Tuberculosis Control Programme
Nepal

National Strategic Plan

Implementation of Stop TB Strategy

2067/68-2071/72
(16 July 2010 – 15 July 2015)

National Tuberculosis Programme
Ministry of Health & Population
Government of Nepal

Executive Summary

Tuberculosis is one of the most widespread infections in Nepal, and poses a serious threat to the health and development of the people of Nepal. Despite almost 100% DOTS coverage throughout Nepal, the Case Detection Rate (CDR) of new sputum positive TB cases has remained at 70% for the last seven years.

The National Tuberculosis Programme (NTP) has been following the 10-year 'Long Term Plan, July 2002 to June 2012. However, in 2006, the NTP adopted the Stop TB Strategy, which recommends activities not covered by the Long Term Plan.

This National Strategic Plan, July 2010 to July 2015, utilizies the ideas of the Stop TB Strategy to increase case finding in Nepal, and hence to reach the goal: to reduce the mortality, morbidity and transmission of tuberculosis until it is no longer a public health problem.

The impact targets are: to halt and begin to reverse the incidence of TB by 2015 and to reduce by 50% prevalence and mortality rates by 2015 relative to 1990 levels (See 1.3.1). The outcome targets are: to achieve a case detection rate of new smear-positive cases of at 82% nationally; and, to reach and maintain a treatment success rate of 90% by 2015.

Since the ultimate goal is to eliminate TB (less than 1 new sputum positive TB case per million population per year) from Nepal by 2050, the NTP and Partners have a vision to utilize the following initiatives to reach this long-term goal.

- 'Improving Diagnosis': microscopic services will be increased by 125 over five years; female community health volunteers (FCHV) will be mobilized to actively increase case finding and carry out contact tracing of family members of registered TB cases.
- 'High Quality DOTS': In addition to the diagnostic centres, a further 75 treatment centres will be added;
- 'Laboratory Network': The NTC laboratory will gain accreditation to become the National Reference Laboratory and will upgrade to liquid culture medium; culture facilities will expand to three regions.
- Practical Approach to Lung Health (PAL): PAL initiatives will reach 29 districts by 2015, thus increasing diagnosis and treatment of all respiratory diseases.
- 'Infection Control' measures will be introduce to reduce nosocomial infections
- Respiratory Hospital will be established in the Valley by 2014.
- 'TB/HIV Collaboration': will be implemented and maintained in 35 districts and reduce the morbidity of TB/HIV co-infection.
- MDR TB Management will expand to a total of 80 centres/sub-centres across the country, increasing accessibility to this disadvantaged group.
- 'Public Private Mix (PPM)': NTP will engage the private sector in 35 municipalities to improve diagnosis and treatment of TB and hence to decrease the occurrence of MDR TB.
- Advocacy, Communication & Social Mobilization (ACSM)': intensified ACSM activities will spread throughout the country so that all 75 districts will benefit and the CDR increase above 80%.
- 'Operational research': will give solutions to questions like gender inequality in TB cases, value of radio communication; what is the true ARI? etc.
- 'Monitoring & Evaluation': will: check that the targets are being reached, and follow-up transfer in/out and migration cases.
- 'Planning & Administration:' will coordinate all the above.

Hence, TB will be decreased in Nepal due to early diagnosis and rapid treatment from the above activities.

List of Abbreviations

ACSM	Advocacy, communication and social mobilization
AHW	Auxiliary health worker
AIDS	Acquired immune deficiency syndrome
ANM	Auxiliary nurse midwife
ARI	annual risk of tuberculosis infection
BHS	Basic health staff/services (government)
BSL	Bio-safety level
CCM	Country Coordinating Mechanism
CHD	Child Health
CMA	Community medical auxiliary
COPD	Chronic obstructive pulmonary disease
DACC	District AIDS Co-ordination Committee
DDA	Department of Drug Administration
DHO	District Health Office/Officer
DHS	Department of Health Services
DOTS	Directly observed treatment short course
DPHO	District Public Health Officer
DTLO/A	District TB and leprosy Officer/Assistant
EDCD	Epidemiology and Disease Control Division
EQA	External quality assurance
FCHV	Female community health volunteer
FHD	Family Health Division
HFMC	Health Facility Management Committees
HIV	Human immune deficiency virus
HP	Health post
GENETUP	German Nepal Tuberculosis Project
GLC	Green Light Committee
HMIS	Health Management Information System
GFATM	Global Fund Against AIDS, TB and Malaria
GoN	Government of Nepal
iLED	auramine fluorescence microscopy
INF/N	International Nepal Fellowship / Nepal
INGO	International Non-government Organization
ISTC	International standards for tuberculosis care
IUATLD	International Union Against Tuberculosis and Lung Disease
LCD	Leprosy control Division
LMD	Logistics Management Division
LQS	Lot quality control system
M&E	Monitoring and Evaluation
MD	Management Division of MoHP
MDG	Millennium Development Goal
MDR TB	Multi-drug resistant Tuberculosis
MDT	Multi-drug therapy (leprosy)
MOU	Memorandum of understanding
MWR	Mid Western Region
NAP	National AIDS Programme
NATA	Nepal Anti-Tuberculosis Association
NCASC	National Centre for AIDS and STI Control
NGO	Non-government organization
NHEICC	National Health Education, Information and Communication Centre
NHTC	National Health Training Centre
NPHL	National Public Health Laboratory

NRL	National Reference Laboratory
NTC	National Tuberculosis Centre, Bhaktapur
NTP	National Tuberculosis Programme
PHCC	Primary health care centre
PLHIV	People living with HIV
PMW	Paramedical Worker
PPM	Public private mix
PR	Principal Recipient of GFATM grant
QC	Quality Control (mostly TB sputum microscopy)
QCA	Quality control assessor
RAD	Return after default
RHD	Regional Health Directorate
RTC	Regional TB Centre
RTLA/O	Regional Tuberculosis and Leprosy Assistant/Officer
SDA	Service Delivery Area
SER	Socio-economic rehabilitation
SHG	Self-help group
SHP	Sub-health post
SOP	Standard Operating Procedures
SR	Sub-recipient (of GFATM grant)
STI	Sexually transmitted infections
TB	Tuberculosis
TBCN	Tuberculosis Control Network (NGOs involved in TB work in Nepal)
VCT	Voluntary counselling and testing (for HIV/AIDS)
VDC	Village Development Committee
WHO	World Health Organization

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1 Introduction

1.1 Geography of Nepal

Nepal is a land-locked country nestled in the foothills of the Himalayas. The country lies between the two most populous countries of the world, India to the east, south, and west and China to the north. Topographically, Nepal is divided into three distinct ecological zones: mountain, hill, and plain (*terai*). The mountain zone (accounting for 35 % of the total land area) ranges in altitude from 4,877 meters to 8,848 meters above sea level. Due to the harsh terrain in the mountains, transportation and communication facilities are very limited and about 7 % of the total population lives here.

In contrast, the hill ecological zone, which ranges in altitude from 610 meters to 4,876 meters above sea level, covers an area of 61,345 square kilometres (accounting for 42% of the total land area), and is densely populated, as about 44 % of Nepal's population lives in the hill zone. This zone includes the Kathmandu Valley, the country's most fertile and urbanized area. The hill terrain is less rugged than the mountain zone, the concentration of people is higher, so transportation and communication facilities are much more developed here than in the mountains.

The Terai lies in the southern part of the country, covers 34,019 square kilometres, and is the most fertile part of the country. While it constitutes only 23 percent of the total land area in Nepal, 48% of the population lives here. Due to its flat terrain, transportation and communication facilities are more developed in this zone than in the other two zones of the country and this has attracted newly emerging industries.

For administrative purposes there are five development regions in Nepal – Eastern, Central, Western, Mid-western and Far-western. In addition, Nepal is divided into 14 zones and 75 administrative districts.

Districts are further divided into smaller units, called village development committees (VDCs) and municipalities. Currently there are 3915 VDCs and 58 municipalities. Each VDC is composed of nine wards, with the number of wards in each municipality ranging from 9 to 35.

Population censuses have been carried out in Nepal since 1911 at decennial intervals. However, detailed information about the size and structure of the population was provided only since the 1952/54 census.

The 2001 Census listed 103 diverse ethnic/caste groups, each with its own distinct language and culture (Central Bureau of Statistics, 2003). The percentage breakdown by size of some of these major groups is as follows: Chhetri (15.8%), Brahmins (12.7%), Magar (7.1%), Tharu (6.7%), Tamang (5.7%), and Newar (5.5%).

Nepal's population doubled in the last 30 years from around 12 million in 1971 to 23 million in 2001. The population grew at a rapid rate between 1971 and 1981 from 2.1 percent to 2.6 percent, but the population growth rate has slowed since 1981 to just over 2 percent (Central Bureau of Statistics, 2003). The population density has doubled over the three decades from 79 persons per square kilometre in 1971, to 157 persons per square kilometre in 2001

Nepal is predominantly rural, nevertheless, the proportion of the urban population has increased steadily over the last 30 years from about 4 percent in 1971 to 14 percent in 2001.

Table 1: Nepal's Key indicators (2009)

Nepal Fact	
Population:	26.8 million
Population growth rate:	2.25% (2001-2010)
Infant Mortality rate:	48 per 1,000
Life expectancy Male:	63.6 years
Life expectancy Female	64.5 years
Adult literacy:	65.5% (M), 42.8% (F)
Urban population:	13.9%
Urban growth rate:	3.44% (1981-2001)
Per capita GDP:	$470
GDP growth rate:	5.56% (1907/8)

Source: Central Bureau of Statistics, 2009

Life expectancy in Nepal is improving, increasing by about 20 years for males and females between 1971 and 2001. Female life expectancy is slightly higher than male life expectancy (60.7 years versus 60.1 years).

Despite the disruption of the Maoist insurgency, the Nepal Living Standards Survey (2003/4) showed an 11-percentage point reduction in poverty, as in 2007/8, 30.8% of Nepalis were poor compared to 42% in the 1995/6 survey. Now approximately 80% of Nepal's primary-aged school children are enrolled in schools. Infant mortality has dropped from 101/1,000 live births in 1990 to 48 in 2009.

1.2 Epidemiology of Tuberculosis

TB is a disease of people in the economically active age groups, which results in an immense economic loss to communities and countries. TB is a disease of poverty – having its greatest impact on developing countries, which carry 95% of the global TB burden, and on disadvantaged groups within society.

1.2.1 Epidemiology of TB globally

According to World Health Organization (WHO), globally, there were an estimated 9.27 million incident cases of TB (2007). There is an increase from 6.6 million cases in 1990. Most of the estimated number of cases in 2007, were in: Asia (55%) and Africa (31%); with small proportions of cases in the Eastern Mediterranean Region (6%); the European Region (5%); and the Region of the Americas (3%). Of the 9.27 million incident TB cases in 2007, an estimated 1.37 million (15%) were HIV-positive; 79% of these HIV-positive cases were in the African Region and 11% in the South-East Asia Region.

There were an estimated 13.7 million prevalent cases of TB in 2007 (206 per 100,000 population), a decrease from 13.9 million cases (210 per 100,000 population) in 2006. Prevalence and mortality rates are falling globally and in all six WHO regions.

An estimated 1.76 million deaths occurred during 2007. Approximately 1.3 million deaths during 2007 occurred among HIV negative incident cases of TB, while 456,000 were among incident TB cases, who were also HIV-positive. Deaths among HIV-positive incident TB cases equate to 33% of HIV-positive incident cases of TB and 23% of the estimated 2 million HIV deaths in 2007.

There were an estimated 0.5 million cases of multi drug resistant TB (MDR TB) in 2007. By the end of 2008, 55 countries and territories had reported at least one case of extensively drug resistant TB (XDR-TB)

1.2.2 Epidemiology of TB in Nepal

TB is one of the most widespread infectious diseases in Nepal, and poses a serious threat to the health and development of the people of this country (Table 5).

The key milestones in TB control in Nepal are:

- 1996 – DOTS implementation
- 2001 – Nationwide DOTS coverage
- 2005 – DOTS Plus Pilot Project – after Green Light Committee (GLC) evaluation
- 2006 – New STOP TB STRATEGY
- 2007 – International In-depth Review
- 2007 – Implementation of PAL Programme (Pilot districts – Bhakatapur/ Nawalparasi)
- 2008 – Adoption of ISTC by Medical Professional Societies
- 2008- GLC permitted to scale up DOTS Plus Programme to MDR TB

Despite the political instability (1994 to 2006), the National TB Programme (NTP) has continued to expand DOTS coverage throughout the country, starting with four DOTS centres in 1996 to 1,079 by July 2008, and 3,147 sub-centres. Case detection rate reached the national target of 70% by 2001/2 and has been maintained (Figure 1). Treatment success rate for new sputum positive cases has been above the national target of 85% for at least the last decade.

1.2.2.1 TB Infection in Nepal

About 60% of adults and 45% of the general population have been infected with the disease. Nearly 2% of people are infected every year. The annual risk of tuberculosis infection (ARI) is falling very slowly, with a decline estimated at only 0.02 points per year. As TB spreads through the air, it is not surprising that the highest rates of infection have been found in the most densely populated areas, such as Kathmandu valley and other urban areas.

1.2.2.2 TB situation in 2007/8

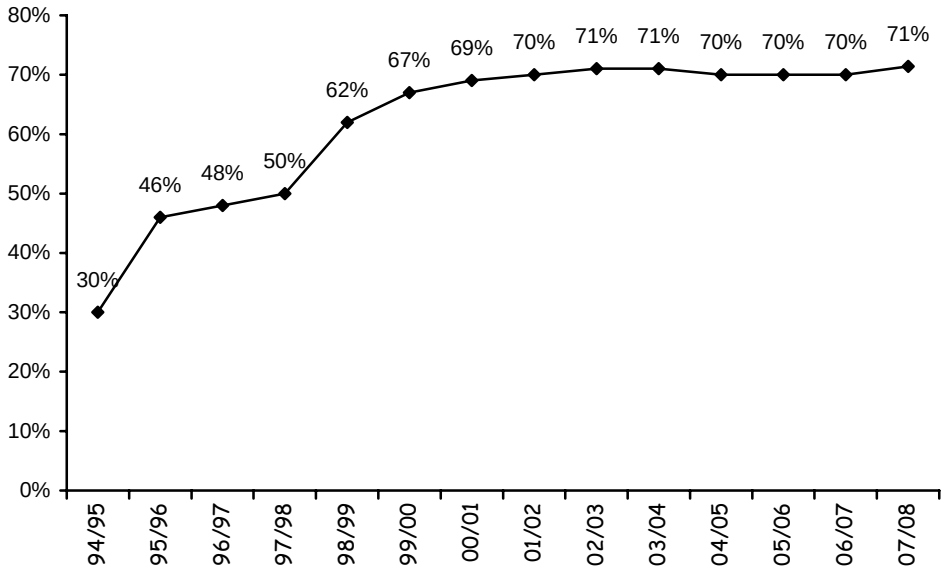
In Nepal nearly 80,000 people currently have TB, with more than 40,000 new cases arising every year. About half of these have infectious (or sputum smear-positive) TB and continue the chain of transmission. Over 200,000 people will develop TB during the next five years which equivalents to the entire population of a densely populated hill district of the country. The majority of these patients will be people in the economically active age groups of 15–45 years.

In 2007/8, there were 30,465 new TB cases registered in Nepal, of whom, 14,640 were sputum positive, 9,298 sputum negative and 6,527 extra-pulmonary. In addition, there were 2,954 Category 2 patients (2,444 relapse cases, 259 failure and 251 return after default (RAD) cases), hence 33,419 registered TB cases. Of the new cases, 48% were sputum positive, less than the WHO standard of 50%.

The sputum conversion rate in 2007/8, was 87% for all new sputum positive cases. The treatment outcome of new sputum positive cases has remained steady for the several years. In 2007/8, the treatment success rate of new cases registered in 2006/7 was 88.8%, defaulter 3.6%, deaths 4.6% and failure 1.2%.

Hence, the incidence rate of new TB cases for 2007/8 was 114 per 100,000, the prevalence rate was 124.7/100,000, and fatality rate (deaths for any cause among registered TB cases) for all TB cases registered in 2006/7 was 5.2 per 100,000 (1,385 deaths).[1]

Figure 1: Case notification trend, Nepal, 1994/5 to 2007/8



Case detection increased from 30% in pre-DOTS era (1994/5) to just over 70% in 2001 when nationwide DOTS coverage was achieved. Case detection rates have remained almost static for past seven years. The CDR in 2007/8 was 71.4%.

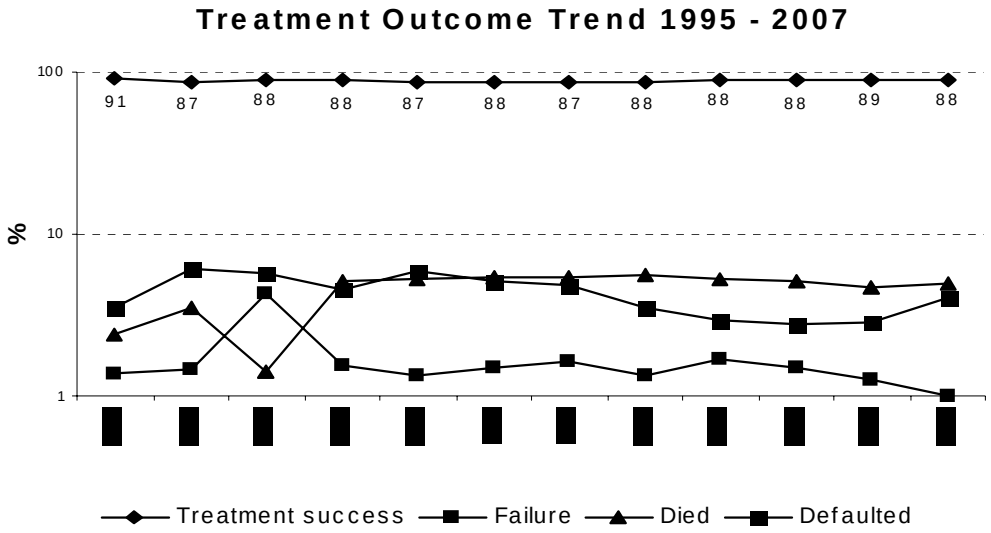
The male to female ratio is 2:1 possibly because Nepali men are more frequently exposed to infection than women are, and/or women, due to cultural influences, have less access to health care services than men. This discrepancy will be investigated through SDA 9:Operational Research.

1.2.2.3 Treatment outcome

Since introduction of DOTS in Nepal in 1996 NTP has consistently achieved (Figure 2) and exceeded the global target of treatment success (85%).

[1] These are calculated based on the Central Bureau of Statistics 2001 Census and official estimated population for 2007/8 population, so differ from WHO publications which use different population estimates.

Figure 2: Treatment outcome of new sputum positive TB cases, Nepal, 1994/5 to 2006/7



1.2.2.4 TB Deaths in Nepal

It is estimated that without treatment, nearly 94,992 people in Nepal would die from TB over the next five years. If the DOTS program is well maintained, as planned, the number of deaths in this period will be reduced by 75% to 24,770, with a saving of around 70,222 lives.

WHO estimated that there were 9,712 deaths from TB in 1990. Current estimates have shown a profound decline in the number of deaths to about 1,385 during 2007/8 (5.2/100,000). This is considered primarily due to improvements in program performance, and demonstrates the immediate and significant impact of the good TB control program in Nepal has had on the death rate.

Nepal can only record fatality rates as there is no certification of cause of death and deaths among TB patients may be due to any cause.

1.2.2.5 HIV and TB in Nepal

Data from the National Centre for AIDS and STD Control (NCASC), show a concentrated HIV epidemic in sex workers and injecting drug users. The national rate at the end of 2002 was 0.5% in sexually active adults with an estimated 60,000 people now infected.

The relationship between human immune deficiency virus (HIV) and TB is well known. Increasing numbers of HIV-related TB cases can be expected as the prevalence of HIV increases in Nepal.

The National TB Programme (NTP) has conducted five rounds of surveillance of HIV in TB patients since 1994. The results indicate that the prevalence of HIV is low but steady since 2001/2 (Table 2). Our latest surveillance results suggest that up to 740 patients undergoing TB treatment by the NTP are HIV infected.

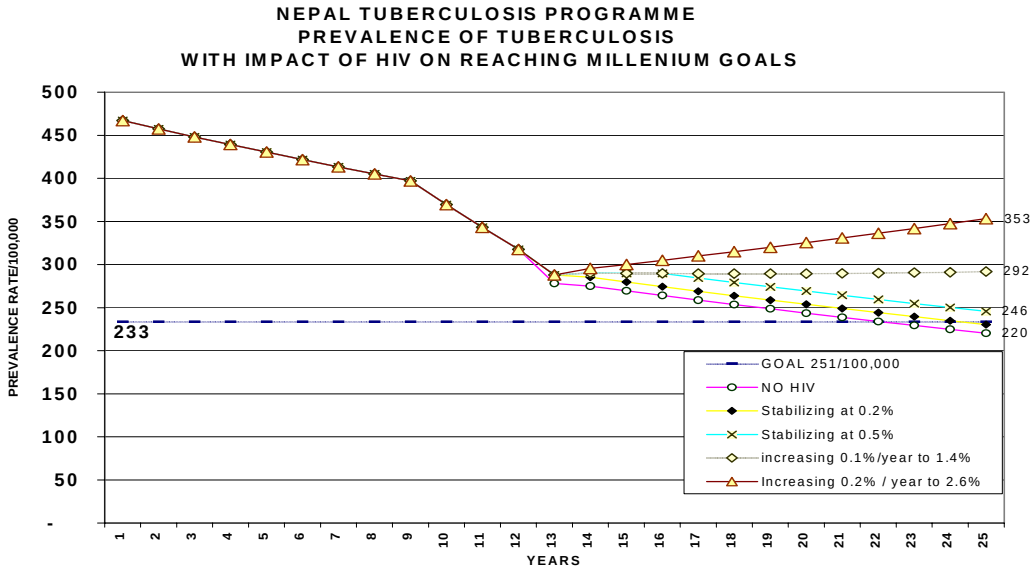
Table 2: Prevalence of HIV in TB patients surveyed 1994 to 2006/7, Nepal

Year	No. Tb Patients Tested	No. HIV Positive	%
1994	300*	0	0%
1996	1,000*	9	0.90%
1998/9	1,221	23	1.88%
1999/0	938	13	1.39%
2001/2	1,023	25	2.44%
2006/7	995	24	2.41
* New smear-positive cases only			

N.B. For the first two surveys (1994 and 1996), only new smear positive TB patients were tested, and from National TB Centre and Tansen Hospital.

For planning purposes total population prevalence of HIV of 0.5% by 2012 has been used, based on an annual increase in infection rates of 0.025% from an estimated 0.2% population prevalence in 2009.

Figure 3: Effect of the HIV/AIDS epidemic on TB prevalence rates, Nepal



In 2003, it was predicted that the downward trend in TB prevalence will be slowed down if the HIV/AIDS population prevalence stays at around 0.5%. However increasing rates of HIV infection, by even 0.1% year or more, will result in reversal of the gains in prevalence and fatality rates made over the years, and result in a failure to meet the Millennium Development Goals of halving these rates by 2015 (see 1.3).

1.2.2.6 Drug Resistant TB in Nepal

Multi-drug resistant TB (MDR TB) is a major threat for successful TB control. WHO and the International Union Against Tuberculosis and Lung Disease (IUATLD) have established a global network for surveillance of anti-tuberculosis drug resistance.

As part of this project, the NTP carried out four sentinel site surveillance of drug resistance in new tuberculosis patients since 1996 (Table 3).

Table 3: Prevalence of Anti-TB Drug Resistance, Nepal, 1996 to 2007

	1996-1997		1998-1999		2001-2002		2006-2007	
	Primary	Acquired	Primary	Acquired	Primary	Acquired	Primary	Acquired
No. of TB patients tested	787 (100%)	0	673 (100%)	112 (100%)	755 (100%)	171 (100%)	914 (100%)	193 (100%)
No. sensitive to all drugs	710 (90.2%)	0	584 (86.8%)	80 (71.4%)	672 (98.0%)	101 (59.1%)	653 (85.2%)	121 (74.6%)
Any resistance	77 (9.8%)	0	89 (13.2%)	32 (28.6%)	83 (11.0%)	70 (40.9%)	113 (14.7%)	41 (25.3%)
Mono resistance	45 (5.7%)	0	51 (7.6%)	13 (11.6%)	53 (7.0%)	22 (13.0%)	70 (9.1%)	10 (6.1%)
Multi Drug Resistance	9 (1.1%)	0	24 (3.7%)	14 (12.5%)	10 (1.32%)	35 (20.5%)	22 (2.9%)	19 (11.7%)
Resistance to all 4 drugs		0	12 (1.8%)	11 (9.8%)	6 (0.8%)	16 (9.4%)	14 (1.8%)	11 (6.8%)

Levels of drug resistance are high, with nearly 14.7% of new patients resistant to at least one drug. Levels of MDR TB are low (2.9% among new cases). However, the pattern of drug resistance in new patients indicates the levels of resistance when they were infected, which may have been several years previously. Rifampicin resistance is low at 2.9% while higher primary resistance is to isoniazid (8.4%) and streptomycin (10/7%). As rifampicin has only been widely used in Nepal for about 8 years, any level of rifampicin resistance is a cause for concern.

1.3 NTP Structure and Organization

The National Tuberculosis Programme (NTP) is fully integrated within Government health care system. The National Tuberculosis Centre (NTC) is one of five national centers within the Department of Health Services (DHS). Others are the National Public Health Laboratory (NPHL), the National Centre for AIDS and STD Control (NCASC), the National Health Training Centre (NHTC), and the National Health Education, Information and Communication Centre (NHEICC).

There are six divisions within the DHS; Leprosy control Division (LCD); Epidemiology and Disease Control (EDCD), Logistics Management Division (LMD),

Management Division (MD), Family Health (FHD) and Child Health (CHD). There is also a Department of Drug Administration (DDA) under the Ministry of Health. The secretariat of the Ministry of Health also has a department for Policy, Planning, and International Co-operation Division, in addition there is a Public Health Administration, Monitoring and Evaluation Division and a Curative Division.

The five regional health directorates (RHD) each have a regional director and support staff, for planning, monitoring and evaluation of health services.

The management unit of the government health services, at the district level, is the District Health Office (DHO). District health services include a district hospital, a Primary Health Care Centre (PHCC) for each electoral unit within the district (an electoral unit serves approximately 100,000 population), health posts (HP) serving populations of about 20,000, and sub-health posts (SHP) in each village development committee (VDC) – average population 4,000.

As of 2008 (Department of Health Services), Nepal's government health care system consisted of 87 hospitals, 205 PHCCs, 682 HPs and 3,129 SHPs.

NTP has TB diagnostic services in all government hospitals, PHCCs and 53 other health facilities within Government health care system, as well as 49 through partner NGOs and 24 in private sector. By July 2009, there were 1,257 DOTS centres and 3,131 DOTS sub-centres (most of the later being at SHP).

NTP has a full time dedicated staff member at each regional (Regional TB and Leprosy Officer) and district level (District TB and Leprosy Officer/Assistant) who are responsible for planning, implementation and monitoring of NTP activities in their respective region/districts.

1.3.1 Directly observed treatment short course (DOTS)

Nepal adopted the directly observed treatment short course (DOTS) strategy in 1996 with pilot implementation in four pilot districts. Nationwide DOTS coverage was achieved in 2001. Currently, DOTS based TB services are available in all 75 districts of the country. All PHC, HP and about 99% of the SHP are providing DOTS services. These centers are fully integrated within the general health services throughout the country.

By July 2009, there were 4,388 health institutions (1,257 Treatment Centers and 3,131 Sub Treatment Centers) offering DOTS services, and 470 microscopic centres testing sputum samples. There were 10 centres offering MDR TB management, and 34 sub-centres. Culture and DST facilities are available at the NTC and GENETUP (see 1.3.3) laboratories.

Besides government health institutions, several NTP partners also provide DOTS including; private nursing homes, polyclinics, factories, I/NGOs health clinics, eye hospitals, prisons, refugee camps, police hospitals, medical colleges, municipalities, etc.

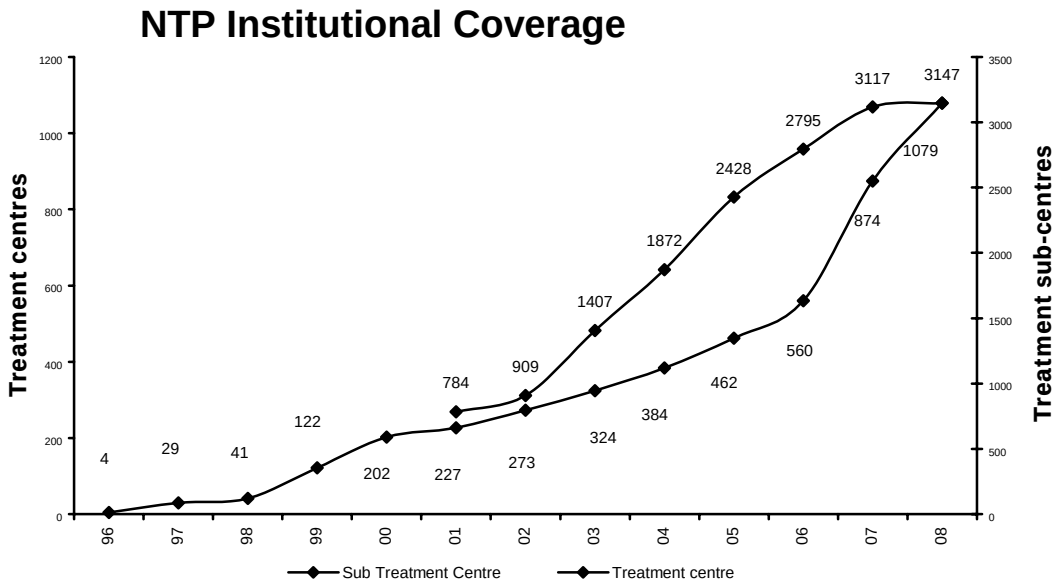
1.3.1.1 NTP Treatment Policy

NTP policy is to provide free diagnostic and treatment services to all TB patients registered in the programme.

The NTP introduced the six-month treatment regimen in 2008, so that Category I and category III patients now receive the same treatment regimen. Treatment

regimen contains fixed dose combination drugs: HRZE, HRE and HR. Category II patients will continue with the previous eight-month regimen.

Figure 4: NTP coverage in Nepal, 1996 to 2007/8



1.3.2 Financing of NTP

In 2009/10, the Government of Nepal's (GoN) health care budget is 6.24% of total government budget. NTP will receive 2.97% of the total health budget – a disproportionately small share, as TB probably accounts for at least 5% of the total disease burden in Nepal, and TB control is one of the most cost effective interventions in primary health care.

The annual government budget allocated to the NTP doubled from $730,129 in 2005/6 to $1.47 million in 2009/10, indicating the GoN's commitment to TB control. During this period the proportion allocated by the GoN as apposed to donor funds fluctuates from year to year – in 2009/10 the GoN will be contributing 19.5% with the remaining 80.5% funded by international donors. However, the amount which the GoN has allocated to the regular recurrent component of the budget, as opposed to the development component, has doubled, demonstrating the government's commitment to TB control.

The additional hidden health service costs are significant but difficult to estimate. They lie in the health personnel salaries, training, transport/ per diem, supplies and clinic maintenance costs, a percentage of which would accrue to tuberculosis control in a cost analysis.

Global Fund against AIDS, TB and Malaria (GFATM) has committed $25.6 million dollars through Round 4 and Round 7 extending up to 2011. Norwegian Association of Heart and Lung Patients (LHL) has been a long standing funding and technical partnership with NTP. LHL has been supporting NTP particularly with provision of funds for training, supervision, monitoring & evaluation, quality control and research since 1995. LHL has committed to approximately $450,000 over a 5-year period with particular focus on patient empowerment, as well other areas important to optimal progress of NTP.

1.3.3 NTP Partners

There is a long standing history of partnership and support available to NTP from international and national non government organizations (INGOs and NGOs), bilateral and multi lateral agencies, and research institutions for TB control in Nepal. This collaboration and assistance include financial assistance, technical assistance, materials in kind, diagnostic and treatment services, research, and management support. The TB control Network (TBCN), consisting of these partners was established some 12 years ago, to assist the National TB Centre develop policies and organize TB control activities across Nepal through the non-government sector.

Britain Nepal Medical Trust (BNMT) is an International non-government organization (INGO). BNMT has been providing support for TB prevention and control services in the Eastern Region since 1968. BNMT is one of the sub-recipients of GFATM Round 4 and Round 7 grants. Activities included: laboratory quality assurance for TB sputum microscopy, expansion of Directly Observed Treatment Short-course (DOTS) services, capacity building, public-private mix (PPM), TB/HIV collaboration, Advocacy, communication and social mobilization (ACSM), and monitoring and supervision are some of the key areas of BNMT support.

Nuffield Centre for International Health and Development started research activities in Nepal in 1998. They encouraged the local Nepali staff to establish **Health Research and Social Development Forum** (HERD) as an NGO in 2004. The Nuffield Centre for International Health and Development, Leeds Institute of Health Sciences UK continues to provide HERD with technical and financial support for research. HERD is engaged in developing public private mix (PPM) and TB/HIV collaboration, as well as research in health system strengthening, right-based approach in health care, community mobilization, etc. HERD is actively involved in several key research and surveys and instrumental in endorsement of ISTC by Nepal Medical Association and other key partners. HERD is one of the sub-recipients in GFATM Round 7.

International Nepal Fellowship has been involved in treating TB patients since establishing the Shining Hospital in Pokhara, in what is now the Western Region of Nepal, in 1953, then moved its TB services to what is now the Mid Western Region (MWR) of Nepal, in 1973. International Nepal Fellowship Nepal, an NGO, runs the Nepalgunj TB Referral Centre, a specialized hospital for diagnosis and treatment of complicated TB and leprosy cases and MDR TB patients, with outpatient services, DOTS and 26 beds for treatment of TB inpatients. This centre is partially funded by GFATM, being a sub-recipient of both GF Round 4 and Round 7. INF Worldwide provided valuable technical support to NTP in writing GFATM grant proposals (2006-9), and coordinating GFATM activities (2009).

Japan-Nepal Health & Tuberculosis Research Association (JANTRA) is an NGO affiliated with Research Institute of Tuberculosis (RIT) and Japan Anti-Tuberculosis Association (JATA). JANTRA is a young NTP partner, being established in March 2008. JANTRA carries out various community development health activities related to TB in urban areas, mainly Kathmandu Valley.

Nepal Anti TB Association (NATA) has a long standing history of collaboration with NTP, being established in 1953. NATA provides awareness raising in 32 districts, and DOTS services in three districts (Kathmandu, Banke and Morang), including a MDR TB treatment centres in Biratnagar, Morang, and the 25-bed

Kalimati Chest Hospital, Kathmandu. German Nepal TB Project (GENETUP) is part of NATA, but was established in 1986 with funds from Germany. GENETUP runs the Kalimati Chest Hospital as well as well equipped, and highly reliable, laboratory with facilities of AFB culture and drug sensitivity testing. NATA/GENETUP Kalimati hospital is the only indoor facility for MDR TB patient in the Kathmandu valley.

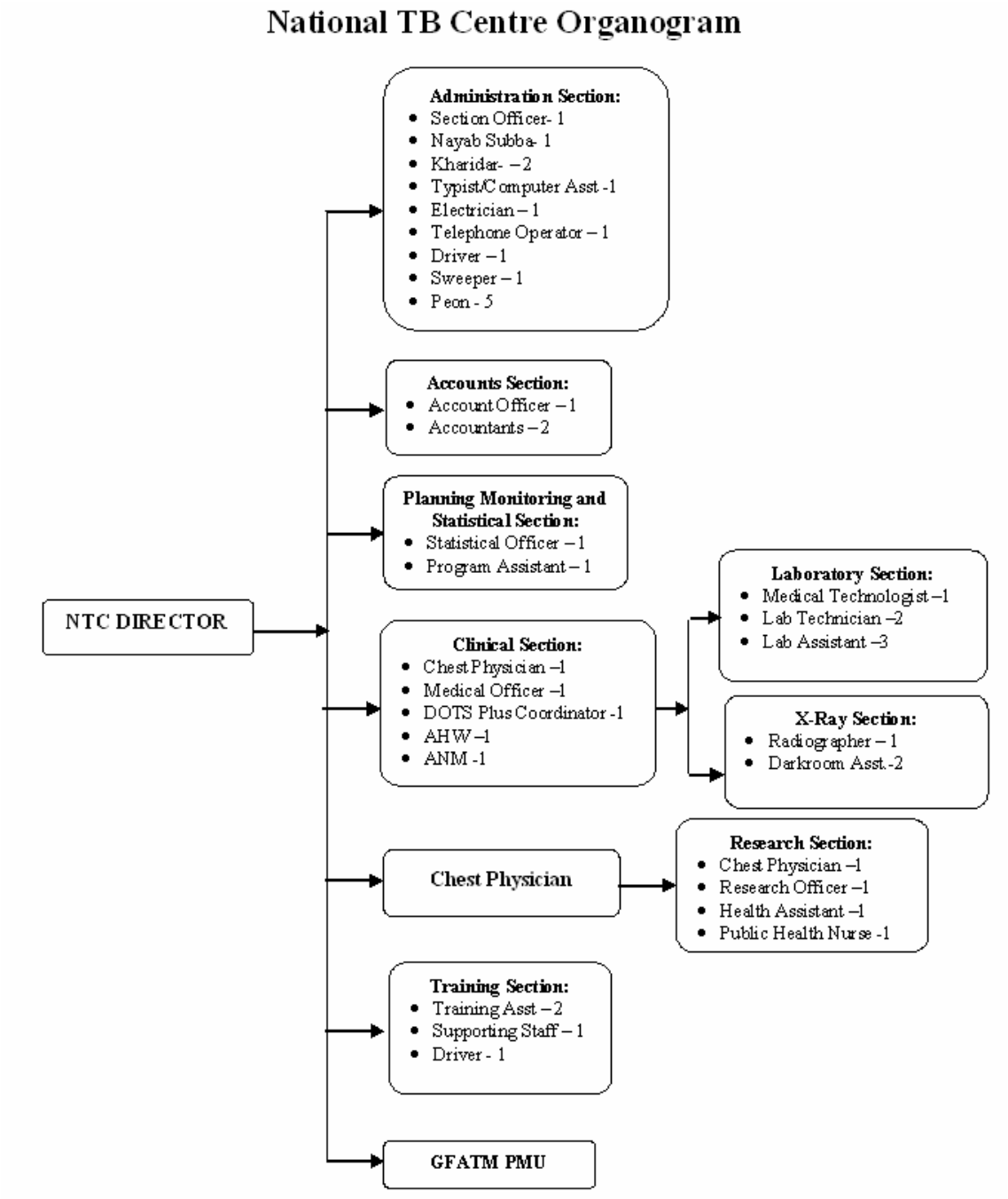
Netherlands Leprosy Relief (NLR), an INGO, has been a NTP partner in the Far Western Region since 1996. Activities include: laboratory quality control, support for training and supervision, technical assistance for conduction of trimesterly monitoring, evaluation and planning meeting, and ACSM. NLR is a sub-recipient for both GFATM Rounds 4 and 7.

SAARC TB and HIV/AIDS Centre (STAC) provides valuable assistance to NTP with human resource development through trainings, workshops, seminars, meetings. Similarly, it provides a crucial platform to NTP for research on various epidemiological and operational aspects of TB.

World Health Organization (WHO) is a key technical partner of Nepal NTP. It provides support through placement of full a time international TB expert. NTP receives valuable assistance from WHO for human resource development, procurement of first and second line TB drugs, research including surveillance of multi-drug resistance and HIV-TB co-infection and monitoring and evaluation. WHO is also providing assistance to NTP for financial and technical resource mobilization and management of GF grants. WHO is instrumental in establishing coordination between NTP and its national and international partners.

1.3.4 The National TB Centre (NTC)

The National TB Centre (NTC) is located in Naya Thimi, Bhaktapur District, within the Kathmandu Valley. The NTC, with over 60 staff, is the central unit of the NTP. It is responsible for policy formulation, planning and monitoring.



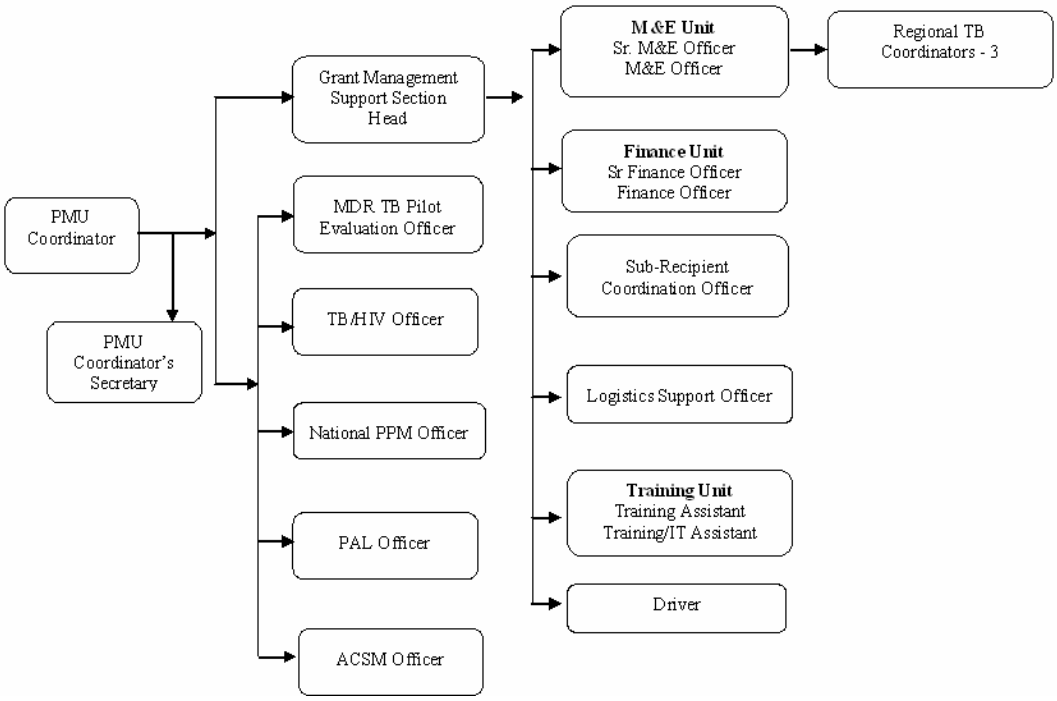
The Centre runs an outpatient service for the treatment of complicated TB cases and MDR TB patients.

On the advice of GFATM in 2008, NTC established the Program Management Unit (PMU) within NTC (bottom of organogram above) to specifically coordinate the GFATM funded activities of the NTP, including the partners who are sub-recipients

(SR). By mid-2009, there were 20 staff positions in the Unit, 19 of which were filled (PAL officer is to be recruited). PMU staff and work closely with other NTC staff implement GFATM activities.

NTC carries out supervisory visits of SRs; prepare regular financial and activity reports to GFATM; and update Country Coordinating Mechanism (CCM) on progress.

Global Fund Program Management Unit (PMU) Organogram



1.3.5 NTP Review

LHL carries out an annual review of the NTP. Every five years, the NTP undergoes an in-depth review by international consultants. The last occurred in October 2007.

1.4 Goals, targets and indicators of the National TB Programme in Nepal

The NTP goal, targets and indicators for TB control were developed in line with the national 10th Five Year Plan and within the framework of the Millennium Development Goals (MDG) as well as Stop TB Partnership Global Plan to Stop TB (2006–2015).

The NTP Goal is to reduce the mortality, morbidity and transmission of tuberculosis until it is no longer a public health problem.[2] The impact targets are: to halt and begin to reverse the incidence of TB by 2015 and to reduce by 50% prevalence and mortality rates by 2015 relative to 1990 levels (See 1.3.1). The outcome targets are: to achieve a case detection rate of new smear-positive cases of at 82% nationally; and, to reach and maintain a treatment success rate of 90% by 2015.

The ultimate goal of eliminating TB, defined as the occurrence of less than 1 new sputum positive TB case per million population per year, is to be achieved by 2050.

[2] Nepal Health Sector Programme Implementation Plan (NHSP-IP) 2004-2009, Output 6.6.

1.4.1 Millennium Development Goals (MDG) and Stop TB Strategy

Millennium Development Goals (MDG) requires the halving of the 1990 tuberculosis prevalence and mortality rates by 2015. In 1990, the TB incidence rate was 243/100,000, prevalence rate 621/100,000 and mortality rate 51/100,000 (Source: Global Tuberculosis Control: Surveillance, Planning, Financing. WHO Report 2007), hence by 2015, the targets should be: an incidence rate of 121.5/100,000, prevalence rate of 310.5/100,000 and mortality rate of 25.5/100,000.

Nepal achieved the Millennium Development Goal (MDG) of halving the prevalence rate of TB, as in 2007, the prevalence rate was 240/100,000, but not the incidence rate (173/100,000) nor the death rate (23/100,000).

The Stop TB Strategy, which Nepal adopted in 2006, sets out the major interventions that should be implemented to achieve the NTP targets.

Nepal Stop TB Strategy

Vision: Nepal free of Tuberculosis

Goal: To reduce the mortality, morbidity and transmission of tuberculosis until it is no longer a public health problem in Nepal.

Objectives:

- Achieve universal access to high-quality diagnosis and patient-centred treatment
- Reduce the human suffering and socioeconomic burden associated with TB
- Protect poor and vulnerable populations from TB, TB/HIV and multi-drug-resistant TB
- Support development of new tools and enable their timely and effective use

Targets

MDG 6, Target 8: ...halted by 2015 and begun to reverse the incidence.....

Targets linked to the MDGs and endorsed by the Stop TB Partnership:

- by 2005: detect at least 70% of new sputum smear-positive TB cases and cure at least 85% of these cases
- by 2015: reduce prevalence of and death due to TB by 50% relative to 1990
- by 2050: eliminate TB as a public health problem (<1 case per million population)

Components of the Stop TB strategy

1. Pursue high-quality DOTS expansion and enhancement
   - Political commitment with increased and sustained financing
   - Case detection through quality-assured bacteriology
   - Standardized treatment with supervision and patient support
   - An effective drug supply and management system
   - Monitoring and evaluation system, and impact measurement

2. Address TB/HIV, MDR-TB and other challenges
   - Implement collaborative TB/HIV activities
   - Prevent and control multi-drug-resistant TB
   - Address prisoners, refugees and other high-risk groups and special situations

3. Contribute to health system strengthening
   - Actively participate in efforts to improve system-wide policy, human resources, financing, management, service delivery, and information systems
   - Share innovations that strengthen systems, including the Practical Approach to Lung Health (PAL)
   - Adapt innovations from other fields

4. Engage all care providers
   - Public-Public, and Public-Private Mix (PPM) approaches
   - International Standards for Tuberculosis Care (ISTC)

5. Empower people with TB, and communities
   - Advocacy, communication and social mobilization
   - Community participation in TB care
   - Patients' Charter for Tuberculosis Care

6. Enable and promote research
   - Programme-based operational research

1.5 Challenges and Constraints of the NTP

The NTP continues to face several challenges and constraints, which influence the ability to expand and sustain the STOP TB Strategy. The following challenges and constraints are main obstacles for optimal program implementation and progress:

1. Inability to increase the national case detection rate (CDR) beyond 70%;
2. Access and utilization of Health Services in rugged areas;
3. Lack of a sustainable National Reference Laboratory within NTP, and decentralized culture facilities for MDR TB detection;
4. Health System weak due to:
   - Inadequate diagnosis and treatment of respiratory illnesses;
   - Lack of required infection control measures with special focus on the MDR TB management sites;
   - No specialized respiratory service in Kathmandu;
5. HIV/AIDS epidemic's influence on TB control;
6. MDR TB defaulter rates due to patients requiring to be away from families and jobs for 24 months;
7. Inadequate IEC materials to meet specific target groups;
8. Lack of coordination of the diagnosis and treatment of TB by the private sector resulting in low CDR and the possible development of MDR TB;
9. Insufficient research to determine: the causes of gender inequity in TB registrations; effectiveness of community-based DOTS in Nepal, etc.
10. Lack of electronic data management for DOTS, MDR TB management program and Logistic Management; and follow-up of Internal and cross border migration
11. Program sustainability at risk due to: limited program financing through Government resources; and insufficient human resources to implement the expanded scope of work after adoption of the Stop TB Strategy particularly for specialized programs such as MDR treatment, TB/HIV collaboration, PAL, ACSM and PPM.

1.6 National Strategic Plan Development

The National Tuberculosis Programme (NTP) has been following the 10-year 'Long Term Plan, July 2002 to June 2012. However, in 2006, the NTP adopted the Stop TB Strategy, which recommends activities not covered by the Long Term Plan.

This National Strategic Plan, July 2010 to July 2015, utilizies the initiatives of the Stop TB Strategy to increase case finding in Nepal, and hence to reach the NTP Goal: to reduce the mortality, morbidity and transmission of tuberculosis until it is no longer a public health problem.

The ideas for expansion of activities to meet the Stop TB Strategy initiatives were developed through several meetings and workshops, including: a two-day National Seminar for R/DTLOs, December 2008; numerous extra-ordinary meetings of the TBCN (1.3.3), February to July; a three-day Strategic Planning Workshop with NTC staff, May 2009; several National Strategic Planning Workshops (June, July and August) to finalize the work plan and budget. All brainstorming suggestions of DTLOs, RTLOs, Regional TB Coordinators, TB Supervisors, NTC staff, I/NGO staff and technical advisors, were considered, discussed extensively, and included, depending on feasibility and budget constraints. Comments were considered from Directors of NCASC, NHEICC, NHTC, NPHL, LMD, as well as from the TB Technical Committee, a sub-committee of the Country Coordinating Mechanism (CCM). Both GoN and I/NGO staff were involved in the development and finalization of this Plan.

Service delivery areas (SDAs) were developed to meet the challenges and constraints of the National TB Programme (1.5) in line with the Stop TB Strategy.

2 Service delivery areas for NSP

In order to eliminate TB (less than 1 new sputum positive TB case per million population per year) by 2050, the National TB Programme will aim, in the short-term, to: achieve a case detection rate of new smear-positive cases of 82% by 2015; and to reach and maintain a treatment success rate of at least 90% by 2012.

Activities will be carried out through the following Service Delivery Areas (SDA) to address the above challenges and constraints (1.5):

1. Improving Diagnosis
2. High Quality DOTS
3. Laboratory Network
4. Health System Strengthening
   - 4.1. Practical Approach to Lung Health (PAL)
   - 4.2. Infection Control
   - 4.3. Respiratory Hospital
5. TB/HIV collaboration
6. MDR TB Management
7. Public Private Mix (PPM)
8. Advocacy, Communication and Social Mobilization (ACSM)
9. Operational Research
10. Monitoring and Evaluation
11. Program Management and Administration

2.1 Improving diagnosis

Objective: To increase the case detection rate to 82% nationally and at least 70% in all districts by 2015

Sputum smear microscopy is the key tool for diagnosis of infectious tuberculosis. By July 2009, 463 microscopy centres were offering smear microscopy services, that is: one diagnostic centre for about 60,386 population. Of these, 354 operated within the GoN Health system, 49 through partner NGOs and 24 in the private sector. This corresponds to.

The number of cases to be treated were calculated by extrapolating the total population of Nepal at 27,958,832 (2009/10) with projected growth rate of 2.1%, an ARI of 1.49 (2009/10) reducing by 0.02% annually, and a gradually increasing case detection rate (CDR). NTP expects to register 185,854 TB cases over the Five-year period of the National Strategy Plan (Table 4).

Table 4: Five-year expansion plan for diagnostic facilities (microscopic centres)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Government						
Himalayan	1	1	1	1	1	5
Other GoN	15	15	21	22	22	95
Private Sector	5	5	5	5	5	25
Total	**21**	**21**	**27**	**28**	**28**	**125**

2.1.1 Expand reach of diagnostic facilities

NTP plans to extend diagnostic services for hard to reach areas/patients, urban centres and in the private sector through the addition of 125 microscopic centres

within the Five-year period, by giving existing laboratories, training, microscopes, etc., and by encouraging local HFMC to hire laboratory staff in hard to reach areas. (See SDA 3: Laboratory for details)

2.1.2 Enhance case finding through PPM, PAL and ASCM urban DOTS

Activities of Public Private Mix (PPM, formerly Private Public Partnership), Practical Approach to Lung Health (PAL), effective use of Advocacy, Communication and Social Mobilization (ACSM) will increase case finding (see the respective Sections).

Table 5: Projected number of TB cases, including MDR TB cases, Nepal, 2010/11 to 21014/15

	2010/11	2011/12	2012/13	2013/14	2014/15	Five year Total
Population	28,545,968	29,145,433	29,757,487	30,382,394	31,020,425	148,851,707
ARI	1.47	1.45	1.43	1.41	1.39	
Estimated P+ (Styblo method)	20,981	21,130	21,277	21,420	21,559	106,367
Case detection rate	78%	80%	81%	82%	82%	
No. of P+ (increasing CFR)	16,365	16,904	17,234	17,564	17,679	85,746
No. of new TB cases (2*P+)	32,731	33,809	34,468	35,128	35,357	171,493
No. of Cat 2 @ 15% of new P+	2,455	2,536	2,585	2,635	2,652	12,862
Total estimated first line TB cases	35,186	36,344	37,053	37,763	38,009	184,355
Estimated MDR cases	300	300	300	300	300	1,500
Total TB cases	35,486	36,644	37,353	38,063	38,309	185,855
Proportion of new TB cases						
Adult	31,749	32,794	33,434	34,074	34,296	166,348
Child (3%)	982	1,014	1,034	1,054	1,061	5,145

Notes:

a) Population increased by 2.1% from the Health Management Information Section, Management Division, Department of Health Services, MoHP, 2008/9 estimated population.
b) ARI decreased by 0.02 points per year from the 2009/10 baseline of 1.49.
b) Styblo method to calculate expected number of new sputum positive TB cases [ARI*population*50/100,000].
c) Assuming 50% of new TB cases are sputum positive.
d) In Nepal, Category 2 cases tend to represe5% of TB cases requiring first line anti-TB medicines.

NTP will pursue the following approaches in order to improve case finding and achieve and maintain case detection targets set for the National Strategic Plan period.

2.1.3 Intensified case finding among specific groups

Clinical staff at each DOTS Centre, will be encouraged to carry out contact tracing regular basis for both TB and MDR TB patients, as per national guidelines which were developed in 2008. In addition, NTP will carry out intensive contact tracing by mobilizing the Female Community Health Volunteers (FCHV) in low case finding districts to visit the patients' family members and encourage them to visit the nearest diagnostic centre for investigation.

The FCHV will also be mobilized to carry out intensive case finding in such districts. NTP will carry out chest camps in high prevalent areas, starting with 10 chest camps in Year 1, and increasing by five per year.

In addition, activities through PAL, TB/HIV Collaboration, PPM and ACSM will increase case finding. As will, contact tracing through MDR TB Management.

2.2 High Quality DOTS

Objective: To achieve and maintain treatment success rates of 90% by 2015 nationally and 85% minimally in all districts

NTP has maintained nationwide DOTS coverage since 2001. By mid July 2008, 4,226 health institutions (1,079 Treatment Centres & 3,147 Sub Treatment Centres) were offering DOTS services; these sites are fully integrated within the Government health care service or run through NTP partner I/NGO. This corresponds to one DOTS treatment or sub treatment centre per 6,480 population.

As per national policy NTP provides free of cost TB treatment services. All DOTS implementation sites use nationally approved treatment regimens. Specific treatment categories are based on type of TB, bacteriological status and history of previous treatment.

Table 6: NTP Six-Month & Eight-Month Treatment Regimens

Diagnostic Category	Treatment Regimen	Duration	Patient Diagnostic Category
Category I and III	2(HRZE)/4(HR)	Six months	New sputum smear-positive, smear negative and extra pulmonary, with or without concomitant HIV related disease
Category II	2S(HRZE)/1(HRZE)/5(HRE)	Eight months	Re-treatment TB cases, including failures, relapse and return after default (RAD)

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

To ensure quality of drugs NTP procures all anti TB drugs through WHO procurement mechanism from Global Drug Facility which has built-in and documented safeguards for drug quality. In order to avoid inadequate therapy and facilitate compliance NTP uses fixed dose combinations drugs (RHZE, RHE and RH). Similarly, NTP will use blister packed drugs for better handling and inventory control. The Department of Drug Administration (DDA) randomly tests a post shipment sample.

Buffer stocks of medicines are maintained at regional (50%), districts (25%) and sub district (25%) levels.

To address the additional human resource needs under the expanded scope of work pertaining to Stop TB strategy and management of donor grants NTP established a Program Management Unit (PMU) in 2008 at NTC and recruited additional staff for technical input and management support. However, NTP still needs full time dedicated staff for newly added/expanded areas of work including MDR TB management, TB/HIV, Public Private Mix, ACSM and operational research in order to lead these core functions of NTP. Due to staffing constraints, these additional staff need to be available from outside the government structure through external donor support.

2.2.1 Revision of NTP Policy and Guidelines

NTP will determine treatment policies based on DOTS strategy. In order to ensure that NTP guidelines are in line with WHO recommendations, review and revision of the NTP policy and guidelines will be carried our during Year 3 of this Five-year

period. Treatment policies and guidelines will be revised by the Technical Advisory Group.

2.2.2 Treatment services (DOTS) expansion

In order to further improve access NTP aims to expand DOTS treatment services in line with the Ministry of Health & Population health services expansion, hard to reach patients/areas, growth of public/private sector NTP partners and expansion of DOTS services in urban health care setting.

Table 7: Five-year expansion plan for DOTS centres/sub-centre without microscopic facilities

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Municipality	5	5	5	5	5	25
Private Sector	10	10	10	10	10	50
Total	**21**	**21**	**27**	**28**	**28**	**75**

In addition to the 125 diagnostic (microscopic) centres described above (2.1.1), NTP will establish five municipality and 10 private DOTS centres without microscopic facilities, per year (see SDA 7: PPM), that is 75 DOTS centres/sub-centre. Hence, 200 DOTS centres/sub-centres (125 government and 75 private) will be added over the five-year period.

Smear Negative and extra pulmonary TB cases form almost half of the cases registered for treatment by NTP each year (48% of cases registered in 2007/08). As per NTP guidelines pulmonary diagnosis of smear negative and extra-pulmonary TB cases requires judgement of a trained doctor, X-ray and histo-pathological evidence. The need for new X-ray machines is also essential to ensure and facilitate diagnosis of TB among HIV infected individuals, who are more likely to acquire smear negative or extra-pulmonary TB.

Currently NTP relies on X-ray facilities at Regional, District and Zonal hospitals, as well as the NTC Clinic. Similarly NTP partners provide x-ray facilities. X-ray machines at NTC and partners are more than 20 years old. Maintenance of these machines is difficult due to unavailability of spare parts.

NTC will procure a digital X-ray machine in 2009/10. NTP plans to install a digital X-ray machine at the Regional TB Centre (Pokhara, Western Region), NATA Kalimati Chest Hospital, Kathmandu and MDR TB Centre, Biratnagar, Morang District (see SDA 6: MDR TB Management).

2.2.3 Drug Procurement & Supply

NTP will ensure continuous availability of good quality and adequate amounts of the drugs at all DOTS implementing public and private sites. NTP maintains a standardized system for procurement, storage, distribution, monitoring and quality control of anti-tuberculosis drugs, in collaboration and Logistics Management Division (LMD).

The NTC and World Health Organization are responsible for preparing estimates of anti-TB drug requirements, and determining technical specifications of drugs. WHO procures all TB drugs from Global Drug Facility (GDF) through direct procurement. For procurement of other supplies NTC follows a mechanism of tendering as per government rules and regulations.

The NTP has a collaborative drugs and equipment distribution system involving the NTC, LMD and regional NGOs.

During the Five year period, July 2010 – July 2015 185,854 TB cases over the Five-year period of the National Strategy Plan (Table 5)

In order to ensure uninterrupted availability of anti TB drugs buffer stocks will be maintained at regional (50%), districts (25%) and sub district (treatment centre and sub-centre) (25%) levels based on case load at each respective level.

NTP will review and adjust drug requirements annually on the basis of actual case finding, epidemiological estimates and targets set. Estimated drug costs (Annex 1) are based on prices obtained from Global Drug Facility website as of August 2009. In order to accommodate price increases in the future, this plan includes an inflation of 7.5% from Year 2 onwards. Based on past experience, 25% of the estimated drug cost is added for transportation, insurance, quality control testing expenses and 'Programme Support Cost' (PSC).

2.2.4 Human resource (HR) development

Currently, there are 61 staff (approved positions) at National TB Centre including staff for NTP clinics, laboratory and X-ray departments (see NTC Organogram, Section 1.3.4). Similarly, there are 75 DTLOs and 5 RTLOs (approved positions) at the district and regional levels. The cost of all these staff are not reflected in this National Strategic plan as this is directly born by the by the regular government budget.

Over the Five-year period, NTP plans to recruit additional staff as per specific needs of activities (see relevant SDAs). NTP plans to retain the position of the WHO Medical Officer.

NTP will maintain and improve the knowledge and skills of health workers through continuous training and supervision, in collaboration with the National Health Training Centre (NHTC) and the NTC.

Basic training for newly inducted, and transferred, health workers is essential. Refresher training will be conducted regularly to update the knowledge and skills of all health workers. As far as possible, all training courses will be carried out in close coordination with National Health Training Center, National AIDS Programme and other concerned departments and agencies within and outside Ministry of Health & Population and NTP partners, as appropriate.

NTP will periodically revise the existing training materials for different levels of health workers, in line with the changing NTP policies and WHO recommendations. New materials will be developed, as needed.

2.2.5 Support to Non Governmental Organizations (I/NGOs)

The NTP has a long standing history of partnership with several national and international partners. These partners have supported NTP in key programme areas including supervision, training, community participation, advocacy, logistic support for drug distribution, microscopy quality assurance and research. Key NTP partners involved in 'High Quality DOTS', include, BNMT, HERD, INF/N, JANTRA NATA/GENETUP and NLR.

NTP aims to expand its partnership to other organizations in public and private sectors, for instance, it is envisaged that Family Health International will become NTP partner to provide support in laboratory, infection control, and operational research.

2.3 Laboratory Network

Objective: To expand and maintain the quality and capacity of the NTP & partners laboratory network and to build up the capacity of the NTC Laboratory to act as National Reference Laboratory.

As per the policy of the NTP sputum smear microscopy remains the key tool for diagnosis of infectious tuberculosis. National Tuberculosis Control Programme operates through a network of laboratories with permanent Quality Control System. The laboratory network is fully integrated with the Government health care including district hospitals, primary health centres, TB clinics, I/NGO clinics and other hospitals.

Currently there are 469 sputum microscopy centres working under NTP for provision of sputum smear microscopy services; this is one laboratory per 59,614 population providing 100% coverage.

NTP operates through a network of laboratories with permanent External Quality Assurance (EQA) System. The sputum microscopy program is being coordinated by the NTP and monitored by the five regional Quality Control (QC) Laboratories. Slides from microscopy centre are cross checked at the regional QC laboratories, on a trimesterly basis. Up to 2008, all positive and 10% of the negative slides were re-checked for quality assurance. The EQA program is implemented at all sites and the performance tended to be 95%, or above, agreement.

In 2008/9, NTP introduced the Lot Quality Control System (LQS) method for quality control of sputum microscopy.

In 2008, NTP developed and piloted Standard Operating Procedures (SOPs) for TB smear microscopy, as part of WHO Global Initiatives. The NTC, in collaboration with local and international experts, developed technical and operations policy and standards for the program.

To date, first- and second-line drug susceptibility testing (DST) are only available in one laboratory throughout Nepal (DOTS Plus MDR TB reference laboratory-GENETUP). GENETUP provides culture and DST facilities for diagnosis of multi-drug resistant (MDR) TB. Sputum samples of MDR TB suspects, are sent to this laboratory from all five regions of the country for DST and follow up assessment.

GENETUP laboratory performs 600-700 cultures per month (>7,200 per year), and 500-600 first-line DST, and approximately 25 second-line DSTs each year.

Up-grading the Central Laboratory to operate as National Reference Laboratory (NRL) at NTC, for TB microscopy is under process. The NTC laboratory currently performs 200 TB cultures/month, but is not as yet, credited for DST.

Although bio-safety level 3 (BSL3) laboratory facility is recommended for DST and secondary manipulation of TB, there are no BSL3 facilities in Nepal, so DST is being performed in bio-safety level 2 (BSL2) laboratories.

2.3.1 Improve the quality and coverage of TB microscopy program

During the Five-year period, the NTP will continue to maintain and improve the existing laboratory network. NTP will ensure timely delivery of required supplies (equipment and reagents), including provision and maintenance of microscopes.

In order to improve access for hard to reach areas NTP will establish five diagnostic (microscopic) centers in the Himalayas, 95 in other government health institutions and 25 in the private sector (Table 4), that is 125 centres.

The NTC laboratory and sputum microscopy centers and the regional QACs currently use conventional microscopy and lack modern auramine fluorescence microscopy facilities. The technique is more sensitive than conventional microscopy and will improve the sensitivity of case detection. Hence, NTP will establish auramine fluorescence microscopy capacity with the NLR and at least two centers in each region (including regional QC laboratories) utilizing iLED microscope to improve the quality of diagnostic services. Fifteen auramine fluorescence (iLED) microscopy facilities will be established during the 5-year period. Key activities will include procurement of equipment and supplies and training of laboratory technicians on auramine fluorescence microscopy.

Implementing LQAS and developing institutional capacity of the QC laboratories at regional levels is the primary focus of this intervention. In 2009/10, NTP is introducing the Lot Quality Control System (LQS) for the sputum microscopy EQA program. By 2015, all 75 districts will be covered.

Training of Trainers of Training (TOT) will be conducted annually. Training to laboratory staff will include: basic and refresher modular training for sputum microscopy; basic and refresher auramine fluorescence microscopy training; and, LQAS training, depending on the type of staff. Sputum smear preparation training is carried out under SDA 2: High quality DOTS.

2.3.2 Build and expand national laboratory capacity for culture and DST

The NTP will establish TB primary culture facilities in the Eastern and Western Regions in Year 1, and Mid-Western Region in Year 2. Except for the Eastern Region laboratory, which will be upgraded to perform both culture and DST, the other two Regional laboratories will perform primary culture only; positive cultures will be transported to NTC or GENETUP for DST. The TB primary culture laboratories will be equipped with media preparation and culture facility. Staff will receive relevant training.

The existing culture and DST facilities at the NTC and GENETUP will be upgraded, including the establishment of liquid culture facilities, to ensure: quality diagnosis/service; safety of the laboratory personnel; and compliance with recommended international standards.

NTP plans to establish the NTC laboratory as the National Reference Laboratory (NLR) for tuberculosis. This will include: establishment of liquid culture, 1st and 2nd line DST facilities; attain satisfactory performance in quality assurance program under supranational reference laboratory; and become a BSL3 facility.

NTP also plans to improve the safety standards of GENETUP laboratory which includes building of infrastructures and upgrading into BSL3 facility.

The NRL will establish an isolate repository to store all MDR and XDR TB isolates for research and outbreak investigation. The NRL will also perform research for drug resistance analysis, outbreak investigation and evaluation of newer diagnostics for TB. NTP will seek technical assistance from international experts in designing the facility and monitoring performances.

2.3.3 Human resource development

NTC after resuming its responsibility as National Reference Laboratory will need addition human resource for implementation of the assignments. The capacity of NTC on sputum microscopy will be strengthened by recruiting one additional senior technologist. Three microbiologists will be recruited for NTC and GENETUP and NTP Partner for maintaining culture, DST and specimen repository activities. For each of the Regional QC laboratories one medical technologist (BMLT) and two laboratory technicians will be in place. NTC will coordinate with National Public Health Laboratory regarding skills development. Staff will be encouraged to participate in conferences, seminars and workshops.

2.3.4 Monitoring and supervision of TB laboratories

Each microscopic centre will submit the relevant number of slides for quality assurance. Regional Quality control Assessors (RQCA) from regional quality assurance centers will conduct regular monitoring of the microscopic centers. NTC will carry out supervision of the regional Quality control centres. See SDA 10: Monitoring & Evaluation for further details on monitoring and supervision.

NTC will provide supervision and monitoring services to three regional TB culture laboratories (when established). Assistance will be sought from GENETUP laboratory to provide supervision and monitoring services. Monitoring visit will be arranged to each TB culture laboratory four monthly during the first two years, and subsequently, twice per year.

2.3.5 Quality and safety standards of TB culture/DST and of TB research laboratories

NTP will ensure that all TB laboratories (NTC, GENETUP and regional TB culture sites) practice and adhere to international standard ISO 15189; Medical laboratories Particular requirements for quality and competence and ISO 15190; medical laboratories requirements for safety. This will include: training of all laboratories staff;, implementation of total quality management; and implementation of laboratory safety standards.

2.3.6 Support to I/NGOs operating QC Laboratories

Through GFATM funds, NTP will continue to support the two INGOs operating QC laboratories for the NTP: BNMT in the Eastern Region and NLR in the Far Western Region.

2.4 Health System Strengthening

2.4.1 Practical Approach to Lung Health (PAL)

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

Both the National Health System and NTP recognize the need for health system strengthening in order to improve the health of the people of Nepal, and in particular to control and reduce TB in Nepal.

Practical Approach to Lung Health (PAL) is an effective approach for strengthening health system. Respiratory morbidity accounts for up to 30% of attendees in the primary health care setting. Improvement in diagnosis and treatment of acute and chronic respiratory illnesses will reduce the morbidity and mortality from these diseases.

NTP already has some experience with PAL implementation. In 1999, the University of Maastricht (UoM), Netherlands, instigated a pilot PAL project in collaboration with the Institute of Medicine (IoM), Kathmandu. The project was piloted in Nawalparasi District from 2002 till 2005. The project stopped at completion of the study. Assessment of this project showed an improvement in diagnosis and management of respiratory diseases, and a rational use of antibiotics and other drugs adjuvant medications.

With technical and financial support from WHO in 2007 revival and scale-up of an integrated package of PAL/ tobacco control was launched once more under the auspices of NTP. Nepal PAL/tobacco control is one of the unique example of joint effort and integrated approach for these two significant global public health epidemics. An international consultant was appointed by WHO for one year. PAL project was piloted in two districts (Bhaktapur and Nawalparasi) with focus on the management of tuberculosis, acute respiratory infections, pneumonia, asthma and COPD. PAL guidelines, training materials recording and reporting materials with smoking cessation modules were revised in the light of WHO PAL, and other respiratory disease management guidelines.

Evaluation of the pilot sites showed a positive impact on diagnosis, recording and reporting of respiratory cases (increased >20% in some centers). PHC and health post staff were able to more effectively manage all respiratory cases resulting in better outcomes, increase TB case detection through increased attention to examining sputum from asthma, chronic obstructive pulmonary disease (COPD) and other respiratory symptomatic and reduced unnecessary antibiotic prescriptions. All consenting cases were counselled on smoking cessation and health facilities started documenting the outcomes of this advice to smokers. An additional benefit was the development of a standard referral system to higher level facilities for patients who could not be managed at lower levels.

In Nepal, expansion of comprehensive and systematic approach to managing patients with respiratory symptoms such as PAL in the primary health care setting is most likely to improve the quality of respiratory care and, subsequently, create conditions resulting in improving the quality of TB diagnosis, and hence increasing TB case detection. Improvement of the referral system for respiratory conditions and TB will also have positive impact on PHC and general health system strengthening.

Hence, the implementation of PAL will contribute to improving national health policy and intervention for one of the leading causes of morbidity in the PHC setting through the provision of an integrated package for up to 30% of patients attending PHC services. PAL will strengthen the health system 'Service delivery' as well as 'Human resource development' within primary health care setting.

2.4.1.1 PAL expansion

NTP plans to implement the PAL initiative in five districts per year, so that by the end of the Five-year period, PAL will be practiced in 29 districts (including four districts which will be implementing PAL by July 2010 i.e. two existing districts and two through GFATM Round 7 Phase 1). The districts will be selected where the case detection rate (CDR) is <70%, the population is high, and where possible, one district per region per year. Based on the CDR of 2007/8, the districts were tentatively selected (Table 8).

Table 8: Proposed expansion plan for PAL, 2010 to 2015

Established district	Year 1	Year 2	Year 3	Year 4	Year 5
Bhaktapur, Nawalparasi, Lalitpur, Kapilbastu	Sunsari Kathmandu Rupendehi, Dang Kailali	Siraha, Dhanusha, Tanahu Bardiya, Baitadi	Saptari, Sarlahi, Sanjya Dailekh Achham	Udayapur Bara Gulmi, Salyan Doti,	Illam Parsa Mohotari Rauthat Baglung

A group of Trainers of Trainers will include staff from national, regional and district level. As this is a new initiative, guidelines, training and recording/reporting materials developed in 2007/08 will be revised in annually to bring these in line with program needs and international recommendations. Basic training will be organized for health workers at all levels of the program, from hospital to sub-health post level. Content and duration of the training will be as per terms of reference of the involved staff.

2.4.1.2 PAL Procurement and Supply

NTP will procure equipment specific for the needs of the respective health institutions: pulmonary function test machines (spirometer) will be procured for hospitals; nebulizers will be procured for hospitals, PHCs and HPs; and peak flow meters will be procured for hospital to sub-health post level. Antibiotics, bronchodilators, etc, will be part of the essential drugs for the respective health facility, and thus covered by the Government health system.

2.4.1.3 Monitoring and evaluation of PAL

The PAL officer, based at NTC, will carry out a situational analysis of each district before implementing PAL. He/she will conduct regular supervision to ensure adequate monitoring of the activities. NTP will conduct annual evaluations of the program. In addition, an external evaluation will be carried out in Year 2, and then it will be combined with the usual NTP In-depth review ever five years.

2.4.2 Infection Control

Objective: To decrease the transmission of TB including Multi Drug Resistant TB in congregate and health care settings through implementation of National Infection Control Policy

NTP currently lacks a infection control policy and strategy. The infection control and safety standards of TB laboratories are also poor. There are no data or estimates of occupational TB risk for staff of TB services and primary health care in Nepal. As a result, infection control practices are not uniform, nor stringently followed in TB laboratories, hospitals, microscopy centres and TB treatment centres. This increases the risk of transmission of infection among patients, health workers and general population.

During 2010-2015, NTP plans to develop and implement a comprehensive national infection control strategy for NTP which will be in place in DOTS treatment centres/sub centres, MDT TB management sites and all laboratories involved in TB smear microscopy. Introduction of infection control measure in NTP will directly benefit overall primary health care as all of these institutions are integral part of health system.

2.4.2.1 Development of National Infection Control Strategy and guidelines

NTP, with assistance from international experts, will develop a comprehensive national infection control strategy, guidelines and policies. The infection control strategy will focus on all health care settings where TB patients, their sputum or culture materials are handled or kept. Such settings include TB clinics, microscopy centres, TB culture / DST laboratories, and hostels. The approved strategy will be widely disseminated to all concerned sites, institutions and personnel. The Strategy will be developed, printed and ready for circulation during Year one. Similarly, training guidelines, orientation and advocacy material will also be developed during Year one. NTP and its partners will launch a advocacy campaign for promotion and introduction of TB Infection Control Strategy.

A situational analysis of the current risk level and implementation of TB infection control will be done in order to contribute to the development of the national IC strategy. Facility level assessments will take place in order to develop specific infection plans and SOPs relevant to the facility.

NTP will ensure triage of TB suspects, separation of symptomatic patients from other patients in the waiting area, and prompt treatment. Patient education programmes and educational posters and pamphlets will available to patients and their families to encourage cough hygiene, and bring an understanding of TB transmission, importance of natural ventilation in transmission prevention, and adherence to TB treatment. Policies will be in place to ensure natural ventilation with training to ensure compliance by the staff.

2.4.2.2 Human resource development

NTP will appoint a full time Infection Control Coordinator at National TB Centre who will be on the National Infection Control Board/Committee to ensure that TB infection control is a key component of general infection control. At the regional and district level Regional/District TB Leprosy Officers (R/DTLO) will be the focal staff for infection control. NTP will develop standardized training curricula for training on infection control.

A core group of staff at NTC, RTLO, QCCA and DTLO will become master trainers during Year 1 (f days). NTP will organize basic Infection Control training for TB laboratories, hospitals, DOTS centre and MDR TB management site staff (3 days) at each of the five regions during Year 2, and a refresher training (2 days) in year five. NTP will adopt the WHO generic training materials.

Adherence to infection control strategy will be monitored during routine monitoring visits to sites by NTC staff including IC Coordinator, RTLO, QCCA and DTLO. A standardized checklist will be developed and implemented for monitoring compliance.

2.4.2.3 Strengthening of infection control measures at TB culture and DST laboratories and sputum microscopy centres

This is required to ensure compliance with National Infection Control Strategy. Waste management and disposal system of all five TB culture laboratories (NTC, GENETUP and regional TB culture sites) will be renovated/upgraded as per WHO recommendations. This will include ensuring sorting of waste and sterilization of waste before disposal. Similarly waste management and disposal system at smear microscopy centres at the peripheral level will be ensured through provision of guidelines, training, supervision and provision of required equipment such as incinerators and waste collection containers.

NTP will upgrade 450 sputum microscopy sites over the Five-year period. Among those, 100 sites will undergo comprehensive upgrading, including: renovation of patients' waiting area (separate space for general and TB sputum positive patients); optimum sputum collection area; sharps disposal containers; safe disposal of sputum containers and other laboratory waste, etc.

Upgrade or renovation, maximize use of natural ventilation by using large windows, louvered doors, and ensure windows on opposite walls when possible. Use of SOPs and regular monitoring will ensure that windows and doors remain open. The construction of a simple privacy screen with a roof cover would be considered.

Infection control measures will be in place at MDR TB and XDR TB patient hostels which will include renovation of the rented houses to maximize natural ventilation, individual rooms for patients, louvered windows and doors, separate cleaning area for staff, outdoor space for visitors.

NTP will ensure provision of UV boxes and respirators for staff at MDR centers. MDR TB sputum positive patients will be provided with masks. NTP will also ensure that all TB sputum positive patients are trained on cough hygiene and proper use of masks as necessary.

2.4.2.4 Upgrade TB sputum microscopy

In addition to above, NTP will ensure laboratory layout allows sufficient ventilation, UV lights are installed and used appropriately, etc.

2.4.2.5 MDR Infection control and staff safety

To ensure compliance with National Infection Control Strategy, provision of N95 or FFP2 respirators for staff, who work in high risk areas, or, who perform high risk procedures such as: bronchoscopy, sputum induction; culture and DST, is essential.

NTP will procure the necessary equipment and supplies for infection control strategy: respirators, fit test kits and measurement device (vaneometers,

anemometers, smoke tube kits) for staff of MDR centres. NTP will ensure autoclaves, disinfectants, gloves and other infection control supplies are available for laboratories and sputum microscopy centres. Supplies will be procured centrally and will be distributed to respective site on a trimesterly basis.

NTP will ensure all staff involved in MDR TB management work are under strict infection control environment, best possible training and regularly supervised and monitored. In addition, NTP proposes the following approaches to safeguard staff to ensure their safety and wellbeing:

- Infection control, including administrative and environmental (engineering) controls and personal protection. NTP will ensure prioritized provision of personal respirator (particulate respirators) to all staff involved in MDR TB management and to laboratory staff who work with TB culture and DST, and for those who do smear microscopy where the workload is high. Details of administrative and environmental (engineering) controls are included under infection control section of this Plan.
- Regular training of staff on infection control and personal protection, including the proper use of respirators, fit testing, and monitoring usage.
- Staff health surveillance program including period health check-up and assessment to rule out MDR TB.
- Routine monitoring and evaluation of the TB IC.

2.4.3 Respiratory Hospital

Nepal does not have a respiratory Hospital. NTP plans to build 100-bed hospital in the vicinity of the NTC, for which land is already available. This hospital will act as the national reference hospital for all respiratory diseases, both non-communicable respiratory diseases, as well as communicable respiratory diseases, such as TB.

NTP expects construction to commence in Year 1, and take approximately three years to build the hospital. Hence, procurement of equipment, recruitment of staff will occur in Year 4 and the recurrent cost will not be required until Year 5.

2.5 TB/HIV Collaboration

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

The HIV/AIDS epidemic in Nepal is concentrated in high risk groups- mainly drug users and female sex workers. NTP and NAP (National AIDS Programme) are beginning to establish collaboration and coordination. The NTP recognized the need for TB/HIV collaboration in its ten-year Long Term Plan (2002-2012). Similarly, National AIDS Programme (NAP) recognizes TB as one of the most common opportunistic infections among HIV-infected people, and plans to address associated challenges.

National TB/HIV Collaboration Committee has been formed and formally approved by Ministry of Health & Population, with representation of the both programs and other concerned stakeholders. Similarly, a National TB/HIV Collaboration Strategy (2008) has been developed which provides policy and operational framework for effective collaboration. Currently there are informal and limited links between local DOTS treatment centres and NGOs working with these risk groups, and links at national level between the programmes.

The National TB/HIV Collaboration Committee and various Technical Sub-groups working under this Committee are responsible for:

- Governance, policy, strategy development and resource mobilization
- Planning and implementation
- Joint monitoring and evaluation
- Capacity-building
- Ensuring coherence of advocacy and communications
- Ensuring participation of communities including involvement of TB and HIV patients support groups and local communities in the planning, implementation and advocacy of TB/HIV activities
- Overseeing the generation and dissemination of evidence based 'good practices' for up-scaling.

Details of major collaborative approaches are as following:

2.5.1 Establish and Strengthen the TB/HIV mechanism for Collaboration at all levels

National TB/HIV Committee established in 2008 will continue to be the key authority. It will remain responsible for policy, strategy, guideline development and overall planning, monitoring and evaluation at the national level. Regional TB/HIV Committees will ensure coordination, planning and implementation as well as supervision, monitoring and evaluation. Regional TB/HIV Committees will function under Regional Health Directorates and involve concerned authorities and partners from both programmes.

District level TB/HIV Committees will be established through DOTS Committee and District AIDS Co-ordination Committee (DACC) where these exist. Ideally these committees will function under the leadership of Chief District Officer, while District Public Health Officer is proposed to be the Member secretary. This committee will also have representation from relevant I/NGOs, public and private sector partners, civil society, corporate sector, FBO, volunteer and community base organization and representatives from people affected by HIV/AIDS and TB. These Committees

will be responsible for coordination, planning, supervision, monitoring and evaluation at the district level.

Likewise, at community level, TB/HIV Coordination mechanism will be developed through Health Facility Management Committees (HFMC). In addition to local level management of collaborative activities, awareness raising, suspect identification and referral to nearby health institution will be part of functions of this committee.

All above mentioned committees will meet at regular internal to review progress, prepare plan of action, identify and resolve issues, review and approve programme reports for submission to upper level.

At national, district and local levels joint annual strategic planning meetings will be organized. The joint plan will ensure coherence and coordination for implementation of TB/HIV activities. Roles and responsibilities of each program, based on comparative advantages of collaborating partners, while implementing specific TB/HIV activities at various levels, will be clearly defined to avoid misunderstanding as well as to facilitate monitoring of progress indicators of the program. Joint strategic planning will focus on the following:

- The National TB/HIV Coordinating Committee will ensure mobilization of adequate resources to implement collaborative TB/HIV activities, thus avoiding competition for the same resources
- Joint capacity building for TB/HIV activities including training of health care providers so that they are able to better cope with increased demands of TB/HIV services
- NTP and NAP will develop joint TB/HIV advocacy, communication and social mobilization strategies
- Plan joint operational research for further improvement and effectiveness of the programme.

2.5.1.1 Expansion of TB/HIV collaboration

NTP and NAP plans to establish formal coordination mechanisms at national, regional and selected district levels. Under this plan, NTP will implement TB/HIV collaboration activities in 25 districts with high HIV burden, that is, five districts per year, in addition to the 10 already started through GFATM Round 7, by July 2010. These districts (Table 9) have been chosen based on the following reasons: located along the East-West highway, high migration problem, tourist areas, known girl trafficking occurrence, IDUs, HIV care services, including VCT, geographical coverage, known high HIV burden, etc. During the Five-year period, the districts may be changed according to changed epidemiology of TB/HIV situation.

Table 9: Proposed expansion plan for TB/HIV Collaboration, 2010 to 2015

Existing	Year 1	Year 2	Year 3	Year 4	Year 5
Morang, Kathmandu, Kaski, Banke, Kanchanpur, Jhapa, Makwanpur, Rupendehi, Dang, Achham	S.Sava, Chitwan, Palpa, Dailekh, Doti	Illam, Dhanusa, Arghakanchi, Bardiya, Kailai	Sunsari, Sindupalchok, Nawalparasi, Surkhet, Baitadi	Solukhumbu, Parsa, Nuwakot, Tanahu, Pyuthan	Saptari, Dhading, Kapilbastu, Salyan, Dadeldhura

2.5.2 Develop operational guidelines, training manuals, and IEC materials

NTP will hold a workshop to revise the operational guidelines for TB/HIV collaboration, already developed in 2008/9. Similarly the training materials and IEC materials developed in 2009, will be revised according to lessons learnt in implementing training and ACSM activities ffor TB/HIV collaboration.

2.5.3 Development and strengthen human resources to implement TB/HIV collaboration

NTP plans to recruit a field officer to assist the present National TB/HIV Coordinator. Six staff will be available for the NTP partners to carry out TB/HIV collaboration activities.

Training will include:

- Training of Trainer's (ToT) for central and regional level trainers on TB/HIV at the national/ international level;
- TB/HIV training for regional level supervisors, basic health services (BHS) staff at DOTS and VCT centers and I/NGO health facilities, and FCHVs at the district and community level for TB/HIV clinical and program management;
- Training to people living with HIV/AIDS (PLHWA) through the existing networks;
- Treatment literacy and adherence orientation for to TB/HIV co-infected individuals;
- Refresher training for the staff (who has been trained two years before);
- Training of VCT laboratory staff on smear microscopy, where applicable;
- Training of TB laboratory staff on HIV testing, where applicable; and
- Training for Income Generating Activities (IGA) to TB/HIV co-infected and and/or their dependents.

2.5.4 Conduct surveillance and operational research (OR) to enhance TB/HIV collaboration

Since 1994, the NTP has conducted six periodic sentinel surveillances to determine HIV prevalence among TB. The prevalence of TB/HIV co-infection increased from 1.9% in 1998/9 to 2.4% in 2001/2, but remained the same in 2006/7 (Table 2).

NTP will continue to conduct periodic (at two year interval) sentinel site surveys to establish HIV prevalence among TB patients. In addition, NTP in collaboration with NAP, will also conduct regular surveillance of TB among HIV patient at selected sites. All consenting TB patients tested for HIV will receive pre- and post-test counselling from trained staff.

2.5.5 Establish intensified TB/HIV case finding and improve access to TB and HIV services

NTP in collaboration with NAP will establish VCT/ART sites in DOTS centers and vice versa in order to improve access (15 and 50 respectively). Where a VCT centre is near a DOTS centre, a referral system will be established. NTP will also ensure early detection of TB/HIV co-infected individuals and provide TB treatment and support and refer for HIV care to designated sites. Based on the guidelines on provider-initiated and delivered HIV testing and counselling (PTC) HIV testing will be offered to all those TB patients who are considered to be risk of HIV.

2.5.6 Advocacy, communication and social mobilization (ACSM) for TB/HIV

NTP will arrange TB/HIV advocacy campaigns for community leaders, organizations and service providers, as well as DACCs. TB/HIV orientation will be given to various groups, students and health workers. Street drama will be carried out in weekly markets, where crowds gather.

2.5.7 Provide care and support to TB/HIV co-infected cases

In addition to National and Regional levels, formal coordination for planning and implementation of TB/HIV activities at the implementation level i.e. district and community levels will be established and strengthened to improve.

NTP in collaboration with NAP will establish VCT/ART sites in DOTS centers and vice versa in order to improve access. Where a VCT/ART site is near a DOTS centre, a referral system will be established. A two-way referral system of TB/HIV patients and suspects will be expanded. A mechanism will be established to ensure provision of antiretroviral therapy to eligible HIV-positive TB patients.

As part of the package of care for people living with HIV, and after excluding active TB, isoniazid will be provided in target districts, as per NTP Protocol. Before launching the program health workers will be trained.

In accordance with national guidelines co-trimoxazole preventive therapy will be provided by NAP to eligible people living with HIV/AIDS, who also have active TB.

Socio-economic rehabilitation activities will assist TB/HIV co-infected clients to support their families.

2.5.8 Joint supervision, Monitoring and evaluation of TB/HIV activities

The existing National HIV/AIDS Programme monitoring system and as well as NTP trimesterly workshops will be the major means for monitoring and evaluation of TB/HIV collaborative activities. Trimesterly planning, monitoring and evaluation workshops will be held at national, regional, district and community level.

Based on the WHO guidelines for M&E of collaborative TB/HIV activities, the joint TB/HIV Coordinating Committee and Technical Sub-groups will develop:

- A core set of indicators and data collection tools
- Field testing of the indicators and data collection instruments for adapting to Nepalese context
- Training of all those involved in data collection tools and monitoring data will be collected for TB/HIV activities
- Enhancement of capacity of staff to analyze data and present them in coherent ways to different stakeholders from policy makers, managers to community people
- The set up and put into practice of a system for knowledge management and cross learning
- A four monthly TB/HIV joint monitoring, evaluation and planning workshop at district, regional and national level to gather data/information, analysis and their utilisation for further planning.

2.6 MDR TB Management

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

NTP has undertaken four national surveys in Nepal as part of the WHO/IUATLD Global Project on Anti-Tuberculosis Drug Resistance Surveillance (Table 3). The proportion of MDR TB among new cases in Nepal has fluctuated from 1.1% in 1996/7, to 3.7% in 1998/9 to 1.3% in 2001/2 and up to 2.9% in 2006/7, making trends difficult to interpret. The latest estimate is 2.9% (95% CLs, 1.8-4.3) among new cases and 11.7% (95% CLs, 7.2-17.7) among re-treatment cases.

MDR TB Management programme started in September 2005 with WHO Green Light Committee (GLC) approval. As per initial approval NTP was given permission to treat 350 MDR TB patients over two year period. On successful implementation of the programme and two independent international reviews, GLC gave permission for continuation of the programme to treat another 1,200 MDR TB patient over the course of four years (300/year from 2008 – 2010). UNITAID grant of second-line TB drugs is available to treat 600 patients over a two-year period.

NTP offers standard treatment regimen for MDR TB (Table 10)[3]. Each dose is given daily, supervised by health workers till sputum and culture are converted to negative status; thereafter a trained and supervised community volunteer or family member supervises the daily intake of medicine.

Table 10: Multi-drug Resistant TB treatment regimen

INTENSIVE PHASE (8 – 12 MONTHS)	CONTINUATION PHASE (16–20 MONTHS)
Kanamycin (KM) Pyrazinamide (Z) Ofloxacin (Ofx) Ethionamide (Eto) Cycloserine (Cs)	Pyrazinamide (Z) Ofloxacin (Ofx) Ethionamide (Eto) Cycloserine (Cs)

All patients must be examined monthly at the DOTS Plus centre in the intensive phase of treatment and two monthly during the continuation phase. The intensive phase may be continued for a further four months on non-conversion of the sputum. During these visits, patients are checked for side effects, sputum is sent for smear microscopy and culture examination, potassium and creatinine levels are monitored, and, if clinical suspicion/ signs of hypothyroidism are noted, then Thyroid Function Test are performed.

Technical Working Group at the national level periodically reviews program policies, strategy and performance, as well as, providing guidance on management of clinically complex MDR TB cases.

Nepal MDR TB Management Programme is a unique example of Public Private Mix. Under the leadership and guidance of NTP several private sector partners are providing MDR TB management services. Almost half of the MDR TB Treatment Centers and close of 30% of the Sub Treatment Centers are operated by NTP

[3] The regimen may be revised according to results of the second line DST survey to be carried out late 2009, and International advice.

partners from the private sector which include Medical Colleges and I/NGOs. All partners follow NTP guidelines and regularly report using standardized forms and formats.

German Nepal Tuberculosis Project (GENETUP) provides culture and Drug Sensitivity Testing (DST) for this programme. GENETUP laboratory is working under quality control of Gauting Supra National Reference Laboratory in Germany.

Figure 6: MDR TB management sites, Nepal, 2009

By 2008, NTP registered 494 MDR TB cases for treatment. Cure rate among 88 MDR patients registered during the first year of the program (Sept. – Dec. 2005) was 70%, while 9% of the patients failed the treatment, 7% died and 14% defaulted.

NTP/MOHP is provide financial support to MDR TB patients for nutrition, transportation and subsistence (Nepali Rupees 1,500/month, ie. 21.4 USD) through Government and Global Fund Grant.

2.6.1 MDR TB Management programme expansion plan and targets

NTP plans to expand six centres/sub-centres offering MDR TB management services per year over the Five-year period. So the number will increase from 11 centres and 39 sub-centres (50) by July 2010 to 80 centres/sub-centres. This expansion will be in light of the patient load, commitment and availability of local sites in both public and private sector health institution with adequate human resource and required facilities.

NTP plans to treat 300 MDR TB cases annually during the next five year period (1,500 during 2010 – 2015).

Second-line anti-TB medicines are prone to causing side-effects. Special biochemical tests and ancillary medicines are required to combat these side-effects. Frequent cultures are required for monitoring of treatment success.

NTP also proposes to provide a cash incentive, equivalent to 20 USD/month, to staffs responsible for MDR TB management in the form of an hazard allowance.

2.6.2 XDR TB Management plan and targets

The GLC annual monitoring mission has recommended XDR TB management. The expert estimates 10 XDR TB cases to be treated annually; hence NTP expects to treat 50 XDR TB patients over the Five-year period. Treatment regimens are being

designed at the time of writing this Plan. These 50 cases will be counted among the 1,500 MDR TB patients targeted to be treated by NTP in the five year period.

2.6.3 MDR TB Management and NTP Partners

NTP will continue to forge partnership with public and private institutions for provision of MDR TB management services. NTP will continue to provide training, second line TB drugs and other supplies as per programme need. Regular supervision, monitoring and evaluation will be carried out by respective national, regional and district levels. The main NTP partners for MDR Management receive partial funding through GFATM Rounds 4 and 7. It is anticipated that these funds will continue.

2.6.4 Socio economic support to MDR TB patients

Close to 60% of the MDR TB registered case leave home and jobs in order to seek treatment. By July 2009, 44 sites were providing MDR TB treatment. Although NTP plans to almost double the number of MDR TB treatment sites over the Five-year period, some 40 to 50% of the cases will still require assistance with accommodation in order to complete the two-year treatment regimen. Further expansion of MDR treatment sites will not be practical due to due to limited number of patients (300/year).

NTP plans to rent and staff one hostel per treatment centre.

2.6.5 Procurement of second line TB drugs and drugs for management of adverse effects

Second line TB drugs will be procured through Global Drug Facility. Drugs for management of adverse effects will be purchased locally. As NTP also plans to treat 10 XDR TB patients annually over next five year period, drugs for these cases will be included in the requirement of SLD for MDR patients. NTP assumes that the cost for treatment of XDR patients shall be covered by the estimated budget for second-line drugs.

2.6.6 Human Resource for MDR TB Management

NTP has appointed a Coordinator for MDR TB Management. A technical assistant will be recruited to assist as the program has expanded.

2.6.7 MDR TB Infection control and staff safety

NTP will ensure all staff involved in MDR TB management, work are under strict infection control environment, best possible training and regularly supervised and monitored. In addition NTP proposes the following approaches to safeguard staff to ensure their safety and wellbeing:

- Infection control, including administrative and environmental (engineering) controls and personal protection. NTP will ensure provision of personal respirator (particulate respirators) to all staff involved in MDR TB management. Details of administrative and environmental (engineering) controls are included under infection control section of this Plan
- Regular training of staff on infection control and personal protection
- Staff health surveillance program including period health check-up and assessment to rule out MDR TB.

See SDA 4.2 Infection control for further details.

2.6.8 Monitoring and Evaluation of MDR TB Management

NTP will continue the routine MDR surveillance at sentinel sites.

Regular supervision and monitoring will be carried out from the national to regional to district to treatment centre level. Reporting occurs at the trimesterly workshops (see SDA 10: Monitoring & Evaluation).

Under GLC policy an annual monitoring mission is carried out by international experts. Currently NTP pays a lump sum fee of 50,000 from each GFATM grants (Rounds 4 and 7).

2.7 Public Private Mix (PPM)

Objective: To engage Public and Private health care providers to ensure provision of quality TB services in line with NTP policy and international standard of TB care (ISTC)

Although NTP has nationwide coverage and achieved 70% case detection target for past several years, it is believed that many TB suspects and patients are still being managed by the public and private sector and not registered through the NTP.

Although NTP has achieved 100% DOTS coverage in the country, this coverage is limited within MOHP and NGO/INGO and other NTP partner. Urban health services, which are under Ministry of Local Development, do not have the same network of DOTS centers as the primary health care system in the country. Currently NTP there are 15 DOTS centers operating in Kathmandu and Lalitpur Districts. There are 58 municipalities in the country, most of which are running public DOTS clinics.

Case finding in some of the urban area is around 50% where diverse health care providers are providing services outside NTP. Also there is evidence that in many areas, patients with symptoms suggesting TB seek care from a wide range of health care providers other than NTP. About 70% of all TB registrations occur in urban and flat (terai) areas of the country where large number of health care providers exist. NTP has successful partnerships in 15 existing urban health clinics run by municipalities in Lalitpur and Kathmandu.

During next Five-year period, NTP will continue to expand its existing collaboration with partners from both Public and Private sectors engaged in TB diagnosis and treatment in urban areas: municipalities, private practitioners, nursing homes, private laboratories, factories, prisons, military, police, etc.

NTP will expand PPM activities from the 10 municipality areas reached by July 2010 to a further 25 densely populated areas, that is five per year, reaching 35 by 2015. The tentative urban areas (Table 11) will be chosen by being municipalities and having active private health services in the private sector. Expansion will depend on willingness and commitment of the municipality to participate and make required human resources available. The title 'urban' will be allocated to the Kathmandu Valley.

DOTS has already been established in a cement and cigarette factory. Two factories and one prison will be opened per year.

Table 11: Proposed expansion plan for PPM, 2010 to 2015

Established	Year 1	Year 2	Year 3	Year 4	Year 5
Kathmandu (Kathmandu), Lalitpur (Lalitpur), Bhaktapur (Bhaktapur), Biratnagar (Morang), Pokhara (Kaski), Birtamod (Jha pa), Butwal (Rupendehi), Dhangadi (Kailali), Nepaljung (Banke), Tansen (Palpa)	Lahan (Siraha), Janakpur (Dhanusha), Bhairawa (Rupendehi), Birendranagar (Sukhet), Mahendranagar (Kanchanpur)	Dharan (Sunsari), Bharatpur (Chitwan), Damauli (Tanahu), Ghorai (Dang)	Inarawa (Sunsari), Damak (Jhapa), Malangwa (Sharlahi), Banepa (Kavre), Kirtipur (Kathmandu)	Rajbiraj (Saptari), Kalaiya (Bara), Dhulikhel (Kavre), Mdhyapur Thimi (Bhaktapur), Krishnanagar (Kapilbastu)	Siraha Bazar (Siraha), Chandranigahapur (Rautahat), Ratnanagar, (Chitwan), Taulihawa (Kapilbastu), Ramgram (Nawalparasi)

The key NTP activities to strengthen Public Private Mix are:

2.7.1 Establish and strengthen coordination for PPM/ISTC at different levels

NTP will arrange regular meetings of the national PPM/ISTC Working Group. For PPM/ISTC coordination a steering committee will be established at national and coordination committees at district levels, to facilitate PPM/ISTC process in NTP. Sensitisation meetings will be held with different health care providers and situational analysis at national and district level will be conducted to map diverse health care providers and identify their potentials to be involved in PPM/ISTC.

The PPM Officer, based at the NTC will collaborate with the Ministry of Health and Population, Ministry of Local Development, Municipality Public health department and other concerned stakeholders for policy formulation and resource mobilization.

2.7.2 Establish referral system between NTP and partners

A patient referral system between private sector and DOTS centres will be established by NTP. A standardized Memorandum of Understanding (MoU) will be established between NTP and private sector for management of TB suspects and patients according to national guidelines.

2.7.3 Develop and improve capacity for effective implementation of PPM/ISTC

PPM/ISTC curriculum will be developed by NTP in collaboration with partner organizations, medical institutions and other medical professional organizations. NTP will engage with Nepal Medical Council and Ministry of Education to include DOTS/STOP TB Strategy components in the medical curricula. This will also require development of curricula, orientation and consensus of concerned authorities.

NTP in collaboration with implementing partners will conduct training of health care providers on PPM/ISTC DOTS in public and private health care settings. Orientation and education programmes on PPM/ISTC DOTS will be conducted in academic institutions.

In order to improve TB case detection and TB treatment management by relevant health care providers, NTP will emphasise an approach of PPM to engage wide range of service providers based on their area of expertise and competence. New DOTS centres will be established in PPM/ISTC areas to increase access to TB services particularly targeting un-reached populations. Functional linkages will be developed among DOTS centres, private health care providers and other relevant stakeholders by establishing cross-referral mechanisms. Free first line TB drugs will be offered to all TB patients managed by private sector partners.

In order to increase access to vulnerable and marginalized populations' NTP, in collaboration with Municipality, D/PHO and other relevant stake holder, will either establish DOTS centers or organize periodic orientation and microscopy camps (See SDA 2: High Quality DOTS) for increased access to vulnerable and marginalized populations including slum dwellers, factory workers, prison populations. NTP will provide financial support and staff to establish DOTS in municipalities.

Links will be established with factories and all prisons in the country (60). Advocacy campaigns/orientations will be carried out in slum areas, factories and prisons as part of both PPM and High Quality DOTS (See SDA 2).

2.7.4 Strengthen Urban TB control in Kathmandu Valley

Orientation and training/re-fresher (process and technical training) will be provided to health staff, urban health management committees and urban TB volunteers at different levels. In addition, in-country and outside the country visits will be organized for the committee members, Urban TB volunteers and Urban TB clinic staff for learning and experience sharing on 'Healthy Municipality.

NTP will organize an annual urban TB volunteers meeting.

2.7.5 Monitoring and Evaluation

In joint collaboration with DPHO, Municipality, I/NGO's and other potential stake holders, NTC will organize Urban - Coalition Against Tuberculosis (U-CAT) meetings three times per year (7.5.6) to share progress and issues in Urban TB control program. NTP will also conduct regular supervision in Urban DOTS Clinics in conjunction with DPHO, municipality, I/NGOs, etc.

Quality of services will be ensured by performing routine supervision, monitoring, and evaluation during the In-depth Review, Year 3.

2.7.6 Human Resource needs for PPM

NTC will recruit a public health nurse and an Urban TB Program Officer to assist the present PPM officer.

Six PPM coordinators and field/program officers will be employed by NTP Partners to assist the NTC in expanding PPM throughout the municipality areas of Nepal.

2.8 Advocacy Communication and Social Mobilization (ACSM)

Objective: To increase case detection rate to 82% by 2015, with particular emphasis on under-reached and high risk groups, through increased awareness at all levels and to increase the treatment success rate to 90% through improved community involvement and support

NTP has been implementing awareness raising activities among community, decision makers, donors and media. NTP and partners also conduct regular ACSM activities aimed at enhancing adherence, combat stigma and discrimination, empowering people affected by TB, mobilizing community people and generating required resources for TB control.

NTP carries out ACSM activities in close collaboration with National Centre for AIDS & STI Control (NCASC), South Asia Association for Regional Cooperation (SAARC), and NGOs working in TB control.

NTP carries out regular behavioural change communication (BCC) activities such as: mass media activities (radio, National TV, press releases on designated days); distribution of IEC materials, school health education and awareness raising programmes in all 75 districts, orientation to health care workers and medical students.

During the Five-year period NTP will implement ACSM to achieve goals of the National Stop TB Strategy. The overall aim of ACSM is to successfully address challenges relating to: improving case detection and treatment adherence; combating stigma and discrimination; empowering people affected by TB; mobilizing political commitment; etc.

NTP carries out simple ACSM activities in every district. In addition, NTP will introduce intensified ACSM activities (described below) in an increasing number of districts, chosen according to the increasing target of the Case Detection Ratio (CDR) over the five-year period (Table 12). The intensified ACSM activities will focus on vulnerable and at-risk groups in these districts, increasing to cover whole country, by 2015.

Table 12: Proposed expansion plan for ACSM, 2010 to 2015

	Year 1	Year 2	Year 3	Year 4	Year 5
CDR target	78%	80%	81%	82%	82%
CDR criteria for selection of districts	<67%	<72%	<`75%	<80%	All
No. of new districts added	7	9	6	2	11
No. of districts continued	40	47	56	62	64
Total No. districts	**47**	**56**	**62**	**64**	**75**

Over the Five-year period, the Case Detection Ratio (CDR) target will increase gradually to 82% in Year 5. Districts have been classified into groupings according to the accepted range of CDR in 2007/8. For instance, in Year 1, there were 47 districts with a CDR less than 67%. Since 40 of these districts already received intensified ACSM activities through GFATM Round 7, and these activities will continue for the whole time period, intensified ACSM activities will be introduced into the remaining seven new districts. Similarly, in Year 2, the 47 districts will continue to receive intensified ACSM activities and 9 will be added. The actual

districts may change if the CDR improves or declines, compared to the criteria, by the respective year.

NTC will consult with the National Health Education Information and Communication Centre (NHEICC) concerning policy matters, development of ACSM materials, etc.

2.8.1 Policy and political commitment

NTP and Partners developed ACSM policy/guidelines in 2009. NTP and Partners will hold regular orientation for politicians including Parliamentarians, Members of National Planning Commission, decision makers, technical & donor agencies. On World TB Day, NTP will appoint national TB Ambassadors to advocate TB control to policy makers and community people.

2.8.2 Capacity Development

NTP will develop the capacity of health care providers/volunteers working in government, NGOs, CBOs in districts with low CDR through the following activities:

- Revitalizing Health Facility Management/DOTS Committee (See SDA 2: High Quality DOTS)
- ACSM training for health care workers, school teachers, female community health volunteers (FCHVs), and NGO/CBO workers, etc.,
- Mobilize cured TB patients (TB patient club) to motivate suspect TB patients to attend DOTS services and encourage and support TB patients and their families to complete treatment
- Train/orient health workers and peer educators (community volunteers) on effective communication with patients for improving interpersonal communication
- Orient local NGOs, CBOs, Civil Society members on TB, TB/HIV
- Conduct patients empowering activities to reduce discrimination and stigma
- Conduct meetings for peer education to teachers, students, self-help groups
- Conduct TB, TB/HIV orientation to civil society members, community leaders and HIV related organisations (See SDA 5: TB/HIV Collaboration)

NTP and Partners will develop 'Patients Charter' according the national context which will be disseminated to relevant people and institutions during workshops, trainings and meetings.

2.8.3 Community awareness

Community awareness activities will be targeted to vulnerable groups to increase case finding among: migrants; slum dwellers; factory workers; displaced persons; street children; HIV positive people; and other at risk groups. Planned activities include:

- Orientation in slum areas, factories, cross-border populations, migrants, displaced peoples groups, refugee camps, monasteries, homeless, etc.
- Workshops among HIV at-risk groups
- Orientation in school health programmes
- Orientation to transport workers
- Street drama
- Folk songs "Lok Dohari" "Teej songs"
- Newsletters.

2.8.4 Behavioural Change Communication (BCC)

Behavioural change communication (BCC) includes:

- Development of IEC materials

- Mass media activities: broadcasting TB related messages through radio, FM, TV, etc
- TB messages in newspapers (advertisements, letters to editor of national newspapers)
- Press conferences and/or workshops for journalists at central, regional and district level
- Celebration of World TB Day (24th March)

For communities with low literacy rates and/or no access to radio, FCHV (8.2.3) and mother's groups (8.3.8) will be utilized to raise TB awareness.

2.8.5 Support to I/NGOs for ACSM activities from GF4

Three I/NGOs receive funds through GFATM Round 4 and Round 7. Britain Nepal Medical Trust (BNMT) will not continue GFATM R4 funded activities after Year 1, as these will be covered by intensified step-wise ACSM activities in it related districts. However, NATA and NLR will continue as their ACSM activities are specific to their districts of concern and are in addition to the intensified ACSM activities.

2.8.6 Monitoring and Evaluation

The NTC and relevant I/NGOs will monitor and supervise ACSM in their respective areas. KAP studies will be carried out in relevant districts to asses the impact of these intensified ACSM activities. See SDA 9: Operational Research for further activities.

2.8.7 Human resources

The NTC ACSM officer will coordinate all ACSM activities of NTP and Partners. He/she shall be responsible for development of methodologies of ACSM activities, IEC materials development and implementation of tools for ACSM monitoring and supervisions.

Three ACSM officers will be recruited for the Partners extensively involved in ACSM activities for this National Strategic Plan.

2.9 Operational Research

Objective: To further improve the quality of care for people with TB and to improve implementation, performance and effectiveness of NTP approaches and services.

Since DOTS implementation in 1996, NTP and Partners have carried out several research projects, tuberculin surveys, TB/HIV and drug resistant TB surveillances (see 1.2), and situational analysis (as part of GFATM Round 7). Research topics include: social awareness in TB; understanding TB related stigma and discrimination; migration and TB; delay in diagnosis and treatment of TB; follow up of a public-private partnership (PPP) initiative; linking TB and HIV/AIDS services; community and family based DOTS strategy, etc.

Nuffield Centre for International Health and Development (NCIHD) supported NTP in TB research from 1998 until 2004, when it assisted local staff to establish HERD, an NGO specialized in research in Nepal.

2.9.1 Research specific to SDA

The following operational research topics are specific to the SDAs (See relevant SDA plan) of this National Strategic Plan.

2.9.1.1 Surveillance and research related to TB/HIV (SDA 5)

- **Sentinel surveillance of HIV among TB patients, and TB among HIV positive people to determine the respective prevalences (5.4.1/2)**
  The NTP will conduct periodic surveys to establish the prevalence of HIV among TB patients and TB among HIV positive people. These surveys will be carried out at sentinel sites and based on standardized protocols and representative samples.
- **Situational analysis (district level) to identify stakeholders for TB/HIV collaboration and to map service providers (5.4.3)**
  To ensure effective TB/HIV collaboration, it is important to identify relevant stakeholders. Mapping of service providers will identify areas with limited coverage that will need further attention, and to facilitate patients to select providers most convenient for them.
- **Study of KAP related to TB and HIV among TB and/or AIDS patients and care providers in the districts (5.4.4)**
  To ensure appropriate care-seeking behaviour, and care delivery, patients and providers need to have appropriate knowledge, attitudes and practices (KAP) related to the two diseases and their interactions. It is therefore important to measure KAP amongst patients and providers, in order to determine the impact of ACSM activities and change in practice.
- **Operational research on Provider Initiated Testing (PIT) to increase TB and HIV case finding (5.4.5)**
  Operational research will be needed to identify ways of implementing Provider Initiated Testing (PIT) appropriate for Nepal.

2.9.1.2 Surveillance and research related to ACSM (SDA 8)

- **KAP study on TB among community people (before and after) (8.6.5)**
  To assess the effectiveness of the ACSM activities, it is important to assess KAP before and after the ACSM activities so that changes in KAP can be estimated.

2.9.1.3 Surveillance and research related to PPM (SDA 7)

- **Mapping of diverse health service providers (7.1.9/10)**
  As TB care provision becomes more diverse, it will be necessary to review conventional and new providers, analyse their strengths and weaknesses, and assess opportunities and threats. This will include mapping of providers to assess service coverage.

2.9.1.4 Surveillance and research related to MDR TB (SDA 6)

- **Surveillance of resistance to anti-TB drugs (6.8.2)**
  As part of the WHO/IUATLD global project on surveillance of anti TB drug resistance, NTP plans to conduct a cluster sample survey of new and previously treated smear-positive TB patients every two years as per WHO/IUATLD protocol.

2.9.2 General operational research

NTP will carry out research projects relevant to improve TB control in Nepal. NTP will hold annual workshop to identify the issues at national and regional level, then disseminate its research findings at national and/or regional workshops, as appropriate.

Research topics identified to date are:

- **Client satisfaction surveys (CSS) - identifying impact of ACSM among general population and TB patients and their families**
  To ensure that ACSM messages and delivery methods are acceptable to the general population and to TB patients and their families, NTP will carry out client satisfaction surveys. If respondents indicate substantial dissatisfaction, messages or methods will be revised.
- **Radio listeners survey in selected districts**
  The reach and recall of radio messages will be assessed to determine the cost-benefit of radio broadcasts that include information about TB.
- **Find approaches to address the gender inequity in TB case finding**
  In Nepal, twice as many male as female TB patients are registered. This research will identify reasons behind gender inequality in TB case registration and find further approaches to address the problems. Fifteen study districts will be randomly selected, yet representing the ecological regions.
- **Follow-up study of TB treatment practices among Private Medical Practitioners to assess change due to PPM implementation**
  As part of PPM activities, attempts will be made to ensure that private medical practitioners follow NTP guidelines in their TB diagnostic and treatment practices. A follow-up study will be necessary to assess change due to PPM implementation.
- **Prevalence survey to determine TB disease burden**
  Current estimates of case load in the country are based on a series of local tuberculin surveys and prevalence surveys. The last tuberculin survey was carried out in 2006 and published internationally. While useful as an initial estimation, the TB situation appears to have changed in Nepal. Hence, NTP plans to conduct a prevalence survey to establish more realistic estimates of the disease burden in the country.
- **Analyze issues regarding cross border migration to develop strategies for diagnosis and treatment and applicable patients**
  Transfer of patients between Nepal and India, (especially coming to Nepal) is a common practice. Performance of DOTS clinics near border areas is not up to the national standard e.g. default rates are much higher in these areas. This study will aim to analyze the cross border related issues which should help NTP to adopt and revise its strategies and approaches.

- **Review of access, acceptability and utilization of NTP services by vulnerable population groups which may include women, poor, HIV positive population, slum dwellers etc.**
  Research shows that vulnerable groups like women, poor, HIV positive population, slum dwellers are more affected by TB. Finding of this research will inform NTP to improve its reach among these specific at risk groups.

- **Compare the effectiveness of Community-based DOTS, Family-based DOTS and Institutional DOTS**
  Although not a NTP policy, Community-based and family-based DOTS is practised by HCWs, especially in the remote areas. Research is required to compare the outcome with the recognized institutional DOTS.

2.9.3 Capacity building

Relevant program staff will receive training on research proposal development, methodology and scientific report writing; and update knowledge on new technologies. Annually, about 50 staff members from NTP and relevant partners will participate in research related conferences/seminars at the national level. Selected staff will participate and/or present their research findings at international conference/seminars, every year. NTP will establish a library of research related books and journals, including internet access for published articles on relevant research topics.

2.9.4 Human resources

NTC will recruit a research officer, in the Monitoring & Evaluation Unit. Relevant NTP Partners will recruit up to three staff to be implement research activities.

2.10 Monitoring and evaluation

Objective: To maintain the routine and "operational research" based monitoring and evaluation system within NTP for performance assessment, and to introduce timely trimesterly comprehensive district and health centre feedback systems.

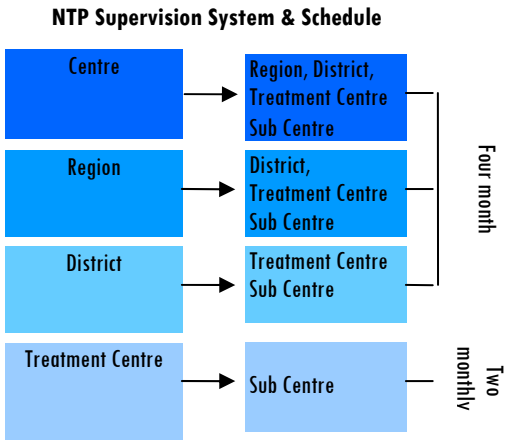
Monitoring and Evaluation (M&E) is an integral component of NTP.

The NTP has a well-established monitoring and evaluation system with a central unit at the NTC. NTP has standardized recording and reporting system and operates using internationally recommended indicators with set targets. The internationally approved reporting system currently used in Nepal is considered to be well-designed, robust, and reliable, although it is still paper-based. Data from the NTP are considered to be among the highest quality data routinely collected within the Department of Health Services. These data are essential for programme management, and help to identify areas requiring further improvements in programme performance.

The NTP monitoring system includes case finding (new sputum smear positive), smear conversion, treatment outcome and programme management reports from all levels of the programme. Currently all records up to regional level are paper based, including data management of MDR TB program.

Data are initially reported and analyzed by the District Health Office during the District Reporting and Planning Workshops for treatment centre staff. District TB and Leprosy Officers (DTLOs) report treatment centre wise data from the district during the Regional Reporting and Planning workshops. Regional TB and Leprosy Officers (RTLOs) report by district at national reporting workshops. These reporting and planning workshops take place every four months, at the beginning of the new trimester. Finally, the NTP submits regular reports on progress with DOTS implementation to the Department of Health Services (DHS), National Planning Commission, the Auditor General, WHO SEARO, SAARC TB/HIV Centre, and to donors (including the Global Fund).

Figure 7: NTP Supervision system



NTP monitoring system is based on the same data that are recorded by service providers and sent up through the Ministry of Health and Population's Health Management Information System (HMIS).

Verification and checking for accuracy of reported data against supporting documents occurs during field monitoring and supervision. Supervisory visits involve the laboratory facility, the central drug stores, treatment centres/sub centers, hospitals, District and Regional TB offices where NTP records and reports are kept (Figure 7). Specific supervisory guidelines and checklists are used. In addition, to ensure quality and timely reporting to the MoHP, donors, and other stakeholders, as well as for its own use, the NTP conducts regular, trimesterly, planning and M&E meetings/workshops at district, regional, and national levels.

NTC is responsible for monitoring the progress of its GFATM grant implemented by sub-recipients (SR). NTC monitors SR activities and performance through: trimesterly activity and financial reports submitted by the SRs; trimesterly SR meetings; and four monthly supervisory visits to confirm the reports.

2.10.1 Monitoring & Evaluation System

NTP is revising the supervision and M&E System in 2009. This will be repeated in Year 2 of the five-year National Strategic Plan.

NTP staff will carry out supervisory visits to regional, district and centre level according to the NTP policy. NTP will carry out the regular trimesterly (four-monthly workshops) at district, regional and national levels. Strategic planning workshops will be carried out annually to prepare for the next fiscal year.

2.10.2 Introduction of electronic data management

At present the NTP M&E system is paper-based. NTP plans to further strengthen the current M&E system through introduction of electronic data management at all levels of the programme. EPI-Center data management programme will be re-installed at National Regional and District level, with the procurement of necessary information technology, and training. NTP will implement Open MRS data management software at Central level as well as at all treatment centers (currently 10 and planned to be expanded to 20 sites by the end of 2015).

A consultant will be hired to develop and install a more sophisticated electronic data management system in Year 2.

2.10.3 External monitoring

The Netherlands Lung & Heart Association (LHL) funds and carries out an external review of the NTP annually.

Every five years, NTC invites a multi-disciplinary team of international experts to review all aspects of the NTP programme. Recommendation and suggestions of the review are utilized for future planning of the NTP. The most recent 'In-Depth Review' occurred in 2007, so the next will be in 2012.

The Global Drug Facility (GDF) carries out an annual monitoring mission as part of the drug purchasing package of anti-TB medicines, to assist NTP to improve logistic management. Cost of this review is not charged to NTP.

The cost for the GLC annual monitoring mission occurs under SDA 6: MDR TB Management.

2.10.4 Capacity development

NTP will revise the M&E training modules and guidelines. NTP will carry out capacity building workshops for DTLOs and statistical assistants. Relevant staff will participate in international conferences or short-course training courses, as appropriate.

2.10.5 Human Resources

At the national level, two Monitoring & Evaluation Officers assist with planning, budgeting, monitoring and evaluation, of all NTP activities, as well as reporting to GFATM on Round 4 and Round 7 activities. With the establishment of a Program Management Unit (PMU) to support NTC's management of Global Fund grants, the M&E staff funded by the Global Fund are administratively "housed" in the PMU, while their activities are directly coordinated with the Planning, Monitoring, and Evaluation Section of NTC. The Regional Coordinators assist NTC with monitoring and supervision at the regional and district level.

2.11 Program Management and Administration

The activities described above, need extensive coordination, management and administration.

2.11.1 Finance Section

The finance section of the NTC, is involved in management of both donor and GoN funds for the NTP. At present, the financial system is paper-based. Early in 2009, NTC installed a computerized financial and accounting system which is being trialled for recording GFATM grant accounts.

2.11.2 Planning, monitoring and evaluation

NTC holds regular planning, monitoring and evaluation meeting to coordinate NTP activities. Relevant staff require upgrading of skills to carry out these activities, especially to manage international donor funds.

The Program Management Unit, established in 2008, coordinates activities funded through the two GFATM grants. The PMU monitors the SRs, prepares reports according to the GFATM criteria, and implements GFATM activities allocated to the NTC.

2.11.3 Administration of National TB Centre and Regional TB Centre

Staff salaries, purchase of equipment, utilities and maintenance require ongoing attention and finances. Both the NTC and RTC stores require refurbishing and rearrangement to improve the timely distribution of anti-TB medicines and reagents for sputum microscopy, etc.

3 Summary Budget for National Strategic Plan, July 2010 to July 2015

The total budget for the National Strategic Plan is 89,336,302 USD. Service Delivery Area, High quality DOTS takes up the highest proportion (25%) of the budget as it includes the anti-TB medicines (Table 13), similarly MDR TB Management (15%). The next is Health System Strengthening (14%), which includes the expensive PAL and the respiratory hospital, then Laboratory network (12%) due to the enhancement of culture facilities.

Table 13: Service Delivery Areas by percentage of Budget, 2010/11 to 2014/15

Service Delivery Area	Five year budget	Percentage of budget (%)
Improving diagnosis	2,776,356	3%
High Quality DOTS	22,503,775	25%
Laboratory Network	10,786,797	12%
Health System Strengthening	12,511,160	14%
TB/HIV Collaboration	5,074,738	6%
MDR TB Management	13,085,215	15%
PPM	4,291,838	5%
ACSM	6,030,763	7%
Operational Research	2,938,779	3%
Monitoring & Evaluation System	2,740,351	3%
Program Management & Admin.	6,596,528	7%
Total	89,336,302	

Using GFATM cost categories (Table 14), Monitoring and evaluation accounts the highest proportion of the budget (19.6%) as not only is it an essential part of each SDA, but also, the M&E cost category includes the expensive Operational Research SDA (2.9 million). Similarly, training is an important component of each SDA to ensure high quality implementation, hence the training budget composes 18.7% of the total budget. The third main component is human resources (13.9%) required to implement the National Strategic Plan.

To fund the National Strategic Plan, 2010/11 to 2014/15, NTP will need to apply for other sources as it is estimated that the GoN and present international donors will provide 36.9% of the required funds. The funding gap of 56,329,973 USD (63.1%), was calculated based on the following assumptions over the five years:

1. The GoN will provide 16,784,578 USD;
2. Other donors (LHL, WHO, etc.) will continue and will fund 2,285,710 USD;
3. GFATM Round 4 will not continue into the RCC after July 2011, but GFATM Round 7 will extend into Phase 2. Hence, the amount from GF4 and GF7 will be 13,936,041 USD until Year 3.

Table 14: Cost categories by percentage of Budget, 2010/11 to 2014/15

National Strategy Plan Cost Categories	Five year budget	Percentage of budget (%)
Human Resources	12,450,281	13.9%
Technical Assistance	1,730,170	1.9%
Training	16,695,918	18.7%
Health Products & Health Equipments	6,412,331	7.2%
Medicines & Pharmaceuticals Products	8,830,358	9.9%
Procurement & Supply Management Costs	2,095,045	2.3%
Infrastructure & Other Equipment	12,094,946	13.5%
Communication Materials	4,025,168	4.5%
Monitoring and Evaluation	17,471,865	19.6%
Living Support to Clients/Target Population	2,406,838	2.7%
Planning & Administration	1,060,703	1.2%
Overheads	2,430,955	2.7%
Other	1,631,725	1.8%
Total	89,336,303	

4 Summary

This National Strategic Plan, July 2010 to July 2015, utilizies the ideas of the Stop TB Strategy to increase case finding in Nepal, and hence to reach the NTP Goal: to reduce the mortality, morbidity and transmission of tuberculosis until it is no longer a public health problem.

The impact targets are: to halt and begin to reverse the incidence of TB by 2015 and to reduce by 50% prevalence and mortality rates by 2015 relative to 1990 levels (See 1.3.1). The outcome targets are: to achieve a case detection rate of new smear-positive cases of at 82% nationally; and, to reach and maintain a treatment success rate of 90% by 2015.

Since the ultimate goal is to eliminate TB (less than 1 new sputum positive TB case per million population per year) from Nepal by 2050, the NTP and Partners have a vision to utilize the following initiatives to reach this long-term goal.

- 'Improving Diagnosis': microscopic services will be increased by 125 over five years; female community health volunteers (FCHV) will be mobilized to actively increase case finding and carry out contact tracing of family members of registered TB cases.
- 'High Quality DOTS': In addition to the diagnostic centres, a further 75 treatment centres will be added;
- 'Laboratory Network': The NTC laboratory will gain accreditation to become the National Reference Laboratory and will upgrade to liquid culture medium; culture facilities will expand to three regions.
- Practical Approach to Lung Health (PAL): PAL initiatives will reach 29 districts by 2015, thus increasing diagnosis and treatment of all respiratory diseases.
- 'Infection Control' measures will be introduce to reduce nosocomial infections
- Respiratory Hospital will be established in the Valley by 2014.
- 'TB/HIV Collaboration': will be implemented and maintained in 35 districts and reduce the morbidity of TB/HIV co-infection.
- MDR TB Management will expand to a total of 80 centres/sub-centres across the country, increasing accessibility to this disadvantaged group.
- 'Public Private Mix (PPM)': NTP will engage the private sector in 35 municipalities to improve diagnosis and treatment of TB and hence to decrease the occurrence of MDR TB.
- Advocacy, Communication & Social Mobilization (ACSM)': intensified ACSM activities will spread throughout the country so that all 75 districts will benefit and the CDR increase above 80%.
- 'Operational research': will give solutions to questions like gender inequality in TB cases, value of radio communication; what is the true ARI?, etc.
- 'Monitoring & Evaluation': will: check that the targets are being reached, and follow-up transfer in/out and migration cases.
- 'Planning & Administration:' will coordinate all the above.

Hence, TB will be decreased in Nepal due to early diagnosis and rapid treatment from the above activities.

Budget summary by Service Delivery Areas

SN	SDA	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	Improving Diagnosis	415,590	481,856	550,401	623,583	704,925	2,776,355
2	High Quality DOTS	4,051,947	4,274,926	4,396,963	4,751,193	5,028,746	22,503,775
3	Laboratory Network	1,955,831	1,963,966	2,411,162	2,173,673	2,282,165	10,786,797
4	Health System Strengthening	526,147	1,331,230	2,641,407	5,496,491	2,515,886	12,511,161
5	TB/HIV Collaboration	730,412	820,863	980,663	1,176,203	1,366,596	5,074,737
6	MDR TB Management	2,601,199	2,385,710	2,497,603	2,633,195	2,967,508	13,085,215
7	Public Private Mix (PPM)	705,510	717,355	833,472	953,475	1,082,025	4,291,837
8	ACSM	1,135,859	1,069,026	1,159,614	1,238,398	1,427,867	6,030,764
9	Operational Research	175,706	2,148,609	203,116	236,857	174,492	2,938,780
10	Monitoring and Evaluation	854,597	570,815	436,653	388,230	490,055	2,740,350
11	Program Management and Administration	1,281,217	1,364,365	1,212,179	1,281,393	1,457,375	6,596,529
	Total	**14,434,015**	**17,128,721**	**17,323,233**	**20,952,691**	**19,497,640**	**89,336,300**

Budget summary by Cost Category

	Summary budget by cost category	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	Human Resources	2,123,894	2,175,559	2,302,714	2,489,540	3,358,573	12,450,281
2	Technical & Management Assistance	299,143	316,971	340,029	365,325	408,701	1,730,170
3	Training	3,165,470	3,088,285	3,259,878	3,336,810	3,845,476	16,695,918
4	Health Products and Health Equipment	1,173,444	808,502	1,206,591	1,592,691	1,631,103	6,412,331
5	Pharmaceutical Products (Medicines)	1,429,463	1,600,226	1,750,924	1,941,840	2,107,905	8,830,358
6	Procurement and Supply Management (PSM)	351,220	384,699	417,051	453,132	488,943	2,095,045
7	Infrastructure and Other Equipment	1,401,699	1,666,058	2,825,463	4,991,653	1,210,075	12,094,946
8	Communication Materials	666,391	741,975	793,821	877,560	945,420	4,025,168
9	Monitoring and Evaluation (M&E)	2,572,415	4,833,099	3,058,821	3,372,665	3,634,865	17,471,865
10	Living Support to Clients/Target Population	358,489	420,026	483,666	539,946	604,712	2,406,838
11	Planning and Administration	159,642	171,616	184,547	198,276	346,623	1,060,703
12	Overheads	515,769	664,178	378,488	415,783	456,738	2,430,955
13	Other	216,977	257,527	321,243	377,469	458,509	1,631,725
	TOTAL	14,434,016	17,128,721	17,323,234	20,952,691	19,497,642	89,336,303

Logical Framework

6 Narrative Summary	7 Expected Results	8 Performance Measurement*	9 Assumptions and Risks
9.1.1 Objective Case Finding and Treatment Increase the case detection rate to 80% nationally and at least 70% in all districts by 2015 and achieve and maintain treatment success rates of 90% by 2015 nationally and 85% minimally in all districts	9.1.2 Impact • Immediate reduction in prevalence • Immediate reduction in mortality • Immediate reduction in transmission • Late decline in incidence • Late reduction in proportion of drug resistant cases	9.1.3 Performance Indicators: Impact • Prevalence of TB per 100,000 population • Estimated incidence of TB per 100,000 population	9.1.4 Assumptions: • DOTS has an immediate effect on reducing mortality and prevalence • High cure rates lead to reduced, rates of relapse and resistance • A decline in prevalence will lead to reduced transmission, and eventually reduced incidence 9.1.5 Risks • Increasing prevalence of HIV will adversely affect TB mortality and incidence
9.1.6 Purpose Provide effective diagnostic and treatment services for all patients with TB, within the existing primary health care services	9.1.7 Outcomes • DOTS expanded • People with TB diagnosed • People with TB cured • Community aware of diagnostic and treatment services	9.1.8 Performance Indicators: Outcomes • DOTS coverage • Case detection rate • Smear conversion rate • Treatment success rate • Smear positive proportion • Retreatment Proportion	9.1.9 Assumptions: • Appropriate strategies for DOTS in hills and private sector, urban areas, and community awareness maintained 9.1.10 Risks: Health sector reforms not compatible with NTP organizational and technical policies
9.1.11 Resources (Inputs and Activities) 9.1.12 Budget: over 5 years 9.1.13 Technical support: Development partners: • Diagnosis of people with TB • Treatment of people with TB • Training, supervision and quality assurance • Procurement, distribution and monitoring of drugs and other supplies • Co-ordination with development partners, NGOs, private sector, other levels and sectors of the health service, and local communities	9.1.14 Outputs • NTP technical and operational polices • Microscopy network • Trained health workers able to diagnose and treat people with TB • Uninterrupted drug supplies • Continuous cohort reporting system • Networks and co-ordination mechanisms, including annual NTP review, TAG and local DOTS committees	9.1.15 Performance Indicators: Outputs • Proportion of microscopy centers with functioning microscopy service • Numbers of health workers trained • Frequency of supervisory visits • Frequency of drug stock-outs • Agreement between drug distribution and reported cases • Completeness of cohort reports	9.1.16 Assumptions: • Technical and financial support from development partners 9.1.17 Risks: • Frequent transfer of staff • Unfilled posts
9.1.18 Objective Laboratory services Expand and maintain the quality and capacity of the NTP & partners laboratory network and to build up the capacity of the NTC Laboratory to act as National Reference Laboratory	9.1.19 Impact • Correct and efficient diagnosis of tuberculosis • • Immediate reduction in prevalence • Immediate reduction in mortality • Immediate reduction in transmission • Late decline in incidence	9.1.20 Performance Indicators: Impact • Prevalence of TB per 100,000 population • Estimated incidence of TB per 100,000 population • Prevalence MDR TB	9.1.21 Assumptions: • DOTS has an immediate effect on reducing mortality and prevalence • High cure rates lead to reduced, rates of relapse and resistance • A decline in prevalence will lead to reduced transmission, and eventually reduced incidence Risks • Increasing prevalence of HIV will adversely affect TB mortality and incidence
9.1.22 Purpose Expand and maintain the quality and capacity of the NTP & partners laboratory network and to build up the capacity of the NTC Laboratory to act as National Reference Laboratory for diagnosis and follow-up of TB patients, including MDR TB patients	9.1.23 Outcomes • Improved access to high quality TB diagnostic services with NTP and Partner organizations	9.1.24 Performance Indicators: Outcomes • Smear laboratory coverage • Case detection rate including MDR TB • Smear positive proportion • Smear conversion rate	9.1.25 Assumptions: • Microscopy centers established in difficult to access populations, private sector, urban areas Risks: Patients continue preferring attendance of private sector

9.1.26 Resources (input and activities) 9.1.27 Budget: over 5 years 9.1.28 Technical support: Development partners • Microscopy centers • Culture laboratories • Upgrading DST laboratories • LQAS • Procurement, distribution and monitoring of laboratory equipment and supplies • Co-ordination with development partners, I/NGOs	9.1.29 Outputs • Technical and operational polices • Microscopy network • Quality of smear microscopy • Quality of culture and DST • DST surveillance • Trained laboratory staff in LQAS, culture and DST • Uninterrupted laboratory supplies	9.1.30 Performance Indicators: Outputs • Proportion of microscopy centres with functioning LQAS • Numbers of laboratory staff trained in smear microscopy • Numbers of laboratory staff trained in LQAS • Number of functional culture labs • Number of functional quality assured DST labs • Number DSTs performed • Frequency of laboratory supervisory visits • Frequency of lab. supply stock-outs	9.1.31 Assumptions: • Continued availability of technical and financial support from development partners 9.1.32 Risks: • High turn-over of staff • Unfilled posts
9.1.33 Objective PAL Improve the quality of diagnosis and treatment of common respiratory illnesses in health care (HC) settings and increase TB case detection through expansion of National Practical Approach to Lung Health (PAL) initiative.	9.1.34 Impact • Improved TB case detection • Improved referral and management of common respiratory illnesses • Immediate reduction in TB prevalence • Immediate reduction in TB mortality • Immediate reduction in transmission • Late decline in incidence	9.1.35 Performance Indicators: Impact • Prevalence of TB per 100,000 population • Estimated incidence of TB per 100,000 population	9.1.36 Assumptions: • DOTS has an immediate effect on reducing mortality and prevalence • High cure rates lead to reduced, rates of relapse and resistance • A decline in prevalence will lead to reduced transmission, and eventually reduced incidence 9.1.37 Risks • Increasing prevalence of HIV will adversely affect TB mortality and incidence
9.1.38 Purpose Increase TB case finding through expansion of the PAL initiative in the general health services network	9.1.39 Outcomes • DOTS expanded • People with TB diagnosed • People with TB cured • Community aware of diagnostic and treatment service • Diagnosis and treatment of common respiratory illnesses increased	9.1.40 Performance Indicators: Outcomes • Case detection rate • Smear conversion rate • Treatment success rate • Smear positive proportion • Retreatment Proportion	9.1.41 Assumptions: • PAL leads to increased attendance of TB suspects and increased community awareness of pulmonary symptoms 9.1.42 Risks: Emphasis on X-Ray examinations and insufficient emphasis on smear microscopy

9.1.43 Resources (Inputs and Activities) **9.1.44** Budget: over 5 years 9.1.45 Technical support: Development partners • Revision of guidelines • Training • Supervision and monitoring • Procurement, distribution and monitoring of equipment drugs and other supplies • Co-ordination with development partners, NGOs, private sector, other levels and sectors of the health service, and local communities	9.1.46 Outputs • NTP technical and operational polices • Trained health workers able to diagnose and treat people with common respiratory illnesses and TB • Uninterrupted drug supplies • Networks and co-ordination mechanisms, including annual NTP review, TAG and local DOTS committees	9.1.47 Performance Indicators: Outputs • Number of centers with functional PAL • Numbers of health workers trained in PAL • Frequency of supervisory visits • Frequency of drug stock-outs	9.1.48 Assumptions: • Technical and financial support from development partners • Provision of drugs for common respiratory illnesses through the general health services network 9.1.49 Risks: • General HS network unable to provide drugs for common respiratory illnesses • Pressure on NTP to provide drugs for common respiratory illnesses
9.1.50 Objective Infection Control Develop and implement National TB Infection Control Policy	9.1.51 Impact • TB prevalence is not higher among health care workers and TB laboratory staff than in the general population	9.1.52 Performance Indicators: Impact • Prevalence of TB in health care workers	9.1.53 Assumptions: • Infection Control measures decrease the risk of TB transmission in facilities with a concentration of patients and/or infectious materials 9.1.54 Risks • Separating (suspect) TB patients in OPDs increases stigma towards them • Laboratory staff become less careful in dealing with potentially infectious materials
9.1.55 Purpose Decrease the risk of transmission of TB and MDR TB infection among staff of (MDR) TB diagnostic and treatment facilities and laboratories responsible for TB culture and DST	9.1.56 Outcomes • TB prevalence in health care staff	9.1.57 Performance Indicators: Outcomes • Case detection rate • Smear conversion rate • Treatment success rate • Smear positive proportion • Retreatment Proportion • Number MDR TB	9.1.58 Assumptions: • Staff implement the IC control measures 9.1.59 Risks: • Masks, respirators not replaced according to instructions

9.1.60 Resources (Inputs and Activities) 9.1.61 Budget: over 5 years 9.1.62 Technical support: Development partners • Development of national IC policy printing document and IC posters • Training • Supervision and monitoring • Procurement, distribution and monitoring of equipment and supplies • Co-ordination with partners I/NGO's	9.1.63 Outputs • IC technical and operational polices • Trained health workers and laboratory staff • IC in place in the different types of health facilities	9.1.64 Performance Indicators: Outputs • Number of DOTS centers with functional IC measures • Number of culture/DST labs with TB IC in place • Numbers of health workers trained on TB IC	9.1.65 Assumptions: • Technical and financial support from development partners 9.1.66 Risks: Regular monitoring of IC not done, resulting in quality deterioration
9.1.67 Objective TB/HIV Decrease the burden of TB/HIV in the population affected by both diseases by ensuring effective collaboration between TB and HIV programmes through effective coordination and delivery of collaborative services	9.1.68 Impact • Reduction in TB prevalence • Reduction in TB mortality	9.1.69 Performance Indicators: Impact • Prevalence of TB among HIV-infected • Prevalence of HIV among TB patients	9.1.70 Assumptions: • Collaborative TB/HIV activities increase diagnosis of TB among HIV infected and HIV diagnosis among TB patients • INH prophylaxis for PLHIV without active disease decreases their risk of TB disease • ARV of HIV-infected TB patients decreases their risk of early death 9.1.71 Risks • PLHIV insufficiently examined for exclusion/confirmation of active TB • HIV testing not accepted by TB patients •
9.1.72 Purpose Limit the effects of the HIV epidemic on the incidence and mortality of TB and decrease the burden of TB in PLHIV	9.1.73 Outcomes • TB prevalence among PLWHA • HIV prevalence among TB patients	9.1.74 Performance Indicators: Outcomes • TB patients tested for HIV • PLWHA examined for TB • PLWHA with TB treated for TB and on ARV	9.1.75 Assumptions: • Collaboration will increase number of TB patients screened for HIV and number PLHHIV examined for TB 9.1.76 Risks: • Less emphasis on smear microscopy and increased emphasis on X- Ray exams in PLWHA • Insufficient capacity for HIV testing of TB patients
9.1.77 Resources (Inputs and Activities) 9.1.78 Budget: over 5 years 9.1.79 Technical support:	9.1.80 Outputs • TB/HIV technical and operational polices • Trained health workers	9.1.81 Performance Indicators: Outputs • Numbers of health workers trained in TB/HIV	9.1.82 Assumptions: • Technical and financial support from development partners • Staff of VCTs prepared to include DOTS, staff of DOTS

Development partners • Development of collaborative TB/HIV activities • Surveillance of HIV prevalence in TB patients • Training • Monitoring and evaluation • Co-ordination with National AIDS Program, development partners, NGOs, private sector, other levels and sectors of the health service, and local communities	• VCTs in DOTS • DOTS in VCTs • Networks and co-ordination mechanisms in place	• Number VCTs with DOTS • Number DOTS with VCT • Frequency of supervisory visits • Frequency of drug stock-outs (TB drugs in VCTs, ARV in DOTS)	prepared to include VCT 9.1.83 Risks: Policies and pace of NTP NAP may hamper collaboration
9.1.84 Objective M/XDR TB Reduce the mortality, morbidity and transmission of M/XDR TB through effective management	9.1.85 Impact • Reduction in M/XDR prevalence • Reduction in death rate of M/XDR TB patients • Reduction in transmission of MDR TB • Reduction in XDR TB	9.1.86 Performance Indicators: Impact • Prevalence of M/XDR TB per 100,000 population	9.1.87 Assumptions: • Management of M/XDR TB reduces its transmission • High cure rates lead to reduced rates of relapse and resistance • Decline in prevalence will lead to reduced transmission, and eventually reduced incidence 9.1.88 Risks • Increasing prevalence of HIV will adversely affect M/XDR TB incidence and mortality
9.1.89 Purpose Establish and expand M/XDR TB diagnostic and treatment facilities country-wide	9.1.90 Outcomes • M/XDR TB diagnosed • M/XDR TB successfully treated	9.1.91 Performance Indicators: Outcomes • Number M/XDR TB diagnosed • M/XDR treatment success • XDR TB among MDR TB treatment failures	9.1.92 Assumptions: • DOT of all patients ensured • High MDR TB treatment success rate maintained • XDR-TB not increased 9.1.93 Risks: • DOT during full course of treatment not ensured • High drop out due to DOT, high patient costs or adverse effects of drugs • Unregulated availability of Rifampicin and other F/SLD in the open market
9.1.94 Resources (Inputs and Activities) 9.1.95 Budget: over 5 years 9.1.96 Technical support: Development partners: • Diagnosis of M/XDR TB patients • Treatment of M/XDR patients • Treatment of adverse effects of the drugs • DOT/Hostel facilities • Socio/economic support for M/XDR TB patients • Staff incentives • Training, monitoring and supervision	9.1.97 Outputs • NTP technical and operational polices for M/XDR TB management established/revised • Trained health workers • M/XDR TB diagnostic facilities • M/XDR TB treatment facilities • Uninterrupted drug supplies • Socio-economic support to patients • Hazard allowance for staff dealing with M/XDR TB • Networks and co-ordination mechanisms,	9.1.98 Performance Indicators: Outputs • Number of M/XDR TB diagnostic facilities • Number of M/XDR TB treatment facilities • Numbers of health workers trained in M/XDR TB • Number of M/XDR patients soc/economically supported • Frequency of supervisory visits • Frequency of drug stock-outs	9.1.99 Assumptions: • Technical and financial support from development partners • 9.1.100 Risks: • Unfilled posts at national and implementation levels • High staff turn-over • Reluctance of staff working with MDR TB

• Procurement, distribution and monitoring of equipment, drugs and other supplies • Co-ordination with partners, NGOs, private sector, other levels and sectors of the health service, and local communities	including annual NTP review, TAG and local DOTS committees		

9.1.101 Objective PPP Engage relevant health care providers with NTP through Public-Private Partnership (PPP) to ensure availability of high quality TB services in line with international standard of TB care (ISTC)	9.1.102 Impact • Improved management of TB in Private sector as per ISTC and national guidelines • Reduction in prevalence • Reduction in mortality • Reduction in transmission • Late decline in incidence • Late reduction in proportion of drug resistant cases	9.1.103 Performance Indicators: Impact • No of private sector partners following ISTC and NTP guidelines • Prevalence of TB per 100,000 population	9.1.104 Assumptions: • Private sector partners willing and able to follow ISTC and NTP guidelines • DOTS has an immediate effect on reducing mortality and prevalence • High cure rates lead to reduced, rates of relapse and resistance • A decline in prevalence will lead to reduced transmission, and eventually reduced incidence 9.1.105 Risks: • Increasing prevalence of HIV will adversely affect TB mortality and incidence
9.1.106 Purpose Increase TB case finding through effective collaboration with the private sectors	9.1.107 Outcomes • DOTS expanded in private sector • People with TB are diagnosed • People with TB are cured • Private partners aware of diagnostic and treatment services	9.1.108 Performance Indicators: Outcomes • Case detection rate • Smear conversion rate • Treatment success rate • Smear positive proportion • Retreatment Proportion	9.1.109 Assumptions: • Successful PPP collaboration experiences will be replicated in planned expansion areas • PPP leads to increased referral of TB suspects and increased numbers of diagnosed patients • Patients attending private sector are willing to be diagnosed and managed according to NTP policy 9.1.110 Risks: • Private sectors continue to rely on X-ray examinations and other tests rather than smear microscopy
9.1.111 Resources (Inputs and Activities) 9.1.112 Budget: over 5 years 9.1.113 Technical support: Development partners • Development/revision PPP policy, ISTC guidelines • Establishment and functioning of NTP PPP and Urban TB unit • Human resources • Development and implementation of PPP/ISTC curriculum • Training • Supervision, monitoring • Co-ordination with development partners, NGOs, private sector, other levels and sectors of the health service, and local communities	9.1.114 Outputs • NTP technical and operational PPP polices • PPP staff in place • Trained health workers • Trained volunteers for linkages • PPP/ISTC curriculum developed and implemented • Networks and co-ordination mechanisms, including annual NTP review, TAG and local DOTS committees	9.1.115 Performance Indicators: Outputs • Number of cities/ districts with functional PPP/ISTC • Numbers of staff recruited for PPP/ISTC • Numbers of health workers trained in PPP • Number of academic institutes, health institutions implementing PPP/ISTC curriculum • Frequency of supervisory visits	Assumptions: • Technical and financial support from development partners 9.1.116 Risks:

9.1.117 Objective ACSM Increase case-finding to 80% by 2015, with particular emphasis on under-reached and high risk groups, through increased awareness at all levels and to increase the treatment success rate to 90% through improved community involvement and support	9.1.118 Impact • Reduction in prevalence • Reduction in mortality • Reduction in transmission • Late decline in incidence • Late reduction in proportion of drug resistant cases	9.1.119 Performance Indicators: Impact • Prevalence of TB per 100,000 population	9.1.120 Assumptions: • DOTS has an immediate effect on reducing mortality and prevalence • High cure rates lead to reduced, rates of relapse and resistance • A decline in prevalence will lead to reduced transmission, and eventually reduced incidence 9.1.121 Risks: • Increasing prevalence HIV will adversely affect TB mortality and incidence
9.1.122 Purpose Strengthen ACSM activities in collaboration with NCASC, SAARC and NGOs to increase and maintain commitment for TB control, increase awareness about TB and TB/HIV, mobilize communities, civil society, cured patients, etc and empower patients in order to increase case finding and treatment success in districts with low case finding rate	9.1.123 Outcomes • DOTS expanded • People with TB are diagnosed • People with TB are cured • Community aware of diagnostic and treatment service • High commitment for TB control	9.1.124 Performance Indicators: Outcomes • Case detection rate • Smear conversion rate • Treatment success rate • Smear positive proportion	9.1.125 Assumptions: • Increasing awareness increases health seeking of people with respiratory symptoms • Empowering communities and patients increases treatment success 9.1.126 Risks: • Microscopy laboratories overburdened, quality of microscopy decreases
9.1.127 Resources (Inputs and Activities) 9.1.128 Budget: over 5 years 9.1.129 Technical support: Development partners: • Reactivation/strengthening of TB control network • Development/revision of ACSM guidelines • Adaptation and dissemination of Patients' Charter • Participation in World TB day, national TB day, HIV/AIDS day • Implementation of awareness campaigns • Development and distribution of advocacy, communication and social mobilization materials • Human Resources • Training • Supervision, monitoring • Co-ordination with development partners, NGOs, private sector, other levels and sectors of the health service, and local communities	9.1.130 Outputs • ACSM guidelines developed/revised • Special days celebrated • Awareness campaigns/activities implemented • ACSM materials developed and distributed • Monitoring tool integrated into NTP monitoring system • Networks and co-ordination mechanisms, including annual NTP review, TAG and local DOTS committees	9.1.131 Performance Indicators: Outputs • Number and type of special days celebrated • Number and type of awareness campaigns/activities conducted, numbers of people reached • Types and numbers of ACSM materials prepared and distributed	9.1.132 Assumptions: • Technical and financial support from development partners • I/NGOs implement major part of the ACSM activities 9.1.133 Risks: • Insufficient capacity and capability to implement all the planned ACSM activities

9.1.134 Objective Operational Research To improve the quality of care for people with TB and to assist in planning and implementing effective TB control	9.1.135 Impact • Reduction in prevalence • Reduction in mortality • Reduction in transmission • Late decline in incidence • Late reduction in proportion of drug resistant cases	9.1.136 Performance Indicators: Impact Prevalence of TB per 100,000 population	9.1.137 Assumptions: • Research outcomes are applicable nationwide and over coming years • Research finding are feasible for implementation • Implementation of research findings have immediate and positive effect on programme performance • High cure rates lead to reduced, rates of relapse and resistance • A decline in prevalence will lead to reduced transmission, and eventually reduced incidence 9.1.138 Risks: Research findings may not be compatible with DOTS strategy and National policies
9.1.139 Purpose Support to strengthen implementation of the components of the WHO Stop TB strategy in program management, estimation of burden of disease, surveillance and patient care, identification of areas that need additional focus/support	9.1.140 Outcomes • DOTS expansion facilitared • Diagnosis of TB imporved • Cure rates enhanced • Community aware of diagnostic and treatment service • High commitment for TB control	9.1.141 Performance Indicators: Outcomes 9.1.142 Research Agenda Research Partnership Forum No of research conducted, completed and reported/published	9.1.143 Assumptions: TB epidemiologic situation remains unchanged during next five year period 9.1.144 Risks: Research findings may not be feasible for implementation or in contradiction with National/International policies
9.1.145 Resources (Inputs and Activities) 9.1.146 Budget: over 5 years **9.1.147** Technical support: Development partners : • TA for protocol development, analysis of study results • Human resources • Training, workshops and meetings • Equipment and supplies • Transport and per diem • Co-ordination with development partners, NGOs, private sector, other levels and sectors of the health service, and local communities	9.1.148 Outputs • Studies/surveillance • Findings of studies/surveillances incorporated in NTP management policies	9.1.149 Performance Indicators: Outputs • Number of studies/surveillances finalized, results analyzed and disseminated • Number NTP policies revised based on results OR	9.1.150 Assumptions: • Technical and financial support from development partners • (part) of ACSM activities are sourced out 9.1.151 Risks: • Insufficient staff capacity and capability to implement the planned OR • Delays in implementation of studies- internal and external reasons

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