Ministry of Health
Department of Health
National Tuberculosis Programme

FIVE YEAR NATIONAL STRATEGIC PLAN FOR TUBERCULOSIS CONTROL

2011-2015

MYANMAR

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Contents

Abbreviations

3DF	Three Disease Fund. To help reduce the human suffering caused by HIV/AIDS, Tuberculosis and Malaria in Myanmar supported by Australia, Denmark, the European Commission, the Netherlands, Norway, Sweden and the United Kingdom
ACSM	advocacy, communication and social mobilization
AFB	acid-fast bacilli
AHRN	Asian Harm Reduction Network
AIDS	acquired immunodeficiency syndrome
ARI	annual risk of infection
ART	antiretroviral therapy
BMU	basic management unit
CHW	community health worker
CPT	co-trimoxazole preventive therapy
CTBC	community-based TB care
DOT	directly observed treatment
DOTS	Directly Observed Treatment Short-course
DRS	drug resistance survey
DST	drug susceptibility testing
EQA	external quality assurance
EXPAND-TB	Expanding Access to New Diagnostics for TB. Project funded by UNITAID and implemented by GLI, FIND, WHO and GDF
FDC	fixed-dose combination
FIND	Foundation for Innovative New Diagnostics
GDF	Global TB Drug Facility
GDP	gross domestic product
GLC	Green Light Committee
GLI	Global Laboratory Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
Global Plan	Global Plan to Stop TB, 2006-2015
HIV	human immunodeficiency virus
HRD	human resource development
IDU	injecting drug user
IEC	information, education, communication
IPT	isoniazid preventive therapy
IOM	International Organization of Migration
ISTC	International Standards for Tuberculosis Care
JATA	Japan Anti-Tuberculosis Association
JICA	Japan International Cooperation Agency
KAP	knowledge, attitude and practice
LHV	Lady Health Visitor
MDG	Millennium Development Goal
MDR-TB	multidrug-resistant tuberculosis
MEDP	Myanmar Essential Drug Project
MGH	Mandalay General Hospital

MHAA	Myanmar Health Assistant Association
MMA	Myanmar Medical Association
MMCWA	Myanmar Maternal and Child Welfare Association
MNA	Myanmar Nurses Association
MOH	Ministry of Health
MRCS	Myanmar Red Cross Society
MSF	Médécins Sans Frontières
NAP	National AIDS Programme
NGO	nongovernmental organization
NTP	National Tuberculosis Programme
NTRL	National TB Reference Laboratory
OI	opportunistic infection
PAL	Practical Approach to Lung Health
PHC	primary health care
PITC	Provider-Initiated Testing and Counseling
PMTCT	prevention of mother-to-child transmission
PLWHA	people living with HIV/AIDS
PPM	Public-Private or Public-Public Mix
PSI	Population Services International
RIT	Research Institute of Tuberculosis
SCC	short-course chemotherapy
SLD	second-line anti-tuberculosis drug
SRL	supranational tuberculosis reference laboratory
STD	sexually transmitted disease
TB	tuberculosis
TST	tuberculin skin test
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNICEF	United Nations International Children Fund
Union	International Union Against Tuberculosis and Lung Disease
UNITAID	international facility for the purchase of drugs and laboratory commodities for HIV/AIDS, malaria and tuberculosis
USAID	United States Agency for International Development
UTI	Union Tuberculosis Institute
VCCT	Voluntary Confidential Counseling and Testing for HIV infection
WHO	World Health Organization
XDR-TB	extensively drug-resistant tuberculosis
YGH	Yangon General Hospital

Executive summary

TB is a major public health problem in Myanmar. The country is listed among the 22 high TB burden countries, among the 41 high TB/HIV burden countries and among the 27 high multidrug-resistant (MDR) / extensively drug-resistant (XDR) TB burden countries. Myanmar has reached the 70%/85% case detection and treatment success rates among new sputum smear positive TB patients since 2006. In 2007, WHO estimated that the TB incidence rate was 171 per 100,000 population, and that the estimated incidence rate of new smear-positive cases was 75 per 100,000 population. However, as the Global TB Report states, the current WHO estimates of the TB burden seem underestimated and need to be reviewed after the ongoing disease prevalence survey in 2009-2010.

The government is clearly committed to TB control which is among the top three priority diseases in the National Health Plan. This is manifested by an annual increase in government spending on TB control, including increased cost matching of the anti-TB drug budget to 3% in 2010 with an annual 1% increase thereafter. The government has endorsed the Millennium Development Goals (MDGs) related to TB, the Stop TB Partnership's TB targets 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. The major challenge for the National TB Programme (NTP) is to secure financial resources for sustained and improved TB control activities.

The interventions described in the National TB Strategic Plan 2011-2015, build upon the excellent achievements of the NTP and partners, and will allow for a massive scale up of TB control in the country. The National Strategic Plan is built around the six components of the Stop TB Strategy which is in line with National Health Plan (2011-2015):

1. Pursue high-quality DOTS expansion and enhancement;
2. Address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations;
3. Contribute to health system strengthening based on primary health care;
4. Engage all care providers;
5. Empower people with TB, and communities through partnerships, and
6. Enable and promote research.

The Plan was developed through the Technical Strategy Group TB (TSG-TB) jointly with all partners. The Plan takes into account the needs of diverse national populations, addresses issues as stigma and discrimination and broadens the partnership for implementation of the Stop TB Strategy in hard-to-reach areas.

At the end of the five year implementation of the National Strategic Plan, by 2015, it is expected that Myanmar will reach the TB-related Millennium Development Goals 6 Target 8: to begin to reverse the TB incidence to less than 75/100,000 and to halve TB prevalence and TB mortality relative to 1990, to 210 and 25/100,000 respectively. It is also expected that the MDR-TB rate among new smear positive patients will be contained at 4%.

The total costs for TB control from 2011 to 2015 have been calculated at US$ 160 million going from 31 million in 2011 to 36 million in 2015. The funding gap for 2011 and 2015 will be totally dependent on the agreement of the Global Fund to support TB control activities in Myanmar. Should Round 9 of the Global Fund be successful, the funding gap for the implementation of all components of the Stop TB Strategy will be ranging from US$ 14 million to 21 million for 2011-2015.

Should there not be Global Fund support to Myanmar, the situation will be devastating. The available funds of about US$ 4 million per year would not be sufficient even to carry out the most basic TB control activities in the country and would not even cover for purchasing first-line anti-TB drugs. Resource mobilization efforts are described in the plan for possible identification of additional external resources for TB control in Myanmar.

1. Introduction

1.1. Geographic, demographic and socio-economic features

Myanmar, situated in mainland South-East Asia, covers 676,578 square kilometers and is bounded by China, Laos, Thailand, India and Bangladesh. The country has a tropical climate with three distinct seasons, the rainy, the cold and the hot season. The country can be divided into five geographical regions: hilly, coastal and dry areas, areas of plain and delta region.

Figure 1. Location of Myanmar

Myanmar is administratively divided into 14 states and divisions consisting of 67 districts, 330 townships, 64 sub townships, 2,891 wards, 13,698 village tracts and 64,910 villages. The population of Myanmar is estimated at 58.38 million (2008-2009). The age structure of the population is as follows, 32.3% is below 14 years, 59% is between 15 and 59 years and 8.7%

are above 60 years. The ratio of males to females is approximately equal. About 70% of the population resides in the rural areas. The population density ranges from 595 per square kilometer in Yangon division to 14 per square kilometer in Chin State the western part of the country. There are 135 national groups speaking over 100 languages and dialects. The major ethnic groups are Kachin, Kayah, Kayin, Chin, Mon, Bamar, Rakhine and Shan. About 89% of the population mainly consisting of Bamar, Shan, Mon, Rakhine and some Kayin are Buddhists. The rest are Christians, Muslims, Hindus and Animists.

Myanmar is classified as a low-income country by the World Bank. For the Human Development Index 2006, Myanmar ranks 135th out of 179 countries with data, measured by its life expectancy at birth (65 years), the adult literacy rate (94.1%), the combined primary, secondary and tertiary gross education enrolment ratio (97.5%) and its GDP per capita measured by Purchasing Power Parity (881 US$).

1.2. Overview of health situation

The below table summarizes the overall health statistics for Myanmar (information from World Health Statistics, 2008, World Health Report, 2006, Health in Myanmar and Myanmar Health Statistics, Ministry of Health, 2010) grouped into the following areas: health system, human resources, financial resources, and Millennium Development Goal (MDG) related health indicators.

Table 1. Country reported data for basic health indicators including health related MDG indicators

Health system	Number of hospital beds	39,719 (2009-2010)
	Population per hospital bed	1,469
	Hospital beds per 10,000 population	6.8
	Number of health centers	2,018
Human resources	Number of physicians (including private)	26,016
	*Provisional actual	(2009-10*)
	Number of nurses	23,746 (2009-10*)
	Population per physician	2,244
	Physicians per 10,000 population	4.46
	Nurses per 10,000 population	4
Financial resources	Total expenditure on health as % of gross domestic product	2.0 (2007)
	Public expenditure on health as % of total expenditure on health	19
	Private expenditure on health as % of total expenditure on health	81
	Social security expenditure on health as % of public expenditure on health	1.3
	Out-of-pocket spending on health as % of private expenditure on health	100
Outcomes	Life expectancy at birth (years):	
	Urban (Male)	64
	Urban (Female)	69
	Rural (Male)	63.2
	Rural (Female)	67.1

MDG related health indicators (excluding TB)	Pregnant women attended by trained personnel during pregnancy (%)	66
	Proportion (%) of births attended by skilled health personnel	67.5
	Maternal mortality ratio (number of maternal deaths per 1000 live births) Urban	0.94 (2007)
	Maternal mortality ratio (number of maternal deaths per 1000 live births) Rural	1.36 (2007)
	HIV prevalence among pregnant women aged 15-24 years (%)	1.2
	HIV prevalence among aged 15-49 years	0.61 (2009)
	Condom use in high risk population	55
	Infant mortality rate (per 1,000 live births) Urban	43.4 (2007)
	Infant mortality rate (per 1,000 live births Rural	46.3(2007)
	Under-five mortality rate (per 1,000 live births) (probability of dying between birth and age five) Urban	62.1 (2007)
	Infants reaching their first birthday that have been fully immunized against diphtheria, tetanus, and whooping cough (%)	73
	Infants reaching their first birthday that have been fully immunized against poliomyelitis (%)	73
	Infants reaching their first birthday that have been fully immunized against measles (%)	72
	Infants reaching their first birthday that have been fully immunized against tuberculosis (%)	76
	Prevalence (%) of underweight children (under-five years of age)	32
	Proportion (%) of population below minimum level of dietary energy consumption	31
	Malaria death rate per 100,000 in children (0-4 years of age)	5.4
	Malaria mortality rate per 100,000 (all ages)	1.84 (2008)
	Malaria morbidity rate per 1000 population	10.75 (2008)
	Proportion (%) of population under 5 in malaria risk areas using insecticide-treated bed nets	12
	Proportion (%) of population under 5 with fever being treated with anti-malarial drugs	10
	Proportion (%) of population with sustainable access to an improved water source, rural	74
	Proportion (%) of population with sustainable access to an improved water source, urban	92
	Proportion (%) of urban population with access to improved sanitation	88

1.3. History of tuberculosis control

After gaining independence, Myanmar established campaigns to fight against major infectious diseases. In 1964, the government of Myanmar signed an agreement with WHO and UNICEF to develop a National TB Programme and to elaborate a five year activity plan. Two years later the NTP started its activities. Later, these campaigns or vertical programmes were integrated with the primary health care system in the People's Health Plan and the National Health Plan. In 1978, the NTP became an integral part of the basic health services under the primary health care system. The below table summarizes the main achievements of the NTP from 1991 to 2010.

Table 2. Summary of achievements of the NTP from 1991 to 2009

Year	Achievement in TB control
1991	Short course chemotherapy for TB was introduced by the Myanmar Essential Drug Programme
1993	The Minister of Health formed a central supervisory committee for prevention and control of TB
1994	The NTP introduced short course chemotherapy in 18 townships
1995	Short course chemotherapy was expanded to 126 townships with anti-TB drugs supplied by five sources, Central Medical Store Department, WHO, UNDP, Sasakawa Foundation and Myanmar Essential Drug Programme, to a total of 144 townships.
1996	Short course chemotherapy was expanded to nine more townships and to a total of 153 townships.
1997	DOTS was introduced in all 153 townships.
1999	DOTS was expanded to another 15 townships to a total of 168 DOTS townships. Intermittent regimens started.
2000	DOTS was expanded to another 55 townships to a total of 223 DOTS townships. Guidelines for TB/HIV collaborative activities were developed.
2001	DOTS was expanded to another 36 townships to a total of 259 DOTS townships. The national TB reference laboratory in Yangon was established.
2002	DOTS was expanded to another 51 townships to a total of 310 DOTS townships. The Global TB Drug Facility started supporting Myanmar with anti-TB drugs. Collaboration with hospitals started under the Public-Public Mix approach. The first drug resistance surveillance survey was completed.
2003	DOTS was expanded to the remaining 14 townships to a total of 325 DOTS townships. The NTP started the Private-Public partnership for DOTS with the Myanmar Medical Association according to the plan for involvement of private sector in TB control. Three schemes of PPM DOTS were developed, out of which the private practitioners could choose the most suitable for them to participate in TB control. The three schemes were: 1. Health education and proper referral 2. Health education, proper referral and act as a DOT provider 3. To run an affiliated DOT clinic. According to the recommendation and suggestion of the Technical Advisory Group, the NTP treatment policy changed from fully intermittent regimen to a daily regimen using fixed dose combination of anti-TB drugs
2004	The Global Fund grant agreement of 17 million US$ for TB control was signed in August with UNDP as the principal recipient. In December, UNDP signed agreements with two sub-recipients, the NTP and Population Services International. The National Reference TB Laboratory was upgraded with the support of the International Union Against TB and Lung Disease (IUATLD).
2005	An Integrated HIV Care Pilot project (IHC) that provided anti-retroviral therapy to co-infected TB/HIV patients started in Mandalay Division. The Stop TB Partnership approved a second GDF three year grant agreement for anti-TB drugs. The Global Fund signed an agreement with the third sub-recipient, the Myanmar Medical Association to scale-up PPM DOTS activities. The National Strategic Plan for 2006-2010 was developed. The Global Fund grant was withdrawn from Myanmar.
2006	A group of six donors (Australia, UK, European Commission, Netherlands, Norway and Sweden) established a new trust fund called the Three Disease Fund (3DF), to address the critical funding gap caused by the termination of the Global Fund grant. GF round 2 termination plan was implemented and ended at the end of 2006.
2007	The Stop TB Strategy was adopted. The Green Light Committee approved a project in Myanmar for the treatment of 275 MDR-TB patients. The second anti-TB drug resistance survey started.
2008	UNITAID committed to support the supply of second-line anti-TB drugs and paediatric formulations to fight TB in children. The Global Laboratory Initiative, the Foundation for Innovative New Diagnostics (FIND), GDF and

	UNITAID started supporting access to rapid diagnostics for patients at risk of MDR-TB.
2009	The International Standards of TB Care were launched on World TB Day and were planned to be adopted by NTP and followed by the Myanmar Medical Association, public health facilities like teaching hospitals and institutes. DOTS Plus project was launched on 9 July at Yangon, Aung San TB Hospital in collaboration with Medecins Sans Frontières (MSF) and on 15 July at Patheingyi TB Hospital with the funding of WHO/3DF/USAID/UNITAID.
2010	Biosafety level 3 laboratories for rapid diagnosis for TB were established on 12th July at Yangon National TB Reference Laboratory and Patheingyi TB reference laboratory.

1.4. Tuberculosis epidemiology

Myanmar 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. Moreover, and due to a high and growing HIV prevalence, the country is included in the 41 global priority countries for TB/HIV.

The exact TB burden in Myanmar is unknown. The current estimates were based on the latest nationwide smear positive TB prevalence survey conducted in 1994. These data suggested that in 2007, the TB incidence rate was 171 per 100,000 population, and that the estimated incidence rate of new smear-positive cases was 75 per 100,000 population. Many factors suggested that the TB incidence is underestimated including: 1) the high and rapidly increasing case notification rate, 2) active ongoing transmission manifested in high TB rates among the younger population and 3) a rapidly growing HIV prevalence. Moreover, in 2006, a TB prevalence study was carried out in Yangon division reported an incidence rate which was 2.3 times higher than the currently estimated rate. Preliminary results of the 2009-2010 TB prevalence survey indicate indeed that the TB burden is underestimated. Once the prevalence survey is finalized, epidemiological parameters will be updated and control activities adjusted.

Due to the uncertainty of the current TB incidence, the preferred epidemiological parameter is the case notification. Over the last few years there has been a rapid increase in the number of notified TB cases (Figure 2). In 2009, 134,023 TB cases were notified (all new and retreatment cases) corresponding to a case notification rate of 220 (all forms of TB) per 100,000 population. In the same year, 41,389 new smear-positive cases were reported or 70 cases per 100,000 population. The proportion of new smear-positive cases out of all pulmonary cases was 30.9% and the proportion of extra-pulmonary cases out of all TB cases was 23.6%. Out of all new and re-treatment cases in 2009, 4.8% were re-treatment cases. Male to female ratio was 2:1 in new smear positive cases. The most affected age group was between 25-54 years which represents the most active socio-economic age group.

Myanmar is one of the countries hit by the HIV epidemic in Asia. The reported HIV prevalence among adults of 15 to 49 year age group in 2009 is 0.61% but much higher rates have been reported in risk groups such among female commercial sex workers (11.3%) and injecting drug users (34%). In 2009, it was estimated that 238,000 people in Myanmar were living with HIV/AIDS. An estimated 75,000 Myanmar people are in need of antiretroviral treatment today, but only 21000 (28%) of this number are receiving it. Only 50% of estimated HIV positive

pregnant women are receiving assistance to prevent transmission of the virus to their babies in Prevention of Mother to Child Transmission (PMCT) project areas.

The sharp increase in extra-pulmonary TB patients and sputum smear-negative TB patients, and high death rates in selected townships early on in the treatment indicated that HIV was beginning to have a major impact on the TB epidemic. In 2009, HIV prevalence among new TB patients was 9.15%. It is estimated that 60-80% of AIDS patients have TB and that TB is the leading opportunistic infection and major cause of death among people living with HIV/AIDS.

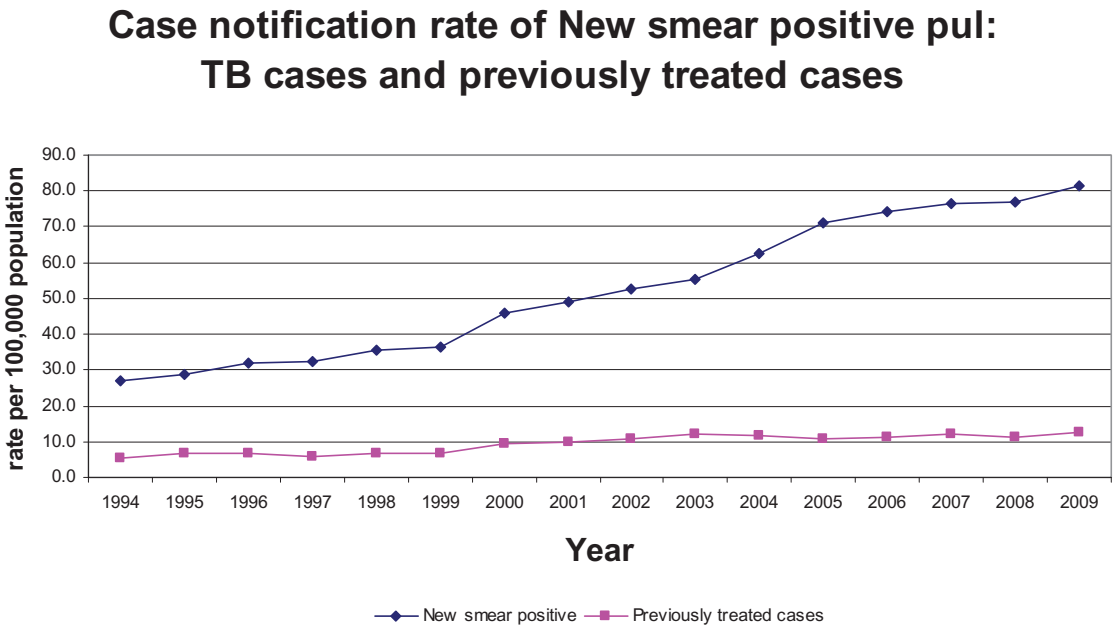


Figure 2. Tuberculosis case notification rate (new smear-positive cases and previously treated cases) per 100,000 population in Myanmar, 1994-2009.

The first nationwide drug resistant survey was carried out in 2002 showing 3.9% MDR-TB among new cases and 15.5% MDR-TB among re-treatment cases. The second nationwide drug resistant TB survey was conducted in 2007 and showing 4.2% MDR-TB among new cases and 10.0% MDR-TB among re-treatment cases. These preliminary data indicate that MDR-TB transmission was still ongoing but that the production of drug resistant cases has leveled off, which was probably a result of Myanmar's successful DOTS programme. In 2008, WHO estimated that there were 8900 MDR-TB cases among incident new and relapse TB cases, and 450 MDR-TB cases of incident acquired MDR-TB cases. During 2007 and 2008, the supranational TB reference laboratory in Antwerp, Belgium, conducted second-line anti-TB drug susceptibility testing on isolates from 86 category II treatment failures. Among the category II failures, 99% had MDR-TB (85 out of 86 cases). One case of XDR-TB was found resistant to rifampicin, isoniazid, ethambutol, streptomycin, ofloxacin, kanamycin and capreomycin. Among the 86 cases, the resistance pattern to second-line anti-TB drugs were as follows: ofloxacin: 14%, PAS: 1%, kanamycin: 2%, capreomycin 1% and ethionamide: 0%.

1.5. Current status of TB control in Myanmar

Despite limited resources for TB control, the NTP of Myanmar has delivered excellent basic TB control services in 314 out of 325 townships (95% administrative DOTS coverage) during the last few years. Case detection rates have continued to increase and the WHO case detection rate target of at least 70% has been reached since 2003 (however, the data should be accepted with caution since the case detection rate cannot be measured adequately due to the current misleading TB estimates). A national TB prevalence study was completed in April, 2010 and analysis was ongoing to ensure a better understanding of the TB situation in Myanmar. Treatment success targets of at least 85% are being achieved in most townships. In 2008 cohort, the country-wide treatment success rate average was 85% with a 6% case fatality rate, 2.6% failure rate, 4.8 % default rate and 1.6% transferred out rate. Default rates were falling, particularly in the Yangon division, as a result of intensified and innovative case management measures being taken, as quarterly cohort peer reviews and treatment interruption prevention and tracing activities including initial home visits at start of treatment. In 2008, for relapses the treatment success rate was 75%, for failure cases 63% and for patients treated after default the success rate was 70%.

With the rapid expansion of sound TB control with accompanying increases in case notification it is key to ensure sustained financial resources, including resources for anti-TB drugs,

A human resource development plan has been developed. The quality of sputum smear microscopy is adequate and a national quality assurance mechanism is functioning. The national TB reference laboratory has been established and upgraded to perform culture and drug susceptibility testing to first-line anti-TB drugs and is linked to the supranational TB reference laboratory in Bangkok, Thailand, for external quality control. Moreover, under the EXPAND-TB project, UNITAID has funded the upgrading of the two reference laboratories to perform rapid MDR-TB diagnosis.

In collaboration with a number of national and international nongovernmental organizations (NGOs), Public-Private and Public-Public Mix DOTS activities were carried out in specialist and TB hospitals as well as by private practitioners. Non-NTP laboratories have also been accredited under the PPM scheme. By 2010, about 1,500 private practitioners out of 26,000 are collaborating with the NTP. The private sector contributed with diagnosing and treating 17.3% of the notified TB cases in 2009. Currently, PPM activities are carried out in 137 townships.

Introduction of MDR-TB management has been carried out in collaboration with Medecins Sans Frontières (MSF) in Yangon Division and Mandalay division, including the achievement of approval by the Green Light Committee for quality-assured and reduced price second-line anti-TB drugs. In addition, UNITAID has agreed to cover the costs of second-line anti-TB drugs for 200 MDR-TB patients. National guidelines for the programmatic management of MDR-TB have been finalized. In April 2009, the government endorsed the Beijing "Call for Action" which stated that the 27 high MDR-TB burden countries should move urgently towards universal access to diagnosis and treatment of M/XDR-TB by 2015 as part of the transition to universal health coverage. DOTS Plus Project in Aung San TB Hospital and Patheingyi TB

Hospital was launched on 9 and 15 July, 2009, and 64 MDR-TB patients were put on treatment by end of December, 2009.

The scale-up of TB/HIV collaborative activities were limited by the availability of Antiretro viral (ARVs) in the country and the centralization of HIV services at State/ Divisional level. While TB control services were included in the primary health care network and provided at rural health centers and station hospitals, and in township hospitals, HIV services were currently limited to hospitals at state/division level as well to Sexual Transmitted Diseases (STD) clinics at district level. ART delivery was restricted to the majority of hospitals at state/division level and district level except for activities geared towards prevention of mother to child transmission of HIV. These services were provided at lower levels of the health system at township hospitals. TB/HIV collaborative activities have begun, in collaboration with NGOs (an in particular with the Union in Mandalay), but were still in pilot phase. For example, only 11 townships are today offering voluntary counseling and testing. In 2009, 1015 HIV-positive TB patients detected and 981 taken cotrimoxazole prophylactic therapy (CPT) and 681 HIV-positive TB patients started or continued on ART in the 11 townships that are providing TB/HIV collaborative activities.

1.6. Financial situation and collaboration with donor agencies

Although the government funding for TB control has increased during the last few years, there is a huge funding gap for the NTP. As a result, the NTP is dependant on external financial resources. From 2006-2010, the external funding sources have increased significantly, from about US$ five million in 2006 to close to US$ 11 and 12 million for 2009 and 2010, respectively (Table 3). However, the funds available under this five year period have been far less than needed. As such, the funding could only cover for the most basic elements of DOTS implementation and not for the other components of the Stop TB Strategy. By far the major extra budgetary resources were from the Three Disease Fund followed by the Global TB Drug Facility, Population Services International, USAID, UNITAID and YADANA Consortium.

Table 3. Funding sources for TB control in Myanmar 2006-2010. For 2010, the figures indicate planned costs.

Funding Source	Budget (in US$)					
	2006	**2007**	**2008**	**2009**	**2010**	**Total**
Government of Myanmar	333,579	358,261	376,174	394,983	414,732	1,877,729
AHRN						
CERF			293,770	264,565		558,335
FIDELIS		194,083				194,083
FIND				900,000	900,000	1,800,000
Global Fund	1,846,164					1,846,164
Global TB Drug Facility	1,806,275	1,000,000	1,000,000	2,000,000		5,806,275
IOM	0	118,974	240,928	346,582		706,484
JATA		8,480	8,480	9,054	9,054	35,068
JICA	93,000	92,000	92,000	133,942	0	410,942
Malteser International						

MSF-Holland	150,000	170,000	120,000	100,000	100,000	640,000
Merlin						
Myanmar Medical Association (budget included in 3DF about 0.5 million US$ from 2008-2010)						
Myanmar Red Cross Society						
PACT	57,385	63,762	71,076	73,204	78,515	343,942
Population Services International			1,044,876	1,538,936	1,662,582	4,246,394
Three Disease Fund (to WHO and MMA)	717,547	903,295	1,806,589	2,076,589	4,806,589	10,310,609
Union (YADANA Consortium)	250,000	450,000	650,000	650,000	650,000	2,650,000
UNITAID			500,359	977,466	1,262,276	2,740,101
USAID				1,500,000	1,500,000	3,000,000
WHO	253,700	68,000	236,900	79,800	236,900	875,300
World Vision	30,000	108,870	319,009	515,090	415,000	1,387,969
Total	**5,539,656**	**3,537,732**	**6,762,169**	**11,562,220**	**12,037,658**	**39,429,395**

1.7. Collaboration with technical agencies

The NTP collaborates with a number of national and international health and development agencies to implement the Stop TB Strategy (Table 4). To ensure best use of comparative advantages and to avoid fragmentation and duplication of efforts, regular coordination meetings are held under the Technical Strategy Group for TB. The role of the Technical Strategy Group for TB is to assist in the overall TB programme implementation and in the monitoring and evaluation of the national strategic plan. The Technical Strategy Group is coordinated by the Department of Health with WHO as a Secretariat and coordination meetings are held every quarter. Specific technical working groups have also been set up under the Technical Strategy Group to coordinate strategies and activities on PPM and TB/HIV. In addition, a national MDR-TB management committee has been established. Coordination is also ensured through the Country Coordination Mechanism set up for Global Fund collaboration. Under this umbrella, wider collaboration with health system strengthening efforts and the HIV/AIDS and malaria programmes is ensured.

Table 4. Health and development agencies support to TB control in Myanmar

Organization	Type of organization	TB control activities	Location of TB control activities as of 2009
Asian Harm Reduction Network	International NGO	• TB/HIV collaborative activities • IDU work	
Expand-TB (FIND, UNITAID, GDF, GLI)	International NGO	• Laboratory strengthening (rapid diagnostic tests) • Technical assistance	National level
Global TB Drug Facility	Stop TB Partnership	• Anti-TB drugs • Technical assistance in drug management	Country-wide
International Organization for Migration	International NGO	• Community-based TB Care (CTBC) • ACSM • Vulnerable populations	6 townships, Mon State
JATA/JICA	Development cooperation	• DOTS • Operational research • PPM • Laboratory strengthening • Training	Yangon & Mandalay Divisions 4 townships, absorbed by MMA (2009)
Malteser International	International NGO	• DOTS • PPM • TB/HIV • ACSM • CTBC	2 townships, Yakhine State
Médécins Sans Frontières - Holland	International NGO	• MDR-TB • ACSM • TB/HIV	Kachin, Rakhine, Shan (North) States and Yangon Division
Médécins Sans Frontières - Switzerland	International NGO	• MDR-TB • TB / HIV	2 townships, Taninthayi Division
MERLIN		• DOTS • ACSM	9 townships, Ayeyarwaddy and Sagaing Divisions
Myanmar Medical Association	National NGO	• PPM • ISTC • DOTS • ACSM	70 townships
Myanmar Health Assistant Association	National NGO	• DOTS • TB/HIV • ACSM	3 townships
Myanmar Women Affairs	National NGO	• DOTS	Country-wide

Federation		• ACSM	
Myanmar Maternal and Child Welfare Association	National NGO	• DOTS • ACSM	Country-wide
Myanmar Red Cross Society	National NGO	• DOTS • ACSM • CTBC	Country-wide
PACT Myanmar	International NGO	• DOTS • ACSM • TB/HIV	14 townships, Sagaing and Magway Divisions
Populations Services International	International NGO	• PPM • ACSM • TB/HIV	166 townships
Union	International NGO	• TB/HIV • Technical assistance, training	10 townships
UNITAID	International organization	• Second-line anti-TB drugs • Paediatric TB drugs • Diagnostic tests	Country-wide
World Health Organization	International organization	• All elements of the Stop TB Strategy	Country-wide
World Vision Myanmar	International organization	• DOTS • Childhood TB • ACSM	5 townships

1.8. Major challenges and opportunities for tuberculosis control

Major challenges for the National TB Programme and in the overall health system that affects the National TB Programme according to the Stop TB Strategy components

1. Pursuing high-quality DOTS expansion and enhancement

- Uninterrupted supply of anti-TB drugs. Without a long-term sustainable financial commitment to first-line anti-TB drugs, programme activities would be severely hampered. An interruption in the first-line anti-TB drug supply would be devastating for the TB patients and would lead to increased suffering of patients, an increase in the number of avoidable deaths and an increase in MDR-TB cases. An interrupted drug supply would also lead to a disruption of the work carried out by a number of national and international NGOs, including for non-NTP health care providers under the Private-Public Mix scheme, since these organizations rely on the a regular anti-TB drug supply from the NTP. While the GDF supplied first-line anti-TB drugs for seven year period up to end 2009, the supply for 2010 has been secured with financial resources from the 3DF. For 2011, the Japanese Government will supply anti-TB drugs. From 2011 and onwards, it is expected that the Global Fund will support a sustainable anti-TB drug supply for five years. Anti-TB drugs for children and MDR-TB are secured until 2010. Again it is hoped that the Global Fund will support pediatric and second-line anti-TB drugs past 2010. For the reduction of the

burden of TB in people living with HIV, the availability of ARVs should be considered countrywide and is a considerable component of Global Fund Round 9.

- Inadequate human resources – which impact all of the other challenges. There is a limited number of posts available under the NTP which is not sufficient to ensure adequate implementation of TB control activities. In addition, many vacant posts need to be filled. Human resource development (HRD): There are issues related to the structure for HRD within the NTP as for example no full time HRD coordinator at central level and no systematic management of HRD for TB control at State/Divisional level including systematic monitoring of vacancies, staff turnover and identification of additional posts. There are issues related to the staffing for TB control: vacancies, in both NTP specific positions and the general health system (288 vacant posts out of 1028 sanctioned posts), overburdened staff, high turnover and motivation of staff is variable, and health system deficiencies are affecting motivation. There are additional staff needs for implementation of TB/HIV and management of MDR-TB. And there are issues related to training within the NTP as for example limited training and supervision of DOT providers and inadequate skills in different TB control fields. Plan for HRD has been developed and needed to be revised and updated.
- Inadequate access to diagnostic services. Although there is 95% DOTS coverage and the quality of sputum smear microscopy services is good and supported by a quality assurance mechanism network, access to diagnostic services is limited due to both distance and terrain challenges, particularly in rural townships and in the hard to reach hilly and border areas of the country. There is only one microscopy center per 150,000 population, which is far from the international standard of one per 100,000 population. Moreover, there are only two reference laboratories performing culture and DST for the entire population, which is again far from the international standard of one reference laboratory per five million population. This has implications for the diagnosis of TB among children, MDR-TB and among people living with HIV/AIDS.
- Inadequate access to TB services. There are significant constraints in accessing health care services in the hard to reach townships and in border areas. Access to health care is therefore hampered to ethnic nationalities living in these areas as well as to migrants.
- Unable sustainability of laboratory consumables and equipment. While Expand-TB, GLI, GDF, FIND and UNITAID are currently assisting two TB reference laboratories with consumables and supplies, particularly for new tools and for MDR-TB diagnosis, a more sustainable funding source is needed, particularly for microscopy centers.
- Limited supervision and management capacity by the NTP. The present limitations in technical, management and supervisory capacity have implications for ensuring sustainable quality programme implementation. Capacity for planning, managing and monitoring activities at the various levels need to be developed particularly at the state, division and township levels. Supervision has to be strengthened by increasing the number of supervisory staff and by provision of training at all levels. Transportation means to enable supervision are limited.
- Constraints in ensuring patient support. Support to treatment adherence is challenging especially in remote rural and busy urban settings. Transport and telecommunication facilities are inadequate for defaulter tracing. Further decentralization of DOT providers is needed to community health workers and volunteers.

2. Addressing TB/HIV, MDR-TB and other challenges

- TB/HIV and MDR-TB. While good progress has been made towards reaching the global TB control targets in terms of DOTS coverage, case detection and treatment success, TB/HIV collaborative activities and activities to diagnose and treat MDR-TB patients need to be scaled up.
- Prevention of TB transmission. Insufficient administrative and environmental measures are in place to mitigate transmission of airborne infections. Infection control policy for all health care facilities needs to be reinforced.
- Hard to reach area and border area. The access to microscopy service is very questionable in area with hard to reach so that special interventions for those area will be introduced in this plan.

3. Contributing to health system strengthening

- Health financing. While free medical care is a fundamental right for all citizens there are serious financial constraints for the health sector. While the government of Myanmar provides support for staff salaries, training, reporting forms, buildings and operational costs, overall government health expenditure in Myanmar was only about US$ 0.4 per capita in 2005-2006. This has resulted in that private out-of-pocket expenditure accounts for over 80% of total health expenditure.
- Policy and governance. The Ministry of Health remains the major provider of comprehensive public health care. However, health facilities under other ministries such as home affairs, labour and education, and large employment sectors under other ministries such as the railways and defense, also provide health services. Efforts to establish coordination with other ministries to comprehensively address health issues needs to be strengthened. Moreover, evidence shows that a substantial proportion of patients with TB present themselves to a wide array of health-care providers not linked to the NTP. It is estimated that nearly 70% of TB patients first seek care in the private sector and hence the involvement of the private sector is critical to ensure quality services to TB patients.
- Health infrastructure. Constrained finances have resulted in interrupted electricity and water supply to health facilities. Mobility of health staff for supervision and logistics for transportation of drugs and consumables is limited. Funding for fuel and repairs is to some extent deficient. The geographical terrain and communication in some parts of the country also pose obstacles to delivery of services, supervision and reporting on activities. Economic sanctions and natural disasters have added to the difficulties in sustaining health sector infrastructure, hospitals and medical supplies.
- Human resources. Myanmar faces similar challenges as other high TB burden countries in terms of restrictions on the number of government health care staff to be recruited at the various levels, low salaries as compared to the private sector, no proper human resource forecasting, and suboptimal human resource planning and coordination across different health sector programmes. There are not sufficient allowances for staff in remote or hardship areas and lack of suitable arrangements for accommodation of staff and or their families in such areas thus making it harder to deploy or retain staff in many areas.

- Health information systems. Epidemiological trends cannot as yet be reliably derived from routine vital registration or programme notifications as these systems are not well developed.
- Service delivery. The quality of care depends on infrastructure and equipment, uninterrupted availability of consumables for diagnosis and patient care, regular electric supply and transport at all levels. Access to services is variable across the country. There are serious constraints to accessing health care for populations living in remote townships, due to the climatic conditions, terrain and limited transport facilities. There are few vehicles available for supervision, distribution, patient transfer, especially on township level and below.

4. Engaging all care providers

- Limited skills of health care providers outside of the NTP. There are recognized gaps in necessary skills for planning, implementing and monitoring the delivery of TB services, including TB/HIV and MDR-TB services, among health care providers outside of the NTP.

5. Empowering people with TB, and communities

- Low community awareness. Lack of awareness of TB and limited social mobilization activities result in underutilization of TB services, particularly in remote areas. Patients groups are not formed for the development of community approaches to TB control or in the discussions on TB control strategies for the country.

6. Enabling and promoting research

- Operational research. Insufficient operational research activities have resulted in uncertainties about the TB incidence in the country, the trends in MDR-TB rates and the HIV burden including among TB patients.

Opportunities

The government is clearly committed to TB control which is among the top three priority diseases in the National Health Plan. This is manifested by an annual increase in government contributing on TB control. The Ministry of Health provides funding to the National TB Programme, a share form the national health budget, taking into account that TB is one of the priority diseases in the National Health Plan 2006-2010. Annual funding from the MoH for TB control has increased from Kyats 14.5 million in 1995-96 to Kyats 475 million in 2008-2009 (NTP Annual Report 2008, November 2009).

These funds are mostly dedicated to salaries for staff and administrative costs. There are no debt relief, grants or loan programs in the country. Government health expenditure has increased yearly, for both current and capital expenditures. Total government health expenditure increased from 464.1 million Kyats in 1988-89 to 51675 million Kyats in 2008-2009 (MoH, Health in Myanmar 2010).

At the High Level Partners Meeting on "Ensuring sustainable first-line TB drug supply in Myanmar", held by the MOH in the capital Naw Pyi Taw in December 2008, the Ministry of Health committed to increase its share of funding to the TB programme to 3% of the total cost of anti-TB drugs in 2009, with annual 1% incremental increase thereafter. This domestic funding will account for US$ 1,013,100 between 2010 and 2014.

Current activities follow the National Strategic Plan developed for 2006-2010. National guidelines and training modules are available for priority areas of the Stop TB Strategy. A Technical Strategy Group is functioning which oversees strategies and activities. This group is composed by NTP officials but also representatives from other ministries and the main technical and development agencies working in the country. NTP has a good infrastructure with dedicated staff. More than 10 national and international NGOs are actively supporting TB control efforts under the guidance of the NTP.

The government has endorsed the MDGs related to TB, the Stop TB Partnership's TB targets 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. Efforts to mobilize external resources for TB control, and most importantly for a sustainable supply of anti-TB drugs and laboratory equipment and consumables, are continuously undertaken and there is a good dialogue with the major multi and bilateral donor agencies.

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. NTP has a plan to adopt the International Standards of Tuberculosis Care followed by the Myanmar Medical Association, public health facilities like teaching hospitals and institutes. 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.

The work carried out to strengthen the overall health system supported by the Global Alliance for Vaccine and Immunization (GAVI) presents another opportunity for TB control, particularly the work undertaken to improve overall management skills of basic health care workers.

2. Structure and organization of the health system and National TB Programme

Structure and organization of the overall health system

The Ministry of Health is responsible for raising the health status of the people and accomplishes this through provision of comprehensive health services by promotive, preventive, curative and rehabilitative measures. The Ministry of Health is headed by a Minister who is assisted by two Deputy Ministers. The Ministry has seven functioning departments, each under a Director-General, and as follows: Department of Health Planning, Health, Medical Science, Medical Research (Lower Myanmar), Medical Research (Upper Myanmar), Medical Research (Central Myanmar) and Traditional Medicine. The Department of Health is responsible for providing health care services to the entire population in the country. Under the supervision of

the Director-General and three Deputy Director-Generals, there are 12 Directors who are leading and managing the following divisions:

1. Administration
2. Planning
3. Finance
4. Public Health
5. Medical Care
6. Disease Control
7. Epidemiology
8. Health Education
9. Food and Drug Administration
10. Laboratory
11. Occupational Health
12. Nursing

The basic health staff down to the grassroots level is providing promotive, preventive, curative and rehabilitative services through the Primary Health Care approach. Infrastructure for service delivery is based upon sub-rural health centre and rural health centre where midwives, Lady Health Visitor and Health Assistant are assigned to provide primary health care to the rural community. Those who need special care are referred to station hospitals, township hospitals, district hospitals and to specialist hospitals successively. The state/divisional Health Department is responsible for state/divisional planning, coordination, training and technical support, supervision, monitoring and evaluation of health services. At the peripheral level, i.e. the township level, actual provision of health services to the community is undertaken. The township health department forms the backbone for primary and secondary health care, covering 100,000 to 200,000 people. In each township, there is a township hospital which may be 16/25 or 50 bedded depending on the population of the township. Each township has at least one or two station hospitals and 4-7 rural health centers (RHC) under its jurisdiction to provide health services to the rural population. Urban health centre, school health team and maternal and child health centre take care of the urban population, in addition to the specifically assigned functions. Each RHC has four to eight sub-centers covered by a midwife and public health supervisor grade 2 at the village level. In addition, there are voluntary health workers (community health workers and auxiliary midwives) in outreach villages providing primary health care to the community. In 2009- 2010, there were 11,158 public doctors, 23,746 nurses, and 26,375 basic health staff (BHS) working in the public sector.

The National Health Committee was formed on 28 December 1989 as part of policy reforms. It is a high-level inter-ministerial and policy-making body concerning health matters. The National Health Committee takes the leadership role and gives guidance in implementing the health programmes systematically and efficiently. The high-level policy-making body is instrumental in providing the mechanism for inter-sectoral collaboration and coordination. It also provides guidance and direction for all health activities. Under the guidance of the National Health Committee various health committees had been formed at each administrative level.

For the purpose of monitoring and evaluation, a National Health Plan Monitoring and Evaluation Committee is formed at the central level. Built-in monitoring and evaluation process is undertaken at state/divisional and township levels on a regular basis. Implementation of the National Health Plan at various levels is carried out in collaboration and cooperation with health related sectors and NGOs.

A National Health Policy was developed with the initiation and guidance of the National Health Committee in 1993. The National Health Policy has placed the Health For All goal as a prime objective using the Primary Health Care approach. The Ministry of Health is systematically developing health plans, aimed at the Health for All Goal. Existing health development plans include: Myanmar Health Vision 2030 (2001-2002 to 2030-2031); and National Health Plan (2001-2002 to 2005-2006).

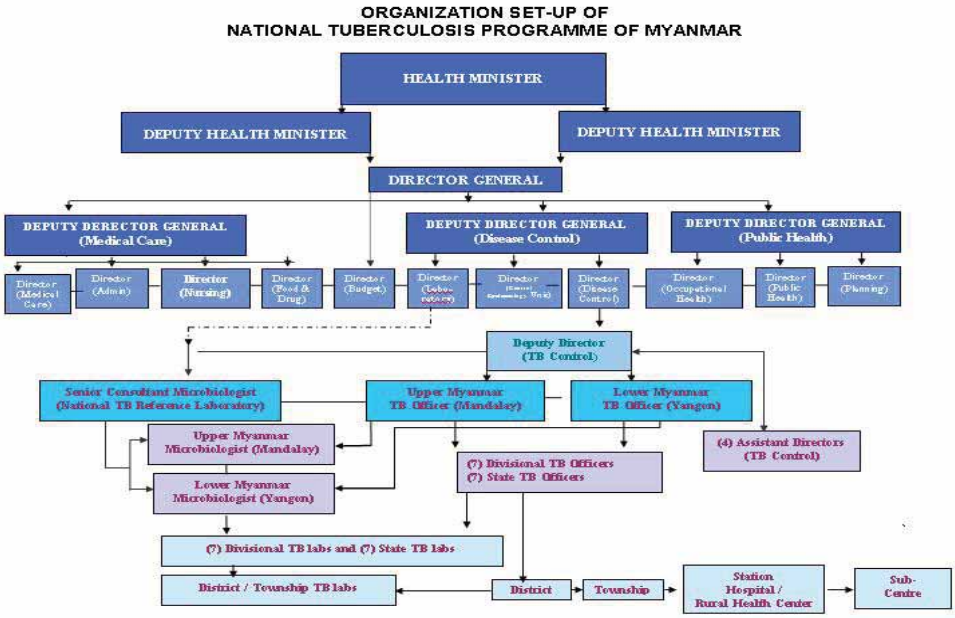
Although Ministry of Health is the major provider of comprehensive health care in Myanmar, health care is also financed and provided by a pluralistic mix of public and private system. Some ministries including Defence, Railways, Mines, Industry I and II, Energy, Home Affairs, Transport and Labour also provide health care.

One important feature of the health system is the existence of the traditional medicine system along with allopathic medicine. In line with the National Health Policy, NGOs such as the Myanmar Maternal and Child Welfare Association (MMCWA) and the Myanmar Red Cross Society also provide health care services. Funding sources for health care services are private out-of-own-pocket (73.4%), government (13.6%), external aid (12.1%), community contribution (0.54%) and social security system (0.36%) according to 2001-2002 estimation of the national health expenditure (Source: Health in Myanmar, 2006).

Structure and organization of the National TB Control Programme

The NTP is led by a Deputy Director (Programme Manager) under the Director-General of the Department of Health, Deputy Director-General of Disease Control and Director of Disease Control of DOH. NTP operates 14 state and divisional TB centers headed by state/divisional TB officers (out of 17 operational states/divisions). Under the 13 state and divisional TB centres, there are 47 TB teams in the 67 districts and 54 TB teams in 263 townships. The remaining townships have either a trained TB coordinator from the general health services or one dedicated TB staff. At the RHC level, TB control activities are implemented by BHS (Figure 3).

Figure 3. Organization of the National TB Programme in Myanmar.



Township hospitals function as DOTS diagnostic and treatment units and TB registers are maintained at this level. Township laboratories or TB laboratories at the township level perform sputum microscopy in 314 townships. Sputum microscopy is also conducted in all general hospitals at the state/divisional level and all specialist hospitals in Yangon and Mandalay. The National TB Reference Laboratory (NTRL) was established in 2001 and is headed by one senior consultant microbiologist and assisted by one microbiologist each assigned at Upper and Lower Myanmar TB laboratories.

3. Goals, objectives and targets for tuberculosis control

The government of Myanmar has adopted the Millennium Development Goals (MDGs) including the targets and indicators under the MDGs that relate to health and disease control and prevention programmes, including tuberculosis control.

Goal

To reduce dramatically the TB morbidity, mortality and transmission, in line with the MDGs and the Stop TB Partnership targets, until it no longer a poses a public health threat in Myanmar.

Objectives

The objectives of NTP Myanmar are:

- To move towards universal access to TB diagnosis, treatment and care by reaching a 95% case detection rate of new sputum smear positive cases and by curing at least 85% of cases.
- To reach the interim targets of halving TB deaths and prevalence towards achieving the MDGs for 2015 which will improve universal access to high-quality diagnosis and patient-centred treatment and protect poor and vulnerable populations from TB, TB/HIV and MDR -TB

Targets

In line with the MDGs as well as the targets set by the Stop TB Partnership and the World Health Assembly, the targets of the NTP of Myanmar are:

- To halt and begin to reverse the incidence of TB by 2015
- To reduce the TB prevalence and death rates by 50% relative to 1990 levels by 2015 (MDG Goal 6, target 8, Indicator 23)
- To detect at least 70% of new sputum-smear positive TB patients and thereafter achieve universal case detection (MDG Goal 6, target 8, Indicator 24)
- To achieve and then surpass the 85% treatment success rate of new sputum smear positive TB patients under DOTS (MDG Goal 6, target 8, Indicator 24)
- To achieve and then surpass a 50% treatment success rate among MDR-TB cases

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

In 2007, the Union of Myanmar adopted the **Stop TB Strategy**. The following six strategies and implementation approaches therefore form the basis for the national response to tuberculosis in the country:

- Pursuing high-quality DOTS expansion and enhancement
- Addressing TB/HIV, MDR-TB and other challenges
- Contributing to health system strengthening
- Engaging all care providers
- Empowering people with TB, and communities
- Enabling and promoting research

4.1. Pursue high-quality DOTS expansion and enhancement

4.1.1. Ensure early case detection, and diagnosis through quality-assured bacteriology

While the TB diagnostic network extends to all 325 townships, microscopy services are not equally accessible in all parts of the country. Diagnostic services are hampered due to poor infrastructure, inadequate functional binocular microscopes and insecure supplies of laboratory consumables. Other diagnostic modalities to diagnose all TB cases including smear-negative and childhood TB are lacking in remote areas. Basic culture and drug sensitivity testing facilities are limited at present and need to be expanded and upgraded to allow for the planned scale up of MDR-TB diagnosis and treatment and TB/HIV collaborative activities.

In 2008, all 424 laboratories performing smear microscopy were included in external quality assurance scheme. The number of smear microscopy laboratories per 100,000 population was 0.7 which is less that the recommendation of having one smear microscopy laboratory per 100,000 population. During the same year only two laboratories were capable of performing culture corresponding to 0.2 culture laboratories per 5 million population, which is again less that the recommended one culture laboratory per 5 million population. By 2010, the two national reference laboratories in Yangon and Mandalay were capable of performing DST to first-line anti-TB drugs. However, the WHO recommendation is to have one DST laboratory per 10 million population while currently in Myanmar there is only 0.2 DST laboratories per 10 million population.

The following activities will be implemented between 2011 and 2015 to expand access to and improving quality of smear microscopy services:

- By 2011, the policy will be considered to collect two sputa per TB suspect for smear microscopy (instead of the currently used three sputa). In addition, the definition of a sputum smear positive case should change according to the new WHO recommendations.
- By 2011, it is planned to expand the smear microscopy network with an additional 432 smear microscopy centers (420 through the NTP and 12 through IOM). These microscopy centers will be based in hospitals at sub-township levels and will complement the existing 325 township level laboratories to achieve the recommended one microscopy center per 100,000 population, including in hard-to reach areas. All new microscopy centers will be included in the existing external quality-assurance system for standard sputum smear microscopy. A total of 160 binocular microscopes will be procured in order to establish these additional microscopy centers and to replace non-functional microscopes in the existing townships.
- To improve case finding and reduce travel of patients, 251 sputum collection points will be set up at village level (36 by MMA, 85 by IOM, 60 by NTP, and 70 by PSI).
- By 2012, 45 district level TB laboratories will perform HIV testing.
- By 2015, all microscopy centers should be able to perform rapid HIV testing.
- By 2015, the number of laboratories with fluorescence microscopes will expand from currently two laboratories to 16 laboratories. Fluorescence microscopes will be available mainly in diagnostic centers examining more than 100 smears per day. The fluorescence

microscopes should be equipped with a light emitting diode (LED) since this will avoid the need for dark rooms.

The following other diagnostic tests including X-rays, culture and DST will be expanded during the period of the National Strategic Plan:

- Increased use of X-rays for wider diagnosis of all forms of TB other than smear-positive cases, and especially in people living with HIV/AIDS is envisaged. Radiology facilities will be established at the TB centers in two remote border states: Shan (East) and Kayin.
- Currently the national reference laboratory in Yangon and the laboratory in Mandalay are the only laboratories performing solid culture on drug resistant TB suspects. By the end of 2015, culture laboratories should expand with an additional five state/division laboratories. As a result seven laboratories will be able to perform culture which is required for the planned scale-up of interventions among children and people living with HIV/AIDS and for the scale-up of the MDR-TB project.
- DST to first-line drugs will continue to be available in the two laboratories in Yangon and Mandalay. By the end of 2015, second-line anti-TB drug susceptibility testing will be performed at the Yangon National TB Reference Laboratory.
- In collaboration with FIND, the use of liquid systems for culture and DST was established in the national reference laboratories in Yangon and Mandalay. Molecular line probe assays for the rapid detection of MDR-TB was set-up in the Yangon and Mandalay TB Reference laboratories.
- FIND, GLI, GDF and UNITAID, will collaborate on the provision of diagnostic tests for rapid diagnostic tools for 3 years. The cost for maintenance and sustainability of equipment and testing is not yet identified the source beyond 3 years.
- By 2011 and in close collaboration with FIND and GLI, retooling activities for introduction, adoption and implementation of new and improved tools will commence. Standard operating procedures will be developed for newer tools. In addition, patient diagnostic algorithms will be developed to give guidance one which patients should have access to which tools. These algorithms should be in line with the planned scale-up of MDR-TB control activities and also the TB/HIV collaborative activities.
- Laboratory staff will undergo regular training in-country and abroad on culture and DST. Technical assistance will be coordinated with GLI and partners.
- Nationwide drug resistance surveys will be carried out in 2011 and 2014 to continue to measure trends of MDR-TB in the country.

4.1.2. Provide standardized treatment with supervision, and patient support

Standardized treatment with 4 Fixed Dose Combination (FDCs) drugs, free of charge to the patients, will continue to be provided to all TB patients on an ambulatory basis (for treatment of MDR-TB see section 4.2.2). 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. According to WHO guidelines, NTP Myanmar will change category III regiment to category I regimen in the year 2010.

To sustain and further increase the treatment success rates, the NTP will continue to work with a number of NGOs, including World Vision, MSF, Merlin, IOM, PSI, Malteser International, MMA, to provide financing of transport, X-ray fees and incentives such as food or hygienic packages for patients and their families. 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. Incentives will also be provided by NGOs to DOT community volunteers and transportation costs will be provided for defaulter tracing will be covered for volunteers from the Myanmar Red Cross Society. PACT (Myanmar) trains and supports community based volunteers to accompany patients to the PACT office where PACT facilitates referrals for sputum examinations. Patients are provided transportation grants, grants for nutritional support and other support by PACT through community managed health funds. Patient's compliance is monitored by community based volunteers.

4.1.3. Ensure effective drug supply and management

A sustainable anti-TB drugs supply is essential to the people of Myanmar. A rupture in the supply of first-line TB drugs would have devastating consequences for Myanmar and the South East Asia Region as a whole, particularly:

- Increased human suffering and deaths among the most socio-vulnerable in Myanmar;
- Provoke an increased regional spread of MDR-TB, XDR-TB and TBHIV; and
- Hamper progress towards the TB-related Millenium Development Goals in South East Asia.

Despite the high level political efforts by the Minister of Health with international partners and the government's commitment to increase its contribution to 3% of the anti-TB drug budget, with annual 1% incremental increase thereafter, additional funding has yet to been confirmed. The Three Diseases Fund (3DF)[1] has filled the gap for 2010 and the Japanese Government will provide TB drugs for 2011. For 2012-2015, it is expected that the Global Fund resources will be used for the vital anti-TB drug supply, including drugs for children, and for second-line anti-TB drugs.

The NTP supplies anti-TB drugs to partners in return for quarterly reports and joint monitoring mission to their project sites. Laboratory equipment and supplies are funded by the Global Fund, JICA, 3DF, FIND and WHO. UNITAID will be supporting second-line anti-TB drugs from 2009-2011 and paediatric formulations until end 2010.

[1] *To address the humanitarian gap left behind by the termination of the Global Fund in 2005, the Three Diseases Fund (3DF) was established by a donor consortium comprising the United Kingdom Department for International Development (DFID), the European Commission (EC), AusAID, Norway, Netherlands and Swedish International Development Agency (SIDA). The aim of the 3DF is to reduce the burden of AIDS, TB and malaria in Myanmar. The 3DF is governed by a 3DF Board and operates through a Fund Manager, UNOPS (United Nations Office for Project Services). The Three Diseases Fund set up systems that ensure accountable and transparent implementation of activities.*

In addition to sustaining the achievements made in drug supply and management, and pursuing resource mobilization efforts to identify funding for anti-TB drugs, the following activities will be conducted during the planning period:

- Pre-packaged patient kits with first-line FDCs to avoid treatment interruptions, simplify handling and improve patient adherence, were introduced in 2007 to 38 townships and will expand to all 325 townships by 2010.
- By 2011, standard operating procedures for second-line anti-TB drugs will be further developed (for the MDR-TB projects SOPs are already developed).
- By 2011, the standard operating procedures on anti-TB drug management will be revised following which refresher training will be provided at all levels.
- Standard operating procedures will also be updated for laboratory equipment and supplies.
- Upgrading of medical stores of Central level and State and Divisional levels will be planned in 2011-2015.

4.1.4. Provide efficient programme management including monitoring and evaluation

Monitoring and evaluation

The 2011-2015 National Strategic Plan is directly related to the last five years towards the Millennium Development Goals. The programme monitoring and evaluation system will be strengthened to measure both progress with programme implementation and the impact of intervention, more accurately determining the progress towards reaching the MDGs.

The central NTP will be strengthened by the recruitment of four additional staff: a senior monitoring and evaluation manager, data entry clerk, computing officer and statistician. Moreover 16 data management assistants will work with data management at state and division level. Data management training will be conducted at district level to oversee the epidemiological implication of the programme (see more details under the human resource development section). Monitoring indicators will be standardized among the partners for the five years of the planning period. The NTP will develop and provide adequate recording and reporting forms to ensure timely reporting of all care providers delivering TB care according to the Stop TB Strategy. The NTP aims to install the computerized data management system at district level (district health information system). Every alternate year (2010, 2012 and 2014) there will be a consultative review meeting for data management.

The schedule for the epidemiological surveys planned during the reporting period is listed under operational research item 4.6.

Management and supervision

The following activities will be conducted during the planning period:

- Annual evaluation meetings with all stakeholders will be carried out at national level. These meetings will be followed by regular planning and budgeting meetings.
- An inter-ministerial level meeting on TB programme management will be held in 2012 whereas inter-departmental coordination and collaboration meeting for programme management will be conducted every year.
- National DOTS-Plus Committee meetings are planned for yearly for further development of the national MDR-TB guidelines and scaling up of the activities.
- A mid-term national TB programme review will take place in 2013 to look for progress and challenges towards the achievement of the MDGs.
- Bi-annual evaluation meetings at state and division level and quarterly evaluation meeting at township level with all implementing partners will provide support to the programme management and share information. Quarterly cohort review meetings will focus in 30 low performance townships every year.
- There will be a consultative meeting in 2011 for revising existing NTP manuals and guidelines. The revised manuals and guidelines will be distributed to all related health workers and stake holders.
- All state and divisions will be supervised at least one time per year by national level staff (a programme manager and a microbiologist). To ensure human resources for the supervisory activities, the NTP will recruit 41 staff. The supervisory staff will carry out supervisory visits to state and division levels at least three times per year.
- Annual supervisory visits by central NTP staff will be conducted to townships implementing community based DOTS.
- State and division level will conduct 130 supervisory visits per year to district level health care facilities. This will result in 650 supervisory visits from district to townships level (two visits per township per year). There will also be monthly visits from the township level to station hospitals and rural health centers (1400 times per year).
- Supervisory visit by NTP staff to townships implementing TB/HIV collaborative activities will be conducted twice per year.
- Every quarter, supervision will be done for MDR-TB management in Mandalay and Yangon by central staff as well as by MSF staff. Every quarter the townships of the MDR-TB project will be supervised by the divisional DOTS-Plus committee.
- NTP staff will conduct every year 50 quarterly supervisory visits to low-performance townships.
- Laboratory consultants will supervise state and divisional TB laboratories at least once per year. Senior TB Laboratory Supervisors will conduct supervision to 200 EQA townships quarterly.
- With regard to PPM activities, the NTP will also provide annual monitoring and supervision to townships implementing PPM activities and to PPM hospitals.
- For supervisory activities, 20 four wheel drive vehicles and 100 motorcycles will be purchased during the five year period.
- All state and division offices will be equipped with photocopiers and LCD projectors for training purposes and all district teams with be equipped with computers by 2015.

4.1.5. Ensure availability of trained and motivated human resources

The strength and sustainability of the NTP depends on timely, adequate and ongoing recruitment, training, deployment, motivation and management of health workers to ensure that the Stop TB Strategy can be implemented in the context of the national guidelines. A national human resource development plan 2011-2015 will be developed and a designated human resource development official will be available at the central NTP level.

With the expansion of TB control activities to embrace all components of the Stop TB Strategy, and to reach additional people suffering from TB, more NTP and partner staff are needed to meet the increasing workload. Moreover, training activities need to be substantially expanded to improve the knowledge of staff on the various elements of the Stop TB Strategy. Finally, technical assistance to the overall TB control programme and to the various elements of TB control is needed to ensure and sustain the quality of the TB control interventions. The activities to be implemented 2011-2015 are grouped into three broad areas: 1) staffing, 2) development of training materials and training and 3) technical assistance.

Staffing

The human resource quality and quantity needs to be strengthening among all implementers of TB control activities. The Ministry of Health policy does not allow for increasing the number of NTP staff or modifying the current functions of staff. However, a limited number of recruitments can be made since all posts are not yet filled. Recruitment of additional staff will be carried out among other care providers including NGOs and international organizations. The following activities will be undertaken to increase the pool of staff from 2011-2015.

- NTP. A total of 60 staff will be recruited at central, state and division levels by 2015 and will include:
  - programme officers
  - assistant programme officers
  - laboratory staff and medical technologists
  - data management assistants
  - support staff
- The Myanmar Red Cross Society will recruit eight staff to implement community support activities in 20 townships.
- The International Organization of Migration will recruit 81 staff to run 85 sputum collection points, undertake contact tracing, provide patient support and referral, to run IOM's 10 microscopy laboratories, and undertake ACSM activities in 150 villages in seven townships.
- World Vision will recruit 13 full time staff members and 21 part-time staff members to implement activities in three townships covering a population of 160,000.
- Population Services International will link to more than 1,000 GP clinics nationwide. The scale up of "second tier" is planned to reach more than 3000 village health workers over the next five years and the work of volunteer wll be overseen by five full time community health worker supervisors, linked to "Sun"network for ongoing training and develpoment.
- Malteser International will recruit a total of 43 staff to carry out activities in two large hard to reach townships in Northern Rakhine state covering a total population of 600,000. The

services covered include community based approaches with awareness programmes at the village level, training and support for at least one DOT provider per hamlet, default tracing, contact tracing, managing three sputum collection centers and training/monitoring of 450 DOTS providers to link services to the government health system.

- Merlin will recruit 15 staff to implement TB control in 7 townships of Sagaing division.
- The Myanmar Medical Association requires a total of 130 staff at central, regional and township level to implement PPM activities in 158 townships (currently 65 staff are available).

Training

While the NTP has undertaken considerable efforts to build the capacity of health staff over the past several years, the knowledge and skills of staff requires to be regularly updated and new staff need to be trained in a number of technical and programme areas, including for the newer interventions of the Stop TB Strategy. The NTP will train staff at the various levels, in a wide range of areas in line with the revised national guidelines and the International Standards for Tuberculosis Care.

- All medical TB staff (800 TB coordinators, doctors and nurses) will receive a five day course every three years on general TB management at central, state or division level as implemented since 2005.
- The NTP will also conduct more specific training on MDR-TB management, HIV associated TB, diagnosis and management of childhood TB, supervision and cohort review, data management, monitoring and evaluation, leadership and programme management, drug management and on sputum collection.
- Basic health staff involved in TB services in the 325 townships (approximately 18,000 township health assistants and midwives) will receive a three days course every five to six years on general TB management conducted at township level. About 3,500 persons are trained each year following this model since 2005. These refresher training activities will continue during the five year period, and will include training to newly appointed staff and relevant staff of partner organizations supporting the NTP in the townships.
- Training for new staff and refresher training on smear microscopy, culture, DST, EQA and new laboratory techniques, will be carried out for laboratory staff including private and hospital laboratory staff within the PPM strategy. These above trainings will be undertaken by the NTP and will be supported by WHO TB staff and occasionally also international laboratory experts, such as for example colleagues from the Research Institute of Tuberculosis from Japan. IOM will train 48 laboratory staff in smear microscopy during the five-year period.
- Recognizing the importance of extending the reach of services beyond the capacity of the public health system, trainings will also be extended to private providers, including private practitioners, hospital staff, doctors from the Ministry of Home Affairs, NGO staff, community volunteers and TB patients as relevant, for activities in which they are involved, such as sputum collection, DOT, default tracing and provision of IPT. These trainings will be undertaken by the NTP, supported by NGO staff and WHO TB staff.

- Relevant staff of partner organizations supporting the NTP in townships will also be trained by partner organization in any of the partners' facilities (PSI, MMA and public hospitals etc). Diagnostic capacity will be improved through training of 37 laboratory personnel in 35 townships, and scaling up of NTP approved microscopy centers for the 28 scheme III implementing townships by end of year five (to a total of 40 implementing scheme III), under regular external quality control by NTP. All general practitioners clinics will be supervised by staff of the Myanmar Medical Association and the NTP in the targeted townships.
- Community and Red Cross volunteers will also be trained on DOT at community level. The World Vision will train and provide refresher training to 800 community DOT volunteers by 2015. In addition, the World Vision will train 500 school teachers for the provision of DOT among pupils. IOM will train 81 outreach workers and 102 basic health staff per year during the five years on case detection, collection of sputum specimen and provision of DOT, as well as more than 600 outreach health workers on TB prevention. PACT will provide training on case detection and DOT for community volunteers at the community level over 1,600 villages in 14 townships by 2015.
- NTP will be responsible for standardized training in TB control for both government and non government sectors and standardized record and report forms will be developed and used by all partners.
- To facilitate training activities, guidelines for the different elements of the Stop TB Strategy and training manuals will be printed.
- On-the-job training to visit other countries TB control programmes will be organized.
- NTP staff will also be joining international training courses on epidemiology and data analysis, second-line drug susceptibility testing, MDR-TB case management, laboratory management etc.

Technical assistance

To meet the technical assistance requirements of the programme and implementing partners, the following TB staff will be sustained during the five year period: a WHO international medical officer, a WHO international technical officer and four WHO national consultants. The staff at WHO will allow to assist not only the Ministry of Health/NTP but also all TB implementers in the country with coordination, planning, monitoring and evaluation, early warning and troubleshooting on important bottlenecks and slow implementation/absorption against agreed quarterly benchmarks and resource mobilization. Short-term consultancies to assist the NTP with MDR-TB management, a national monitoring and evaluation strengthening workshop, data management including data analysis, HRD planning, protocol development for the national prevalence and mortality surveys planned to commence in 2015, and financial gap analysis have been included.

External programme reviews will be undertaken in 2011 and 2015 together with independent external technical agencies to help objectively and comprehensively review the performance of the entire programme implementation as undertaken by the NTP and in-country partners. All international technical assistance will be conducted under the TBTEAM umbrella.

4.2. Address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations

4.2.1. Scale-up collaborative TB/HIV activities

The delivery of TB/HIV collaborative activities will be driven by the scale-up of HIV/AIDS prevention and control activities into peripheral facilities/health centers by the National AIDS Programme (NAP). Where feasible, integration of HIV and TB services particularly at primary facilities should be promoted to encourage the use of "one-stop" service delivery centers for patients. The current activities are planned for from 2011 to 2015.

- Annual meetings of the national coordinating body for TB/HIV and national TB/HIV evaluation workshops will continue to provide a forum for overall planning and oversight of all planned TB/HIV collaborative interventions. Meetings at the community level to enhance community involvement in TB/HIV activities are planned to be organized all townships implementing TB/HIV collaborative activities.
- The 11 TB/HIV collaborative activities will be expanded from the following 11 townships to another 15 townships totaling 26 townships in 2015. The activities will be implemented in the townships worst affected by HIV and in the townships that the NAP plans to deliver ART. The activities will serve seven million population, with an expected 80% of TB patients in these townships receiving HIV testing and 95% of HIV-positive TB patients receiving CPT. In these townships, all people living with HIV should be screened for TB during each facility visit (by using the screening tool already developed by the NTP and NAP), and all available investigations, including smear microscopy, chest X-ray and culture, should be given to suspected TB cases among people living with HIV.
- In addition to the 26 townships mentioned above, TB service delivery centers will be providing HIV voluntary counseling and testing and co-trimoxazole treatment in 45 townships where both TB and AIDS/ STD teams are existing.
- Trainings for the different categories of health staff from both programmes.
- Following the results of the Isoniazid Preventive Therapy (IPT) pilot survey (which will commence in 9 townships in 2009) consensus of HIV and TB policy makers should be built on the country's standpoint and/or targets for the provision of isoniazid preventive therapy.
- Annual TB/HIV sentinel surveys will continue and will be expanded to the inclusion of 15 townships in 2009 to 40 townships in 2015.
- PACT will include sputum examination in 10 townships where VCCT services offered by 2015
- By 2012, the TB registers should be updated with HIV variables including:
    - Provider-initiated testing and counseling performed
    - HIV test performed
    - HIV result
    - HIV care
    - Co-trimoxazole prophylaxis
    - Antiretroviral treatment

4.2.2. Scale-up prevention and management of multidrug-resistant TB

Treatment and care of MDR-TB is demanding, complex and costly. The prevention of MDR-TB by "turning off the tap" through improving basic TB control is therefore the most important factor in MDR-TB control. With a strong DOTS programme and with the use of FDCs for a number of years, Myanmar has ensured a good system to prevent the development of MDR-TB. Additional measures to prevent drug resistance have been undertaken by improving treatment success rates. Workshops have been conducted in townships with high unfavorable treatment outcomes, and especially high default rates, to improve treatment provider and patient adherence to treatment. Defaulter tracing has been improved and expansion of community-based patient centered care is undertaken. The involvement of private-practitioners in DOTS through the PPM scheme is also preventing the development of drug-resistance. The provision of quality-assured FDCs to private practitioners by the NTP avoids the need for patients to buy drugs of unknown quality and in a non-standardized fashion at pharmacies. The adoption of the International Standards of Tuberculosis Care will further ensure the use of high-quality anti-TB drugs and completion of the six month standard TB treatment among TB patients.

While prevention activities will continue and expand, diagnosis and treatment of MDR-TB cases will also scaled-up. It is planned that 100 and 175 MDR-TB patients will initiate treatment in 2009 and 2010 respectively in the two Green Light Committee (GLC) approved pilot hospitals in Yangon (5 townships) and Mandalay (5 townships). The implementation will be conducted by the NTP and MSF-Holland. The project will enroll category II treatment failures on a standardized MDR-TB regimen consisting of a six month intensive treatment phase of levofloxacin, amikacin, ethionamide, cycloserince, PAS and pyrazinamide. An 18-month continuation phase of all drugs excluding amikacin will follow. This treatment has been designed following the resistance patterns to second-line drugs and discussions with the GLC. The patients will be hospitalized for the initial two to three months at two hospitals in Yangon and Mandalay, following which the treatment will continue by basic health staff and by NGOs supporting community based treatment. Nutrition incentives and financial support to cover transport costs will be provided to the MDR-TB patients. Hospital sections for MDR-TB have been renovated and infection control measures have been taken into account. The actions planned from 2011 to 2015 are as follows.

- A total of 4,000 MDR-TB patients will be treated according to WHO standards from 2011 to 2015 (400, 600, 800, 1000, 1200 from 2011 to 2015). The main partner for MDR-TB management is MSF-Holland and also more recently MSF-Switzerland has expressed interest to join the MDR-TB battle.
- The national MDR-TB guidelines and policy will be revised in 2011 to take into account the expansion of MDR-TB treatment practices. Following a national consultation, it should be decided which patients should be eligible for DST and rapid MDR-TB diagnosis, in addition to the category II failures (for example, DST or rapid MDR-TB testing could be conducted on category I failures, institutionalized TB patients, TB patients living with HIV, chronic TB patients, contacts to MDR-TB patients). Considerations should also be given to the appropriateness of the standardized MDR-TB treatment regimen as used during the pilot phase. Moreover, the treatment provision during the pilot phase should be evaluated and if needed modified to ensure a patient-centered delivery of MDR-TB treatment.

- Additional partners should be engaged, such as PSI and MMA, to allow for geographical scale-up of MDR-TB treatment.
- To coordinate and provide oversight to the MDR-TB case management activities, annual meetings will be held with the central MDR-TB management committee. In addition, quarterly meetings of the local level committees set up in Yangon and Mandalay will be held. The GDF will assist with the monitoring of the second-line medicine management and the GLC will provide technical assistance annually to the MDR-TB treatment sites.
- Staff at the central level (central level NTP staff and hospital staff in Yangon and Mandalay), and concerned NTP staff at states and divisions and townships, as well as public non-NTP services providing MDR-TB care under the auspices of the NTP (such as the prisons) will receive MDR-TB management training. On-the-job training will be organized to neighboring countries to exchange ideas on MDR-TB management in different settings.

4.2.3. Ensure treatment of tuberculosis in children

There is an urgent need to improve the prevention, diagnosis and treatment of TB in children in Myanmar by ensuring their inclusion in the NTP, including the response to TB/HIV and MDR-TB in children as well as in adults. The engagement of all who provide care to children (including paediatricians and other clinicians) is crucial. Reducing the burden of TB in children will require changing and improving many existing practices, such as those that relate to diagnosis and contact investigations.

In 2007, national guidelines for the management of TB in children were developed, published and disseminated. In 2008, TB medical officers in Yangon and Mandalay participated in a training-of-trainers course on the policies and practices for TB control in children. Following the training-of-trainers, all senior paediatricians working in general hospitals at the state and division level were trained, as well as all township medical officers.

Since 2008, UNITAID is providing quality-assured formulations of anti-TB drugs for children in all 325 townships. Currently, there is no tuberculin available for tuberculin skin testing but a request has been put forward in the Global Fund Round 9 proposal.

BCG vaccination is provided to all newborns under the umbrella of the Expanded Programme on Immunization.

For 2011-2015, the below activities will be implemented by the NTP and in close collaboration with partners / organization:

- The child friendly quality-assured anti-TB drug formulations for children currently supplied by UNITAD will be sustained.
- For the prevention of TB in children, screening of household contacts of infectious pulmonary TB cases will be implemented. Moreover, screening of babies born to mothers with smear positive TB will be undertaken. All children found to have TB will be registered and treated, and for those children not found to have TB but who are at high risk of TB should receive IPT. These practices will be gradually implemented in all townships by 2015.

- Children who are close contacts of MDR -TB patients should receive careful clinical follow-up for a period of at least two years. If active disease develops, prompt initiation of treatment with a regimen designed to treat MDR -TB is recommended. These interventions should be available in all townships providing MDR-TB management.
- By 2012, all TB and township medical officers should be trained in reading chest X-ray films of children. Information and advocacy about chest X-rays in children should be provided to all radiologists working at district hospitals.
- Training in fine needle aspiration cytology for extra-pulmonary TB in children should be provided to district and township level TB medical officers.

4.2.4. Address the needs of poor and vulnerable populations

Under the 3DF programme, the NTP has strengthened community based DOTS in two townships bordering Thailand (Myawaddy and Tachileik) targeting the whole population but focusing on cross border migration. Based on this experience, it is proposed to expand this community based DOTS project to an additional 4 townships including areas along the border with China (Muse), India (Kalay) and Thailand (Kawthoung).

These activities include:

- Advocacy with local authorities, district and township level officials, NGOs and GPs;
- Development of IEC material in local language;
- Cross border health collaboration meetings conducted at local area;
- Quarterly evaluation at township level;
- Initial home visiting at start of treatment for all TB patients by BHS;
- Health talks by BHS at village level;

The following activities are budgeted under other relevant service delivery areas:

- Training on Management of TB for Health Facility Staff;
- DOTS Providers Training;
- Refresher Training for Laboratory Technicians;
- Increased supervision from all levels down to the Station Health Units and Rural Health Centres;
- Monthly laboratory supervision and quality control by State TB officers.

Most of the work conducted to date to confront issues relating to equity to access TB treatment and care, has been focused on ethnic groups and people living in remote areas. Work have been conducted to overcome geographical barriers to health care and have included: extension of diagnostic and treatment services to remote, poor regions, bringing patients from remote areas to TB services, and the development of community-based TB care. Social and cultural barriers have been dealt with by ensuring that information on TB is included in several local languages and again the promotion of community care and mobilization. All these activities are conducted with substantial support from a number of NGOs. In particular, IOM will continue to strengthen its activities focusing on migrants and communities affected by constant cross-border migration (i.e. the Thai-Myanmar border). This work will also include internal migrants in search of labour, internally displaced people as well migrants crossing and re-crossing into Thailand. IOM will work to ensure better service provision, adherence and continuity of care for this high risk

group, by conducting IEC activities focused on health risks associated with mobility, sensitizing outreach health workers to be aware of migration factors, facilitating village mobility working groups, and collaborating with other agencies working in cross-border areas.

Indirectly, the removal of economic barriers to TB control has been achieved by the provision of free diagnostic and treatment service by the government and also by the implementation of PPM activities and especially the involvement of general practitioners through the Myanmar Medical Association and the "Sun Quality Health" clinics by PSI. These activities are clearly benefiting the poor population. A possible reason for this is that general practitioners' services are user friendly, they often practice within the community, have flexible opening hours and are therefore easy to access, at low indirect costs for patients.

While diagnosis, treatment and care services will continue to expand to remote areas and pro-poor activities will continue with the PPM activities, the NTP will also embark on a more systematic approach to address the needs of the poor and the vulnerable populations. By 2012, an assessment of the vulnerable groups will be made and the barriers to access will be determined. Following this assessment, a strategy and plan will be developed and implemented by the NTP and partners.

The special interventions will be reinforced in hard to reach area and border area where there were low case detection rate. Those activities include community empowerment, mobile team activities, contact tracing by health staff, partnership with other department and INGOs. Local NGOs will be organized to empower the community is planned to cover the whole country in this plan. Mobile team activities to those areas will be planned twice a year. This activity will be strengthened by regular visiting to there by health staff four times a year. If there is no health staff in those areas, school teachers will be trained to conduct this activity.

4.2.5. Strengthen infection control in health services, other congregate settings and households

With plans to scale-up MDR-TB treatment, and given that Myanmar is one of the countries hardest hit by the HIV epidemic in Asia, it is imperative to focus attention on the prevention of TB transmission in health facilities which care for TB patients and suspects, paying particular attention to facilities caring for MDR-TB patients and patients with HIV. With foreseen support from the Global Fund, Round 9, infection control measures to decrease nosocomial transmission of TB will therefore be strengthened in the townships implementing TB/HIV collaborative activities and MDR-TB programme management (26 TB/HIV sites, 22 MDR-TB sites; 7 sites overlap between TB/HIV and MDR-TB).

Following an assessment of the needs for TB infection control measures by international experts, and NTP participation to training of trainers on Infection Control in Jakarta, Indonesia, in 2009, the NTP should finalize the national infection control policy by 2010 as well as the national infection control plan. The TB infection control plan will be part of the general infection control plan for the country. During 2011 and 2015 the following activities are planned:

- The initiation and scale-up of the TB infection control plan will be pursued.
- By 2011 the NTP will designate a focal point for TB infection control at the national level to coordinate the implementation, scale-up, and evaluation of TB infection control.
- As MDR-TB treatment is scaled-up, the national TB reference laboratories and the MDR-TB hospitals in Yangon and Mandalay should have facility level TB infection control plans developed with support from infection control officers by 2012. Technical support for laboratory infection control practices will be provided by the GLI and FIND.
- By 2012, an engineer will be designated under the NTP who will perform certification of biological safety cabinets and maintenance of other equipment.
- Infection control measures will be upgraded in 22 townships that will cater for MDR-TB patients, and in 26 sites TB/HIV management sites.
- Health care facilities and diagnostic centers with a high volume of TB suspects and confirmed TB patients, e.g. divisional TB centers, will have TB infection control measures in place in line with national guidelines.
- Infection control trainings will be carried out for health care workers and will be supported by WHO and international NGOs.
- Although personal protection devices (respirators) are recommended for all health workers when caring for patients or suspects with infectious TB, priority should be given to MDR-TB wards and pilot sites, laboratories performing culture and DST, HIV/TB programme sites, and divisional TB centers and diagnostic services. In addition, health workers should use respirators during aerosol-generating procedures associated with high risk of TB transmission (e.g. bronchoscopy, intubation, aspiration of respiratory secretions, and autopsy or lung surgery with high-speed devices). A comprehensive training programme for use of respirators should be implemented, to include a fit-testing component.
- By 2015, and wherever it is possible, all outpatient facilities will have their waiting areas located in well ventilated spaces. Moreover, sputum collection should also be performed in an outdoor, dedicated space.

4.3. Contribute to health system strengthening based on primary health care

The TB programme is an important part of, and well integrated into, the general health systems. In a number of ways, the programme is therefore contributing to health system development through for example:

- Overall support to public health management capacity through working with the HIV/AIDS and malaria programmes on strengthening of health services at all levels
- Investments in laboratory infrastructure at state/division and township levels
- Investment in health infrastructure at primary care level (computers, vehicles, communication means)
- Optimizing the use of shared resources such as frontline health staff
- Capacity-building of health staff at primary health care level including basic health staff

- Capacity-building and empowerment of community representatives, local community groups, health volunteers and patient representatives
- Decentralization of health care services to hard to reach townships and border areas
- Expansion of innovative service delivery strategies such as PPM approaches and community-based care
- Enforcing rational use of drugs through the NTP and through the PPM strategies (provision of quality-assured anti-TB drugs to private practitioners)
- Respiratory infection control measures in laboratories, hospitals and health centers

During the planning period, the NTP will further strengthen its work to:

- Further integrate TB control planning and budgeting process with national sector-wide planning frameworks
- Coordinate with sector-wide planning processes to improve rational use of human resources
- Decentralize TB/HIV service delivery interventions, promoting as much as possible "one-stop" health delivery clinics
- Strengthen infection control measures and integrate the TB infection control strategy into the overall infection control plan for the country. Reduce TB transmission in HIV/AIDS treatment and care centers by working closely with the NAP and with the TB/HIV committee.
- Strengthen and expand PPM approaches

4.4. Engage all care providers: Involve all public, voluntary, corporate and private providers through Public-Private Mix approaches and promote the use of the International Standards for Tuberculosis Care (ISTC)

PPM activities have progressed fast during the last five years in Myanmar. In 2008, the second national assessment of the engagement of all health care providers in TB control was performed. Following the national workshop to adapt the ISTC to Myanmar context in March 2009, the International Standards of Tuberculosis Care were launched by the Ministry of Health and the Myanmar Medical Association on World TB Day 2009.

Annual national level PPM meetings will continue be held and will involve all partners to review progress, resolve common problems, and finalize plans. National level workshops are also planned every year to continue to disseminate the International Standards for Tuberculosis Care. Coordination meetings with all partners involved will also take place at township levels. The following PPM activities are planned for the planning period with regard to 1) the involvement of private-practitioners (including private laboratories), and private hospitals, 2) public hospitals both under the Ministry of Health and under other ministries, and 3) rolling out the ISTC.

4.4.1. Scaling up Public-Private Mix DOTS

- **Collaboration with private practitioners**. There are currently three schemes available for engagement of private practitioners in TB control: 1) referral of suspects and cases, 2) referral and treatment provision and 3) referral, diagnosis and treatment provision. These schemes will continue during the planning period but more emphasis will be made to expand the third scheme. The promotion of the International Standards of Tuberculosis Care will be key for the expanded engagement of private practitioners. The following activities are planned for 2011-2015:
    a. The social franchise scheme run by PSI, under the brand "Sun Quality Health" and which involves private general practitioners who provide quality controlled and highly subsidized TB diagnosis and treatment will be expanded. By 2009, 604 "Sun Quality Health" clinics provided TB services and by 2015 it is planned to increase the network to cover 1050 clinics.
    b. Through working with the Myanmar Medical Association, the number of private general practitioners involved in the different TB service delivery schemes as described above will increase from the current 768 private practitioners to 7,200 or to 60% of all private providers in the country operating in more than 150 townships. Through support of the MMA, 35 additional private laboratories will also be accredited to perform sputum-smear microscopy and will be included in the national EQA network (total 40 by the end of 2015 since there are already five existing ones).
    c. JICA activities terminated at the end of December, 2009. JICA supported PPP DOTS activities were transferred to MMA PPM DOTS.

- **Embarking on involving private hospitals and polyclinics in TB control according to international standards**
    d. MMA will expand PPM DOTS to two private hospitals in 2009 and thereafter continue to expand PPM activities to two hospitals per year so that in 2015, 14 private hospitals will be delivering TB services according to the national guidelines.

4.4.2. Scaling up Public-Public Mix DOTS

- **Collaboration with public hospitals under the Ministry of Health and under other ministries**.

Currently four public hospitals under the Ministry of Health are managing TB under the auspices of the NTP. The following activities are planned:

- The Public-Public Mix DOTS model introduced by the NTP in 4 specialist hospitals in Yangon will be expanded to 25 state/divisional general hospitals (including the 2 TB Hospitals in Yangon and Mandalay where MDR-TB management will be implemented and the Specialist Hospital Waibagi managing severe AIDS patients) by the end of 2015. All hospitals will be utilizing the International Standards of TB Care.

- Partnership with large hospitals where reputed specialists are handling large numbers of TB patients, outside the NTP and often not in line with the NTP guidelines, will be strengthened.
- Integration of hospital into NTP through incorporation of the national DOTS strategies with regard to diagnosis, treatment and recording/reporting;
- Creation of a TB control network by establishing a referral link between public hospital and township health department/ township TB team;
- Quality control of hospital laboratory and linkages between the TB activities of the hospital laboratory and the NTP structure; and
- Establishment of a uniform TB surveillance system
- Orientations will be organized for administrators and para-medical staff. Proper medical recording will be introduced, medical social workers trained into counseling and tracing of defaulters to near by Townships from Hospitals in Yangon Division. Joint monitoring will be done by NTP and hospital staff.
- A Hospital Committee with representatives of all relevant sectors will be formed and quarterly convened to review the implementation process and do joint monitoring.
- Transport for hospital staff to perform home visits and defaulter tracing and nominal incentives for the hospital TB coordinators to overlook the case management and recording and reporting will be set up.

4.5. Empower people with TB, and communities through partnership

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 Myanmar. For this component, the NTP relies on support from decision- and policy-makers, opinion leaders, NGOs, the media, the private sector, communities and individuals.

Enhancement of advocacy, communication and social mobilization to improve case detection and treatment adherence, to combat stigma and discrimination, to empower people affected by TB, to mobilize political commitment and resources for TB control, and to institute social change and poverty reduction, is required for long-term control of TB. The NTP of Myanmar has been successful in ensuring political commitment to TB control, building national and sub-national ACSM capacity and forging partnerships with health and development agencies 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.

Patient satisfaction, TB-related knowledge and TB-related stigma was assessed by a knowledge, attitude and practice survey in 2009. The findings of the survey (to be finalized in 2010) will underpin the ACSM and community-involvement practices during 2011-2015. To review the effectiveness of ACSM and community-involvement activities, a second nation-wide KAP survey is planned for 2013. By the end of 2010, an ACSM strategy and plan of action will be developed for the planning period 2011-2015. By 2011, a working partnership between the

health sector and the community, the local population, especially the poor, and TB patients, should be formed and a TB community representative should be included in the Technical Strategy Group. The experiences of TB patients help fellow-patients to cope better with their illness and can guide the NTP in delivering services responsive to patients' needs.

4.5.1. Pursue advocacy, communication and social mobilization

The following activities will be implemented during 2011-2015 by the NTP and partners:

Advocacy

- Annual World TB Day activities will be carried out by the NTP at central, state, and divisional levels as well as in 48 districts. The Myanmar Red Cross Society, Myanmar Medical Association, Myanmar Health Assistant Association, World Vision, International Organization of Migration, Malteser International, PACT, Population Services International and MSF will all carry out annual World TB Day events at central level and in the respective townships they work.
- The media will be provided with material for articles on TB in daily newspapers, journals and magazines. Television spots and radio messages and "jingles" on TB will be developed and aired.
- The World Vision will undertake advocacy meetings thrice a year and organize yearly meetings with authorities at township level in three townships.
- The International Organization of Migration will conduct regular village, township and state level advocacy meetings on a monthly and quarterly basis to improve multi-sectoral involvement, streamline implementation and mobilize the communities and local authorities.
- Township level advocacy meetings will be convened by the NTP and will include all stakeholders and political and health authorities with the aim of obtaining commitment and support for activities in hard-to-reach and border townships.

Communication

- In 2011, the NTP will conduct a workshop with all TB stakeholders on strategies for information, communication and education tool development. IEC materials will be developed, based on the KAP survey, and disseminated to all sub-groups of the population to increase awareness on TB.
- Communication materials such as posters, pamphlets, books will be developed and distributed. Short films or plays on TB will be captured on videos for viewing by the community in patient waiting rooms, village health centers, shops or similar places where people gather to watch movies. Appropriate communication tools such as mass media messages and campaigns, posters and pamphlets specially designed for population groups living in the border areas in their local dialects and languages will be developed wherever required. Malteser International will develop patient information booklets in the form of "patient charter booklets" that will be distributed to about 1,000 TB patients per year. MMA will develop IEC materials to be delivered to all the townships in which they work. IOM

will use outreach health workers for interpersonal communication and education activities, and support will be provided to establish and maintain a village mobility working group in each village to prioritize and implement educational activities in their own villages. Merlin will adopt a culturally-sensitive behavior change communication strategy including IEC materials, theatre and appropriate media campaigns and interpersonal communication. PACT will develop IEC materials to be used in combination with 3 day workshop facilitated by village health facilitators. "TB Hero" will be selected and additional materials will be developed and updated for TB Hero refresher training. PSI will support a comprehensive and targeted TB communications campaign using voluntary heath workers and involving all levels of media. The communication strategy will be developed, pre-tested and implemented to encourage the early detection and diagnosis of TB as well as effective treatment completion. The communications strategy will include community-level health talks and interpersonal communication activities. Appropriate behavior change communication materials will be developed, pre-tested and produced based upon themes identified via target group research. The impact of the communication campaigns on key behavioral factors relating to TB diagnosis and treatment among the target population will be assessed using PSI's market research methodology.

Social Mobilization

- The Myanmar Medical Association will hold social mobilization meetings with general practitioners targeted to sensitize health care workers and communities at township level. The Myanmar Health Assistant Association will develop and display banners and billboards in markets, factories and pubic places, to encourage health seeking behavior and participate and contribute to activities that include social mobilization approaches among targeted populations. The World Vision will conduct community mobilization campaigns to raise awareness among people in the townships. Malteser International reaches about 1,000 TB patients per year in health education. World Vision will organize video shows and shows during local pagoda festivals. Merlin and PACT will mobilize communities to promote health seeking behavior and DOTS compliance at household and community levels, by training and equipping one community health worker for each target village.

4.5.2. Foster community participation in TB care, prevention and health promotion and promote use of the Patients' Charter for Tuberculosis Care

Effective partnerships between health services and the community may facilitate access by bringing services to people's homes, and reducing the cost of care-seeking for patients and health services as well as the cost of workload for staff. Carefully designed community and/or patient involvement initiatives also facilitate patient and community empowerment. Through the involvement of local communities, education on relevant health issues and stimulation of change in health-related behavior, communities become increasingly knowledgeable and self-reliant.

NTP will scale up, building on the successful FIDELIS project between 2006-2007 in Sagaing Division, the community-based services to achieve at least 70% case detection and 85%

treatment success in 77 hard-to-reach townships in Sagaing Division (32 township), Northern (10 townships) and Southern Shan States (10 townships) and Magway Division (25 townships).

These activities include:

- monthly meetings with TB patients introducing the Patient Charter and to involve cured TB patients as a DOT provider;
- advocacy meetings for Myanmar Red Cross Volunteers in 20 townships;
- twice yearly evaluation meetings will be held with by with local NGOs and partners working in the 75 townships;
- quarterly review meetings at divisional level;
- travel allowances for community health workers for initial home visits and defaulter tracing;
- costs for transport of sputa from peripheral sputum collection centers;
- health talks at rural health centre level;
- increased supervision down to community level; and
- incentives for township medical officers, TB focal persons, support clerks and microscopists at the most peripheral level.

Incentives across several partners will be standardized through the TSG TB.

The following community-based TB care services will be provided by NGOs.

Myanmar Health Assistants Association. The association will provide TB control services in three low performing townships Meikhtila, Tharzi and Mahlaing. Communities will be involved in developing a plan of activities through a project planning workshop. Village Health Committees will be set up in these townships and all activities will be carried out in collaboration with community based organizations. Health education, peer education and group discussions with be held with community members to increase community awareness for TB, identify issues relating to treatment compliance, and earlier referral for TB patients. Cured TB patients will be involved in providing DOT, peer education and will conduct home visits. As a recognition to their work they will be given awards.

World Vision will establish and manage community development centers for IEC and provide care for TB patients in an area covering 160,000 population. Community-based TB prevention and control activities through volunteers will help to identify and refer suspected cases, trace contacts of TB cases, provide DOT and care and support for TB cases to complete treatment. Incentives will be provided to 20 trained community health volunteers involved in these activities per township per year.

International Organization for Migration aims to continue and expand existing community-based activities for TB detection, diagnosis and treatment in migration affected communities in 150 villages in Mon State, through which the land route for migration to Thailand runs. Village Mobility Working Groups constituted by community members ranging from village leaders, village elders, religious leaders, employers, migrant workers, young people, married men and women and local NGO members will be established, and outreach health workers

selected from the communities trained to provide care and support of TB patients. IOM will cover for salaries of the community health workers.

Population Services International will extend their social franchising initiative to include voluntary health workers to improve access to quality health services for poor, underserved and remote rural communities. PSI will coordinate activities with the NTP and other service providers to reach high priority areas identified in collaboration with the NTP and partners. Village health workers will be trained in case finding through appropriate referral and contact tracing in townships where case detection rates may be as low as 40%. All village health workers will be trained in basic symptomatic TB screening and referral processes, and 600 village health workers will serve as DOT observers and will be trained to support TB patients, through counseling, monitoring adherence and tracing defaulter. They will be linked to "Sun Quality Health" franchised clinics and routinely monitored and supervised by PSI staff. Incentives will be provided to village health workers for referrals that result in treatment. Where barriers to access to diagnosis are significant, PSI will through a pilot programme, train village health workers to send sputum rather than the patients, to the nearest health centers including public sputum collection points and "Sun Quality Health" clinics. PSI estimates that, through this project, village health workers will identify approximately 10,000 TB cases, who would otherwise remain untreated. The project will therefore potentially prevent up to 150,000 new TB infections over five years. In addition, the established cooperation between the community, village health workers and "Sun Health Clinics" will provide an effective platform for future interventions, including, for TBHIV and MDR-TB services.

Myanmar Medical Association will scale up community based services in four hard-to-reach area's in Sagaing Division, and in an additional three townships along the border with China, India and Thailand.

4.6. Enable and promote research

4.6.1. Conduct programme-based operational research

The below operational research activities are planned for during the five year period in close collaboration with technical agencies and partner organizations:

- A national TB prevalence survey will be conducted in 2015 in order to measure progress towards achieving the MDGs.
- For measuring the MDGs, TB mortality surveys will conduct in 2011 and 2015.
- National drug resistance surveys will be conducted in 2013 and 2015. In addition, surveys on second-line anti-TB drug resistance among MDR-TB cases will be performed in the same years. HIV testing should be included in the drug resistance surveys.
- Annual MDR-TB surveillance will be conducted from 2010 and onwards in three townships bordering Thailand.
- The TB/HIV annual sentinel surveys will continue, in collaboration with the NAP, in 15 sentinel sites and will expand up to 40 sites at the end of 2015.
- A baseline knowledge, attitude and practice survey was conducted in 2009. A repeat survey is planned in 2013

Additional operational research activities will be planned according to budget availability and in close collaboration with partners. These activities are as follows:

- Research aimed at understanding the casual factors for the development of drug-resistant TB.
- Field-testing of available molecular resistance assays in collaboration with FIND and GLI.
- Operational research into health seeking behavior and social determinants of TB.
- TB/HIV related research.
- PPM related research.

5. Financing

5.1. Total costs for tuberculosis control, funding availability and gaps

The total costs for TB control from 2011 to 2015 have been calculated at US$ 160 million going from 31 million, 29 million, 31 million, 33 million and 36 million in 2011, 2012, 2013, 2014 and 2015, respectively. Figure 4 shows the total funding required during the time period as well as the breakdown of fund for different activities/interventions.

The most costly interventions during the five year period are:

- Diagnosis: 24.4 million (15.3%)
- First-line anti-TB drugs: 25.2 million (15.8%)
- TB/HIV collaborative activities: 20 million (12.6%)
- MDR-TB management (including second-line anti-TB drugs): 31 million (18.9%)
- Human resources: 27.9 million (17.5%)

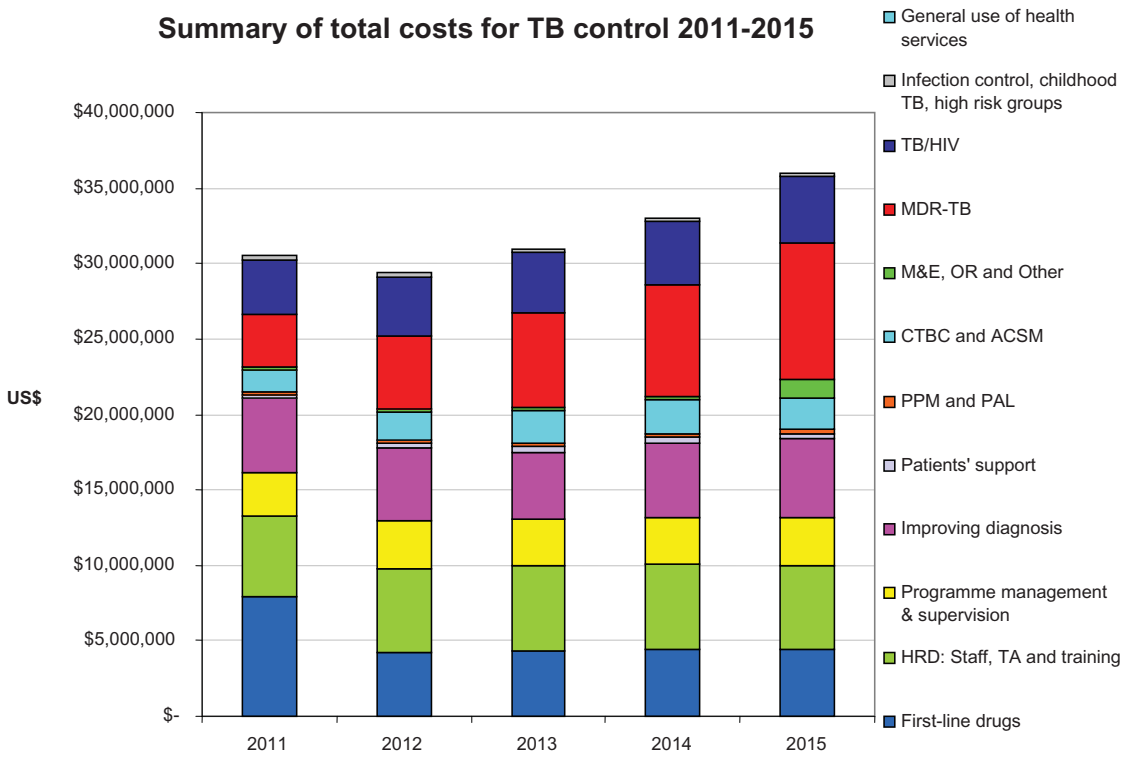


Figure 4. The total cost of TB control in Myanmar, 2011-2015, per activity

Table 5. Estimated funding sources for TB Control, Myanmar in 2011-2015 in (US$)

Funding Source	2011	2012	2013	2014	2015	Total
Government	$ 594,921	$ 647,167	$ 700,525	$ 755,052	$ 810,804	$ 3,508,469
Global Fund (NTP+partners)	$ 9,866,933	$ 12,967,038	$ 12,909,538	$ 13,167,204	$ 13,957,251	$ 62,867,964
WHO	$ 154,000	$ 147,000	0	0	0	$ 301,000
3DF (NTP+MMA)	$ 2,037,563	0	0	0	0	$ 2,037,563
JICA	$ 3,142,918	$ 142,918				$ 3,285,836
FIND	$ 900,000	900,000				1,800,000
MSF-Holland	$ 414,677	$ 350,000	$ 300,000	$ 200,000	$ 200,000	$ 1,464,677
USAID	$ 622,000	$ 620,000	$ -	$ -	$ -	$ 1,242,000
UNION	$ 650,000	$ 650,000	$ 650,000	$ 650,000	$ 650,000	$ 3,250,000
World Vision (additional budget)	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 150,000
Other Grants	$ 5,759,595	$ 2,692,918	$ 980,000	$ 880,000	$ 880,000	$ 11,192,513
Expected Funding	**$ 24,172,607**	**$ 19,147,041**	**$ 15,570,064**	**$ 15,682,255**	**$ 16,528,055**	**$ 91,100,022**
Funding Gap	**$ 3,414,014**	**$ 10,214,785**	**$ 15,383,703**	**$ 17,305,466**	**$ 19,437,604**	**$ 65,755,572**

Table 5, shows the estimated budget sources for Myanmar during the planning period. The vast majority of funding for TB control is expected to be provided by the Global Fund (US$ 65.3 million for the planning period), followed by the government (US$ 3.3 million) and YADANA Consortium (US$ 3.3 million). The majority of NGOs such as the Myanmar Red Cross Society, Myanmar Medical Association, Population Services International, World Vision, Malteser International, Merlin, IOM, Myanmar Health Assistant Association and the Union are also dependant on Global Fund support for carrying out their planned activities. Of these organizations, only World Vision has additional funding of US$ 30,000 per year from its own budget sources. MSF-Holland plans to support TB control in Myanmar with US$ 1,250,000 including MDR-TB management and also with staff, MSF is not included as a subrecepient in the the Global Fund support. Table 6 shows the total estimated costs for TB control per service delivery area, the total amount is equivalent to figure 4 and table 5.

The funding gap for 2011 and 2015 will be totally dependent on the agreement of the Global Fund to support TB control activities in Myanmar. Should Round 9 of the Global Fund be successful, the funding gap for the implementation of all components of the Stop TB Strategy will be ranging from US$ 14-20 million in 2011-2015.

Should there not be Global Fund support to Myanmar, the situation will be devastating. The available funds of about US$ 4 million per year would not be sufficient even to carry out the

most basic TB control activities in the country and would not even cover for purchasing first-line anti-TB drugs. Resource mobilization efforts are described below for possible identification of additional external resources for TB control in Myanmar.

Table 6. Total costs for TB control in Myanmar, 2011-2015

Service delivery area	2011	2012	2013	2014	2015	Total for 5 years
1.2 Improving diagnosis	$ 4,897,228	$ 4,814,959	$ 4,449,532	$ 4,937,003	$ 5,230,909	$ 24,329,631
1.3 Patient support	$ 200,600	$ 351,397	$ 351,235	$ 356,535	$ 357,135	$ 1,616,902
1.4 First-line drugs procurement and management	$ 7,921,999	$ 4,194,591	$ 4,289,258	$ 4,387,899	$ 4,443,960	$ 25,237,706
1.5.1 M&E	$ 123,967	$ 82,566	$ 120,666	$ 112,706	$ 1,106,982	$ 1,546,887
1.5.2 Programme management and supervision	$ 2,917,624	$ 3,209,051	$ 3,141,628	$ 3,071,682	$ 3,126,254	$ 15,466,239
1.5.3.1 HRD: Staff	$ 3,350,118	$ 3,817,750	$ 3,881,891	$ 3,939,623	$ 3,858,825	$ 18,848,209
1.5.3.2 HRD: International TA	$ 449,000	$ 185,000	$ 195,000	$ 175,000	$ 205,000	$ 1,209,000
1.5.3.3 HRD: Training	$ 1,538,683	$ 1,533,861	$ 1,561,212	$ 1,609,657	$ 1,513,873	$ 7,757,284
2.1 Collaborative TB/HIV activities	$ 3,576,304	$ 3,838,093	$ 4,005,718	$ 4,163,899	$ 4,369,060	$ 19,953,075
2.2 MDR-TB	$ 3,509,107	$ 4,873,405	$ 6,269,605	$ 7,420,855	$ 9,064,105	$ 31,137,077
2.3.1 High risk groups	$ 155,450	$ 141,830	$ 141,890	$ 138,450	$ 138,540	$ 716,160
2.3.2 Infection control	$ 229,312	$ 132,876	$ 73,464	$ 73,892	$ 62,900	$ 572,444
2.3.3 Childhood TB	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 50,000
3.2 PAL	$ 15,500	$ 15,800	$ 20,800	$ 15,800	$ 12,300	$ 80,200
4.1/4.2 PPM/ISTC	$ 187,732	$ 204,950	$ 218,671	$ 262,775	$ 319,583	$ 1,193,711
5.1 ACSM	$ 919,979	$ 990,463	$ 1,196,133	$ 1,238,955	$ 1,236,581	$ 5,582,112
5.2 Community involvement	$ 496,918	$ 878,134	$ 939,964	$ 985,890	$ 822,552	$ 4,123,458
6.1 Operational research	$ 44,600	$ 44,600	$ 44,600	$ 44,600	$ 44,600	$ 223,000
Other	$ 42,500	$ 42,500	$ 42,500	$ 42,500	$ 42,500	$ 212,500
Total costs for TB control	**$ 30,586,621**	**$ 29,361,826**	**$ 30,953,767**	**$ 32,987,721**	**$ 35,965,659**	**$ 159,855,594**

5.2. Resource mobilization

A resource mobilization plan will be developed for 2011 to 2015. Donor coordination meetings, involving all stakeholders for TB control and also HIV partners, will be held on an annual basis to inform on achievements and challenges and ensure rational use of resources and no duplication or fragmentation of efforts. Donor progress and final reports should be submitted as according to donor agreements. The possible solutions for resource mobilization include:

- **Patients/households**. The cost of treatment per patient in the DOTS programme is estimated at US$ 190 per person and the cost per MDR-TB patient treated is above US$ 4,000 per patient per year. These costs cannot be expected to be financed by patients and therefore some form of collective financing mechanism is required.

- **Government.** As previously mentioned, the government budget for TB control has continued to increase on an annual basis. From 2010 onwards, the Government will cost match 3% of the annual TB drug needs, with an annual 1% incremental increase thereafter.

- **The Global Fund** is the single biggest source of external funding for TB control. Continuous efforts should be made to successfully apply and get approval for funding from the Global Fund.

- **UNITAID** provides funding for drugs and diagnostics related to HIV, TB and malaria. To date, it has committed US$ 900 million for the three diseases, including US$ 146 million for TB drugs and diagnostics. Currently Myanmar is benefiting from UNITAID support for TB drugs for children (0.45 million USD per year), second-line drugs and diagnostic tests. This collaboration should continue to allow for planned programme activities to continue.

- **Other donors**. Various bilateral donors and foundations provide funding via mechanisms besides the Global Fund and UNITAID, with the most important one being the 3DF. The NTP and national partners should continue its good collaboration with bilateral donors from Australia, France, Norway, Japan, Sweden, United Kingdom and United States of America. In addition, collaboration with private sector and particularly YADANA Consortium but also Eli Lilly should continue. Funding should also be explored from the Bill & Melinda Gates Foundation and USAID. The Government of Japan also support through JICA.

6. Indicators and targets

Table 7 indicates 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 targets.

Table 7. TB impact targets with baseline value and target for year 2015

Impact indicators	Baseline			2015 target
	Value	Year	Source	
Reduced TB prevalence per 100,000 population / year	595	2009	WHO, Global TB report, 2005	461
Reduced TB mortality (all forms of TB) per 100,000 population / year	59	2009	WHO, Global TB report, 2005	55
Reduced TB incidence per 100,000 population / year	404	2009	WHO global TB report, 2008	<400
Prevalence of MDR-TB among new smear positive TB patients	4.2%	2008	National drug resistance survey, 2007	<4%

Outcome indicators	Value	Year	2011	2012	2013	2014	2015
Case detection rate (new sputum smear positive cases)	95%	2009	75%	80%	85%	90%	≥ 95%
Case notification rate (all forms) / 100,000 population / year	263	2009	270	275	280	285	290
Treatment success rate	85%	2009	≥85%	≥85%	≥85%	≥85%	≥ 85%
Treatment success rate among MDR-TB cases	N/A	N/A	50%	55%	58%	60%	≥ 50%

Table 8 illustrates the monitoring and evaluation of programmatic targets or outcome targets for the planning period, structured according to the key Stop TB Strategic components.

Table 8. Programmatic indicators for the activities to be conducted 2011-2015 by the NTP of Myanmar in close collaboration with partners.

Stop TB Strategy Component	Indicators	Baseline	Year	2011	2012	2013	2014	2015	2015 Target
Pursue high-quality DOTS expansion and enhancement									
Ensure early case detection, and diagnosis through quality-assured bacteriology	Number of sputum collection centers	29	2009	120	160	50	60	60	450
	Number of microscopy laboratories monitored under the external quality control system (existing 415 + expansion 420 + 12 IOM)	415	2009	106	86	80	80	80	847
	Number of laboratories with fluorescence microscopes	4	2009	65	40	-	-	-	109
	Number of culture laboratories available	2	2009	2	4	3	3	3	17
	Number of laboratories conducting quality-assured DST to second-line drugs	0	2009	-	-	-	1	-	1
	Number of laboratories performing molecular line probe assays for the rapid detection of MDR-TB	2	2010	-	1	-	-	-	3
	Number of new TB patients (all forms) registered for treatment (Baseline not included)	134023	2009	152691	156091	159598	163217	166951	798549
Provide standardized treatment with supervision, and patient support	Number of community health worker trained and actively involved in TB case finding and/or treatment activities at community level	NA	2009	1500	2250	3000	3250	3500	13500
	Number of TB patients/ families receiving community support/ incentives	7696	2008	1100	1400	1600	2000	2000	15796
Ensure effective drug supply and management	Number of treatment units reported no stock out of first line anti-TB drugs (adult and child formulations) at the last day of each quarter (including PPM)	336	2009	346	352	355	358	361	361

Stop TB Strategy Component	Indicators	Baseline	Year	2011	2012	2013	2014	2015	2015 Target
Provide efficient programme management including monitoring and evaluation	Number of townships supervised and feed back provided by NTP during each quarter	175	2009	330	330	330	330	330	330
	Proportion of new smear positive TB patients successfully treated among all new smear positive TB patients detected	85%	2009	>85%	>85%	>85%	>85%	>85%	>85%
Ensure availability of trained and motivated human resources	Number of basic health staff trained on selected modules of management of TB for health facility staff	3059	2008	3000	3000	3000	3000	3000	18059
	Number of laboratory technicians trained	618	2008	120	120	120	120	120	1218
	Number of community member trained	NA	2009	8022	8022	8022	8022	8022	40110
	Number of private practitioners trained	1500	2009	1350	1350	1350	1350	1350	8250
Address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations	Number of TB patients tested for HIV (Base line not included)	4174	2009	68026	70036	72060	74098	76149	360370
Scale-up collaborative TB/HIV activities	Diagnosed TB/HIV patients received CPT in areas where comprehensive TB/HIV services are in place (%)	97%	2009	>97%	>97%	>97%	>97%	>97%	>97%
	Diagnosed TB/HIV patients eligible for ART received ART in area's where comprehensive TB/HIV services are in place (%)	65%	2009	>65%	>65%	>65%	>65%	>65%	>65%
Scale-up prevention and management of multidrug-resistant TB	Number of laboratory confirmed MDR-TB patients enrolled in the MDR-TB treatment programme (DOTS Plus)	64	2009	400	600	800	1000	1200	4000
	Number of TB/HIV, MDR-TB management units implementing infection control measures (Base line not included)	6	2009	7	7	7	7	7	41
Ensure treatment of tuberculosis in children	Number of <15 years childhood TB patients diagnosed and registered for treatment	32540	2009	30411	31596	32828	34110	35443	164388
Address the needs of poor and vulnerable populations	National plan developed for scaling-up TB control interventions to the poor and vulnerable populations	0	2009						1
	Number of new smear positive TB patients registered in targeted border townships (Baseline not included)	560	2009	650	750	850	900	955	4105

Stop TB Strategy Component	Indicators	Baseline	Year	2011	2012	2013	2014	2015	2015 Target
Strengthen infection control in health services, other congregate settings and households	National Infection Control policy & plan for health facilities should have developed and implemented. (Cross cutting)	0	2010	-	-	-	-	-	1
Contribute to health system strengthening based on primary health care	TB control planning and budgeting integrated with national sector-wide planning frameworks (Cross cutting)	1	2009	-	-	-	-	-	1
Engage all care providers									
Involve all public, voluntary, corporate and private providers through Public-Private Mix approaches and promote the use of the International Standards for Tuberculosis Care	Number of private practitioner involved in DOTS	1500	2009	3500	4500	5500	7000	8250	8250
	No. of TB patients (all type) registered for treatment in Public-Private Mix DOTS clinics (Scheme 3)	17123	2009	15000	30900	47400	64500	82200	82200
Empower people with TB, and communities through partnership									
Pursue advocacy, communication and social mobilization	Population with correct knowledge about TB (Mode of transmission, symptoms, treatment and curability) (percentage). Based on KAP survey	To be available by end of 2010.	2010						Target set according to baseline to be available
	Number of people who correctly identified "cough of 2 weeks or longer" as symptom of TB out of all surveyed	To be available by end of 2010.	2010						Target set according to baseline to be available
Foster community participation in TB care, prevention and health promotion and promote use of the Patients' Charter for Tuberculosis Care	Proportion of new smear positive TB patients successfully treated among all new smear positive patients detected by community health workers	NA	2008						85%

Enable and promote research									
Conduct programme-based operational research	Operational research studies completed (as indicated in the national strategic plan) and results disseminated through national/global TB monitoring and evaluation systems. (Baseline not included)	2	2010	1	1	1	1	2	8

7. Projected impacts of implementing the whole plan

From 2011 to 2015, it is expected that 796,989 TB patients, including 164,388 children, will receive high quality TB diagnosis, treatment and care. Of these cases, at least 677,441 will be cured. All patients will be treated with an uninterrupted supply of quality-assured fixed-dose combinations of anti-TB drugs which will prevent the development of drug resistance. The high-quality referral, diagnosis, treatment and care will be implemented by the primary health care network throughout the whole country, by a number of private and public hospitals, and by 1,500 private practitioners. The treatment of these cases will avert more than 400,000 deaths due to TB, compared to if there was not treatment available, since about 50% of TB patients die without treatment. The absence of treatment would, however, have a much higher negative effect on TB patients co-infected with HIV, which constitute about 10% of all TB cases.

The expanded MDR-TB diagnosis, treatment and care programme will ensure that 4,000 MDR-TB patients will receive adequate treatment. Without treatment, the majority of these cases would die after having transmitted MDR-TB to their families and communities. The absence of an MDR-TB control programme would stimulate self-treatment and the purchase of substandard and/or inadequate quantities and combinations of medicines, which can lead to the development and spread of incurable forms of TB.

The cure of at least 677,441 TB patients will have a tremendous socio-economic impact on patients, families and communities. Without treatment and cure, many families would encounter economic difficulties due to loss of employment and income resulting in further negative effects such as children dropping out of school on the account of parental illness.

The high case detection and treatment success rates will reduce the TB incidence, prevalence and mortality because the average duration of infectiousness will fall and the proportion of cases dying will decrease.

Should the Myanmar National TB Programme achieve the targets set fourth in this plan, the MDGs and the Stop TB Partnership’s targets for TB control will be reached.