase the case detection rate of new smear positive cases to 80% and improve diagnosis of new smear negative, extra-pulmonary cases and children TB by 2015

While the TB diagnostic network extends to 950 centers by the end of 2008, microscopy services are not equally accessible in all parts of the country. For the upazilas with a population of over 250 000 additional peripheral laboratories have been established in government or NGO facilities. However, there are still hard-to-reach and remote areas, urban centers and in private sectors which need additional laboratory for AFB microscopy for better accessibility. As per policy of the NTP sputum smear microscopy remains the key tool for diagnosis of infectious tuberculosis. NTP operates a network of laboratories with External Quality Assessment (EQA) system. The laboratory network is fully integrated with the Government health care including UHC, district hospitals, medical colleges, chest disease clinics, and other hospitals. Slides from microscopy centers are cross checked at EQA centers on quarterly basis. NTP developed Standard Operating Procedures (SOP), for TB smear microscopy, as a part of WHO Global Initiatives in 2008.

About 70% of patients diagnosed under NTP are new-smear positive patients, 3% are relapses and 27% are smear-negative pulmonary and extra-pulmonary patients (as compared to 50-55% expected to occur in case of smear-negative and extra-pulmonary). Only 3% of the patients are children. These figures indicate a substantial under-diagnosis of smear-negative and extra-pulmonary patients as well as TB in children. Other categories of retreatment cases, though not routinely reported, appear also under-diagnosed.

There is inadequate functional facilities and capacity to diagnose smear-negative and extra-pulmonary TB. During DOTS expansion (2003-2007), major priority was given to detection and treatment of smear-positive patients. Functional X-ray facilities were available in only a few CDCs and UHCs. In the rural areas sputum collection and processing is largely done through community-based services while for the diagnosis of smear-negative or extra-pulmonary TB patients had to be referred to medical officers of CDCs, medical college hospitals and UHCs. Further, many patients diagnosed with smear-negative and extra-pulmonary TB at hospitals and also by private practitioners were not reported to NTP. As only about 3% of the reported TB cases are children, there is also substantial under-reporting of childhood TB.

Major emphasis is given by NTP to substantial increase in the detection and treatment of smear-negative and extra-pulmonary patients and child TB. The X-ray facilities at the CDCs and upazila health complexes (UHCs) will be functionalized and supplies will be provided. Collaboration with pediatricians will be intensified and linkages with graduate private practitioners strengthened. It is expected that the number of

diagnosed smear-negative and extra-pulmonary patients will increase from about 40 000 in 2006 to 75 000 in 2015 and child TB from about 3300 during 2006 to 12000 in 2015.

Proposed activities and interventions:

4.1.1 Maintain and expand NTP laboratory network for sputum microscopy

- The NTP plans to further expand the diagnostic and treatment facilities in hard-to-reach and remote areas, urban centers, private sectors, work places, at all prisons, private hospitals, among specific at risk population groups including PLWHA, refugee, slum dwellers. A further increase in the detection of new smear-positive patients, about 1% per year, is envisaged, while maintaining treatment success at 90% or above;
- 15 additional laboratories are planned to be established by NGO partners within the next 5 years. Additional laboratory staff will be recruited by NGOs.

4.1.2 Strengthen External Quality Assessment System

- Implementing EQA system and developing institutional capacity of microscopy centers is the primary focus of this intervention. Currently 35 EQA centers are operating in the country and is expected 10 more EQA centers will be functional by NTP to cover newly and previously established laboratories by 2015.

4.1.3 Enhance the quality of microscopy by training, supervision and monitoring

- NTP will continue providing training on sputum microscopy for AFB to the medical technologist (laboratory)/laboratory technician for one week followed by refresher training;
- Training on EQA and SOP will continue for the staff of EQA and microscopy centers respectively;
- Supervision and monitoring will be carried out by NTP and NGOs at all levels. NTP will require technical assistance from international agency for review and improvements once every two years.

4.1.4 Improving diagnosis of smear-negative, extra-pulmonary and children TB

- The X-ray facilities at the CDCs and upazila health complexes (UHCs) will be functionalized and supplies will be provided. Medical Officers will be trained in reading X-ray films. Collaboration with pediatricians will be intensified and linkages with graduate private practitioners strengthened;
- NTP shall establish linkages with pathologists and surgeons of the districts district hospitals to strengthen FNAC and biopsy services;
- Pediatricians at district level will be oriented in national guidelines on child TB to refer child TB cases to NTP designated centers for treatment.

4.2 CASE HOLDING

Objective: To maintain treatment success rate to over 90% till 2015

Standardized treatment with FDCs, free of charge to the patients, will continue to be provided to all TB patients on an ambulatory basis. DOT should be provided in a patient-friendly manner by a variety of treatment providers suitable to the local conditions. The NTP will further expand the use of cured and treatment completed patient and peer support groups to promote adherence to treatment. To sustain and further increase the treatment success rates, the NTP will continue to work with NGOs. These NGOs will also support the NTP with the provision of appropriate patient education, including information regarding the regimen duration and possible treatment outcomes, provided repeatedly by well trained and considerate staff. Patient's compliance is monitored by health workers and community health volunteers.

All DOTS implementation sites use nationally approved treatment regimens. Specific treatment categories are based on type of TB, bacteriological status and history of previous treatment.

Table 5: **NTP treatment Regimens**

Diagnostic Category	Treatment Regimen	Patient Diagnostic Category
Category I	2 (RHZE)/ 4 (RH)	New sputum smear-positive, smear-negative and extra-pulmonary TB with or without concomitant HIV related disease
Category II	2 S (RHZE)/ 1 (RHZE))/ 5 (RHE)	Retreatment TB cases including failures, relapse and treatment after default

For the purpose of categorization, HIV testing should not be done

To ensure quality of drugs NTP procures all anti TB drugs from Global Drug Facility which has built- in and documented safeguards for drug quality. In order to avoid inadequate treatment and facilitate compliance, NTP uses fixed dose combinations drugs. Similarly, NTP will use blister packed drugs for better handling and inventory control. Buffer stocks of medicines are maintained at central, districts and upazila levels. NTP maintains a standardized system for procurement, storage, distribution, monitoring and quality control of anti-tuberculosis drugs. For procurement of other supplies (laboratory reagents and equipments) NTP follows a mechanism of tendering as per government rules and regulations.

To obtain information on TB/HIV collaborative activities and PPM activities, new indicators have been incorporated in the NTP recording and reporting system. NTP data and quarterly reports are sent from the peripheral levels through upazila and district authorities to the central level where they are analyzed. After adapting and incorporating the new concept of management information for action (MIFA) in MIS, data entry and analysis has been initiated at district level. All 64 districts have been provided with a computer and software; district level statistical assistant have been trained in data entry.

Periodic internal and external reviews are being conducted by NTP, WHO and NGO partners. Particularly external reviews offer opportunities for analysis of the programme.

The NTP has a long standing history of partnership with several national and international partners. These partners have supported NTP in key programme areas including supervision, training, community participation, advocacy, logistic support for drug distribution, microscopy quality assurance and research.

Proposed activities and interventions:

4.2.1 Expand and sustain treatment centers

- In order to further improve access NTP aims to expand DOT centers in hard-to-reach and remote areas, urban centers, private sectors, work places, at all prisons, private hospitals, among specific at risk population groups including PLWHA, refugee, slum dwellers. NTP plans to add 30 DOT centers during the five year period. Special focus will be given to DOTS service availability in the urban areas and medical colleges. In addition NTP will identify effective and sustainable alternatives to health worker supervision for patients living in difficult to access areas, including community and family based treatment observation and support.

4.2.2 Procurement and supply of first line anti-TB drugs and laboratory consumables

- NTP will ensure continuous availability of good quality and adequate amounts of the drugs at all DOTS implementing public and private sites. The NTP is responsible for preparing estimates of anti-TB drug requirements, and determining technical specifications of drugs and procures all TB drugs from Global Drug Facility (GDF) through direct procurement. Procurement of all drugs, diagnostics and consumables is under the responsibility of NTP to ensure availability of uniform drug formulations across the country;
- During 2011- 2015 approximately over 200 000 TB patients will be treated. In order to ensure uninterrupted availability of anti TB drugs buffer stocks will be maintained at central (50%), districts (25%) and upazila (treatment centre and sub-centre) (25%) levels based on case load at each respective level. Estimates for drug requirements are based on the annual risk of infection, the number of patients treated during previous years and targets sets for each year (estimates of TB burden annex I). Using this mechanism NTP will review and adjust drug requirements annually on the basis of actual case finding, epidemiological estimates and targets set. Estimated drug costs are based on prices obtained from Global Drug Facility website. In order to accommodate price increases in the future, this plan includes an inflation of 3% from year 2 onwards. Based on past experience 25% of the estimated drug cost is added for transportation, handling, insurance, quality control testing. The estimated drug needs and the costs are presented in annex II.

4.2.3 Human resource development

- NTP will maintain and improve the knowledge and skills of health workers through continuous training and supervision, in collaboration with NGOs;
- Basic TB management, laboratory course on AFB microscopy, mid and field level supervision, PPM, data management, store management, orientation on specific areas and refresher training will be conducted regularly to update the knowledge and skills of all health workers by NTP. NGOs will continue training and retraining

for DOTS providers, NGO staff and community health workers. Existing training materials for different levels of health workers will be periodically revised in line with the changing NTP policies and WHO recommendations. Similarly new materials will be developed as per programme needs;

- NTP will be responsible for new training activities that includes diagnosis of smear-negative, extra-pulmonary and childhood TB for medical officers of UHCs and district hospitals; PAL for medical officers of UHCs and CDCs; infection control for staff of DOTS centers; planning and budgeting, and strategic leadership for medical officers of DOTS centers; intensified training for doctors and paramedic staff under PPM network; TB/HIV for staff of CDCs and NGOs involved in TB/HIV collaborative activities; patient management, recording/reporting for LTCAs and financial management for central-level staff. Also as new activity workshop are included for establishing linkages with surgeons and pathologists of district hospitals level for FNAC/biopsy;
- NTP will engage Bangladesh Medical and Dental Council to include Stop TB Strategy components in the medical curricula. This will also require development of curricula, orientation and consensus of concerned authorities;
- International training and study tours will continue for NTP and partners.

4.2.4 Supervision and monitoring

- NTP will continue quarterly monitoring meetings and workshops in all districts and city corporations. Supervision of all implementing facilities and areas to be continued by national, district and UHC staff. Chest disease clinic will continue to supervise and monitor TB control activities within the district. The quarterly coordination meetings with all implementing authorities at central/divisional level will be continued;
- Intensification of involvement of private practitioners, village doctors and shastho shebikas will need a close follow up in order to institutionalize this approach. In addition new activities, such as PAL, MDR-TB, computerized data entry and analysis, intensified implementation of TB/HIV require increased frequency of supervision. Key programme staff at district level will continue to be trained on data analysis and information management;
- NTP will continue to collaborate with these partners in the next five year and seek their assistance in pre-determined areas for support.

STRATEGIC APPROACH # 2: Address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations

4.3 TB/HIV

Objective: To decrease the burden of TB/HIV in the population affected by both diseases by ensuring effective collaboration between TB and HIV programmes through effective coordination and delivery of collaborative services

Bangladesh is a low HIV prevalence country. Due to several risk factors present in the country (IDU, cross-border traffic) HIV may increase to epidemic levels in the coming years. Although the proportion of HIV positives among TB patients is found as low as 0.1% in three (limited) surveys, the high prevalence of TB infection (approximately 50% of the adult population) and the increasing HIV prevalence among injecting drug users (IDUs) to 7% is crucial for strengthening TB/HIV collaboration and coordination.

National TB/ HIV Coordination Committee have been formed duly approved by the Ministry of Health and Family Welfare, with representation of the both programmes and other concerned stakeholders. NTP has initiated TB/HIV collaboration activities and has initiated joint planning for TB/HIV activities through the National TB/HIV Coordination Committee.

Proposed activities and interventions:

4.3.1 Strengthen the mechanism for collaboration and coordination

- National TB/HIV Coordination Committee will continue to be the key authority for policy, guideline development and overall planning, monitoring and evaluation at the national level. National TB/HIV Coordination Committee will ensure coherence and coordination for implementation of TB/HIV activities;
- The coordination committee will meet quarterly to review progress, prepare plan of action, identify issues, review and approve programme reports and arrange workshop with the stakeholders;

4.3.2 Establish functional linkages between DOTS and VCT centers and capacity building

- Infectious disease hospital in Dhaka will function as a main center for management of TB/HIV co-infection;
- To decrease the burden of TB in People Living with HIV/AIDS, NTP in collaboration with National AIDS and STD Programme (NASP) will establish functional linkages between DOTS and VCT centers with NGOs. NTP plans to cover bordering districts, port cities and medical colleges during the five year period of this Strategic Plan. The collaborative activities will include referral and management of TB/HIV co infected cases, improve recording and reporting system and supervise and monitor activities;
- NTP will continue to build capacity of HIV counselors and other staff of VCT and DOTS centers for managing TB/HIV co-infection.

4.3.3 TB/HIV surveillance

- A nation-wide representative TB/HIV survey will be carried out within this Strategic Plan to explore real TB/HIV co infection and its trend.

4.4 MDR-TB

Objective: To reduce mortality, morbidity and transmission of MDR-TB through effective management

There are no representative data on drug resistance in the country. The Fourth Global MDR-TB Report estimates that 3% of new and 20% of previous treated TB patients are MDR-TB cases. This implies that approximately 2500 MDR-TB cases occur annually. With more in-patient facility becoming available, and NTRL being functional, NTP has planned to accelerate enrollment of MDR-TB cases. A National DOTS-Plus Coordination Committee is functional, a clinical care and social support sub-committee is also in place. The country specific guideline for management of drug-resistant tuberculosis is available. The NTRL is supporting the DOTS-Plus project. The NIDCH reconfirmed their commitment through allocating more beds and space for MDR-TB patients and participates actively in the NTP. Under GF Round 5, funds to manage 700 MDR-TB cases were approved. It was planned to treat 50 MDR-TB patients in 2007 as per the Green Light Committee (GLC) approved project. Due to various delays, NTP could not start to enroll the patients in 2007. However, MDR TB management started in NIDCH in August 2008. 700 patients will be treated under GF Round 5 grant. Under GF Round 8 grant, 600, 750 and 1000 patients are planned to be enrolled during years 3, 4 and 5, respectively i.e. up to 2013. NTP plans to enroll 1200 and 1500 patients in 2014 and 2015 respectively. The NGO Damien Foundation Bangladesh is supporting management of drug-resistant TB in North West part of the countries with its own fund. The NTP also planned to decentralize management of MDR-TB stepwise, gradual extension of MDR-TB management to the Chest Disease Hospitals in Chittagong, Khulna and Sylhet is planned.

As soon as culture and DST is established with proficiency in a given laboratory, it is expected that the laboratory is ready to take up newer diagnostics. All new diagnostics need to be compared with the established solid culture (gold standard) for uptake into a given laboratory. Therefore establishment of solid culture will precede uptake of newer diagnostics in a given laboratory.

Bangladesh is a year-3 country (2011) under the proposed UNITAID supported EXPAND-TB project of WHO GLI- FIND- GDF. Accordingly, new diagnostics will be provided to NTP by EXPAND-TB in 2011. If NTP progresses rapidly in the establishment of solid culture and in establishing appropriate BSL-3 laboratory facilities as are required, NTP can request the EXPAND TB project to expedite uptake of liquid culture and line probe assay. EXPAND-TB will assess the country's lab facilities and then proceed with establishment of newer diagnostic methodologies. The EXPAND TB project will supply the country with the following consumables, which is expected to cover 35% of the MDR-TB suspects in the country:

NTP, Bangladesh	2011			
	TB culture	1 st line DST	2 nd line DST	Line Probe Assay
	112,236	11,224	2,245	1,459

All equipment for liquid culture systems and line probe assay for given labs will also be covered under UNITAID.

For subsequent years the NTP has to plan for the budgetary provision for liquid culture and line probe assay consumables. Establishment of BSL-3 or BSL-2 plus facilities and adequate manpower support for using and providing services with the new technologies will need to be done by NTP and the EXPAND TB project is an additional input for the country in assisting for uptake of rapid diagnostics. EXPAND TB project also will undertake training of staff and assistance in establishing new technologies in the lab in terms of establishing SOPs, trouble shooting advice and supervisory visits for corrective actions.

NTP offers the following standard treatment regimens for the treatment of MDR TB.

Table 6: *NTP treatment Regimens for MDR TB*

INTENSIVE PHASE (6-10 MONTHS)	CONTINUATION PHASE (13-18 MONTHS)
Kanamycin (KM) Pyrazinamide (Z) Ofloxacin (Ofx) Ethionamide (Eto) Cycloserine (Cs)	Pyrazinamide (Z) Ofloxacin (Ofx) Ethionamide (Eto) Cycloserine (Cs)

The intensive phase should be at least 6 months provided 4 months of continuous culture and smear negativity were reached within the period of time. More than 6 months in case of late culture conversion. In these cases intensive phase should be prolonged up to 4 months of consecutive culture and smear negative. The continuation phase will continue at least for 13 months and total treatment duration will be at least 18 months after culture conversion (not followed by any positive culture). NTP plans to treat about 5000 MDR TB cases during the next five year period 2011-2015.

Proposed activities and interventions:

4.4.1 Strengthen and expand national laboratory capacity for culture and DST

- NTP plans to strengthen National TB Reference Laboratory at NIDCH by providing additional human resources;
- Regional/Divisional TB Reference Laboratory for culture and DST will be established in Chittagong, Khulna and Sylhet phase wise within the next five years (initially culture followed by DST).

4.4.2 Human resource development

- NTP will organize international training courses to update the knowledge and skills for the staff of NTRL during year two and four;
- Two medical technologist (laboratory)/ laboratory technicians from each Regional/Divisional TB Reference Laboratory will be trained at NTRL. The training will happen during the year of implementation (first and third year) and refresher training will be organized in year four and five. The duration of the basic culture training will be 4 weeks. The staff from the centers performing DST will undergo 1 week additional training for DST. The duration of the refresher training will be 7 days;
- Training for medical officers on MDR TB management, mid and field level staff will continue.

4.4.3 Supervision and monitoring of culture and DST laboratories

- NTP will provide supervision and monitoring services to three Divisional/Regional TB Reference Laboratories when established. Monitoring visit will be arranged to

- each TB culture laboratory quarterly during the first two years and subsequently twice per year;
- NTP will require technical assistance from WHO/Union for review and improvements once every two years.

4.4.4 Socio economic support to MDR TB patient

- NTP will identify MDR TB management sites with the NGOs and make plan for ambulatory treatment;
- NTP plans to provide transportation, food or hygienic packages for patients and their families. NTP will continue to work with NGOs to provide financing of transport, incentives such as food or hygienic packages for patients and their families. These NGOs will support with the provision of appropriate patient education, including information regarding the regimen, duration and possible treatment outcomes, provided repeatedly by well trained and considerate staff.

4.4.5 Procurement of second line anti-TB drugs and drugs for management of adverse effects

- NTP will continue procuring second line anti-TB drugs through Green Light Committee (GLC) using direct procurement mechanism. Details of drug requirements and cost estimation are under annex III. Drugs for management of adverse effects will be purchased locally as per rules of the government.

Under GLC policy an annual monitoring mission will be carried out by international experts. An annual GLC fee is budgeted.

4.4.6 Upgrading NTRL with liquid culture and DST facility

- NTP plans to upgrade NTRL by establishing liquid systems for culture and DST. With support UNITAID, the use of liquid systems for culture and DST will be established in NTRL. Molecular line probe assays for the rapid detection of MDR TB will be set up. Standard operating procedures will be developed for newer tools. In addition, patient diagnostic algorithms will be developed to give guidance on which patients should have access to which tools. These algorithms should be in line with planned scale-up of MDR TB control activities;
- Laboratory staff will undergo regular training in-country and abroad on culture and DST. Technical assistance will be coordinated with GLI and partners;
- WHO, GLI, FIND, GDF and UNITAID will collaborate on the provision of diagnostic tests for rapid diagnostic tools for one year. The cost for maintenance and sustainability of equipment and testing need to be identified beyond one year.

4.4.7 Drug resistance survey

- Nationwide drug resistance survey will be carried out in 2009 and 2014 to continue to measure trends of MDR TB in the country.

4.5 ADDRESSING NEEDS OF THE POOR

Objective: To prevent transmission of infection to disease by addressing needs of the poor

Pulmonary TB patients have usually lost 5-10 kg at the time they commence anti-TB treatment. Yet, the health system neglects the poor nutritional status and the inadequacy of the diet among the patients, as well as non-infectious diseases such as diabetes mellitus, which may have played a role by causing flare-up of latent TB. Despite being a curable disease, TB continues to spread at an alarming rate in Bangladesh. A major reason for this is the high prevalence of compromised immune systems resulting from poor living conditions, poor standards of hygiene, poverty, malnutrition, stress and escalating HIV/AIDS pandemic.

Proposed activities and interventions:

4.5.1 Develop policies to address needs of the poor

- NTP will develop policies to link with National Nutrition Programme (NNP) under the Ministry of Health and Family Welfare. NNP will provide additional vitamins and food package to the under nutrient TB patients. Operational studies to be undertaken by NTP and NNP to see whether people who take vitamins along with the standard medicine for tuberculosis recover better and quicker than people who take only the standard medicine for TB; whether lowered immunity from nutrient deficiencies is enabling dormant TB to become active; whether lack of good nutrition is increasing drug side-effects, encouraging non-compliance;
- NTP will enhance advocacy for good nutrition to prevent transmission of infection to disease, assist in keeping TB infection in a dormant state;
- NTP will address non-infectious diseases such as diabetes mellitus which may play vital role in prevention of latent infection to active diseases.

4.5.2 Implementation of policies to address needs of the poor

- NTP with NGO partners will implement policies in addressing the needs of the poor to prevent transmission of infection to disease.

4.6 PRACTICAL APPROACH TO LUNG HEALTH (PAL)

Objective: To improve the quality of diagnosis and treatment of common respiratory illnesses in health care settings and increase TB case detection through Practical Approach to Lung Health (PAL) initiative

NTP recognize the need for health system strengthening in order to improve the health of the people, and in particular to control and reduce TB in Bangladesh. The “Practical Approach to Lung Health” (PAL) is an effective approach for strengthening health system. The Stop TB strategy emphasizes the need of strengthening the health system through innovative approach such as PAL. PAL, which is based on improving the quality of care of all respiratory patients above five years of age, focuses on the primary health care level. It is estimated that respiratory symptoms constitute about 50% of outpatients at the UHC level. ARIs rank third in hospital morbidity, pneumonia is the first reported cause of death, over 40% of male adults smoke and chronic obstructive pulmonary disease is frequent in females due to indoor air pollution (stove fumes). Improvements in diagnosis and treatment of acute and chronic respiratory illnesses will reduce morbidity and mortality from these diseases. NTP developed interim policy of PAL by an international expert in 2008.

Proposed activities and interventions:

4.6.1 Development of PAL strategy and guideline

- At the national level, a PAL technical staff will be recruited or to be designated among the staff to develop the strategy and guidelines, prepare training materials, develop monitoring and evaluation plan, supervise and monitor implementation, prepare plans for expansion and prepare plan for procurement of supplies. NTP shall be responsible for planning, implementation and monitoring of PAL.

4.6.2 Procurement and supplies

- Basic equipment like peak flow meters, spirometers are to be procured by NTP on the basis of expansion plan. Nebulizer is the only medicine to be included; other medicines are to be provided by the general health services. Procurement shall be done through government rules. Antibiotics, bronchodilators, etc, will be part of the essential drugs for respective health facility, and thus covered by the Essential Service Delivery of MoH&FW.

4.6.3 Implementation and expansion of PAL

- NTP plans gradual implementation of PAL activities, starting with a pilot in one health facility in each of the six divisions of the country. After lessons learned, operational aspects may be revised, if required, and PAL will gradually be expanded, covering 310 upazilas at the end of the fifth year. It is planned that thereafter PAL will be extended to all upazilas and metropolitan areas. It is expected that PAL shall contribute to strengthening the overall healthcare system, as well as improve diagnosis and management of respiratory diseases, including TB, and particularly smear-negative TB. It is also expected that the widespread prescription of fluoroquinolones to respiratory patients, which make provoke resistance to quinolones in TB patients, will be reduced following

implementation of PAL guidelines. Its implementation will be overseen by a National PAL Coordinating Committee.

4.6.4 Human resource development

NTP will be responsible for training of staff as per expansion plan. A tentative plan is given below:

Consultative meeting at national level	1 day meeting, 30 participants
Consultative meeting at district level	1 day meeting, 25 participants
Training of Trainers (Junior Consultant CDC, Medical Officer designated TB Civil Surgeon Office, NGO staff)	5 days training at national level
Training of UH&FPO and Medical Officer UHC	5 days training at district level
Mid level staff of UHC	2 days training at district level
Field level staff of UHC	1 day training/orientation at upazila level

4.7 INFECTION CONTROL

Objective: To decrease transmission of TB including Multi Drug Resistance TB in congregate and health care settings through implementation of Infection Control policy

Currently NTP lacks an infection control strategy and is limited to laboratory waste disposal. The infection control and safety standards of TB laboratories are also poor. There are no data or estimates of occupational TB risk for staff of TB services and primary health care. As a result infection control practices are not uniform nor stringently followed in TB laboratories, hospitals, microscopy centers and TB treatment centers. This increases the risk of transmission of infection among patients, health workers and general population. As drug-resistant TB and TB/HIV are growing concerns, infection control needs to be properly addressed.

During 2011-2015 NTP plans to develop and implement a comprehensive national infection control strategy for TB program which will be in place in DOTS treatment centers, chest disease clinics and hospitals, MDR TB management sites and all laboratories involved in TB smear microscopy. Introduction of infection control measure in NTP will directly benefit overall primary health care as all of these institutions are integral part of health system.

Proposed activities and interventions:

4.7.1 Development of national infection control strategy and guidelines

- NTP with assistance from international experts, will develop a comprehensive national infection control strategy, guidelines and policies. IC strategy will focus on all health care settings where TB patients, their sputum or culture materials are handled or kept. Such settings include chest disease clinics and hospitals, microscopy centers and TB culture and DST laboratories;
- The approved strategy will be widely disseminated to all concerned sites, institutions and personnel. Strategy will be developed, printed and ready for circulation during year one. Similarly, training guidelines, orientation and advocacy material will also be developed during year one. NTP and its partners will launch a advocacy campaign for promotion and introduction of TB Infection Control Strategy;
- A situational analysis of the current risk level and implementation of TB IC will be done in order to contribute to the development of the national IC strategy. Facility level assessments will take place in order to develop specific infection plans and SOPs relevant to the facility.

4.7.2 Human resource development

- NTP will develop standardized training curricula for training on infection control. A core group of staff from NTP and chest disease clinic will be developed as master trainers during year one (duration 5 days). Basic IC training will be organized for DOTS centers, chest disease clinics, chest hospitals and MDR TB management site staff (duration 3 days) during year two and a refresher training (2 days) in year five. WHO generic materials will be adapted for such trainings. Adherence to infection control strategy will be monitored during routine supervision by NTP. Check list will be revised and updated.

4.7.3 Implementation of infection control measures at TB culture and DST laboratories and sputum microscopy centers

- This is required to ensure compliance with national infection control strategy. Waste management and disposal system of NIDCH, Chest Disease Hospitals will be renovated/upgraded as per WHO recommendations. This will include ensuring sorting of waste and sterilization of waste before disposal. Similarly waste management and disposal system at smear microscopy centers at the peripheral level will be ensured through provision of guidelines, training, supervision and provision of required equipment such as incinerators and waste collection containers;
- To ensure compliance with national infection control strategy and provision of N95 or FFP2 respirators for staff who work in high risk areas or who perform high risk procedures such as bronchoscopy, sputum induction, laboratory staff who perform culture and DST is essential;
- NTP will upgrade 270 sputum microscopy sites (90 sites/year from year 3). Among those, 100 sites will undergo comprehensive upgrading including renovation of patients' waiting area (separate space for general and TB sputum positive patients), ensure optimum sputum collection area, as well as safe disposal of sputum containers and other laboratory waste;
- NTP will ensure triage of TB suspects, separation of symptomatic patients from other patients in the waiting area, and prompt treatment. Patient education programmes and educational posters and pamphlets will be available to patients and their families to encourage cough hygiene, and bring an understanding of TB transmission, importance of natural ventilation in transmission prevention, and adherence to TB treatment. Policies will be in place to ensure natural ventilation with training to ensure compliance by the staff;

4.7.4 Procurement and supplies

- NTP will procure necessary logistics and supplies for infection control strategy. This will include respirators, fit test kits for the MDR treatment centers and necessary measurement device (vaneometers, anemometers, smoke tube kits) for staff of MDR centers and masks for MDR TB patients, autoclaves, disinfectants, gloves and other supplies for laboratories and sputum microscopy centers. Supplies will be procured centrally and will be distributed to respective site on a quarterly basis as per government rules;
- NTP will ensure provision of UV boxes and respirators for staff at NIDCH, 44 chest clinics and 4 chest disease hospitals (3 staff x 49). MDR TB sputum positive patients will be provided with masks. NTP will also ensure that all TB sputum positive patients are trained on cough hygiene and proper use of masks as necessary.

4.7.5 MDR TB Infection Control and staff policy

- NTP will ensure all staffs involved in MDR TB management work are under strict infection control environment, best possible training and regularly supervised and monitored-periodic health check-up and assessment to rule out MDR TB;
- NTP will ensure prioritized provision of personal respirator (particulate respirators) to all staff involved in MDR TB management and to laboratory staff who work with TB culture and DST, and for those who do smear microscopy where the workload is high;
- NTP will ensure training of staff on infection control and personal protection, including the proper use of respirators, fit testing, and monitoring usage.

STRATEGIC APPROACH # 4: Engage all care providers

4.8 PUBLIC PRIVATE PARTNERSHIP

Objective: To engage public and private health care providers to ensure provision of quality TB services as per policy of NTP and international standard of TB care

NTP implemented and scaled up various pilot projects in urban cities in collaboration with Nuffield Center for International Health and Development (NCIHD) under the University of LEEDS UK since 2003-2004. A major priority is expansion and sustaining of participation and linkage with graduate private practitioners. Enhanced linkages, intensified supervision and monitoring are the key strategies for Public-Private-Mix component of NTP.

On the other hand only around 500 large factories are linked with NTP; however there is a bigger scope to engage other corporate sectors. NTP has already established formal linkages with the largest association of the corporate sector, the Bangladesh Garments Manufacturers and Exporters Association (BGMEA) which employs 2.4 million workers through about 3000 factories. To ensure effective engagement of and access to the workplaces, BGMEA is establishing collaboration with NTP for implementation and expansion of DOTS. In addition, NTP and NGOs will expand the DOTS activities in other work places.

NTP established PPM coordination committee at central and divisional level in 2008 and will continue to function within this strategic plan. The implementation of PPM activities are guided by national operational guidelines developed by NTP in 2005.

Proposed activities and interventions:

4.8.1 Strengthen coordination for PPM at different levels

- Revise/update PPM coordination committee with terms of reference at different level;
- NTP in collaboration with NGOs will conduct sensitization meeting through PPM coordination committee at various levels twice in a year to assess situation, map diverse health care providers and identify their potentials to be involved in PPM;
- NTP will gradually involve professional bodies Bangladesh Medical Association (BMA), Bangladesh Private Medical Practitioners Association (BPMPA), Bangladesh Lung Foundation, Chest and Heart Association, Asthma Association of Bangladesh and other bodies by 2015.

4.8.2 Expansion, scaling and establishment of referral system between NTP and partners for PPM

- NTP plans to expand PPM in all cities (urban DOTS) including hospitals, while NGOs in consultation with NTP will expand in the district (including municipality)/upazila and at community levels. NTP plans to scale up 1-2 cities and 25 municipalities each year thus covering expansion and scaling within this strategic plan period;
- NTP will establish/scale up collaboration with graduate private practitioners, private hospitals, public hospitals, medical colleges under the MoH&FW and under other ministries within this period;

- NTP in collaboration with NGOs will either establish DOTS centers or organize periodic orientation for increased access to vulnerable and marginalized populations including slum dwellers, factory workers;
- Local volunteer organization will be involved in tracing of absentees and defaulters and referral of TB suspect from communities to the nearest diagnostic centers for case detection;
- A patient referral system between private sector and DOTS centers will be established by NTP. A standardized Memorandum of Understanding (MoU) will be established between NTP and private sector for management of TB suspects and patients according to national guidelines.

4.8.3 Human resource development

- NTP and NGOs will be responsible for orientation/training to public and private providers at all levels;
- In addition, in-country and outside the country visits will be organized for the members of PPM coordination committee for learning and experience sharing on urban TB control.

4.8.4 Supervision and monitoring

- NTP in collaboration with the stakeholders will enhance linkages through effective and intensified supervision and monitoring during the period of the plan.

STRATEGIC APPROACH # 5: Empowering people with TB and communities through partnership

4.9 ADVOCACY, COMMUNICATION AND SOCIAL MOBILIZATION (ACSM)

Objective: To increase case detection to 80% by 2015 through increased awareness at all levels and to maintain treatment success rate to over 90% through improved community involvement and support

This component of the Stop TB Strategy seeks to increase advocacy, communication and social mobilization and the involvement of communities and patients in TB care and prevention to promote and enable health-seeking behavior among all people living in Bangladesh. NTP relies on support from decision- and policy-makers, opinion leaders, NGOs, the media, the private sector, communities and individuals.

NTP requires long term planning to enhance advocacy, communication and social mobilization. This will improve case detection and treatment adherence, combat stigma and discrimination, empower people affected by TB, mobilize resources and institutionalize social change and reduce poverty. The NTP has been successful in ensuring political commitment to TB control forging partnerships with health and development agencies (NGOs) working in the country. While these activities will continue to be strengthened, particular emphasis will be put to foster inclusion of patients and communities in the fight against TB, since this area of the component to empower people and communities with TB has been lagging behind.

Proposed activities and interventions:

Advocacy

4.9.1 Implementation of ACSM policy and guideline

- During the next five years NTP will implement ACSM policies and guidelines with different stake holders. There will be mid-term review of the guidelines to include new strategies and interventions arising from various studies and reports.

4.9.2 Advocacy to gain/maintain political commitment

- The activities on advocacy with high-level policy makers, round table meetings, TV talk show, billboard display, media involvement, TV and radio spot airing and folk song, people's theatre, DOTS committee meetings at district and upazila levels will continue by NTP and partners;
- World TB Day is observed to create awareness, inform and empower people to have access to TB care. This event will be continued by NTP and NGOs to gain political commitment;
- Currently, National Anti TB Association of Bangladesh (NATAB) is conducting advocacy workshop with civil society at district level. This advocacy will be continued. However it is planned to extend advocacy meetings with civil society at upazila level. NATAB will continue to support annual national conference to raise and sustain awareness on TB under the guidance of NTP every year.

Communication

4.9.3 Conduct community awareness activities

- NGOs will conduct orientation on TB among the folk team, involve women group, support ultra poor to seek care for TB, micro credit workers to disseminate TB knowledge and information among the rural and urban population. This will have positive impact on disease burden more specific to case detection.

4.9.4 Behavioral Change Communication

- NTP will develop IEC materials, TB related messages, messages for newspapers;
- NTP will organize press conference and/or workshop for journalists at central and district levels in collaboration with NGOs.

Social Mobilization

4.9.5 Develop capacity of community health workers/ leaders/volunteers

- Orientation with cured TB patients, opinion and religious leaders, and other NGO workers will continue during the five year plan by NGOs under the guidance of ACSM steering committee. This will increase awareness among the individual and the community ensuring that overall case detection will not go down and sustaining high cure rates;
- Foster community participation in TB care, prevention and health promotion and promote use of the Patient's Charter for TB care by effective partnerships between health services and the community.

STRATEGIC APPROACH # 6: Enable and promote operational research

4.10 OPERATIONAL RESEARCH

Objective: To further improve implementation, performance and effectiveness of NTP approaches and services

NTP carried out several operational researches since implementation of DOTS in 1993. The Research Institute of TB, Japan carried out operational research on development of urban DOTS through participatory methods in collaboration with NTP for several years. This has improved management capacity and strengthened linkages within NTP partners in big cities. Nuffield Center for International Health and Development (NCIHD) supports NTP in operational research and establishment of collaboration with private sectors for implementation of DOTS since 2003-2004. Research covered include causes of stigma and discrimination associated with TB; management and technical lessons learnt from a successful Public Private Partnership for TB control; and linking private and public sectors in diagnosis and treatment of TB.

Recently the directorate of Mycobacterial Disease Control carried out several researches under HNPS, the results is still waiting.

Proposed activities and interventions:

4.10.1 Conduct programme-based operational research

- NTP conducted a national TB prevalence survey in collaboration with ICDDR,B since 2007. The preliminary results are available.
- National drug resistance surveys will be conducted in 2009-2011;
- TB/HIV sentinel surveys will be conducted in 2011 and 2014;
- NTP plans to conduct operational research on the following areas: healthcare seeking behavior, quality of sputum in urban laboratories, quality of sputum collection, TB/HIV collaboration, and socio-economic condition of TB patients, TB in prisons, evaluation of EQA and TB in diabetics.

The NTP will conduct research in collaboration with WHO, ICDDR'B, NGOs, medical colleges and other research organization by direct collaboration or contracting out. Rationality of OR are improving accessibility, facilitate in valid diagnosis and ensure quality care and strengthen the service delivery system.

5. Monitoring and Evaluation

Monitoring and evaluation is an integral component of NTP. Recording and reporting one of the major elements in the DOTS strategy. It facilitates to follow the patient once diagnosed, to monitor the progress of treatment and also helps in cohort analysis to assess case detection and treatment outcome against set targets at different implementation levels –upazila, district and national. NTP has introduced standardized recording and reporting system through out the country since inception of DOTS.

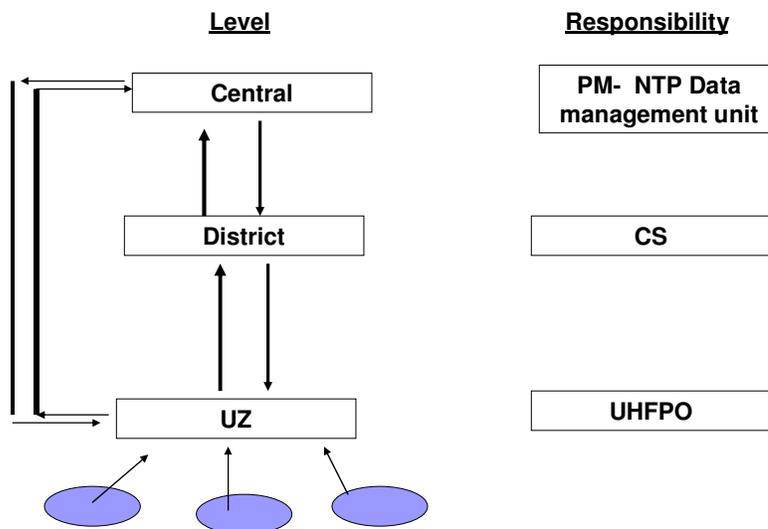
The data management system of NTP is computerized at central level. NTP analysis data at central level and provide regular feedback to the implementing units. However there is lack of skilled human resources at district and upazila levels. NTP plans to computerize data management at the district level within the next five year plan. There is insufficient capacity to analyze data more specifically at the district level.

5.1 NTP data flow

The reporting system is unified in line with the global reporting system. The reporting units submit reports quarterly to the UH&FPO at the upazila level from where the reports are forwarded to the district level and then to the MIS of the NTP at central level. The data are analyzed and reports are prepared quarterly and annually by NTP HQ. Feedbacks are given as and when required.

NTP has initiated the process of computerized data management at district level. The NTP MIS needs to be linked up with MIS of Directorate General of the Health Services (DGHS) within this five year plan.

Data flow



5.2 Strengthening monitoring and evaluation systems

Currently NTP uniformly had undertaken organized supervision activities in the rural, as well as urban areas, where the NTP structure, including its partner NGOs, is well established. Intensification of involvement of public basic health workers, private practitioners, village doctors and shastho shebikas will need a close follow up, in order to institutionalize this approach. In addition new activities like TB/HIV, computerized data entry and data management or management information for action (MIFA) need more frequent supervision to ensure effective implementation of these new activities.

The quarterly coordination meetings with all implementing authorities in city corporations and district level will be continued during 2011-2015. Furthermore, quarterly monitoring meetings at upazila level are also planned to intensify involvement of upazila level managers and other upazila workers in the TB control activities. These monitoring meetings will also help to strengthen the ACSM activities, as well as support the TB-HIV activities through networking with the HIV programme implementers.

Data entry and analysis at district levels, which are essential activities expected to result in more efficient use of available data. The paper-based versions currently in use lead to substantial paperwork at peripheral, intermediate and national levels, while insufficient attention is given to the more essential activities linked to reporting, i.e. analysis, providing feed-back and usage of the data for steering the program. These shortcomings are expected to be overcome with the use of a computerized package within this strategic period. The IT supplies provided for this purpose by the NTP can be made available to other health programs. In this way the TB program can be an entry point for reinforcing data entry and analysis of other programs, and thus NTP contributes in strengthening the overall health system.

Periodic internal and external reviews are being conducted. Particularly the external reviews offer opportunities for analysis of the program by including outside TB specialists as well as crosscutting experts. NTP plans to continue external review once in two years.

6. Indicators and targets

Table 7 indicate the impact related targets according to the overall goal and targets set forth for the planning period to reach the MDGs and Stop TB Partnership target.

Table 7: *TB impact targets with baseline value and target for the year 2015*

Impact indicators	Baseline			Year 5 target
	Value	Year	Source	
Reduce TB prevalence per 100,000 population/year	639	1990	WHO Global Report 2009	210
Reduce TB incidence (smear-positive) per 100,000 population/year	119	1990	WHO Global Report 2009	<60
Reduce TB mortality (all forms of TB) per 100, 000 population/year	77	1990	WHO Global Report 2009	39
Outcome indicators				
Case detection rate: new smear positive TB cases	72%	2007	MIS NTP	80%
Treatment success rate: new smear positive TB cases	92%	2007	MIS NTP	>90%
Treatment success rate among MDR TB cases	N/A	N/A	N/A	>70%

Table 8 illustrates the monitoring and evaluation of programmatic targets or outcome targets for the planning period 2011-2015.

Table 8: *Process Indicators*

Indicators	Baseline			Year 1	Year 2	Year 3	Year 4	Year 5
	Value	Year	Source					
Number of smear-negative and extra-pulmonary TB cases reported	39268	2007	MIS NTP	60000	65000	72000	73000	75000
Number of smear-positive cases reported	104296	2007	MIS NTP	112000	115000	117000	120000	122000
Number of children diagnosed with TB	4033	2007	MIS NTP	8000	9000	10000	11000	12000
Number of health facilities giving indents timely	150	2007	MIS NTP	400	650	850	850	850
Number of quarterly monitoring meetings at district level	256	2007	MIS NTP	256	256	256	256	256
Number of medical officers trained on X-ray	0	2007	MIS	100	150	175	200	250

Indicators	Baseline			Year 1	Year 2	Year 3	Year 4	Year 5
	Value	Year	Source					
Number of government field staff (health and family welfare) trained	17494	2007	MIS NTP	16000	16000	16000	16000	16000
Number of NGO health workers trained	1528	2007	MIS BRAC	375	375	375	375	375
Number of PLWHAs referred for TB screening	0	2007	MIS NTP	200	300	400	500	500
Number of MDR TB patients enrolled in treatment	89	2007	MIS NTP	600	750	1000	1200	1500
Number of health facilities implementing PAL	0	2007	MIS NTP	30	50	60	80	90
Number of patients referred by private practitioners	290	2007	MIS NTP	500	1000	2000	3000	5000
Number of patients registered in corporate sector health facilities	381	2007	NTP MIS	750	1000	1200	1500	1800
Number of people oriented among micro credit workers and women group	0	2007	MIS BRAC	800	900	1000	1000	1000

ANNEXES

Annex I: Estimates of TB burden

Category	2011	2012	2013	2014	2015
Population					
ARI	Prevalence survey report				
Number of new smear-positive TB cases	112 000	115 000	117 000	120 000	122 000
Number of new smear-negative and Extra pulmonary TB cases	60 000	65 000	72 000	73 000	75 000
Number of children diagnosed with TB	8000	9000	10 000	11 000	12 000
Case detection rate: new smear positive TB cases	76%	77%	78%	79%	80%
Number of patients to be treated and treatment success rate	103 040 (92%)	105 800 (92%)	107 640 (92%)	110 400 (92%)	112 240 (92%)
Number of MDR TB cases	600	750	1000	1200	1500
Number of MDR TB cases to be treated and treatment success rate	390 (65%)	488 (65%)	700 (70%)	840 (70%)	1050 (70%)

Annex II: TB drug and cost estimates

Annex III: Second line TB drug estimate and cost

Annex IV: Budget summary

Annex V: List of GoB, NGOs and Developing partners contributed in preparation of NSP

1. Ministry of Health and Family Welfare
2. Directorate General of Health Services
3. National Tuberculosis Control Program
4. National Institute of Diseases of Chest and Hospital
5. National AIDS and STI Programme
6. Infectious Disease Hospital
7. BRAC
8. Damien Foundation, Bangladesh
9. Urban Primary Health Care Project (UPHCP)
10. Smiling Sun Franchise Programme
11. Bangladesh Garments and Exporters Association
12. National Anti-TB Association of Bangladesh
13. Family Health International
14. USAID
15. Japan International Cooperation Agency
16. ICDDR,B
17. World Health Organization

Annex VI: Working areas of NTP-NGOs

