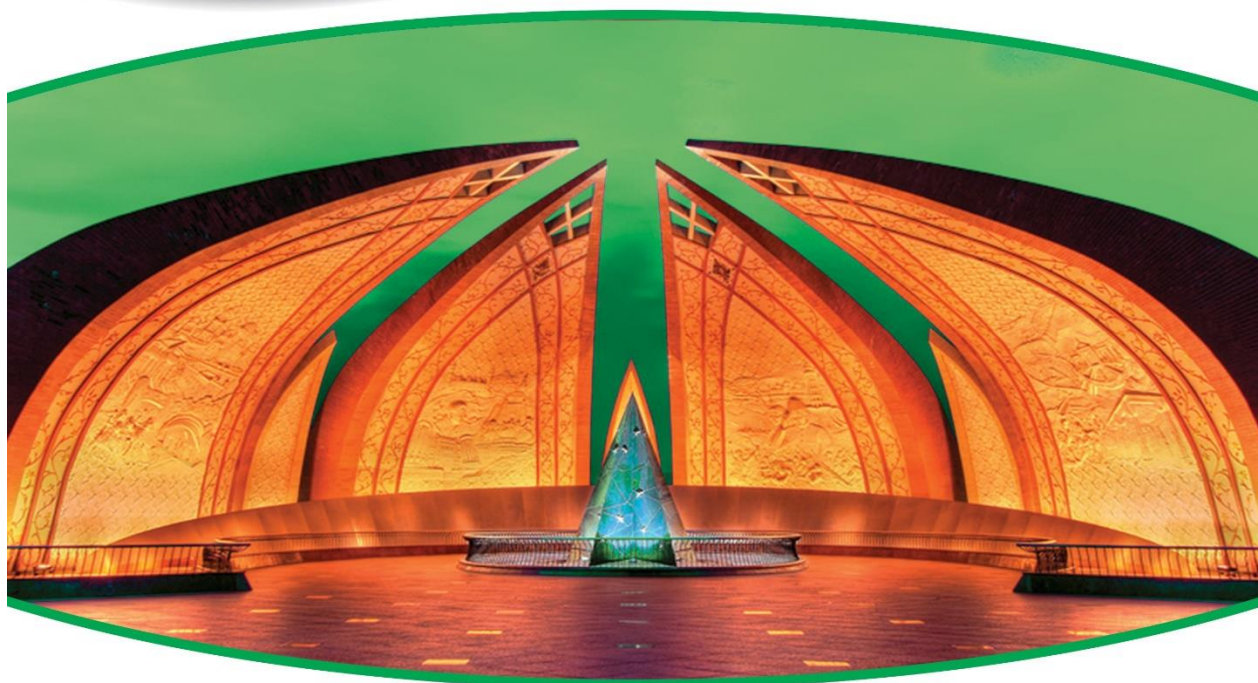


National END **TB** Strategic Plan 2017 - 2020



National TB Control Program Pakistan
Ministry Of National Health Services, Regulations & Coordination
Islamabad



National TB Control Program

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ACRONYMS

ADR	Adverse Drug Reaction
AFB	Acid Fast Bacilli
AKU	Aga Khan University
BHU	Basic Health Unit
CCM	Country Coordinating Mechanism
CDC	Communicable Disease Control
CHW	Community Health Worker
CPT	Co-trimoxazole Preventive Therapy
DDHO	Deputy District Health Officer
DGHS	Director General Health Services
DHO	District Health Officer
DHQ	District Headquarter Hospital
DLS	District Laboratory Supervisor
DMU	Drug Management Unit
DTC	District TB Coordinator
DO	Direct Observation
DOTS	Directly Observed Treatment (short course)
DR TB	Drug Resistant TB
DRS	Drug Resistance Survey
DST	Drug Sensitivity Testing
EDO	Executive District Officer
EQA	External Quality Assurance
EPTB	Extra Pulmonary TB
FATA	Federally Administered Tribal Area
FLD	First Line Drug
GDF	Global Drug Facility
GF	Global Fund
GFATM	Global Fund to Fight Against AIDS, Tuberculosis and Malaria
GoB	provincial Governemnt of Baluchistan
GP	General Practitioner
HCP	healthcare Practitioner
HMIS	Health Management Information System
HIV	Human Immunodeficiency Syndrome
HPF	High-Power Field
IEC	Information, Education & Communication
INH	Isoniazid
IPC	Interpersonal Communication
KP	Khyber Pakhtunkhwa
LED	Light Emitting Diode
LHW	Lady Health Worker

LPA	Line Probe Assay
MALC	Marie-Adelaide Leprosy Center
MDG	Millennium Development Goals
M&E	Monitoring and Evaluation
MDR-TB	Multi-drug Resistant Tuberculosis
MO	Medical Officer
MS	Medical Superintendent
NGOs	Non-government Organizations
NSP	National Strategic Plan
NTP	National Tuberculosis Control Program
PATA	Pakistan Anti-TB Association
PCS	Pakistan Chest Society
PC-1	Planning Commission Proforma-1
PSCM	Procurement & Supply Chain Management
PHC	Primary healthcare
PTB	Pulmonary TB
PMA	Pakistan Medical Association
PMDT	Programmatic Management of Drug Resistant TB
PPHI	People's Primary healthcare Initiative
PPM	Public Private Mix
PR	Principal Recipient
PRL	Provincial Reference Laboratory
PTP	Provincial Tuberculosis Control Program
RHC	Rural Health Center
RR-TB	Rifampicin-resistant TB
SLD	Second Line Drug
SPDC	Social Policy & Development Center
STAG-TB	Strategic & Technical Advisory Group on TB
TB	Tuberculosis
TBC	Tuberculosis Clinic
THQ	Tehsil Headquarter Hospital
WRD	WHO-approved Rapid Diagnostics
XDR-TB	Extensively Drug-resistant TB

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FOREWORD



Tuberculosis remains a major public health problem in Pakistan, ranking fifth among 30 high burden countries globally for both drug sensitive and drug resistant TB. Amongst more than 500,000 incident cases, annually, about one third are still missed to be diagnosed and notified. TB affects the most productive years of life with high catastrophic cost to TB families and impacting the socio-development indices in the country. The national and provincial governments, with the allied partners are pledged to provide quality assured free diagnostic and treatment services across the country both for drug sensitive and drug resistant TB in Pakistan.

The post-2015 era signifies the historic transition from Stop TB Strategy to The End TB Strategy for TB control as well as from the Millennium Development Goals to the post-2015 development agenda with its Sustainable Development Goals (SDGs).

Post-2015 Global plan to end TB offers an innovative approach towards ending the TB epidemic and achieving the 90-90-90-90 targets for TB. It focusses on key affected populations, the most vulnerable and high risk groups, involving communities for multisectoral partnerships and positions the private sector as an integral partner.

WHO recommended End TB Strategy has been adapted to be translated into National End TB Strategic Plan (2017-2020) for Pakistan, led by the National, Provincial and Regional TB Control Programs, through a consultative process amongst all stakeholders with complete ownership on respective TB Control Programs.

The national and provincial strategic plans provide a clear roadmap to scale up proven interventions, implement innovative approaches and accelerate research and development to move towards ending the TB epidemic in Pakistan with enhanced domestic and donor support. The plan aims for TB free Pakistan, reduction in TB deaths and TB sufferings and shares the global vision of a world free of TB.

Dr Nasir Mahmood Khan
National Manager
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Message by Mrs. Saira Afzal Tarar

Minister for State

Ministry of National Health Services, Regulations &
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It is a matter of great pleasure that National TB Control Program in collaboration with provincial and Regional TB Control Programs has taken initiative towards development of National and Provincial strategic plans (2017-2020).

Tuberculosis (TB) is a leading cause of death and a major public health problem not only globally but also in Pakistan as currently the country ranks 5th amongst the 30 High Burden Countries. TB is an impediment to the human development and it's included in the targets for Sustainable Development Goals.

Pakistan has aligned its TB Control Strategies with Global initiatives from DOTS strategy to STOP TB strategy and currently joining hands with the global community in the ambitious paradigm shift to End TB. END TB Strategy is a plan of action that provides a blueprint for the TB community to drive bold action and ambitious change.

The Global Plan 2016-2020 sets out the actions and resources needed over the next five years to set the world on a course to end the global TB epidemic by 2030, as endorsed by world leaders in the newly adopted Sustainable Development Goals. We strongly support and reiterate our commitment to implement the Global plan with urgency and vigor.

TB has been a priority area for the Government of Pakistan and strong political commitment exists at national and provincial levels. Pakistan Vision 2025 recognizes that Health is pivotal to economic and social development. It along with education defines the human capital of a nation. We support gender equality and Human Rights approach through Resilient and Sustainable Systems for Health.

We are working in close collaboration national and international technical & development partners' i.e GFATM, WHO & USAID. Global Fund for Aids, TB & Malaria (GFATM) has been the main funding support in the fight against TB through its various rounds.

NTP under the 18th constitutional amendment has assumed a decentralized approach that integrates TB control activities within the primary health care settings through provincial and district health system.

Ministry of National Health Services, Regulations & Coordination, appreciates the joint efforts made by NTP / PTP / RTP teams and all national & international partners in the development of national document. We are sure that the Strategic Plan (2017-2020) will be pivotal in shifting business as usual to business unusual which is needed to save our generations from TB and to fulfill the vision of a world free of TB.

EXECUTIVE SUMMARY

BACKGROUND

The Islamic Republic of Pakistan's *National Strategic Plan for Tuberculosis Elimination (NSP), 2017-2020* is the country's strategic guide and national response to the tuberculosis (TB) epidemic for the next three years. It addresses the drivers of the epidemic and builds on the achievements of the previous plans. Best practice and new evidence-based interventions will be scaled up and implemented while ensuring a high quality of service delivery. The NSP will be continually reviewed for relevance and effectiveness and, when necessary, adjustments will be made. It is a framework that will guide the activities of all stakeholders including the national government, provincial, regional and district governments, development partners, civil society, international agencies, research institutions, and private sector who all work together to eliminate TB in Pakistan. (1)

Pakistan's NSP is a "full expression of demand" and provides insight to the TB programme, sensitises policy-makers and partners, and provides the foundation to mobilise domestic resources. Activities translated through this NSP at the national and provincial levels for TB control will support the achievements of targets within the given time period.

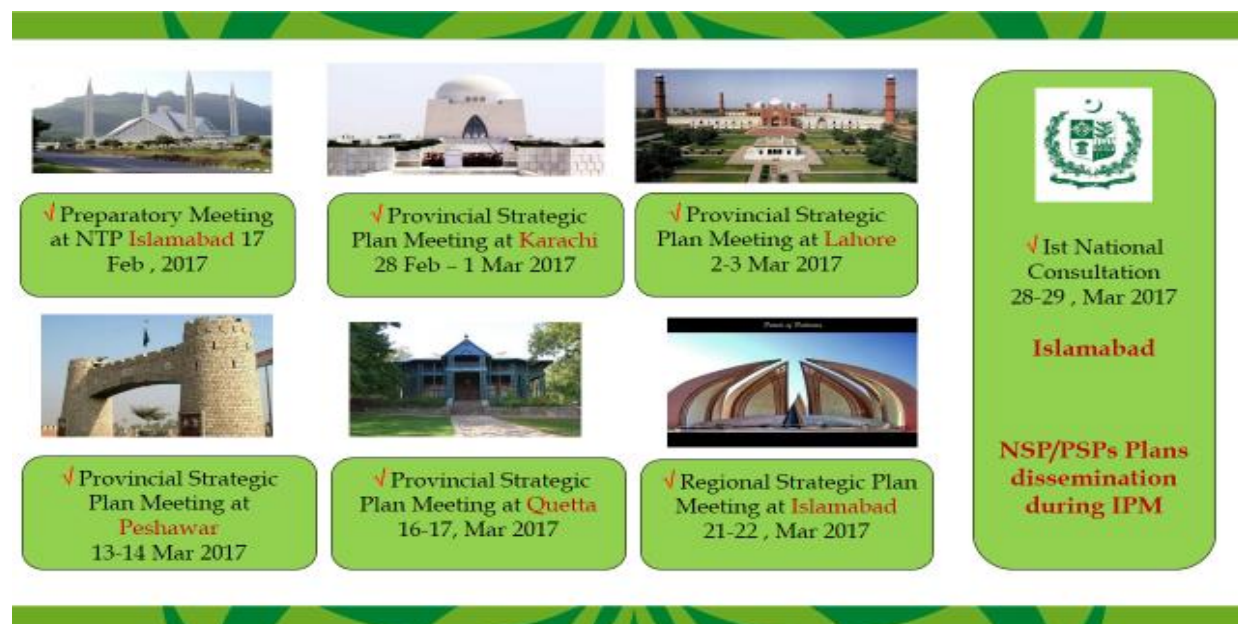
The NSP, therefore, aims to inform national, provincial, district, and community stakeholders on strategic directions that should be considered when developing implementation plans. It will make TB control visible in the health agenda and will advocate for substantial resources from the Pakistan Government. The NSP will be used by the National Tuberculosis Control Programme (NTP) as a framework to co-ordinate and monitor the implementation of TB activities and interventions by sectors, provinces, districts, stakeholders, and international development partners. It is the pathway to reaching the World Health Organisation's (WHO) END TB targets, and is aligned with the broader development plans of government. These include the *Vision 2015 of One Nation, One Vision, Pakistan 2025*, and *Pakistan Post 2015 Development Framework*. The NSP is aligned with the two international guidelines, WHO's END TB strategy and the UN's Sustainable Development Goals (SDG).

Implementing the NSP will require intensified interventions described under the three strategic directions of the plan. All three levels of governance are required to collaborate closely with stakeholders. The three levels include the NTP, the Ministry of National Health Services (MoNHS), and higher levels in the national government responsible for setting the social development agenda, resource allocation, and inter-ministerial coordination. The NTP, in the post-devolution context, working under the MoNHS, Regulation and Coordination (MoNHSRC), is a collaborating body at the central level for developing uniform policies and strategies, and for facilitating donor liaison at national and international levels. The NTP is integrated within the primary health care system through the support of provincial TB control programmes.

The development of this NSP is a collaborative effort among national, provincial, regional and district governments, development partners, civil society organisations, and the private sector in Pakistan and was led by the NTP (see Figure 1). Knowledge and insights generated from a series of workshops and consultations with the stakeholders, learnings from the implementation of the past NSPs and experiences over the last NSP periods informed the strategies proposed in the current NSP. The strategic framework

has been developed after extensive situational and gap analysis on “where we are”, “where we want to be” in 2020 and “how to get there”.

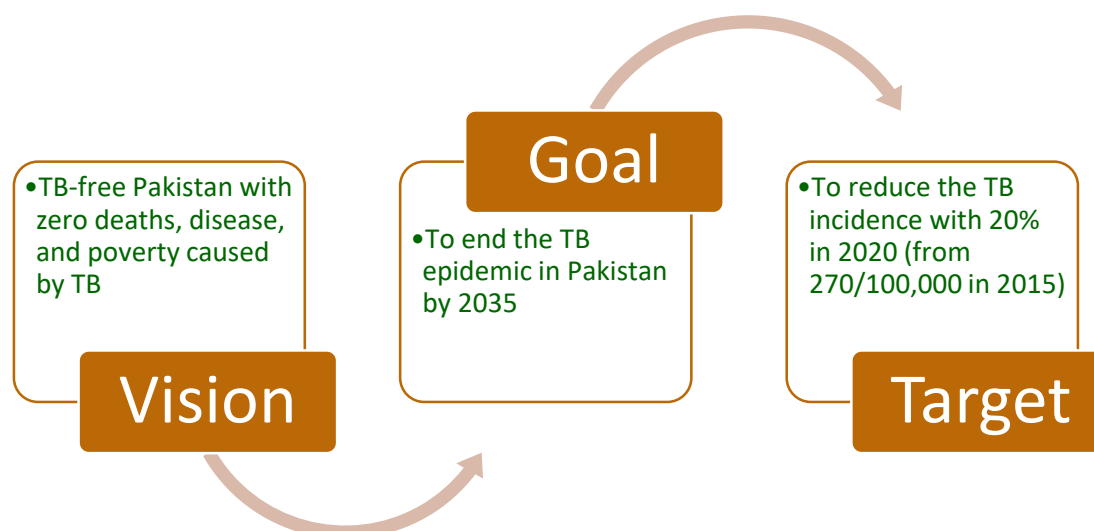
Figure 1. Developing the the NSP, 2017 - 2020



VISION, GOALS, AND TARGETS

The NSP proposes bold strategies using existing resources to decrease TB in the country rapidly by 2035, in line with the END TB Strategy and SDGs to attain a TB-free Pakistan.

Figure 2. Vision, Goal and Target



Pakistan has scaled up basic TB services in the public health system and many TB patients have been successfully treated, but the country must scale up interventions to meet the 2030 SDGs and 2035 END

TB targets. The country has the insight and expertise to inform TB programme decision-making, but these skills may be under-utilised. The requirements for moving towards TB elimination are described in three strategic pillars that include integrated patient TB care and prevention, policies and support in TB care, and research activities that guide programme implementation. The framework shown in Table 1 highlights the objectives and programmatic components of the NSP.

Table 1. Objectives and Programmatic Component Framework

PILLAR	OBJECTIVES	PROGRAMMATIC COMPONENT
PILLAR 1: INNOVATIVE CARE INTEGRATED PATIENT CENTERED TB CARE AND PREVENTION	1. To increase the number of notified TB cases (all forms) from 63% in 2015 to 90% in 2020.	<ul style="list-style-type: none"> • Diagnosis • Management of Drug-Susceptible TB (• Contact management • TB prevention among high-risk groups including: <ul style="list-style-type: none"> • Children • The elderly • Tobacco users • Diabetics • People living with HIV (PLHIV)
	2. To maintain the treatment success rate at 93% till 2020.	
SEARCH, TREAT AND CURE	3. To increase the notification of Multi-Drug Resistant TB (MDR-TB) from 20% in 2015 to 60% by 2020 of the estimated incident of pulmonary TB cases.	<ul style="list-style-type: none"> • Programmatic Management of Drug-Resistant TB (PMDT) • Diagnosis • Treatment (short course, new drugs) • Contact management • Social support • Palliative care
	4. To increase the treatment success rate from 69% to 75% by 2020.	
PILLAR 2: BOLD POLICIES AND SUPPORTIVE SYSTEMS	5. To ensure that TB remains on high political agenda.	<ul style="list-style-type: none"> • Political commitment and resource generation • Public/Private Mix (PPM) • Regulatory framework and rational use of medicines • Vital registration • Partnerships and community development • Infection control and prevention
SUPPORT, CARE AND ENGAGE	6. To ensure that all TB policies are developed by stakeholders and implemented by the NTP by the end of 2020.	
PILLAR 3: INTENSIFIED RESEARCH AND INNOVATION	7. To establish institutional collaboration on TB regarding research priorities in the country by 2020.	<ul style="list-style-type: none"> • Research to optimise implementation and impact
SEEK, KNOW AND APPLY		

The NSP targets and indicators in Table 2 highlights the core impact, outcome indicators and targets of the NSP. Throughout the NSP period, concerted attempts will be made to sharpen the programmes' focus to achieve the set targets, specifically through:

- Enhancing access to WHO-approved rapid diagnostics (WRD) to all presumptive cases;
- Expanding Private Public Mix (PPM) interventions;
- Strengthening collaborations and linkages between national, provincial/regional, and district programmes, and other departments;
- Improving intersectoral collaboration;
- Expanding PMDT to ensure easy accessibility;
- Improving social support for all TB patients;
- Developing a client-focused communication strategy;
- Strengthening research, innovations, and knowledge management;
- Exploring and mobilising mechanisms to raise strategic resources for TB control; and
- Strengthening political commitment.

Table 2. Top Ten Monitoring and Evaluation Indicators (2015 - 2020)

INDICATOR		2015 BASELINE	2016	2017	2018	2019	2020
1A	TB treatment coverage of Drug Susceptible TB (DS-TB)	63%	72%	80%	85%	88%	90%
1B	TB treatment coverage of drug-resistant TB (DR-TB)	20%	21%	30%	40%	50%	60%
2A	TB treatment success rate DS-TB	93%	93%	93%	93%	93%	93%
2B	TB treatment success rate DR-TB	69%	71%	72%	73%	74%	75%
3	% of households that experience catastrophic costs due to TB	NA	Baseline after patient cost survey				
4	% of new and relapse TB patients tested using WRD	NA	20%	30%	40%	50%	60%
5	Latent TB Infection (LTBI) treatment coverage	NA		10%	20%	35%	50%
6	Contact investigation coverage	NA	15%	20%	30%	45%	60%
7A	Drug susceptibility testing (DST) coverage for TB patients (new cases)	1%	8%	10%	25%	35%	50%
7B	DST coverage for TB patients (previously treated)	84%	86%	88%	90%	90%	90%
8	Treatment coverage, new TB drugs	NA	5%	10%	20%	40%	80%
9	Documentation of HIV status among TB patients	4%	3.4%	10%	30%	40%	60%

INDICATOR		2015 BASELINE	2016	2017	2018	2019	2020
10	Case fatality ratio (CFR)	9%	<8%	<7%	<6%	<5%	<5%

Table 3 depicts activities and interventions that should be implemented moving towards TB elimination and reaching the targets integrated into the three strategic pillars.

Table 3. Activities and Interventions towards TB Elimination 2016 - 2020

PILLAR	ACTIONS	INTERVENTIONS
PILLAR 1: INNOVATIVE CARE FIND, TREAT AND CURE	<ul style="list-style-type: none"> Find all DS-TB and DR-TB cases with the emphasis on TB and DR-TB patients seeking care from public and private service providers and undiagnosed TB in high-risk populations. Initiate and sustain all patients on appropriate anti-TB treatment in public and private health care facilities, with patient friendly systems. Empower institutions and human resources with enhanced capacities. 	<ul style="list-style-type: none"> Scale up free sensitivity diagnostic tests and algorithms. Strengthen TB case detection through active and passive case-finding. Conduct universal screening and testing for TB and MDR-TB among rifampicin-resistant and high-risk populations. Treat for ILTBIs in contact of bacteriologically-confirmed cases. Provide free TB drugs for all cases. Ensure a universal daily regimen for patients and rapid scale up of short-course regimens. Build capacity for effective management of the NTP.
PILLAR 2: BOLD POLICIES AND SUPPORTIVE SYSTEMS SUPPORT, CARE AND ENGAGE	<ul style="list-style-type: none"> Strengthen political commitment. Implement systems and provide social support to all TB cases. Prevent the emergence of TB in susceptible populations. 	<ul style="list-style-type: none"> Translate high-level political commitment to action through supportive policy and institutional structures. Prevent the loss of TB cases in the cascade of care with support systems. Scale up effective private provider engagement approaches. Ensure patient-friendly adherence monitoring and social support to sustain TB treatment. Address social determinants of TB through inter-sectoral approach. Eliminate catastrophic costs by linking eligible TB patients with social welfare schemes (e.g., nutritional support for DR-TB and DS-TB). Scale up air-borne infection control (IC) measures at health care facilities Align and harmonise partners' activities with programme needs to prevent duplication.

PILLAR	ACTIONS	INTERVENTIONS
PILLAR 3: INTENSIFIED RESEARCH AND INNOVATION SEEK, KNOW AND APPLY	<ul style="list-style-type: none"> • Develop a coordinated research agenda for the NSP. • Establish a coordinated and funded system of national surveillance to generate periodic estimates of TB statistics in the general population as well as key and vulnerable populations. 	<ul style="list-style-type: none"> • Build supportive structures for surveillance, research, and innovations at national and provincial levels. • Identify and prioritise research gaps. • Strengthen research capacity at the local level. • Share research evidence and emerging best practices to strengthen policy and practices. • Strengthen the stewardship role of governments at all levels for research and knowledge management systems. • Build institutional capacities to promote, undertake and utilise research for evidence-based policy-making in health at all levels. • Develop, implement and institutionalise health research and communication strategies at all levels). • Establish health information exchanges to make up-to-date data widely available.

EPIDEMIOLOGY

In 2015, the total number of cases notified were 331,809 with an estimated incidence of 510,000 (330 - 729) per 100,000 of the population. The country had a treatment success rate of 93% for new and relapse cases, and 82% for retreatment cases. (2)

The TB epidemic is compounded by MDR-TB, with almost 3,059 laboratory confirmed MDR-TB cases and 99 cases of extensively drug-resistant TB (XDR-TB) in 2015. The WHO (3) estimates for MDR- and Rifampicin-Resistant TB (RR-TB) cases among notified pulmonary TB (PTB) cases are 14,000 (11,000 – 16,000). Of these reported cases, 2,553 MDR-TB and 68 XDR-TB cases had started on second-line drugs. In 2015, 4% of new and relapse TB cases had a known HIV result and 59 (<1%) were tested positive; all these cases were started on antiretroviral therapy (ART). (2)

Pakistan ranks fifth among the 30 high TB burden countries in the world, sharing approximately 67% of the TB burden of the WHO's EMR.

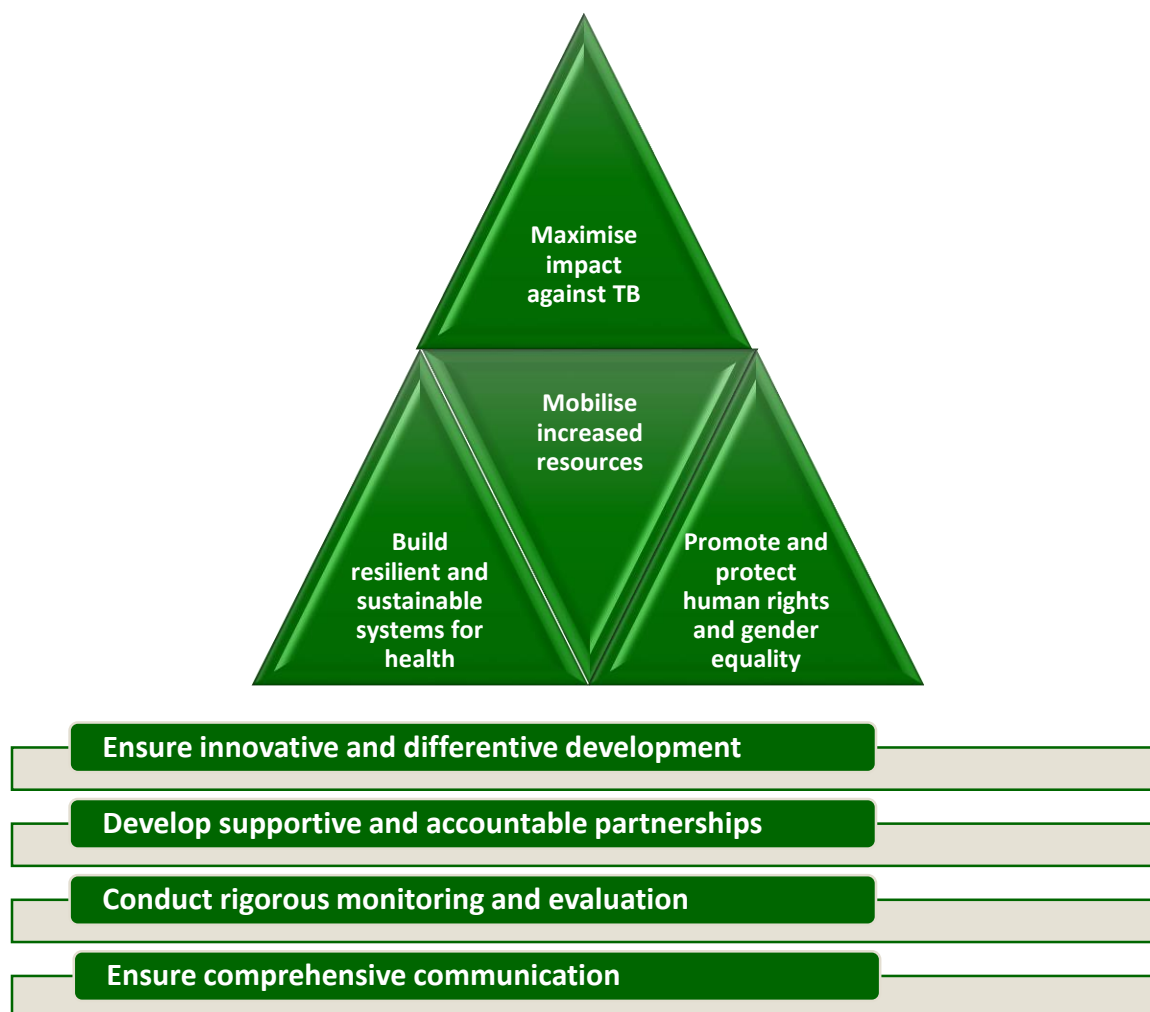
STRATEGIC ENABLERS

Key strategic enablers that underpin the entire NSP and that will determine the success of its implementation are shown in Figure 3 and include:

- Governance and institutional arrangements;
- Effective communication;
- Monitoring and evaluation; and
- Research.

Effective communication is critical for the implementation of the NSP. Social and behaviour change communication (SBCC) is also critical to changing high-risk behaviours and the social conditions that drive the TB epidemics, while at the same time supporting demand for prevention, care, and treatment services. A challenge for communication in a hyper-endemic country is to reach key populations while still ensuring that the general population is well informed and able to prevent and mitigate the effects of TB. Each of the NSP strategic objectives will require major communication efforts at all levels of implementation.

Figure 3. Strategic Enablers



SITUATIONAL ANALYSIS

INTRODUCTION

Ending the TB epidemic in a high burden TB and MDR-TB country like Pakistan will require a paradigm shift: changing the attitude towards the disease. Collaborating within the health sector; working closely with other departments; working with the private sector, civil society, partners, and communities must become “everybody’s business”. Ending the TB epidemic is not merely a biomedical challenge but also a developmental challenge. The global, national, and local responses to ending the TB epidemic must therefore be a part of an inclusive response designed to meet the overall development goals. Progress towards ending the TB epidemic will depend as much on achieving overall health improvement as it will on optimising current strategies, developing new tools and technologies to diagnose, treat and prevent TB, and providing these to all those in need. (4)

Ending the TB epidemic will require an expansion of the scope and reach of interventions for TB prevention, care and control: the institution of systems and policies to promote an enabling environment, shared responsibilities with universal coverage and aggressive pursuit of research and innovation to promote development and use of new tools for TB care and prevention.

By adopting the *Post-2015 Development Agenda*, Pakistan committed to a shared vision of inclusive growth and development ensuring “no-one is left behind”. (5; 6) The *Pakistan Vision 2025, One Nation One Vision* will serve as a critical guide for the development of an effective strategy and road map to address development challenges and poverty. (7) The ultimate goal envisioned is for Pakistan to be one of the 10 largest economies in the world by 2047.

After becoming a participatory member in the Millennium Development Goals (MDGs) in 2002, the government of Pakistan pioneered the establishment of a national public and private mix (PPM) to achieve the MDGs. There are many examples in which PPM was very successful. The family planning programme and school nutrition programs implemented in 29 of the poorest rural districts are some examples of best practices. (8)

These pillars of the vision meet elements of the MDGs and SDGs:

- **Connecting people first:** develop social and human capital and empower women.
- **Growth:** Facilitate sustained, indigenous, and inclusive growth.
- **Governance:** Ensure democratic governance – institutional reform and modernisation of the public sector.
- **Security:** Provide energy, water and food security.
- **Entrepreneurship:** Facilitate private sector and entrepreneurship led growth.
- **Connectivity:** Modernise transport infrastructure.
- **Knowledge economy:** Develop a competitive knowledge economy through value addition.

NTPs should review and modify -- as needed -- the NSP to align with the new strategy and the SDGs. This will require defining the status of the various interventions listed under the strategic directions and subsequent strategies of the NSP.

BACKGROUND

TB is one of the major public health problems in Pakistan, with the country ranking fifth among TB high-burden countries worldwide. Although steady progress has been made from 2001 to improve case detection and treatment success rates, TB continues to be a major public health problem. (9) The WHO-recommended DOTS strategy was piloted and adopted in Pakistan in 1995. Major progress in TB control, however, was only achieved after the revival of the NTP in 2001 when TB was declared a national public health emergency through the “Islamabad Declaration”. (10) The NTP functions MoNHSRC and is responsible for overall coordination, policy direction and technical guidance for TB control, while implementation is the responsibility of the Provincial TB Programmes (PTPs) and district health authorities. (11) Government commitment, coupled with technical leadership resulted in the development of three multi-year strategic plans in the past 15 years. These are described in Table 4.

Table 4. The Development of National Strategic Plans for TB in Pakistan

TIME	REASON FOR REVISION	NSP TARGETS	ACHIEVEMENTS (%)
2001-2005	<ul style="list-style-type: none"> “DOTS” expansion (100% coverage in public sector across the country) 	<ul style="list-style-type: none"> 100% DOTS 70% TB case detection 85% treatment success rate 	<ul style="list-style-type: none"> 100% of DOTS coverage 57% of CDR 95% of TSR
2006-10	<ul style="list-style-type: none"> Stop TB Strategy MDGs Global TB Plan 	<ul style="list-style-type: none"> To reduce, by 50%, the incidence, prevalence and the mortality due to TB 	<ul style="list-style-type: none"> Prevalence - Partially achieved Mortality target achieved
2011-15	<ul style="list-style-type: none"> Revised in 2013 due to Devolution (18th Amendment) 	<ul style="list-style-type: none"> To detect and manage 80% of incident DR-TB cases 	<ul style="list-style-type: none"> 24% of NSP target achieved
2014-17	<ul style="list-style-type: none"> Revised in 2016 due to END TB strategy Aligned with SDGs 	By 2017 <ul style="list-style-type: none"> 71% CDR DS-TB 32% DR-TB enrolment 10% TB patients screened for HIV 32% PPM contribution Optimise and sustain NTP/PTP operations 	By 2016 <ul style="list-style-type: none"> 71% CDR DS-TB 21% DR-TB 4% TB-HIV 27% PPM contribution NTP restructuring done
2017-20	<ul style="list-style-type: none"> Anticipating national population census in 2017 2nd TB Prevalence survey in 2018 	By 2020 (refer to top 10 indicators) <ul style="list-style-type: none"> 90% CDR DS-TB 60% CDR DR-TB 93% TSR DS-TB 75% TSR DR-TB 	

TIME	REASON FOR REVISION	NSP TARGETS	ACHIEVEMENTS (%)
		<ul style="list-style-type: none"> 60% screening for HIV among TB patients 	

The first NSP (2006 - 2010) focused on expanding 100% DOTS in public sector health-care facilities across the country to reach the WHO global targets (i.e., detect 70% of estimated TB cases and 85% successful treatment of detected TB cases). Many strategic interventions specified in the previous NSPs were funded by Global Fund (GF) through the Rounds 2, 6, 8 and 9; the Rounds 6, 8 and 9 grants were merged in a single stream of funding in 2012 which ended in June 2015.

The second NSP (2011-15) targeted the MDGs (i.e., reducing TB prevalence and mortality in 1990 by half in 2015) and focused on the implementation of the six components of WHO's Stop TB Strategy. The second NSP was revised in 2013 because of: (a) changing roles and responsibilities of federal and provincial units due to the devolution of Ministry of Health at federal level under the 18th Constitutional Amendment in 2011; and (b) the revised epidemiological estimates of disease burden in the context of the findings based on the National TB Prevalence (2010-11) and Drug Resistance Surveys (2012-13), that were made available in 2014. (12) Both these developments necessitated the NTP to re-formulate the NSP for 2014-2020, commonly known as "Vision 2020". However, due to transition from the MDGs to the post-2015 development agenda with its SDGs and the launch of the END TB Strategy in 2015, this plan must be re-visited to adopt and adapt the targets and objectives of the NSP 2017-20.

The current NSP (2017–2020) describes the future directions and focus on the work towards TB elimination. The aim 'is to support all provinces/regions in reducing TB mortality and incidence in line with global targets as set in World Health Assembly (WHA) resolution 67.1. The resolution guides countries in addressing persisting and emerging epidemiological and demographic challenges and advancing universal health coverage and robust health systems. (13)

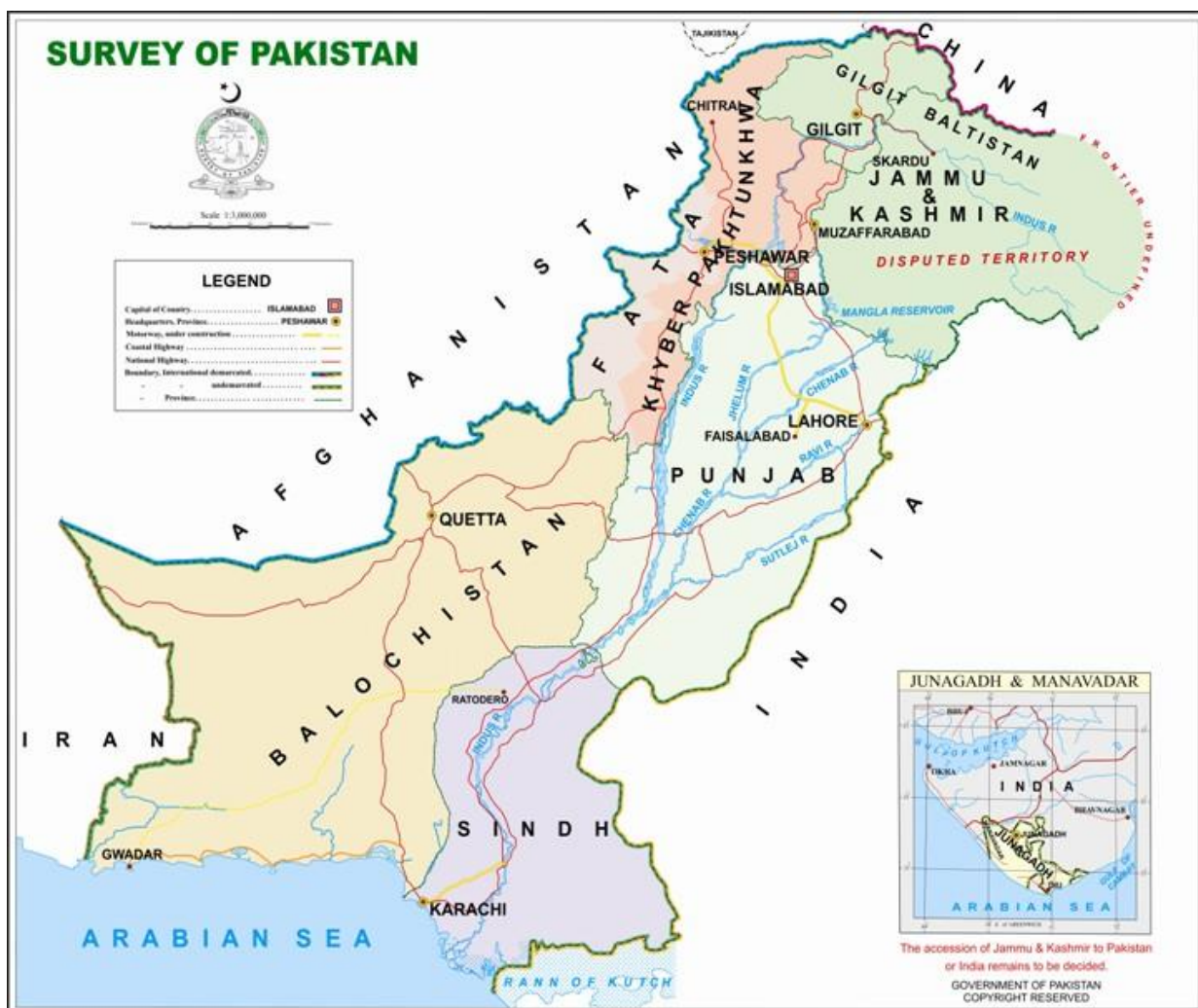
Ending the TB epidemic is part of the UN's new global agenda embodied in 17 SDGs and adopted on 25 September 2015 by the 193 member states. Goal 3.3 of the SDGs aims to end the epidemics of HIV, TB, malaria, and neglected tropical diseases and combat hepatitis, waterborne diseases and other communicable diseases by 2030. (6)

The current NSP will focus on the next three years instead of the usual five years as we anticipate two developments that will necessitate a revision in three years' time. One of these developments is a national population census that was launched in March 2017. New data on population size, age, and density would require adaptation of the programme strategies to respond to the challenges of the new demographic. The second development is the TB Prevalence Survey which is expected to be conducted in 2018.

The NSP 2017 – 2020 outlines a way to address persisting challenges, scale up and integrate TB prevention and care into a wider health and community system approach, including an overall commitment to health systems strengthening and major progress towards universal health coverage.

DEMOGRAPHIC PROFILE

Figure 4. Official Map of Pakistan



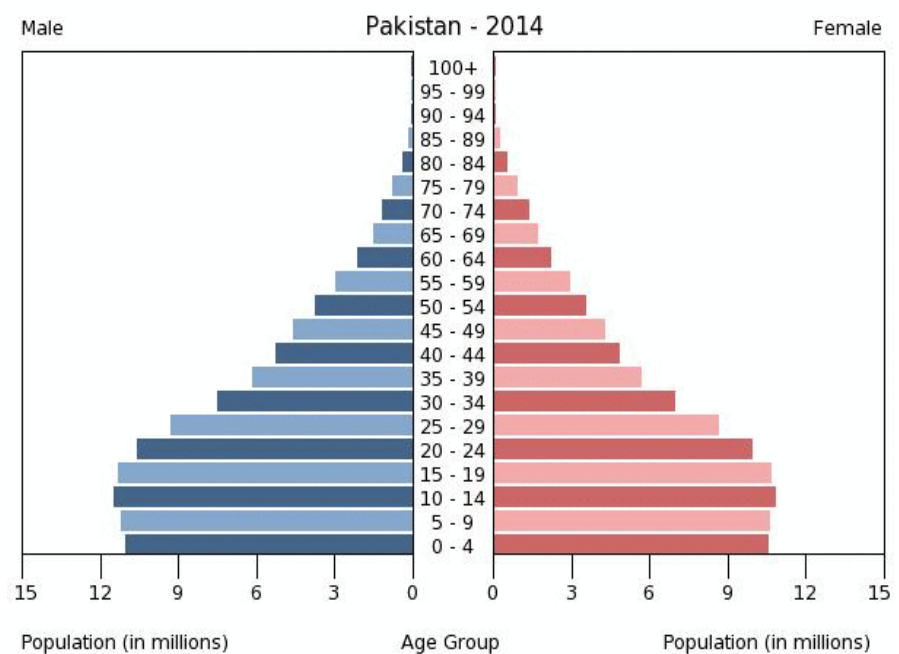
Source: <http://surveyofpakistan.gov.pk/>

Pakistan is strategically located in South Asia and is bordered by Afghanistan, India, Iran and People's Republic of China. Pakistan has five provinces: Balochistan, Khyber Pakhtunkhwa (KP), Punjab, Gilgit Baltistan, and Sindh and three regions or administrative areas Azad Jammu Kashmir (AJK), Federally Administered Tribal Areas (FATA), and Islamabad Capital Territory (ICT).

Urdu is the national language and one of two official languages of Pakistan (the other being English). The country is also home to several regional languages, including Balochi, Balti, Brahui, Burushaski, Dhatki, Hindko, Kashmiri, Khowar, Marwari, Pashto, Punjabi, Saraiki, Shina, Sindhi, and Wakhi. Of these, four (Punjabi, Pashto, Sindhi, and Balochi) are provincial languages.

The last population census was done in 1998. Pakistan is the sixth most populous country in the world with an estimated population of 194,931,848 (January 2017 estimates). This is an increase of 2.10% (4,014,982 people) from the estimated population in 2016. The Pakistan population is projected to reach 199,031,265 at the beginning of 2018 (Country meters, 2017) with an estimated 39% of the population living in urban areas and 61% in rural area. The population density is reported to be 255 per km².

Figure 5. Population Breakdown by Age and Gender



The sex ratio of the total population was 1,033 (1,033 males per 1,000 females) in 2016, which is higher than the global sex ratio of 1,016. The total life expectancy at birth is 66 years with 64.2 years for men and 67.9 years for females..

Table 5. Population per Age Group

0 – 14 YEARS	15 – 64 YEARS	>65 YEARS
35.4%	60.4%	4.2%

GOVERNMENT STRUCTURE

Pakistan has a federal parliamentary government system with a president as head of state and a popularly elected prime minister as head of government. The federation consists of four provinces, one federal capital territory and FATA with their respective governments. The provincial government is headed by the Chief Minister who is elected by members of the Provincial Assembly and assisted by the Provincial Cabinet. The Provincial Cabinet comprises the Ministers and Advisors of various departments (e.g., Development Advisor). The 18th Constitutional Amendment provides complete financial autonomy to the provinces whereby they independently generate resources and manage expenditures. This Amendment also provided for the devolution of more than 17 social sector subjects, including health, from the federal to provincial governments. Although services were devolved, the MoNHSRC was established to coordinate several health functions including the management of public health programmes focusing on TB.

In the post-devolution era, the NTP supports the development of national policies and guidelines, monitoring and reporting of the programmatic and financial achievements to Global Fund and Local Fund Agents (LFAs). Additionally the NTP used international funds to plug the resource gaps both at technical and financial levels. The NTP plays a larger role in coordination than implementation at provincial level but is responsible for the implementation of the NTP in the allied regions and the ICT and provides technical assistance (TA) to the provinces and regions. The NTP also coordinates international donors and partners, and provincial and regional TB programmes and other in-country stakeholders.

The commitment to achieve the health goals has become more challenging post-devolution as many areas where federal roles were crucial have been left vacant. In addition, the devolution of the health sector poses many questions in terms of the capacity of provinces for health planning and regulation of policies, strategic direction and leadership, health information generation, human resource development, and international agreements with donors.

ECONOMY

Pakistan is a lower-middle income country, having, primarily an agrarian economy, with diverse cultural and geographical patterns. Pakistan's Human Development Index value for 2015 is 0.550— which puts the country in the medium human development category and positions it at 147 out of 188 countries and territories. (14)

According to Pakistan's first official report on multidimensional poverty (released in 2016), nearly 39% of Pakistanis live in multidimensional poverty, with the highest rates of poverty in FATA and Balochistan. Pakistan's Multidimensional Poverty Index (MPI) showed a significant decline, with national poverty rates falling from 55% in 2004 to 39% in 2015. However, progress across different regions of Pakistan is uneven. Poverty in urban areas is 9.3%, while rural areas display 54.6% of poverty levels. Disparities also exist across provinces. The

The 18th Amendment provides complete financial autonomy to the provinces with regard to generating resources and managing expenditures. This 18th Amendment also provided for the devolution of more than 17 social sector subjects (including health) from the federal government to provincial governments.

report found that more than two-thirds of people in FATA (73%) and Balochistan (71%) live in multidimensional poverty. Poverty in KP stands at 49%, Gilgit Baltistan and Sindh at 43%, Punjab at 31%, and Azad Jammu and Kashmir at 25%.

The annual per capita health expenditures for Pakistan as per National Health Accounts (NHA) 2014-15 is USD 39.4 and spending on the health sector is 2.6% of the gross domestic product (GDP) in contrast to the desire minimum expenditure of 6%. This inequality in wealth distribution creates a severe impact on diseases among the poor among which TB is the lead communicable disease. (15)

The (GDP is the monetary value of all the finished goods and services produced within a country's borders in a specific period. (16) The GDP in Pakistan was worth 271.05 billion USD in 2015. The Gross National Product (GNP) in Pakistan increased to 12,465,443 PKR million in 2015 from 11 781,022 PKR million in 2014. The external debt in Pakistan averaged 51354.99 USD million from 2002 until 2016 (figure 6) (17). Agriculture is the mainstay of Pakistan's economy, employing more than 40% of the population.

Cotton, wheat, rice, sugarcane, Figure 6. GDP of Pakistan fruits, vegetables, and tobacco are

the chief crops, and cattle, sheep and poultry make up husbandry. There is also a fishing industry. Most of Pakistan's agricultural output comes from the Indus basin. The country is now self-sufficient in food, as vast irrigation schemes have extended farming into arid areas and fertilisers and new varieties of crops have increased yields. The annual cost of Pakistan's imports usually exceeds its



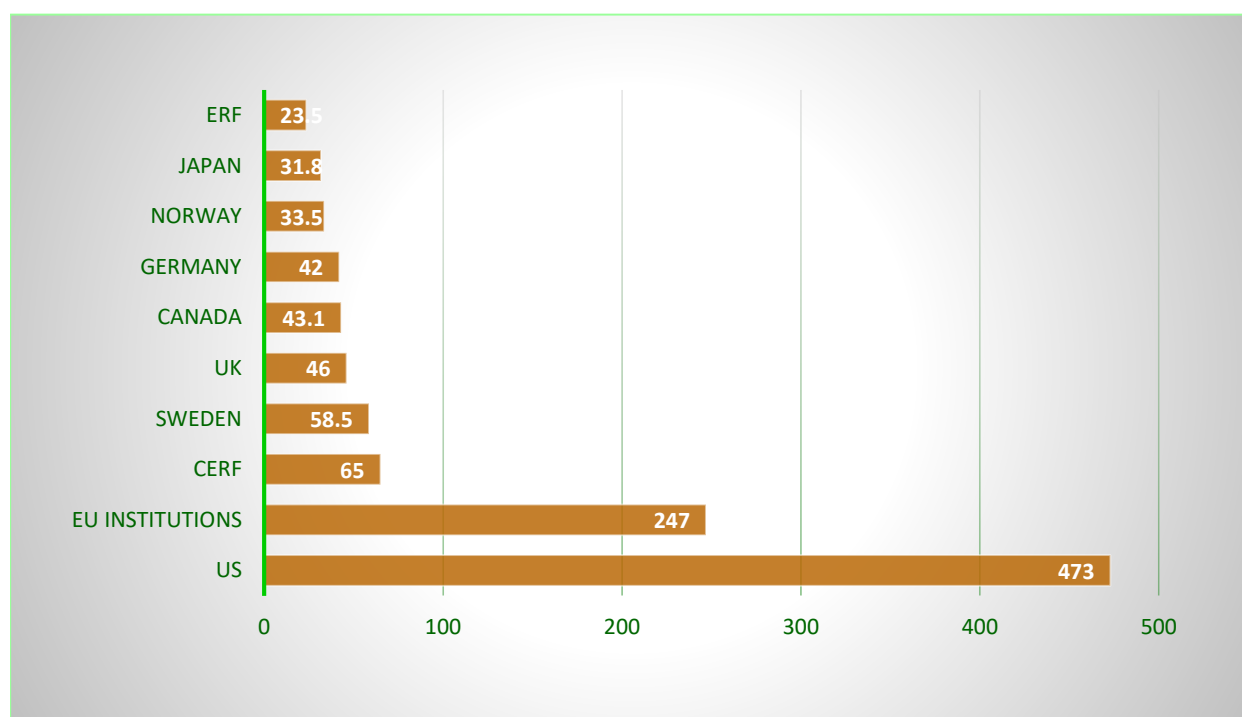
earnings from exports. The chief imports are petroleum, machinery, plastics, transportation equipment, edible oils, paper, iron and steel, and tea. Exports include textiles and clothing, rice, leather and sporting goods, chemicals, and carpets. The chief trading partners are the United States, the United Arab Emirates, Saudi Arabia, and China. (18)

Pakistan has a reasonably developed transport infrastructure. The transport and communications sector accounts for about 10% of the country's GDP. An estimated 55% of the population have access to electricity while the rest of the population uses alternative sources of power (e.g., oil). (19) Key challenges include water, energy, food security, a huge infrastructure deficit, issues pertaining to climate change, and leveraging world trade and markets. (20)

HEALTH FUNDING AND EXPENDITURE

According to the United Nations (UN) Office for the Coordination of Humanitarian Affairs (OCHA)'s Financial Tracking Service (FTS), USD 59 million comes from domestic funding from the Government of Pakistan. Of the total funding in 2015, donors have committed/contributed USD 221 million of humanitarian assistance to Pakistan. The UN-coordinated Pakistan Humanitarian Strategic Plan 2015 requested USD 434 million from donors to respond to humanitarian needs in the country. It is currently 37% funded at USD 160 million. Fourteen percent (USD 29.9 million) of humanitarian funding to Pakistan in 2015 was allocated to the health sector. The United States donated the largest sum to Pakistan in 2015, contributing 30% (USD 66.6 million) of total current funding. (21)

Figure 7. International donors to Pakistan, 2012–2015 (USD) Projected in USD millions



Development Initiatives based on UN OCHA FTS data. Data downloaded 29 June 2105
(CERF: Central Emergency Response Funds; ERF: Emergency Response Funds; EU: European Union)

Most TB funding is provided by the GF, which has, from 2004 to 2015, signed total grants of USD 309.1 million (TB: USD 214.8 million; malaria: USD 56.9 million; and HIV/AIDS: USD 37.5 million).with the Pakistan Government. The country has been allocated USD 255 million under the New Funding Model (NFM) for 2015 to 2017. Approximately 2.5% of the allocated amount is for support for Health Systems Strengthening (HSS). Despite the availability of free anti-TB drugs, patients struggle with out-of-pocket payments with catastrophic consequences and great income loss. (22) Most Pakistanis are in the lower middle class making costs associated with TB treatment is a key concern.

Since 75% of TB patients in the working force are between 19 and 50 years, TB has far-reaching economic and social consequences for the patients, their families, and communities. Studies indicate that patients spend a lot for treatment from conventional, under-qualified general health practitioners and

conventional medicine practitioners. On TB diagnosis, patients are forced to confront socio-economic constraints, including unemployment. This tempts patients to hide the disease from colleagues and employers. The average direct cost of TB treatment per month is Rs1500 -1800 (USD 15 - 18). The majority of patients are earning much less than the estimated cost. These economic factors may ultimately lead to malnutrition, which is itself a risk factor of non-compliance.

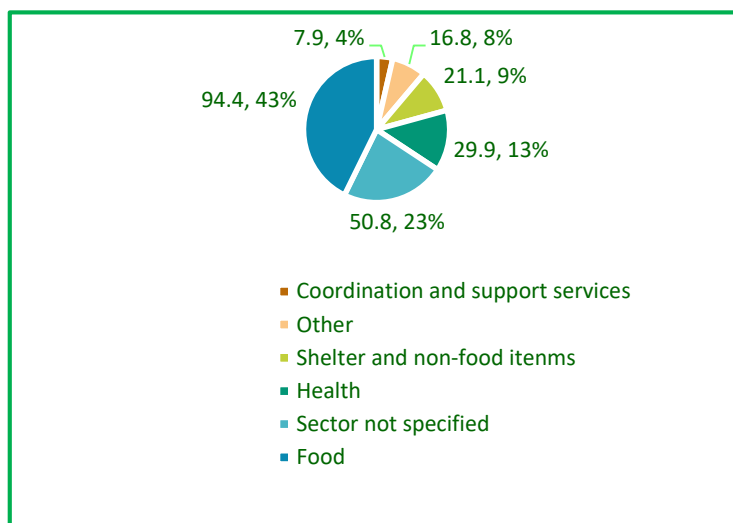
Public health spending provides an important insight on a country's health progress, if efficiently used.

Foundations, societies, individual philanthropists, community associations, Islamic organisations, and individuals contribute to financing health care in Pakistan. According to data from the World Bank, Pakistan spends USD 39.4 per capita on health; this expenditure is lower than the WHO's prescribed minimum spending package of per capita USD 44. The total public health expenditure as percentage of GDP has increased to 0.45% in 2016. (23)

A NFM grant was approved for July 2015 to December 2017, with total budget of USD 140 million for the NTP. Using the Pakistani

NSP as a foundation, people responding to and those affected by the disease participate in an ongoing conversation about the best way to invest these funds. The resources in terms of finances as well as commodities/products are distributed through the implementing partners. A significant portion of the budget (~80%) has been allocated to purchase first- and second-line anti-TB drugs, up-gradation/equipment and social/food support, which are being managed by the PR as per GF Guidelines. (7) The federal government announced a budget of Rs24.951 billion (USD 237 million) for the MoHSRC under the Public Sector Development Programme for fifteen ongoing schemes and three new schemes in 2016-17. The federal government will continue to support the provincial governments for the national health and population welfare programmes. The federal government also allocated Rs2 billion (USD 211 million) for the scheme under PSDP for the fiscal year 2016-17. The scheme will be launched in 23 districts to provide coverage for hospitalisation for several diseases and in this regard, the government has decided to provide loans on soft terms and conditions to these hospitals. The hospitals will be able to upgrade health-care facilities with the help of loans, which can be repaid from the budget next year. A total of Rs10,195 billion (USD 96, 85 million) would be spent on hospital services, and Rs1.467 billion (USD 13, 94 million) on health administration while only Rs28 million (USD 266 million) would be used to purchase medical products, appliances, and equipment.

Figure 8. Expenditure by Programme Area

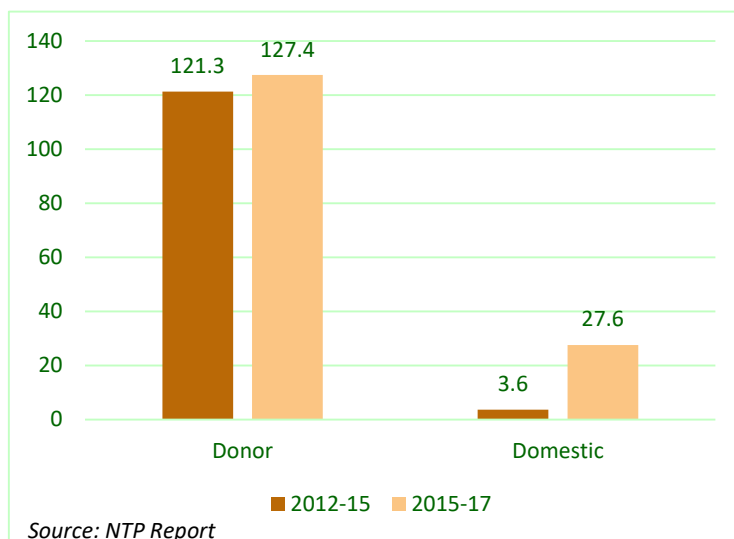


Development initiatives based on UN OCHA FTS data. Data downloaded 29 June 2015. Note: 'Other' includes economic recovery and infrastructure, education, water and sanitation, protection/ human rights/ rule of law agriculture. IASC: Inter-Agency Standing Committee.

There are three principal recipients of the Global Fund grant for TB in Pakistan under New Funding Model viz; NTP – 71,681,713, The Indus Hospital: 39,716,566, Mercy Corps (USD 11,177,617.

All these principal recipients of GF funding through the NFM, and will contribute towards achieving the NSP targets to reduce TB and MDR-TB in Pakistan.

Figure 9. Financing Trends for TB Control in Pakistan



The PFM in Pakistan has achieved milestones in the past years. The most significant may be the development of a centralised and advanced financial reporting system supported by the World Bank through the Pakistan Improving Financial Reporting and Audit Project. To end poverty and achieve shared prosperity, the PFM has to find ways of helping the country by getting the most out of limited resources, and to enhance investors' confidence by making an impact

on the lives of people through better service delivery and a balance between development and recurrent budget.

HEALTH PROFILE

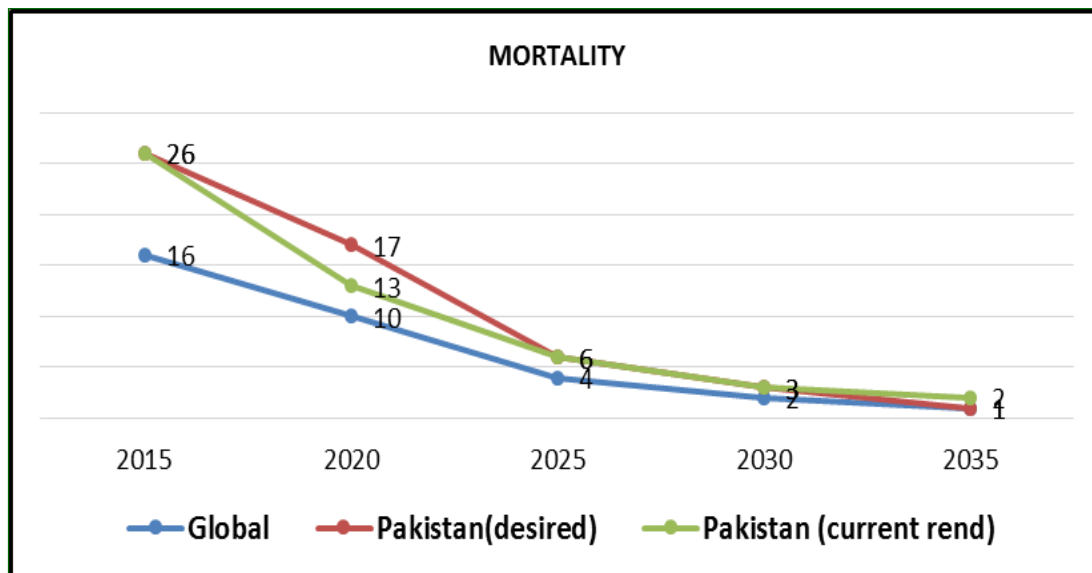
Pakistan falls under the WHO's EMR. The estimated birth rate is 22.3 births (per 1,000 population), mortality rate 6.4 (per 1,000 population) (24), under-5 mortality rate (81 per 1,000 live births), and the maternal mortality rate per 178 per 100,000 live births in 2015. The total life expectancy at birth is 66 years with 64.2 years for men and 67.9 years for females. Although Pakistan has a high TB burden, it is a low HIV prevalent country with an estimated 100,000 PLHIV.

The main causes of death reported in 2015 include ischemic heart disease (8%), cancer (8%), lower-respiratory infections (8%), stroke (6%), diarrheal diseases (6%), neonatal encephalopathy (5%), chronic obstructive pulmonary disease (5%), **TB (5%)**, pre-term birth complications (4%), and diabetes (3%). The main causes of neonatal deaths are prematurity (36%), birth asphyxia and birth trauma (23%), congenital anomalies (6%), pneumonia (5%), tetanus (3%), injuries (3%), sepsis and infectious diseases (2%), diarrhea (1%), and other (4%) (25). Communicable diseases have always been the prime cause of mortality in Pakistan. Pakistan is one out of two countries where polio endemic exists. Other communicable diseases that cause mortality are acute respiratory infection (51%), viral hepatitis (7.5%), malaria (16%), diarrhea (15%), and Deputysentery (8%). (26)

Like other South Asian countries, health and sanitation infrastructure is adequate in urban areas but is generally poor in rural areas. The provincial and district health departments, parastatal organisations,

social security institutions, non-governmental organisations (NGOs), and private sector finance provide services mostly through vertically managed disease-specific mechanisms. The country's health sector is marked by urban-rural disparities in health care delivery and an imbalance in the health workforce, with insufficient health managers, nurses, paramedics and skilled birth attendants in the peripheral areas.

Figure 10. Current and Desired Mortality Rates Compared to Global Mortality Rate



As of 2016, there were 184,711 doctors, 16,652 dentists, and 118,869 hospital beds in the country. The ratio of 1 doctor per 1,038 persons, one hospital bed for 1,613 person and one dentist for 11,513 persons shows clear inadequacies, particularly in case of dentists and hospital beds. (27) Based on a threshold of 4.45 skilled health professionals per 1,000 population, the estimated needs-based shortage of health-care workers globally is approximately 17.4 million of which almost 2.6 million are doctors and more than 9 million are nurses and midwives. If current trends continue, the global needs-based shortage of health-care workers is projected to be more than 14 million in 2030. (28) The urban/rural comparison for the provinces shows that Sindh has the highest percentage of urban health care providers (71%) followed by Balochistan (41%), Punjab (36%) and KP (29%).

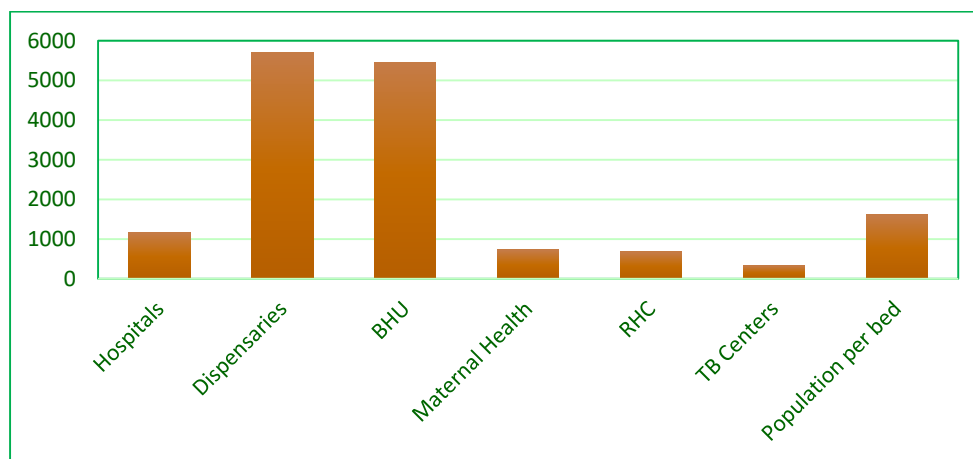
Table 6. Medical Workforce of Pakistan

HEALTH WORKFORCE	2011 - 2012	2012 - 2013	2013 - 2014	2014 -2015	2015 - 2016
REGISTERED DOCTORS	152,368	160,880	167,759	175,223	184,711
REGISTERED DENTISTS	11,649	12,692	13,716	15,106	16,652
REGISTERED NURSES	77,683	82,119	86,183	90,276	94,766
POPULATION PER DOCTOR	1,162	1,123	1,099	1,073	1,038
POPULATION PER DENTIST	15,203	14,238	13,441	12,447	11,513
POPULATION PER BED	1,647	1,616	1,557	1,591	1,613

Pakistan Bureau of Statistics (2015)

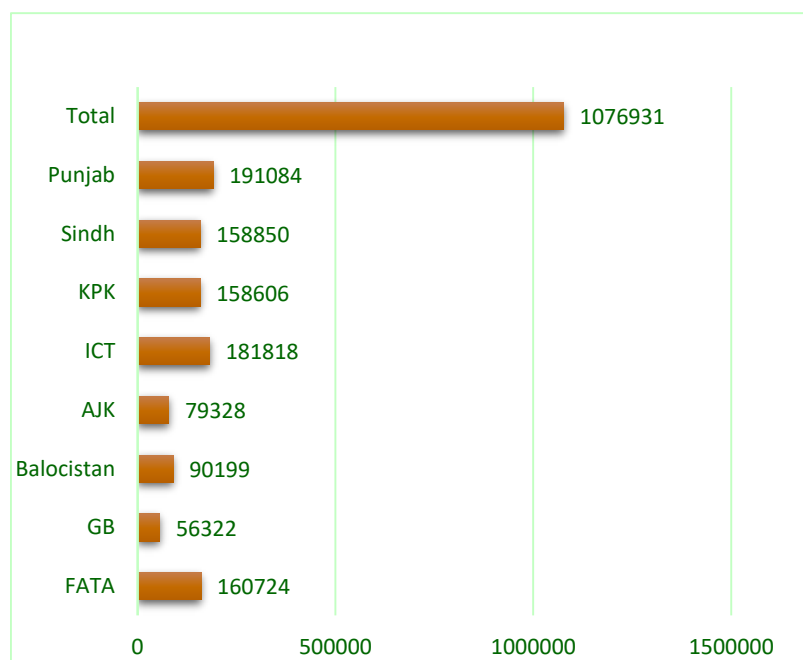
The public sector caters for approximately 25% of the population in the provision fo curative care for minor ailments. Various types of general and specialised hospitals provide health services in public sector. There is a network of primary health care outlets including Rural Health Centers (RHCs), Basic Health Units (BHUs), dispensaries and Maternity and Child Health (MCH) Centers in addition to secondary and tertiary care facilities in a district that are all managed by the provincial departments of health. Each district generally has one District Headquarter (DHQ) Hospital, three to four Tehsil Headquarter (THQ) Hospitals, 10 to 15 Rural Health Centres (RHC) and 50 to 100 Basic Health Units (BHU). The Executive District Officer Health (EDOH) is in charge of all preventive, promotional, and curative health programs and services. In 2015 Pakistan had 1,167 hospitals, 5,695 dispensaries, 5464 BHUs, 733 MCH services, 675 RHCs and 339 TB centers with a total of 118,869 beds (1,613 population per bed).

Figure 11. Health Care Centers Pakistan



Although we see an overall 14% increase in the number of health facilities, this is not sufficient to provide adequate health services to the population at large. Moreover, the primary and secondary health units

Figure 12. Population Served per Basic Management Unit, Pakistan 2015



focus on basic health care and lack the ability to provide specialised care. With approximately 40% of the population living below the poverty line it is evident that costly private health facilities are out of reach of the poor, meaning that the already overburdened health units will be further pressurised. In 2016 the federal government announced that 46 new hospitals will be built and fully funded before the end of the present government's tenure.

There are more outpatient service providers (public and private) than 'Hospitals' and 'Laboratories and diagnostic service providers'. The tertiary

care units in Pakistan are overburdened. It is estimated that there are 125 large hospitals and 4,255 small hospitals in Pakistan.

The average population coverage by one BMU and its correlation with the population density in the different provinces and regions is depicted low. The variation in numbers of BMUs among the provinces explain the fluctuation in case notification as shown in Figure 12.

Other public sector institutions such as armed forces, police, railways, the Fauji Foundation (providing employment and welfare benefits to Pakistani ex-military personnel and their dependents), municipal authorities, employees' social security institutions, railways and departments of police also provide health care. The parastatal health care facilities are autonomous bodies that provide free care to employees and their dependents. More than 50 hospitals and health-care centers are managed by Pakistan Armed Forces which provide mostly specialised facilities. Social Security manages a chain of 50 hospitals and health centers in the country, and Fauji Foundation has almost 70 hospitals and health centers. These health facilities have an enormous potential to contribute to TB care delivery in the country.

The private sector comprises of qualified and unqualified service providers in the disciplines of allopathy, homeopathy and *tibb* (traditional herbal medicine). Qualified providers include the not-for-profit NGOs as well as for-profit private sector institutions, and individual practitioners. The not-for profit NGOs range from small-scale local setups to a countrywide network of health outlets such as Punjab Rural Support

Programme (PRSP) or People's Primary Healthcare Initiative (PPHI) (managing about 4,000 primary health care facilities in the country). The technical and managerial capacity of the NGOs varies widely. In context of TB control services there is a vast network of health centers countrywide, being managed by the Pakistan Anti-TB Association (PATA), which are exclusively providing TB care services.

The inclusion of TB as part of the curricula for under-graduate medical and nursing students have been developed by the NTP but still needs to be approved by Pakistan Medical & Dental Council (PMDC) and Pakistan Nursing Council (PNC) to be included in their syllabi for continued medical education.

HEALTH PRIORITIES AND HEALTH POLICY

The federal and provincial governments have adopted the National Health Vision (NHV) for Pakistan. The NHV provides a road map to improve the health of all Pakistanis — particularly women and children — by improving universal access to essential health services. The NHV also brings the country's provincial and federal health policy frameworks in line with international health treaties, commitments and regulations, to which Pakistan is a signatory. (29)

The health vision also includes a monitoring and evaluation (M&E) mechanism, conducted through an inter-provincial health and population council. The council is responsible for overseeing the Vision's implementation and will endorse reports that will be presented to parliament on an annual basis. (29)

Pakistan has launched the Prime Minister's National Health Insurance Programme (PMNHIP), which aims to provide health insurance to poor families in 23 districts. The PMNHIP, launched in December 2015, supports families living below the poverty line (less than Rs3, 030 (USD 29,78) per month). Such families receive treatment for the amount of Rs300, 000 (USD 4,200) per year and the amount is doubled in cases of emergencies. Special cards are issued to families for insurance. According to the latest estimates based on the Cost Basic Needs (CBN) 2013-14, using the Household Integrated Economic Survey data, 29.5% of the population lives below the poverty line which translates to approximately 55 million people. (30)

The past few years saw an improvement in the health-care delivery system in Pakistan. Health policies were developed, vertical programs initiated, PPM partnerships established, human resources developed, and infrastructure improved through establishment of BHUs and RHCs. After WHO's Alma Ata Declaration in 1986, the paradigm of health care shifted to primary health care (PHC). This resulted in provision of PHC services in all urban populations with 70% of rural populations having access to health facilities within five kilometers. One of the biggest strengths of the health-care system is that it has committed to participate in the SDGs and MDGs. After re-structuring the national health policy in 2001, PHC was an essential component of all health policies. Due to these changes, the government started the implementation of vertical programs for preventive approaches like the Expanded Programme for Immunisation, and strengthening the MCH project by training LaDeputy Health Workers (LHWs) to improve the health status of the population. (31)

The NHV is aligned with the Ministry of Planning, Development & Reform's Vision 2025, and international health priorities to achieve universal health coverage.

In spite of major improvements, there are still weaknesses in the system, which is hindered by poor governance, lack of access and unequal resources, poor quality of the Health Management Information Systems(HMIS), corruption, and a lack of trained staff. As evidenced by literature, health facilities in Pakistan have flourished but most of them have poor management, poor quality of health, shortage of resources, drugs, trained staff, unavailability of female staff, absenteeism of staff, most of the assigned doctors are busy in their private practice because of lack of incentives to improve performance. (32)

The lack of governance in the Pakistani health services has resulted in poor implementation and evaluation of health planning and policies. Most public health facilities are not providing satisfactory care, which compels people who can afford it to use the expensive private facilities which are generally out of reach for poor. (32)

**The National Health Policy of 2001
acknowledged that good governance
is the key to achieving quality of
care.**

Most of the Tehsil hospitals are in urban areas and people in remote areas depend upon BHUs and RHCs, which often have poor infrastructure. Consequently, many people avoid public facilities like the BHUs and RHCs and many rural people are diverted to the tertiary care hospitals. The distance to health services and dearth of transportation with poor roads hinder access to these services. Moreover, it is also found that public sector in Pakistan is under-used because of weak human resources, lack of health education, lack of openness, and cultural gaps. These factors make it a nightmare for many people visiting BHUs. (31)

Provincial health system reforms are needed to adjust to the country's needs and requirements, focusing mainly on primary health care as well as investing in advanced health care. Training for staff is urgently required to ensure skills in clinical practice, leadership, planning, and monitoring. Provinces must focus on preventive programs like immunisation and TB.

Strong M&E activities will support the smooth running of programmes. Integration of health activities at provincial and district level to maximise the use of resources and avoid duplication is also necessary. The private sector – especially NGOS – must be streamlined. For example, the private sector can take active part in social insurance schemes. There are many opportunities for improvement, but these must be identified and leveraged to improve service delivery with the goal of universal health coverage. (33)

Table 7. Implementation of GF's TB Control Partners in Pakistan during 2015-16

IMPLEMENTING ENTITY	STAKEHOLDERS/PARTNERS		GEOGRAPHICAL COVERAGE
NATIONAL TB CONTROL PROGRAMME (NTP)	Public sector	<ol style="list-style-type: none"> 1. Provincial TB Control Program (PTP) Punjab 2. Provincial TB Control Program (PTP) Khyber Pakhtunkhwa 3. Provincial TB Control Program (PTP) Sind 4. Provincial TB Control Program (PTP) Baluchistan 	All (148) Districts
	Private sector	<ol style="list-style-type: none"> 1. GSM (Green Star Social Marketing) 2. Association for Social Development (ASD) 3. Association for Community Development (ACD) 	
THE INDUS HOSPITAL (TIH)	<ol style="list-style-type: none"> 1. The Indus Hospital (TIH) 2. Community Health Solutions (CHS) 		26 Districts
MERCY CORPS (MC)	<ol style="list-style-type: none"> 1. Association for Community Development (ACD) 2. Association for Social Development (ASD) 3. Bridge Consultants Foundation (BCF) 4. Marie Adelaide TB & Leprosy Control (MALC) 5. Pakistan Lions Youth Council (PLYC) 6. Strengthening Participatory Organization (SPO) 		75 Districts

The public and private sectors do collaborate. (34) PPM partnerships aim to improve health coverage, quality and infrastructure of health care, as well as raising the demand for health by the community. PPMs create long-term, task-oriented, and formal relationships among the public and private sectors by sharing their core competencies and resources. For example, joint decision-making and innovative interactions provide sustainable improvements in the provision and enhanced utilisation of health care services.

Currently PPMs in Pakistan are not strategically placed to address health care issues. The public sector attempts to provide free health care to all Pakistanis, but due to inappropriate allocation of resources and insufficient budget, it is unable to deliver on this promise. It is estimated that the private sector provides 70% of health care services in Pakistan, with expenditure burden on patients' pocket. (8) Mercy Corps has been operating in Pakistan since 1986, when it began providing humanitarian assistance to Afghan refugees in Baluchistan province. Since then, Mercy Corps' activities have expanded throughout the country. Mercy Corps has been the PR for several GF rounds in Pakistan for TB Control. In 2010, Mercy Corps started implementing PPM interventions, which enhanced the coordination between public and private sectors to increase TB case detection in the country. It also ensured that standard diagnosis and treatment were provided to TB patients. Since July 2015, the PPM interventions, under the GF grant, have been scaled up in 75 districts along with new initiatives such as a voucher scheme for consultation and laboratory testing fees. The focus of interventions has been shifted to enhanced case detection through innovative approaches such as mobile health (mhealth) technology.

The GF-supported programs in Pakistan have parallel and vertical systems, which have resulted in inefficiencies in supply chain and support functions. Despite having common functions, there is little or no coordination among the three disease programmes in terms of supply chain management, distribution, and logistics management information systems (LMIS). There is also little collaboration between the TB and HIV programmes on case detection, diagnosis, and treatment. (35)

Since the devolution of services in Pakistan, the country has experienced challenges related to Human Resources for Health (HRH) including rural/urban maldistribution of health workers; weak HRH management systems; shortage of staff, mostly in rural areas; “brain drain” of skilled health workers to other countries; a non-regulated private sector that operates primarily in urban areas; tenuous quality control and standardisation of care; health information systems that exclude HRH; and absence of a coordination mechanism for HRH stakeholders. The reorganisation of the HRH regulatory function and establishment of linkages and coordination between the Federation and the provinces to develop and implement HRH policies and decisions is problematic. (36)

TUBERCULOSIS CONTROL PROGRAMME

TB BURDEN AND EPIDEMIOLOGY

Global Perspective

TB remains a major public health problem globally. Approximately one third of the world's population (two billion people) is infected with Mycobacterium TB (MTB), though not everyone shows signs of the disease. (2)

There were an estimated 10.4 million new (incident) TB cases reported in 2015 worldwide, of which 1 million (10%) were found among children. People living with HIV (PLHIV) accounted for 1.2 million (11%) of all new TB cases. India, Indonesia, China, Nigeria, Pakistan and South Africa accounted for 60% of all new cases. The rate of decline in TB incidence remained at 1.5% from 2014 to 2015. In 2015, an estimated 480,000 new cases of MDR-TB and an additional 100,000 people with RR-TB who were eligible for MDR-TB treatment were found. There was an estimated 1.4 million TB deaths in 2015, and an additional 0.4 million deaths resulting from TB disease among PLHIV. Although the number of TB deaths fell by 22% between 2000 and 2015, TB remained one of the top 10 causes of death worldwide in 2015. (2)

Between 2000 and 2015, TB treatment averted 49 million deaths globally. In 2015, 6.1 million new TB cases were reported to WHO. Notified TB cases increased mostly due to a 34% increase in notifications. In 2015, of the estimated 580,000 people newly eligible for MDR-TB treatment, only 125 000 (20%) were enrolled. Globally, the MDR-TB treatment success rate was 52% in 2013. In 2015, 55% of notified TB patients had a documented HIV test result. The proportion of HIV-positive TB patients on ART was 78%. A total of 910,000 PLHIV were initiated on ART in 2015, as well as 87,000 children under the age of five (7% of those eligible).

The new NSP provides for universal access to TB services through expanding TB DOTS and case detection by all types of health care providers, including the large, and currently unregulated private sector.

(2) The MDG target of halting and reversing TB incidence by 2015 was achieved globally. (2)

TB in Pakistan

Pakistan ranks fifth among the 30 high TB burden countries in the world, sharing approximately 67% of the TB burden of EMR area of the WHO. In 2015 the total number of notified cases was 331,809 with an estimated incidence of 510,000 (330 - 729) per 100,000 of the population. The country had a treatment success rate of 93% for new and relapse cases and 82% for re-treatment cases. (2)

The TB epidemic is compounded by MDR-TB, with almost 3,059 laboratory confirmed MDR-TB cases and 99 cases of XDR-TB in 2015. Of these 2,553 MDR-TB and 68 XDR-TB cases had started second-line drugs. In 2015, 4% of new and relapse TB cases had a known HIV result and 59 (<1%) were tested positive; all were initiated on ART. (2)

The previous NSP targets for one of the outcome indicators (DS-TB case notification) were achieved. The remaining two indicators (“MDR-TB case notification and proportion”, and “cases notified through PPM of HIV screening among TB cases”) were not reached. Access to TB care has expanded substantially, and nearly 3.3 million TB patients have been treated free of cost with quality assured anti-TB drugs since inception of NTP in 2001.

The estimated mortality rate for TB (excluding TB/HIV co-infection) in 2015 was 23 (4.9 - 56) per 100,000 of the population. For TB/HIV co-infection it was estimated as 0.82 (0.6 - 1.1) per 100,000 of the population. (2)

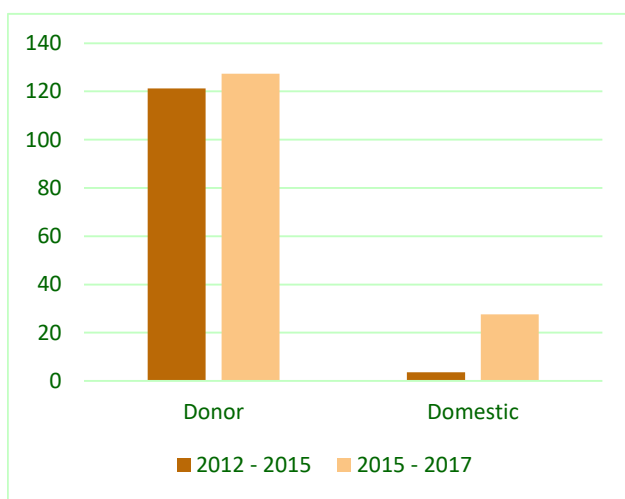
FUNDING FOR TB CONTROL IN PAKISTAN

Political commitment and resource generation: The proportion of domestic to donor funding for TB in Pakistan during the years of SSF and NFM grant periods remained 4% and 22% respectively with approximately a 14-fold increase in domestic support in 2015-17 from 2012-15 as shown in Figure 13. However, donor support showed a slight increase in NFM grant as compared to the SSF grant for TB in Pakistan. The graph shown in Figure 15 shows that GF funding for TB in Pakistan has shriveled gradually during the years 2013 to 2016. The high dependence on donor inputs (85%) is a caution to NTP/PTPs to work in parallel and access an equitable contribution from the public sector funding.

PC-1 funds that have been used for TB control in Pakistan is not satisfactory, mainly due to inadequate and delayed releases of the annual allocated amount. Almost no funds have been allocated in the new provincial and federal PC-1s for management of DR-TB (e.g., for second-line anti-TB drugs, GeneXpert

machines and cartridges, and social support for patients. All these components have been supported through the GF grant creating more donor dependence. More than 95% of the human resources provided through the public sector comprise support staff; in contrast, more than 95% of the human resources provided through donor support are technical staff, which has high cost implications and thus jeopardises sustainability. (37)

Figure 13. Donor and Domestic Contribution (Million USD) for NTP Pakistan 2014-17



National TB Control Programme Pakistan 2015

Table 8. Public Sector Funds for National TB Control Program, 2011-17 (Million PKR)

Political Commitment and Domestic support (2011-17)				
Province/ State/ Region	Domestic support (million PKR)			
	PSDP (2011-14)		PC-1 (2015-18)	
	Amount	% contribution	Amount	% contribution
PJB	192.606	53%	1340.98	49%
SNDH	77.784	22%	619.00	22%
KP	48.153	13%	285.00	10%
BAL	23.124	6%	177.27	6%
GB	9.261	3%	90.00	3%
FATA	9.261	3%	186.83	7%
NTP+ICT	0	0%	52.53	2%
AJK	0	0%	11.7	0%
Other SRs	0	0%	0	0%
TOTAL	360.189	100%	2763.31	100%

Source: National TB Control Programme Pakistan 2015

ORGANISATION OF THE NATIONAL TB PROGRAMME (NTP)

NTP Management Structure

The NTP was revived in 2001 when TB was declared a national emergency. The NTP, with the support of PTPs is responsible for TB care and control activities that are integrated into PHC at district level. The structure and functions of different levels of TB care and control in the country changed after the devolution in 2011.

The NTP has defined roles and responsibilities at national, provincial and district levels. Donors support most of the technical and administrative staff at national and provincial levels. The NTP has strengthened the PTPs by shifting resources and delegating responsibility, skills, and authority. (37)

TB care and management has become an integral part of health care at all levels starting from district hospitals to PHC facilities, and among community health workers. This integration has made it possible to plan and carry out TB control in a district without the addition of TB-specific care delivery staff. The district TB team is primarily responsible for advocating, planning, financing, implementing, and monitoring TB care services in their respective districts.

Management of the NTP

The MoNHS has led the health sector since the devolution when more autonomy was given to the provinces and districts. Since 2013 the NTP has reported to the MoNHSRC. (7) According to the operational regulations laid out during the devolution, international donor funded projects are affiliated with the

Economic Affairs Division. Funds are disbursed to the relevant departments that are responsible for the management of the funds and implementation of the funded activities. The NTP facilitates donor liaison at the national and international levels.

The NTP is the central coordinating body that conducts disease surveillance and impact evaluations to guide the development of national policies and guidelines. They are also responsible for monitoring and reporting the country's programmatic and financial achievements, and for maintaining national stewardship and fulfilling global commitments such as the SDGs and END TB goals.

The implementation of DOTS services was achieved in 2005. The NTP is integrated with PHC at the district level. In each district there is a designated District TB Coordinator (DTC) or District TB Officer (DTO) who is responsible for monitoring and implementation of TB care activities in the district (e.g., managing BMUs in the public and private sector). He/she is responsible for monitoring all health facilities in the district and report to Executive District Officer Health (EDO)/District Health Officer (DHO). The EDO/DHO monitor TB control activities in the district during their routine visits.

The NPO and DLS/SLS also provide M&E support to the district. All 149 districts are engaged in TB case management creating a network of TB care facilities in public and PPM sectors as reflected in Table 9. The primary and secondary public sector facilities (RHCs/THQ Hospital/DHQ Hospitals) are completely covered for TB case management as per NTP protocols and guidelines. A large number of BHUs in the country (up to 50%) are managed by NGOs (PRSP/PPHI) and several can be up-skilled to handle TB diagnostic services. However the involvement of the tertiary care hospitals in the country for TB case management remains a challenge.

PUBLIC SECTOR

The public sector is the primary provider of preventive and hospital care to urban and rural populations. In the provision of curative care for minor ailments, the public sector caters to approximately 25% of the population. Health services in the public sector are provided by various types of general and specialised hospitals. There is also a network of PHC outlets including BHUs, RHCs, dispensaries, and MCH centres, which are under the control of the provincial departments of health. (34)

PRIVATE SECTOR

It is important to involve private practitioners in the detection and treatment of TB because most Pakistanis have their first health care contact with a private provider. Many private facilities, including private hospitals/clinics, solo private practitioners, NGOs, pharmacies, and informal non-qualified practitioners are involved in the management of TB. A high proportion of patients use private-for-profit providers because of their acceptability; greater ease of access; shorter waiting periods; longer or more flexible opening hours; better availability of staff and drugs; more sensitive health workers; and greater confidentiality in dealing with diseases such as TB and sexually transmitted infections (STIs) which carry social stigma. However, the TB cases managed by private providers are neither recorded nor reported and so are not consolidated into national data. There is sufficient evidence that privately practicing physicians in Pakistan lack sufficient knowledge to manage a typical case of TB.

PPM Models in Pakistan

Through its PPM initiative, the NTP has employed four models to engage the private sector. PPMs aim to establish linkages between private practitioners and the public sector to standardise and improve diagnostic techniques, decrease maltreatment and partial treatment, and enhance TB control. (38)

Solo GP Model (PPM 1): PPM 1 has been implemented in 88 of the national 149 districts where private general practitioners (GPs) are working in collaboration with the NTP and reporting cases to the national case grid. Approximately 3,500 private health facilities are contributing towards PPM 1 in the implementation districts. In addition, 435 private laboratories have been strengthened through training, and equipped with microscopy by the NTP.

Potential GPs and private laboratories are first selected in consultation with district health authorities, and then are mapped. These selected providers, their paramedics, and lab technicians are trained on standard TB management and recording protocols and AFB microscopy. The District TB Control Programme provides ATT drugs to the GPs, and reagents and microscopes to the lab. GPs and labs are provided incentives. Coordination and liaison linkages are established for facilitation in diagnosis, registration, treatment, reporting and follow up, and contact screening of the TB patients. In addition to passive case finding, active case detection interventions are conducted. These active case detection interventions include community awareness events followed by chest camps; here a trained provider, paramedic, lab technician, and field staff of PPM collaborate to identify, diagnose, record, and follow up TB presumptive cases.

The private sector plays a vital role in the delivery of health care services in Pakistan. Most private hospitals, clinics and health related facilities are in the urban areas and are well equipped with latest diagnostic facilities.

NGO (Non-Profit: Health Outlet Models) (PPM 2): One hundred and sixteen BMUs managed by NGOs are included in the PPM-2 Model. Most of these are managed by Pakistan Anti TB Association. In this model, the diagnostic and treatment facilities are provided to TB patients as per national protocols. The patients registered at these facilities are reported in national case data as shown in Table 9.

A memorandum of understanding (MOU) is signed by the NGOs and the PTCP. Health care providers (i.e., doctors, paramedics, and laboratory staff) at NGO-run facilities are trained on national TB guidelines. The district health department provides ATT medicines, laboratory supplies, and microscopes to the designated health facilities. Incentives are provided to the, paramedics, and lab technicians for recording and reporting of patient data to the NTP as shown in Table 9.

Private Hospital Model (PPM 3): Thirty-four private hospitals are collaborating with the NTP in Punjab, Sindh, Balochistan KP, and ICT. Large hospitals are linked with the public sector in the same way as the NGO-run health care facilities. An MOU is signed by hospital management and the PTCP. Hospital staff is trained on national guidelines, and TB drugs, lab supplies and microscopes are provided through the district health departments. Hospitals are incentivised to record and report patient data to national programme.

Other Public Sector Parastatal Hospitals (PPM 4): The NTP collaborates with other public sector organisations/corporations and autonomous bodies (e.g., parastatal hospitals). The NTP supports the Railways, Military, Social Security, prisons and other sectors to provide TB care services. Seventy parastatal hospitals are collaborating under this PPM model.

An MOU is signed by parastatal hospital management and the PTCP. Hospital staff is trained on national guidelines, and drugs, lab supplies, and microscopes are provided through the district health departments. Hospitals are incentivised to record and report patient data to the NTP.

The Hospital DOTS Linkage (HDL) (PPM 5): The HDL programme was first implemented in 2008 to expand DOTS coverage to tertiary hospitals, the largest health facilities in the country. Tertiary care hospitals have heavy patient loads and are therefore constituted for DOTS expansion. The lack of implementation of standardised TB DOTS protocols, deficiency of resources, and patients being scattered across various departments have resulted in cases missed and TB treatment failure. The tertiary care and teaching hospitals in both public and private sector, specialised care institutions, and TB care facilities under four PPM models are also engaged in TB care activities in the district. Selected TB care facilities also function as sites for PMDT and TB/HIV sentinel sites. All TB care facilities have routine diagnostic facilities including sputum microscopy and chest X-ray augmented at selected sites with fluorescent microscopy services and Xpert/MTB-RIF testing.

Table 8. TB Care Facilities in Pakistan (2015)

PROVINCE NAME		Population	Public sector				PPM sector				PMDT Sites	TB HIV Sites
SR. No.	DISTRICT		Primary (BHU)	Secondary (THQ & DHQ)	Tertiary	Total	PPM-1 (GP Clinics) Functional)	PPM-2 (NGO run BMU)	PPM-3 (Pvt Hosp.)	PPM-4 Other Health Sector		
1	AJK	5,288,087	43	14	1	58	32	0	0	0	1	0
2	Balochistan	9,916,595	58	38	3	99	47	9	0	1	2	1
3	FATA	4,381,707	12	10	0	22	0	0	0	0	0	0
4	GB	1,279,246	3	14	0	17	39	0	0	0	1	0
5	KP	25,260,986	75	91	7	173	199	12	2	5	4	2
6	Punjab	97,908,093	309	182	16	507	1052	32	16	14	12	6
7	Sindh	44,578,786	101	89	8	198	585	64	7	7	8	7
8	ICT	1,152,534	4	0	2	6	0	0	2	0	1	1
TOTAL		189,766,034	605	438	37	1080	1954	117	27	27	29	17

Source: Monitoring and Evaluation Plan Pakistan 2014 – 2020

MANAGEMENT OF TB IN PAKISTAN

DRUG SUSCEPTIBLE TB

Management of patients with symptoms compatible with TB and identification of TB cases:
Case detection and identification

The delivery and management of TB care has been integrated within district health-care services so that continuing care can be provided close to the patient's home. TB care has become an integral part of

health-care at all levels, starting from district hospitals to PHC facilities and community health workers. This integration has made it possible to plan and carry out TB control in a district without the addition of a TB-specific care delivery staff. In the context of devolution, the district health authorities (i.e., Executive District Officer Health (EDO), District Health Officer (DHO), Medical Superintendent of District Head Quarter Hospital, District TB Coordinator (nominated person), in-charge doctors, DOTS facilitators, and laboratory technicians at RHCs and BHUs, and the District Laboratory Supervisor are the key district personnel that are involved in TB control activities. The district EDO-H/DHO and the DTC are primarily responsible for advocating, planning, financing, implementing, and monitoring TB care services in their respective districts.

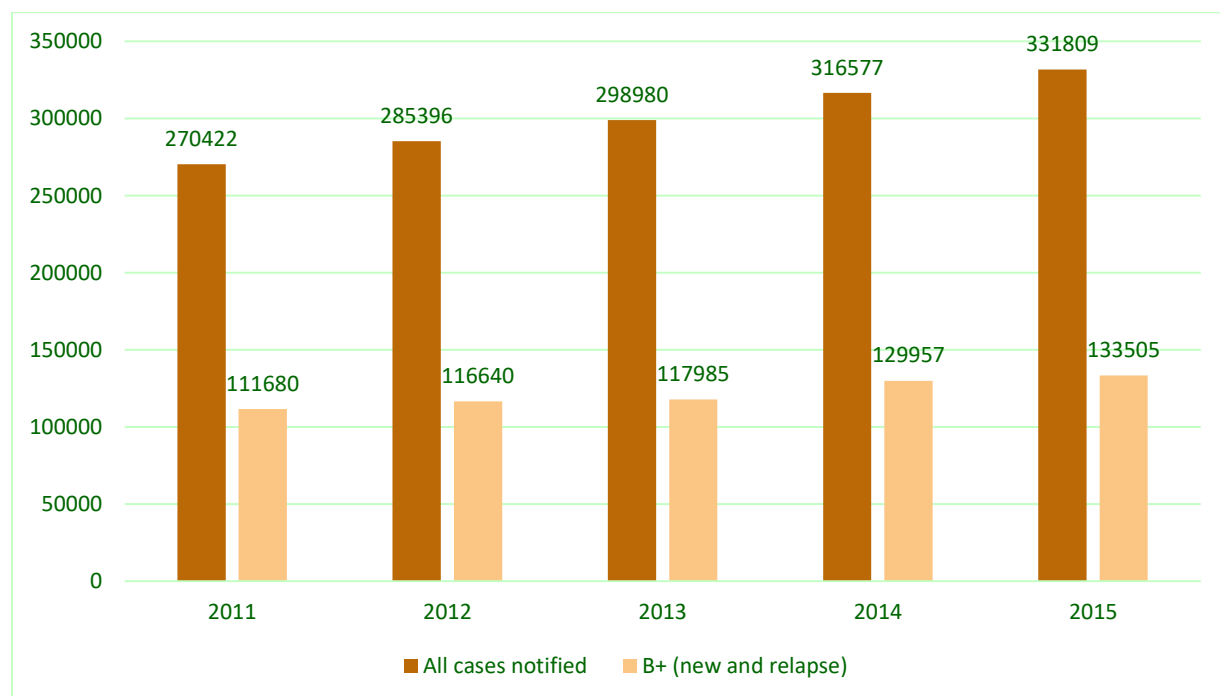
The district and sub-district hospitals, the RHCs, and selected BHUs (where needed) in public health /other health sector operate as BMUs. A BMU has a staffed laboratory and a doctor/qualified medical staff who is trained to diagnose and initiate treatment. The BMU is also a facility where patients return for re-examination and confirmation of cure. The BMU maintains record on standard formats and provides periodic reports to the district coordinator including report on treatment outcome.

The PHC facilities such as BHUs and dispensaries work as treatment centres. The treatment centre is the nearest or most convenient health facility for the patient to continue his/her treatment. The health facility supplies anti-TB drugs and ensures that the "direct observation" is carried out through appropriately selected supporters. Some patients who live close to a diagnostic centre may prefer to access TB care at the BMU. If this is the case, then the BMU also becomes a treatment centre.

The tertiary/specialised hospitals, district and sub-district hospitals, and TB clinics offer TB services as diagnostic centres. The district, teaching and specialised hospitals also provide care to difficult adult TB cases as well as childhood TB cases. Selected teaching, specialised. and district hospitals also offer diagnosis and case management of MDR-TB cases (with capacity enhancement and support from the NTP). The medical schools and post-graduate training institutions contribute to the under- and post-graduate training of doctors and chest specialist, and also support TB research. TB care diagnostic and treatment facilities in private sector settings include a variety of implementing models (see section on PPM). (38)

The frequency of patients with presumptive TB who are not investigated by sputum smear microscopy is unknown in Pakistan. (34) The National TB Guidelines issued by the NTP clearly state that a patient with signs and symptoms compatible with TB should be evaluated for TB. The NTP data of last five years shows a linear increase in case detection rate (CDR), static child TB case notification, and slight increase in the proportion of previously treated cases.

Figure 14. TB Case Notification 2011 – 2015



Source: National TB Control Programme Pakistan 2015

According to the WHO's Global Report on TB, 2011 -2015, steady progress has been made from 2001 onwards to improve the TB case detection and treatment success rate. This has been done by:

- Ensuring quality assurance of smear microscopy;
- Improving drug management;
- Mobilising the community; and
- Involving tertiary care hospitals, NGOs, intersectoral organisations and the private sector in service delivery.

Table 9. Case Detection Rate per Province/Region (2015)

PROVINCE	TB CASES NOTIFIED (ALL CASES)	CASE DETECTION RATE (ALL CASES) %	CASE DETECTION RATE B+ CASES %	DEFAULT RATE %	TREATMENT SUCCESS RATE
AJK	5,638	46	31	0	95
GB	1,824	48	11	2	98
ICT	1,653	50	24	6	87
KPK	43,196	64	43	2	93
PUNJAB	205,036	76	59	2	95
SINDH	61,878	49	44	6	88
FATA	3,835	31	21	3	92
BATAN	8,575	32	26	8	88

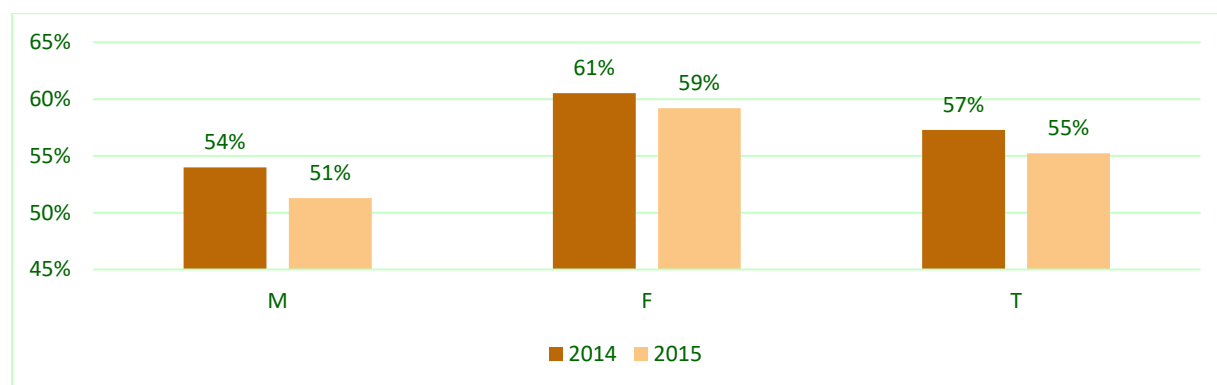
Source: National TB Report 2015

Table 10. TB Case Notification (all forms) by Age (2014-15)

YEAR	TOTAL		<15		15-64		65+	
	M	F	M	F	M	F	M	F
2014	153,265	155,152	12,213	15,032	124,506	128,268	16,546	11,852
2015	161,333	161,934	15,818	18,552	126,854	131,571	18,661	11,811

NTP Pakistan data 2014-2015

Figure 13. Proportion of Economically Productive Age Group (15 -44 years) by Gender, Notified among all Forms of TB Cases (2014-15)



NTP Pakistan data 2014-15. M: Male; F: Female; T: Total

Table 11. Estimated TB Burden v/s TB Notification (2011-2015)

YEAR	POP. (MILLION)	ESTIMATED TB CASE BURDEN IN PAKISTAN	ALL FORMS OF TB	CASE DETECTION RATE ALL FORMS	B+	CHILD TB CASE NOTIFICATION		PREVIOUSLY TREATED (INCLUDING RELAPSE)		TOTAL TB PATIENTS INCLUDING PREVIOUSLY TREATED
						NUMBER	%	NUMBER	%	
2011	177	477900	261069	55%	111680	25737	10%	9353	4%	270422
2012	179	483300	275803	57%	116640	26159	9%	9593	4%	285396
2013	182	491400	289445	59%	117985	28113	10%	9535	4%	298980
2014	185	499500	308417	62%	129957	27245	9%	8160	5%	316577
2015	189	510300	323267	63%	133505	34370	11%	8542	6%	331809

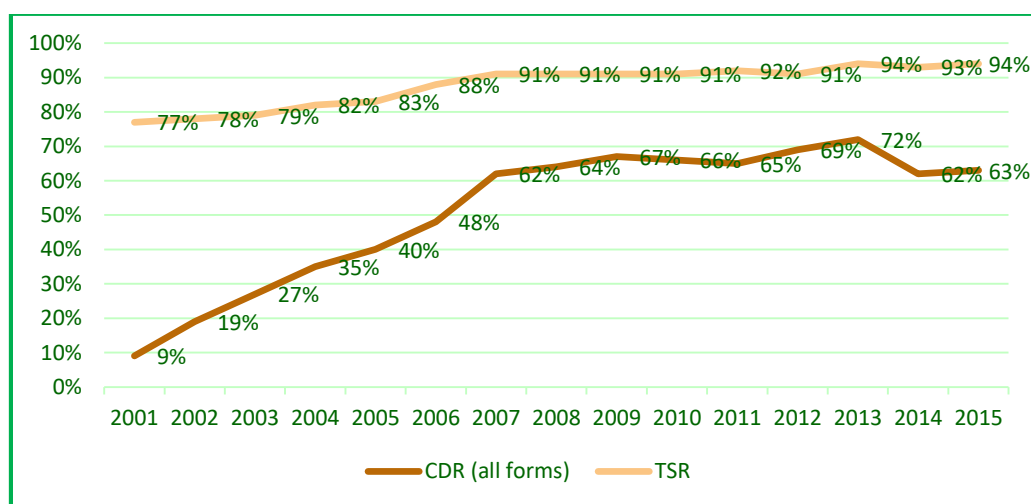
Source: NTP Report 2015

The National TB Prevalence Survey (2010/2011) showed that the diagnostic rate is 41.5% and the case detection rate, 45.4%. This suggests that a high proportion of cases present in the community is being missed (38). Passive case finding is likely to delay diagnosis and treatment of TB and increase the transmission of TB. Active and systematic screening strategies need to be considered. (41)

Outcomes of TB Control Activities in Pakistan

According to NTP guidelines, every laboratory confirmed TB case must be initiated on treatment and be registered in the patient register. In the last decade, a steady increase in case detection rate and treatment success rates has been observed (figure 15). Since 2008, a gradual rise in treatment coverage (CDR) is noted, with a successful outcome of more than 90%. These improvements can be attributed to strengthened quality assurance of smear microscopy, drug management, community mobilisation, involvement of tertiary care hospitals in the management of TB, NGO involvement, inter-sectoral involvement, and PPM expansion. (42) (43)

Figure 15. Trend of TB Case Notification and Treatment Outcome among DS-TB patients (all forms) (2001-2015)



Source: NTP Pakistan data 2014-15

MULTI-DRUG RESISTANT TB (MDR-TB)

The national MDR-TB unit is comprised of a manager, coordinator, data manager, and social support coordinator, who all operate under the guidance of Chief Policy Officer. The unit functions to provide policy guidelines, technical support, human resource development, planning, monitoring and evaluation, advice on clinical practices, and coordination for logistic support. The national unit is linked with provincial programmes' MDR-TB units. It also coordinates with sub-recipients (SRs) in the implementation of MDR-TB interventions.

Provincial MDR-TB Units are made up of a MDR-TB coordinator, data management officer, and office assistant. The unit works under the guidance of provincial programme manager. This team collaborates with the SR to ensure high-quality implementation of clinical and programmatic management of patients, contract tracing and retrieval of lost to follow up.

The PMDT treatment sites are mandated to provide treatment and overall management of enrolled DR-TB patients. These are located in tertiary care hospitals and specialised chest hospitals under the supervision of a pulmonologist. The PMDT team consists of MDR-TB physician, pharmacist, case management facilitator, counsellor/psychologist, treatment coordinator, social support facilitator, program/data assistant, and laboratory attendant. The hospital technical review panel comprising of head of the department, pulmonologist, pharmacist and MDR-TB physician guides the PMDT team. The DR-TB patients are managed mainly on ambulatory based model of care, but those in need of admission are provided indoor services.

There are 30 functional PMDT sites across the country; eight more sites will be functional by 2017. The provincial distribution of PMDT sites are listed in the appendix.

In 2009, the NTP, with the support of the GF, developed the National Guidelines for PMDT, and started piloting the management of DR-TB cases on hospital-based and ambulatory models in three hospitals: Gulab Devi Chest Hospital, Lahore, Ojha Institute of Chest Diseases Hospital, Karachi and Indus Hospital, Karachi. Two hundred patients were enrolled.

The tertiary care and teaching hospitals in both public and private sector, specialised care institutions and TB care facilities under four PPM models are also engaged in TB care activities in the district. Selected TB care facilities also function as sites for PMDT and TB/HIV sentinel sites. All TB care facilities have routine diagnostic facilities including sputum microscopy and chest X-ray augmented at selected sites with fluorescent microscopy services and Xpert/MTB-RIF testing.

In 2010, the NTP aimed to enhance the capacity of the public and private sectors with the target of detecting and managing 80% of the estimated annual MDR-TB incident cases by year 2015. This would be achieved by scaling up the programmatic management of DR-TB in 30 tertiary care and specialised chest hospitals in public and private sectors.

Currently Pakistan has a well established laboratory network including a National TB Reference Laboratory, five provincial TB Reference Laboratories and two Regional TB Reference Laboratories supporting the PMDT. **By the end of 2016**, there were 80 Xpert machines in the country. The BMU health care providers are trained on the identification of presumptive DR-TB and BMUs are linked with Xpert sites through a sample transport mechanism. DR-TB is formidable public health challenge. Early diagnosis and appropriate treatment remains the corner- stone of successful implementation. The WHO's Global TB Report, 2016 states that there are 14,000 new DR-TB cases among notified TB cases annually. Eighty percent of these cases are among new patients while less than 1% of new cases were tested for rifampicin

resistance in 2015. The NTP and partners enrolled 2,881 DR-TB cases in 2016, which is 21% of the estimated DR-TB cases. Among these cases, only 4% were from new TB cases.

Early and effective contact tracing among DR-TB close contacts is the most important intervention to break the chain of transmission of infection.

Case Detection and Identification

Table 12. Screening Criteria for Presumptive DR-TB Patients

GROUP	TYPE OF TB PATIENTS
GROUP I: TB PATIENT / SYMPTOMATIC AT RISK OF DR-TB	ALL RE-TREATMENT TB CASES All TB cases (AFB SS +ve or negative) with a history of previous ATT must be tested for Xpert at month zero of enrolment. This includes Treatment Failure Cat-I and II, Relapse, Treatment after loss to follow up and other retreatment.
	SYMPTOMATIC CONTACTS OF DR-TB PATIENTS All household and workplace symptomatic contacts of DR-TB patients must be screened for RR-TB. Specimens from these individuals should be processed for AFB smear and then the specimen is referred for Xpert MTB/RIF assay irrespective of smear results.
	TB PATIENTS ON TREATMENT WHO FAIL TO CONVERT AT THE END OF INTENSIVE PHASE AND DURING SUBSEQUENT FOLLOW UP AFB smear +ve patient on Cat-1 who fail to convert at the end of month # 2 of treatment. AFB smear +ve patient on Cat- II who fail to convert at the end of 3 months. AFB smear negative Patient who is reported AFB smear positive at the end of intensive phase.
GROUP II: TB SYMPTOMATIC AMONG VULNERABLE POPULATION	Children younger than 15 years PLHIV Other immune-compromised patients (e.g., diabetic patient on immunosuppressive or chemotherapy) People who inject drugs TB contacts Health care workers (including laboratorians) Hospitalised patients Prison inmates
GROUP III: INDIVIDUAL WITH LIFE-THREATENING DISEASE OR DIFFICULT CLINICAL DIAGNOSIS	Specimen from individuals suffering from life threatening illness, and at risk of TB, should be tested with Xpert/MTB Rif assay (e.g., CSF).

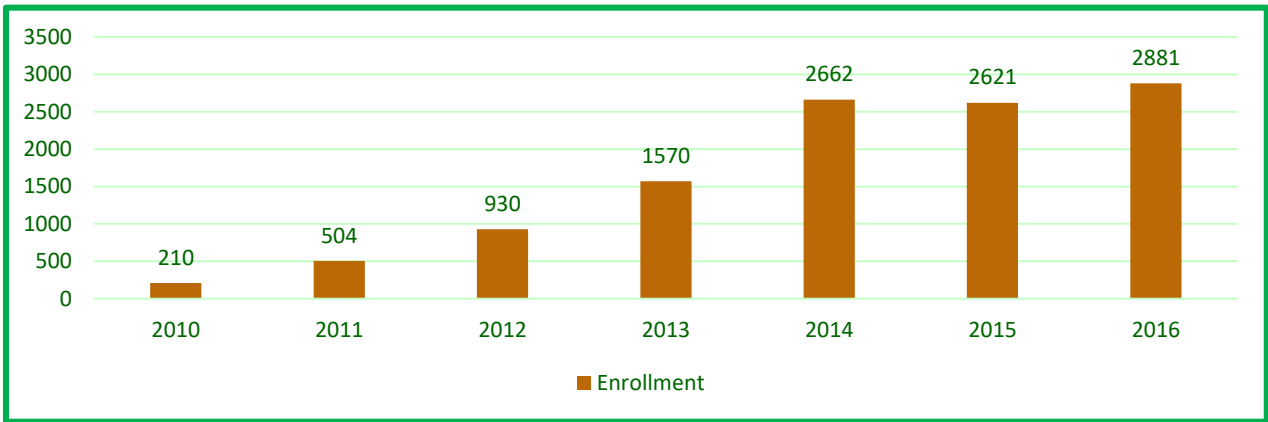
Contact Tracing

Pakistan does not have a standardised, routine implementation of household or community-based contact tracing. In 2013, a pilot study on contact screening operating under the TB Reach Wave 3 project detected more than 3,000 TB cases with a significant number of MDR-TB cases. These findings led the NTP to implement a new screening system, expanding the screening to household contacts of MDR-TB index patients. This strategy was piloted in three high burden PMDT sites. (38) The relatively low proportion of presumptive TB cases and overall yield of TB among children in the study was worrying. It is therefore suspected that the yield in health settings are likely underestimated. The screening strategy

based on “verbal screening” among index cases and limited home visits may have missed an important number of symptomatic children (38)

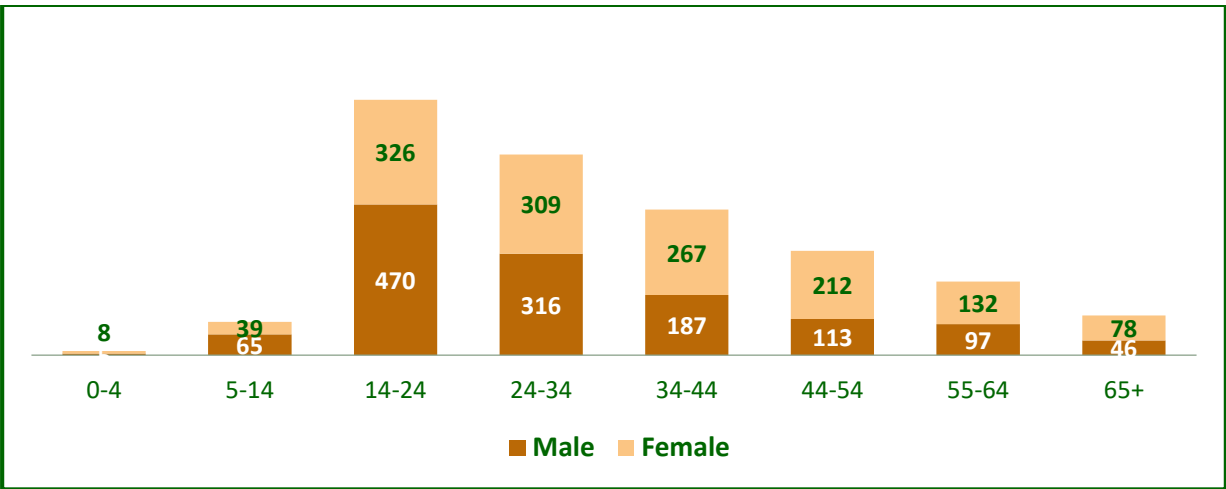
Close contacts of DR-TB patients are one of the highest risk groups and should be referred for Xpert testing. By the time patients are enrolled on effective MDR-TB treatment, the family has been in close contact with a highly infectious patient for months or years. SOPs have been developed for contact screening and management. After the patient is enrolled, the treatment coordinator from PMDT site visits the patient’s home, conducts verbal screening, and collects sputum samples of all symptomatic contacts for Xpert testing. On every follow-up visit, patients are questioned about the presence of any symptomatic family member. All symptomatic children are assessed and referred to paediatrician or chest specialist for further evaluation and management.

Figure 14. DR-TB Case Notification and Scale up of PMDT Sites in Pakistan (2010-16)



Source: NTP Pakistan data 2014-15

Figure 15. Proportion of MDR-TB Patients Enrolled in 2015, by Age and Sex



MDR-TB Treatment

New Drugs

Two new anti-TB drugs have been introduced. These are Bedaquiline (BDQ) introduced in 2012, and Delamanid (DLM) in 2013. BDQ is administered for six months as recommended by WHO. BDQ drugs are funded by USAID, through GDF. BDQ was introduced in four PMDT sites (Jinnah Hospital, Lahore, Gulab Devi Hospital, Lahore, Ojha Institute of Chest Diseases, Karachi, and LaDeputy Reading Hospital, Peshawar). Indus Hospital started prescribing BDQ in two PMDT sites, namely Indus Hospital, Karachi and the Institute of Chest Diseases, Kotri. The NTP has developed a selection criteria for BDQ at PMDT sites, clinical protocols and an active drug safety monitoring and management system (aDSM) for BDQ implementation. The NTP plans to have BDQ available at all PMDT sites by 2020 and will initiate at least 80% of the eligible patients on the new drugs. DLM has conditional approval by EMA (2014). The WHO has issued interim guidance on DLM prescription for children, adolescents, and adults. The Indus hospital has enrolled two patients in DLM as part of the END-TB project. The NTP plans to start DLM in near future. It is believed that adding these new two drugs to the MDR-TB regimen will have a positive impact on reducing the morbidity and mortality of MDR-TB.

Short Treatment Regimen

WHO recently announced new recommendations to speed up diagnosis and improve treatment outcomes for MDR-TB through a shorter, cheaper 9-12 month treatment regimen. The new treatment regimen can be completed in 9-12 months— less than half the time required by the current 24-month treatment standard used worldwide. The new regimen is not only much less expensive than the current standard regimen, but it also reduces the duration of treatment by 12 to 15 months.

After the Bangladesh studies on Short Treatment Regimen (STR), WHO endorsed STR under programmatic conditions and made recommendations on its introduction. Due to high fluoroquinolone resistance, Pakistan needs LPA SL to be in place to start STR. NTP plans to start LPA SL in 2017. Pakistan aims to initiate at least 80% of eligible patients on STR by 2020 as it has been proven more to be more efficacious, cost effective, and patient friendly with fewer side effects and better treatment outcomes.

Treatment Outcomes

Table 13. Treatment Outcomes of DR-TB Patients (2010 - 2014)

YEAR	CURED	TREATMENT COMPLETED	TREATMENT SUCCESS	DIED	FAILED	LOST TO FOLLOW-UP	NOT EVALUATED	STILL ON TREATMENT	TOTAL
2010	146	5	151	32	7	18	2	0	210
	70%	2%	72%	15%	3%	9%	1%	0%	100%
2011	365	22	387	64	24	26	3	0	504

	72%	4%	76%	13%	5%	5%	1%	0%	100%
2012	631	39	670	150	42	43	25	0	930
	67%	4%	71%	16%	5%	5%	3%	0%	100%
2013	1092	27	1 044	277	65	88	18	3	1570
	70%	2%	72%	18%	4%	6%	1%	0%	100%
2014	1 579	43	1 622	483	88	258	138	73	2 662
	59%	2%	61%	18%	3%	10%	5%	3%	100%

Since 2010, 11,588 DR-TB patients have been enrolled until the end of 2016. Patients who were still on treatment in 30 PMDT sites totalled 4,065.

TB/HIV CO-INFECTION

Pakistan is a low HIV prevalence country, with an antenatal prevalence of 0.045%. Recent surveillance, (HASP Round 4, 2011), however, shows that Pakistan has a concentrated HIV epidemic with prevalence rates higher than 5% in most-at-risk populations. Pakistan follows a comparable HIV epidemic trend having moved from 'low prevalence, high risk' to 'concentrated' epidemic. Pakistan's epidemic is primarily concentrated among two of the key population groups (i.e., people who inject drugs (PWID) and transgender sex workers). PWID have a national prevalence of 27.2% (weighted prevalence of 37.8%); followed by Hijra (Transgender) Sex Workers (HSWs) at 5.2%, and 1.6% among male sex workers (MSW). Fortunately the prevalence among female sex workers still remains low at 0.6%. (39)

Co-infected TB/HIV patients are managed at HIV Treatment and Care Centres. Active TB case finding among PLHIV is conducted from these centres. National guidelines have been developed and implemented for screening of TB patients for HIV.

The NTP coordinates with the National AIDS Control Programme (NACP) to ensure the provision of high quality care for TB/HIV co-infected patients. A national TB/HIV Board has been constituted to steer the two programmes' coordinated work for TB/HIV co-infection and MDR-TB. Although the strengthening of these centres includes staff training, infection control measures, provision of materials, referral linkages, and monitoring support to provide quality counseling and testing, the quality of service delivery varies between services. Linkages between the two programmes at various levels of implementation are not well established, resulting in weak coordination especially at facility level. Data on TB/HIV co-infection is also not readily available (as segregation by age, gender and risk group identification). Guidelines for the management of TB-HIV co-infection are available, but these need to be updated.

A joint collaborating board for MDR-TB and TB/HIV, and a national technical working group for TB/HIV have been constituted. The NTP/PTPs follow a policy of Intensified Case Finding (ICF) – active TB case detection among PLHIV.

There are 40 TB/HIV screening sites in Pakistan, mostly in the province of Punjab, which has the highest incidence of HIV (HASP Survey Report). In 2015 of the 3,4% of TB patients who were screened for HIV, only 0,48% had reactive HIV.

TB AND DIABETES

Diabetes is associated with higher risks of TB (40) and adverse TB treatment outcomes. Diabetes has a detrimental effect on treatment outcomes of patients with TB, which may hinder achieving the goals of the END TB strategy by 2030. (42) The increasing number of people with diabetes in Pakistan may complicate the control of TB, especially in populations with high burdens of both diseases. (43) Diabetes can pose a challenge for the management of TB, and TB can worsen glycemic control in people with diabetes. Individuals with both conditions thus require careful clinical management. Pakistani health professionals have limited experience with managing TB/Diabetes conditions. Strategies are needed to ensure that optimal care is provided to patients with both diseases.

A pilot project on “Enhanced and Integrated Care for Diabetic and TB Patients” was initiated in 2015 in the province of Khyber Pakhtunkhwa. This project was developed and implemented in collaboration with the Provincial TB Control programme KP with technical inputs from the NTP and supported by the World Diabetes Foundation. The principal recipient of the project is Department of Diabetes, Endocrinology and Metabolic diseases, PGMI Hayatabad Medical Complex, Peshawar.

Through this pilot project, guidelines, and tools were developed to help structured delivery of TB and diabetes bi-directional screening and management in selected TB and diabetes/medicine clinics. Doctors and paramedics are trained to conduct systematic screening and referral. Thirteen public sector hospitals/TB centers are piloting this intervention in five districts of province of KP (Peshawar, Mardan, Swat, Abbottabad and D.I. Khan).

The pilot project will run till September 2017. Interim results of bi-directional screening are shown below.

Table 14. Patients Screened for Diabetes at TB Clinics

DISTRICT	DOCTORS TRAINED	PARAMEDICS TRAINED	PATIENTS SCREENED FOR DM AT TB CLINIC					
			PPBG	RBS +	FBG	FBG +	REFER TO DM	REG
Peshawar	03	05	2399	247	67	16	182	15
Mardan	03	04	1336	113	8	3	105	21
Swat	02	03	768	31	12	10	28	2
Abbottabad	02	03	874	179	91	50	119	6
D. I. Khan	02	03	1074	120	5	5	51	20
TOTAL	12	18	6451	690	183	84	485	64

Table 15. Patients Screened for TB in Diabetes Clinics

	DOCTOR TRAINED	PARAME-DIC	PATIENTS SCREENED FOR TB AT DM CLINIC
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WHO estimates that children may comprise 3-23 % of the disease burden in high TB burden countries. Globally, however, of the estimated 8.8 million new cases of TB that occurred in 2010, about 11% occurred in children (<15 years of age).

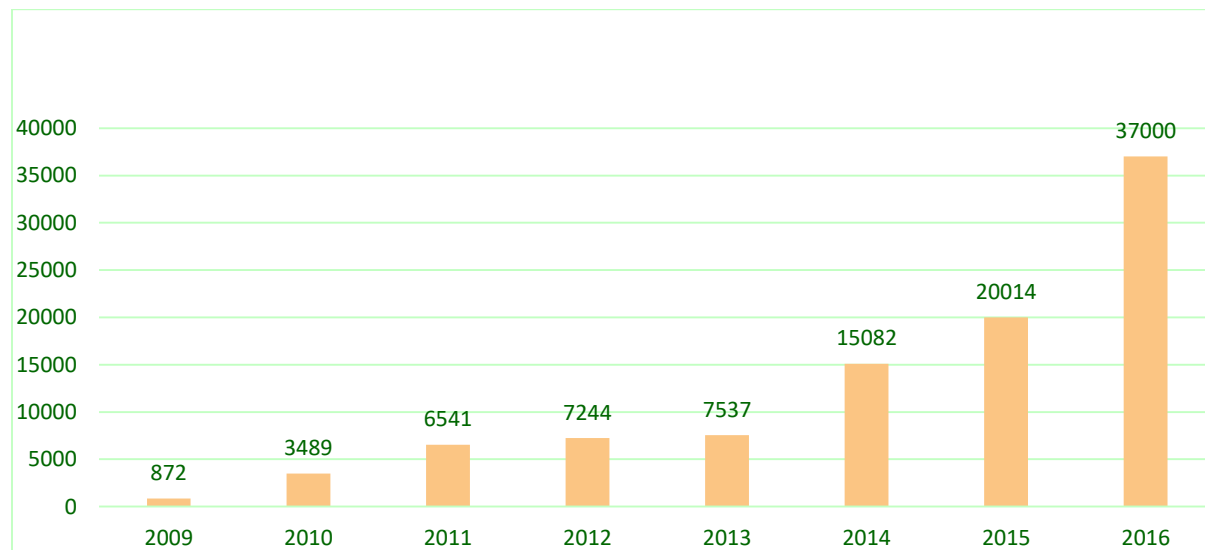
		TRAINED	SCREENED FOR TB	PRESUMPTIVE TB	REFER-RED	DIAGNO-SED WITH TB
Peshawar	06	04	25514	442	442	165
Mardan	02	04	6673	66	63	1
Swat	02	03	4836	50	50	4
Abbottabad	02	03	6326	71	71	4
D. I. Khan	01	03	5957	73	73	13
Total	13	17	49306	702	699	187

CHILDHOOD TB

In Pakistan, the National Institute of Population Studies projects that, by 2020, there will be 67 million children (35% of the population) between ages 0-14 years in the country. The exact proportion of children with TB in Pakistan is unknown. The proportion of Childhood-TB among national case notification has been very low since 2007, with a slight rising trend with 11.6% of the total cases younger than 15 years in 2016 (internationally 10% is an acceptable number for childhood TB. A recent inventory stuDeputy that identified TB cases among all non-NTP sectors in 12 districts of Pakistan showed that 27% of cases identified were not reported to the NTP and 32% of all identified cases were diagnosed in the non- NTP sector (44).

In a stuDeputy on screening among household contacts (45) it was found that a relatively low proportion of presumptive TB cases and overall yield of TB among children are worrying. Even though little is known globally about the actual disease burden among children, this is a large pool of exposed, undiagnosed, and untreated active and latent infections. It is therefore suspected that the yield in health setting is likely underestimated. (45)

Figure 16. Childhood TB in Tertiary Care Hospitals (TCH) and District Headquarter Hospitals (DHQ)



Source: NTP Pakistan data

However, based on field experience, high smear positivity rates among adult TB cases, and limited contact screening it is expected that childhood TB cases may be much higher than currently notified.

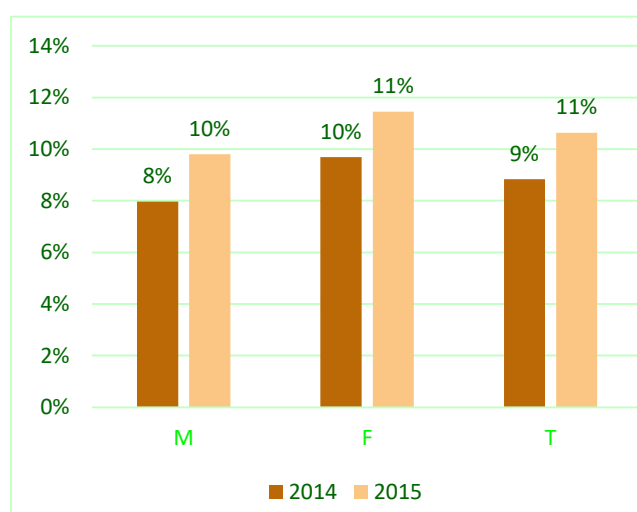
In the last few years the NTP has developed a comprehensive set of guidelines and training materials for standardising the management of childhood TB cases which have been revised and

updated in January 2017 in consultation with the Pakistan Paediatric Association (PPA), revising their PPA scoring chart, and adopting the new WHO recommended treatment regimen. A pool of master trainers has been developed and the provincial and district level trainings are underway. Moreover, the new recording and reporting tools have also incorporated key variables required to monitor childhood TB care services. The availability of PPD has remained a challenge for the last many years but now NTP has managed to procure as per national requirement. There has been a paradigm shift in policy regarding management level of childhood TB and the strategic and technical advisory group has recommended to enable the medical officers and general practitioners for the management of childhood TB cases at peripheral TB care facilities. The strategy has been adopted by the provinces and regions.

During the International Joint Review Mission of the NTP in 2014, 9% of all TB cases reported in Pakistan were children (0-14 years of age). With the review it was noted that a low number of sputum specimens were sent to laboratories, PPD was not readily available and NTP paediatric guidelines not implemented. Most of the public sector hospitals that participated in the review did not have digital X-rays and lacked mechanism for tracing lost to follow-up (LTFU) children. No or little active contact investigation is

There is a wide variation among the notified childhood TB cases among the different provinces ranging from 5% in Punjab to 27% in KP, with a very low proportion of cases in age group 0-4 years of age.

Figure 17. Proportion of Childhood TB Case (<15) Notified Among all Forms of TB Cases (2014-15)



conducted to trace the adults related to the sick children and it was reported that diagnosis or treatment of latent infection in small children was not done. (46)

There was a wide disparity between the population fraction of children (35%) and children notified with TB in Pakistan (11%) in 2015. The annual risk of infection among children is 2.5% and it is estimated that 5% to 10% of all infected children will acquire TB disease. TB deaths in children accounted for 8% to 20% of all TB deaths in 2015.

Childhood TB is often overlooked due to non-specific symptoms or difficulty in diagnosis. Children with vulnerable immune systems (very young, HIV-infected or severely

malnourished) are most at risk for falling ill or Deputying from TB. New-born children of women with TB and/or HIV are at increased risk of contracting TB. Most infection occurs within two years after exposure/infection. Smear negative or smears are not done among this early age group. Adolescents are at particular risk of developing smear-positive and are highly infectious. Any child living in a setting where there are people with infectious TB can become ill with TB, even if they are vaccinated.

Pakistan has implemented the Pakistan Paediatric Association (PPA) scoring chart system and is following the WHO recommended guidelines (2014) for the management of childhood TB emphasising:

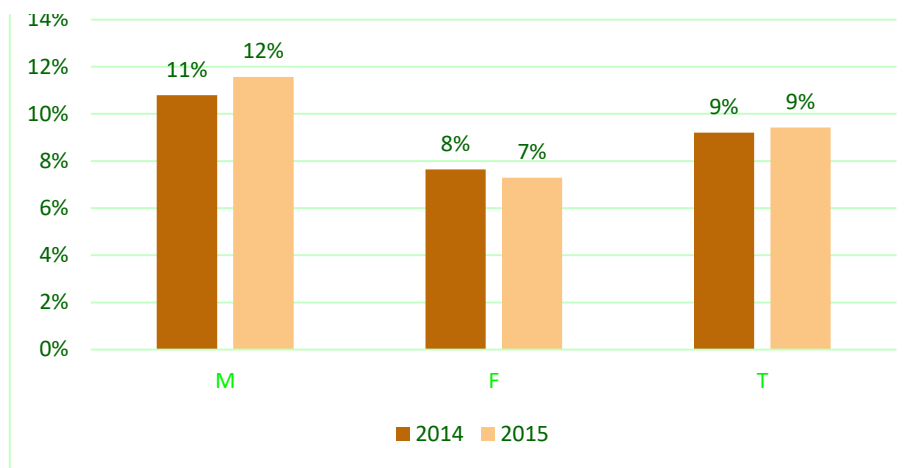
- Streptomycin should not be used as part of first-line treatment regimens for children with pulmonary TB or tuberculous peripheral lymphadenitis.
- HIV-infected children with TB require ART and co-trimoxazole preventive therapy (CPT) in addition to TB treatment.
- Isoniazid in the same dosage is recommended as preventive therapy over six months for children under the age of five as well as HIV-positive children of any age.

Childhood TB is relatively neglected because of the difficulty and atypical presentation and is therefore underreported, particularly in the private sector (as high as 27% in children). (47)

TB IN THE ELDERY

Age is an important aspect of the epidemiology of TB. Approximately 10% of annually reported cases (7) are among the elderly patients, defined as people older than 65 years. This correlates with the TB prevalence study done in 2011-2012. The TB prevalence increased with age; a similar pattern is also observed in the TB surveillance data of Pakistan. The high TB prevalence among elderly people may be due to the recurrence of TB from endogenous reactivation in combination with a weak immune system rather than recent transmission. (48) Currently no specific interventions targeting TB among older people are implemented.

Figure 17. Proportion of Elderly People (>65) Notified with TB among all Forms of TB Cases (2014-15)



Data National TB Control Programme (M: Male; F: Female; T: Total)

TOBACCO USE AND TB

Several recent studies and interventions demonstrate the link between TB and tobacco. Tobacco use has been declining in developed countries but in South Asia it has tripled in the last decade. It is difficult to raise awareness of TB risk factors such as tobacco while resources are focused on the on-going battle against what has become an infectious disease epidemic. (49)

The Asia Pacific region represents the fastest growing tobacco market in the world with Malaysia, Indonesia, Pakistan, and Vietnam being the top four countries reporting rapid increase in tobacco use. (50)

Tobacco use has emerged as a serious health challenge in Pakistan that now ranks among the top four countries of Asia Pacific with rapid increase in tobacco market. Tobacco kills nearly six million people each year in the world, of which more than 600,000 are non-smokers suffering from passive smoking. In Pakistan, an estimated 40% of males and 9% of females are smokers and the number is increasing day by day. Tobacco use kills more than 100,000 people every year in the country.

The ASSIST (Action to Stop Smoking in Suspected Tuberculosis) study -- a research trial in Punjab -- compared approaches to smoking cessation and found that the most successful intervention was counselling sessions delivered by health staff with information highlighting the health risks of smoking while, at the same time, giving patients practical strategies to help them quit. More than 20 districts and around 600 doctors across Pakistan have adopted the ASSIST programme which is expected to reach up to 35,000 smokers with TB. (51)

LABORATORY NETWORK

The laboratory network that supports the diagnosis of TB has evolved over the years. Direct smear microscopy was the front-line tool for diagnosis for all types of presumptive TB patients. However, after the introduction of Xpert and its scale up, Xpert testing services were made available to priority groups of patients including those at risk of DR-TB. Other high-risk groups included people who had had previous TB treatment or contact with DR-TB patients, and those belonging to clinical vulnerable groups (i.e., children, PLHIV and other immune-compromised conditions, and seriously ill and hospitalised patients). TB laboratories offering TB culture and DST offering services for PMDT has also expanded.

ORGANISATION OF THE TB LABORATORY NETWORK

The TB laboratory network has four tiers. The national reference laboratory (NRL) is located in federal capitals and provincial reference laboratories are located at provincial headquarters (Lahore/Multan, Peshawar, Karachi, Quetta). Two reference laboratories are functioning in Punjab. Two regional laboratories are established in AJK (MIRPUR) and GB (CHILLAS). One Intermediate laboratory is operates at district level as an intermediate between provincial and peripheral laboratory networks.

Table 16. Laboratories: Organisation and Technical Services

	NRL	PRL	RL	DISTRICT	PERIPHERAL
# OF LABS	1	5	2		
TECHNICAL SERVICES					
DST (MGIT)	Yes	Yes			
DST (LPA)	Yes	Yes			
CULTURE(MGIT)	Yes	Yes			
CULTURE (LJ)	Yes	Yes	Yes		
XPRT MTB/RIF	Yes	Yes	Yes		
MICROSCOPY (FM)	Yes	Yes	Yes	Yes	Yes ±
MICROSCOPY (ZN)	Yes	Yes	Yes	Yes	Yes
EXTERNAL QUALITY ASSESSMENT					
DST	Yes				
CULTURE	Yes	Yes			
XPRT MTB/RIF	Yes	Yes			
SSM	Yes	Yes	Yes	Yes	
HUMAN RESOURCE DEVELOPMENT					
TOTAL	Yes				
CULTURE AND DST	Yes				
XPRT MTB/RIF	Yes	Yes			
SSM	Yes	Yes	Yes		

MICROSCOPY NETWORK

In the public sector microscopy services are integrated and well established at primary (RHCs), secondary (THQ/DHQ hospital) and tertiary care hospitals. It has also been extended into the private sector, under the PPM model.

In 2015 there were 1,532 microscopy laboratories which included private laboratories. By the end of 2015, one microscopy laboratory was serving approximately 127,156 people country-wide, but catchment population varies from area to area depending on population density and geographical terrain. For example, a microscopy lab in GB would serve 45,238 people, and one in ICT would cater for 200,125 people.

Table 17. Microscopy Coverage

	DHQ	THQ	RHC	BHU	TCH	Para stat al	TB clini c	Oth ers	NGO	PPM	Tot DCs	Pop.	Average population /DC
Punjab	32	75	294	7	14	37	13	33	31	153	689	104,402,438	151,527
Sindh	16	47	96	19	9	7	8	30	47	60	339	43,365,989	127,923
KP	18	14	81	9	5	10	14	49	15	71	286	25,293,088	88,437
B.Tan	27	2	29	22	1	1	3	8	1	3	97	9,370,938	96,608
FATA	4	1	4	1	0	0	2	12	0	0	24	4,442,748	185,115
GB	4	0	2	1	0	0	0	11	4	6	28	1,266,654	45,238
AJK	8	8	21	7	0	0	9	1	0	4	58	4,460,102	76,898
ICT	0	0	2	0	4	2	0	0	0	3	11	2,201,378	200,125
Total	109	147	529	66	33	57	49	144	98	300	1532	194,803,336	127,156

XPRT LABORATORY NETWORK

Pakistan, with the financial support of the United States, successfully piloted the use of GeneXpert in 2011 at 11 sites across the country. Xpert was scaled up in subsequent years at more sites in KP and FATA with the support of KFW (2012 and 2015) and in Sindh with support of UNITAID (2013).

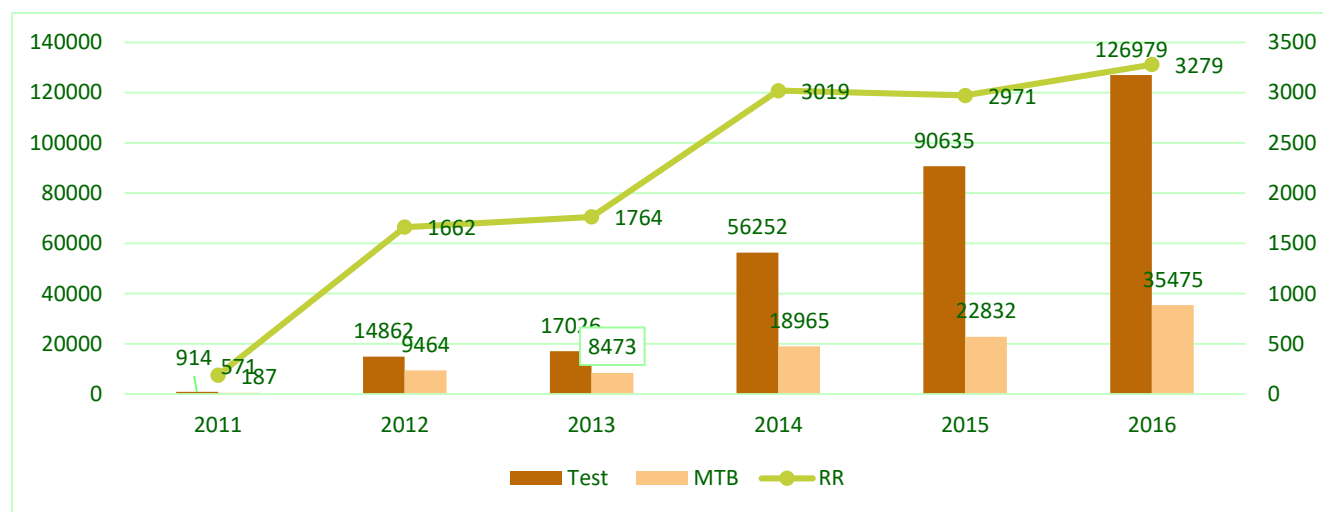
All GeneXpert scale up as well as support with KITS and other recurrent costs is achieved with donor funds. Optimal functioning of GeneXpert at all sites are achieved through the use of supplementary equipment including UPS, chillers, and air-conditioners.

More than 90,000 cartridges were used in 2015; this is almost double the number used in 2014. Out of total consumption, 44,000 cartridges were used in NTP-supported Xpert sites to screen patients at risk of MDR-TB. The remaining 46,000 cartridges were used to screen for presumptive TB at UNITAID/TB Reach Xpert sites in Karachi (TIH).

Table 18. GeneXpert Scale and Donor Support (2011-2017)

Year	Number of TB Labs with XPERT										
	Donor	GX_Type	# GX	ICT	Pun	Sind	KP	B.Tan	FATA	AJK	GB
2011	US	4_Module	12	1	5	3	1	1	0	0	0
2012	KFW	4_Module	10	0	0	0	10	0	0	0	0
	GF	4_Module	15	1	9	4	0	1	0	1	1
2013	KFW	4_Module	6	0	0	0	0	0	6	0	0
	UNITAID	4_Module	25	0	0	25	0	0	0	0	0
2014											
2105	GF	4_Module	6		6	0	0	0	0	0	0
	GF	16_Module	1	1							
	KFW	4_Module	12	0	0	0	7	0	0	0	0
2016	GF	4_Module	13		8	4				1	
2017	GF	4_Module	54	1	30	15		4		2	2
		16_Module	6		3	2	1				
	GF(RP)	4_Module	196	2	95	71	15	28		6	2
		16_Module	61		36	17	6	1			
	TOTAL	4_Module	349	5	153	122	33	34	6	10	5
		16_Module	68	1	39	19	7	1	0	0	0

Figure 18. Xpert Uptake and Detection of Rifampicin-Rresistant TB Cases

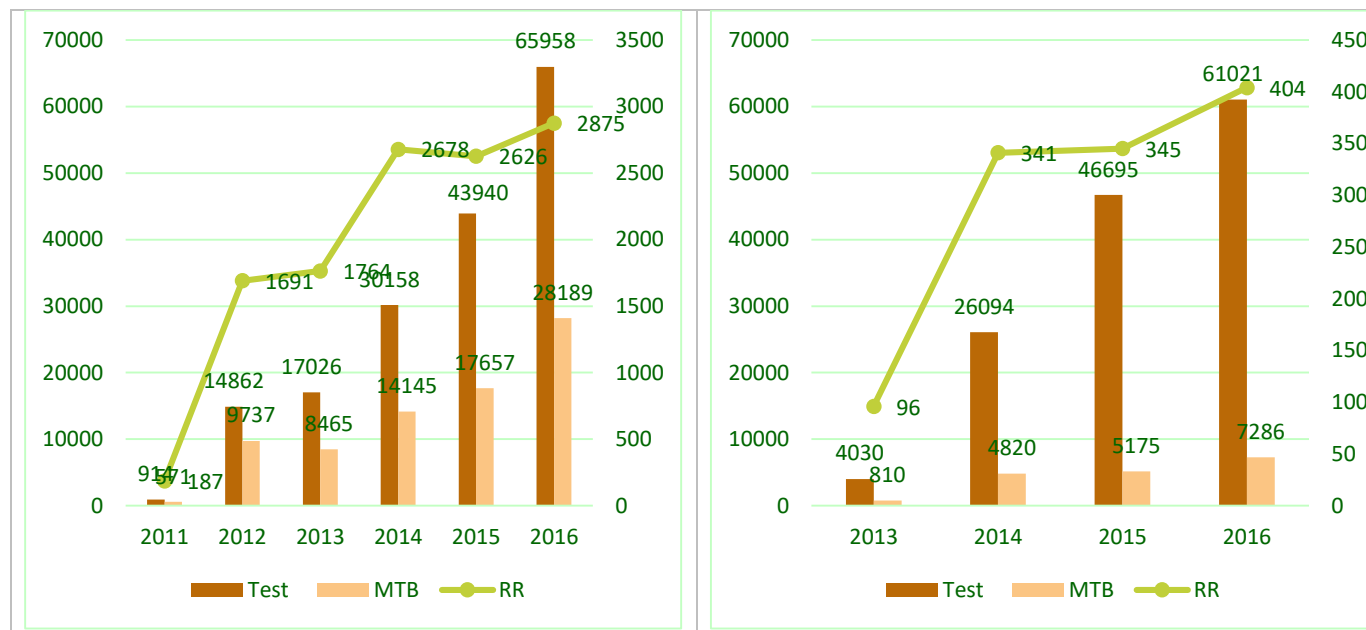


NTP Pakistan data 2014-16

Compared to 2015, Xpert uptake increased to 126,979 in 2016. Almost an equal number of cartridges were consumed in the NTP sites using Xpert testing to follow up on microscopy in high-risk groups to those used at the Xpert site of the Indus Hospital. Different approaches were used with equal consumption of

cartridges. A total of 2,875 RR-TB cases were reported by NTP/PTP Xpert sites compared to 404 by the TIH Xpert sites.

Figure 19. Diagnostic Yield of Xpert Testing in the Diagnosis of RR among TIH Sites and the Yield in NTP Sites



Source: NTP Pakistan data 2014-16

Both approaches used for Xpert testing improved the RR/MDR case detection among previously treated TB cases. However, only a very small fraction of new TB cases were screened for drug resistance and no impact was seen on the proportion of bacteriologically confirmed TB cases in the country.

TB CULTURE AND DST LABORATORY NETWORK

The establishment of TB culture and DST laboratories is primarily supported through GF (GFR-6, 9 and NFM), with the exception of the provincial reference laboratory in Khyber Pakhtoon Khwa, which was supported through KFW. Each culture laboratory has the capacity to perform 10,000 cultures annually and DST laboratories can conduct 1,000 DST annually. Beside infrastructure, laboratories are supported with equipment and recurrent costs for laboratory supplies and kits, human resources, and equipment maintenance.

Culture Laboratories

By the year 2015, eight culture laboratories were functioning in the public sector. Most of the culture and DST services are offered for patient enrolled in PMDT for indirect comprehensive DST at baseline and monitoring treatment. Due to introduction of Xpert MTB/Rif assay and the limited number of culture laboratories, the role of culture laboratories in diagnosis of TB smear Negative PTB or in pauci-bacillary disease in children or HIV-positives, and extra-pulmonary TB, is not clearly defined in the diagnostic algorithms.

DST laboratories are equipped with automated liquid and solid culture (LJ) facilities whereas culture laboratories at sub-provincial level have solid culture facilities only. Facility of liquid culture (MGIT960) is provided to national and provincial laboratories.

Table 19. TB Culture and DST Laboratory Expansion Plan

	ICT	PUNJA B	SINDH	KP	BALUCHISTA N	AJK	GB	TOT
DST	1	2	2	1	1	1	1	7
CULTURE		7	4	2	2			17
TOTAL		9	6	3	3	1	1	24

The TB culture workload increased significantly in 2015, with the number of cultures performed increasing from 38,138 (2014) to more than 45,000 (2015). Treatment monitoring of patients on second-line drugs was the main reason for performing culture. However the NRL performed the majority of cultures for diagnostic purpose as opposed other laboratories.

Table 20. Culture and DST Laboratory Network

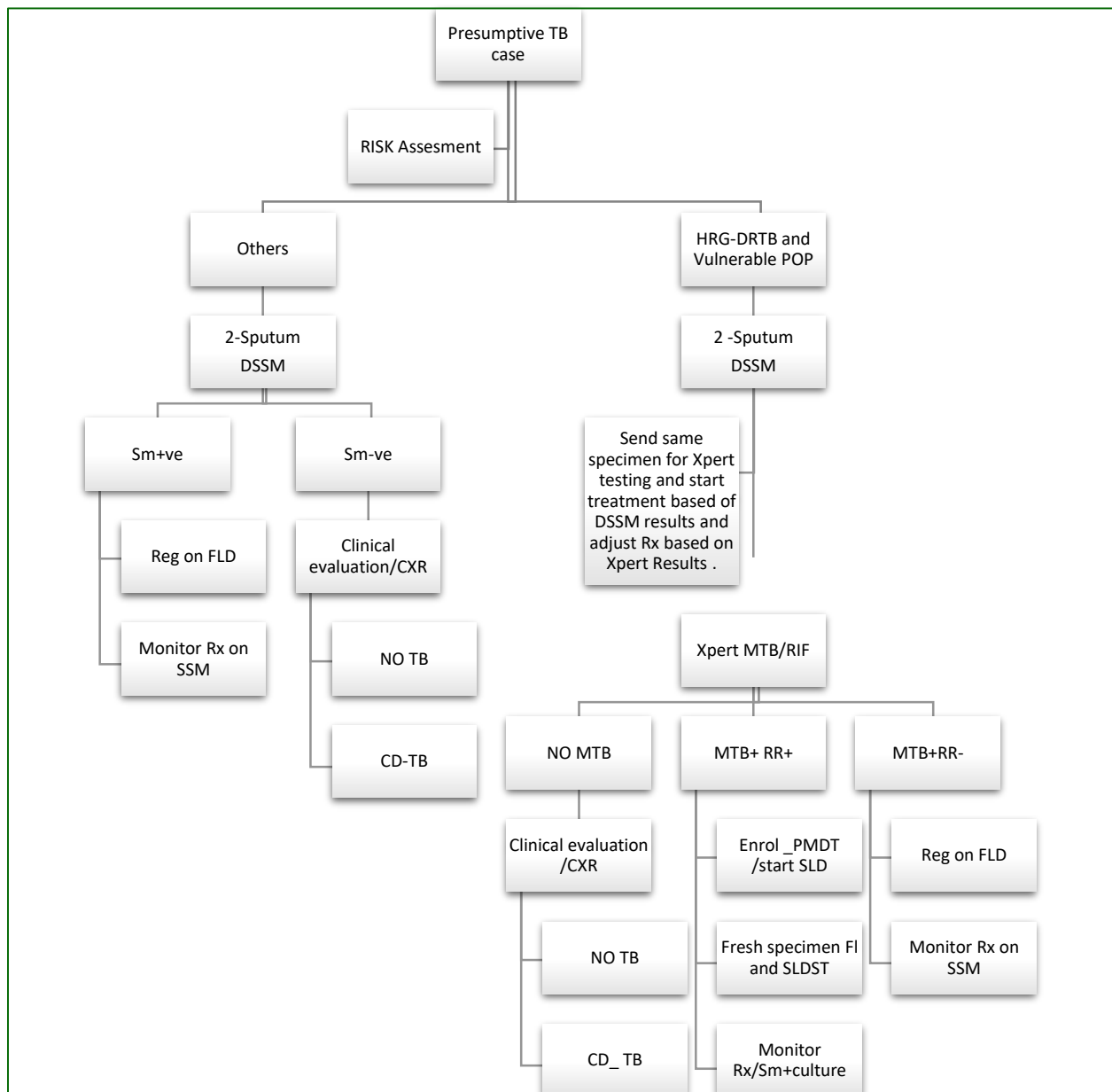
LAB		2008	2009	2010	2011	2012	2013	2014	2015
NRL-ICT	Culture		285	4563	9754	5215	10668	10009	12482
	DST		135	370	491	1025	1388	834	1391
PRL-Sindh	Culture	2725	3406	4307	4209	5356	5757	5391	5555
	DST							148	621
PRL-KPK	Culture		319	768	823	760	3402	7097	7803
	DST							398	577
PRL-Punjab			164	1452	1577	1739	2567	4875	6111
PRL NHM									1612
PRL-Bal			261	173	146	375		1326	1505
GDH					215	2339	3086	5118	4470
ICD Kotri								3748	4440
DTO Abbottabad								574	1770
Total	Culture	2725	4435	11263	16724	15784	25480	38138	45748
	DST		135	370	491	1025	1388	1380	2589

DST Services

Before 2014, the DST laboratories were not established and the NRL was occupied with supporting the prevalence survey (2010-2011) and DRS survey (2012-13). TB culture and DST services for PMDT were contracted to AKU in October 2014, but the contract was terminated and DST services were taken over by DST laboratories KP, SINDH and NRL. In addition, DST services were also provided by Indus Hospital TB. All these DST laboratories are equipped with Liquid Culture (MGIT) but shortages of kits often force laboratories to revert to solid culture for DST. Laboratories are equipped with LPA facilities and staff has been trained but currently only four laboratories have adequate skills for performing LPA. IT is expected that these four laboratories will soon start performing DST for both first- and second-line on LPA .

ALGORITHMS

Figure 20. Current Diagnostic Algorithm for Presumptive Pulmonary TB



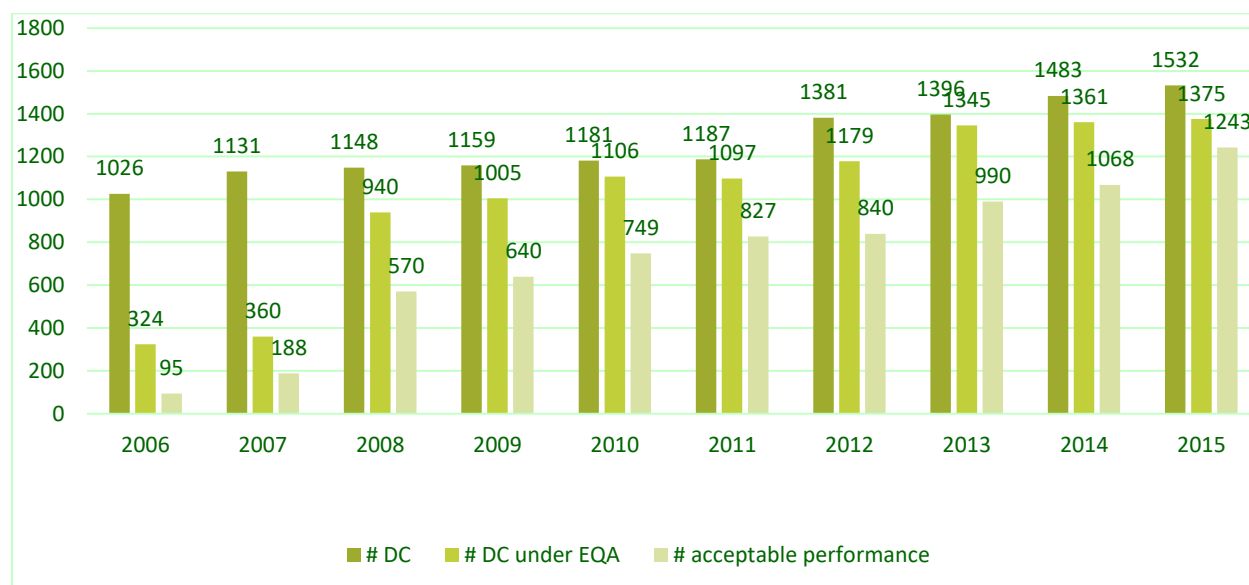
QUALITY ASSURANCE OF TB LABORATORY SERVICES

Microscopy Services

External Quality Assurance (EQA), through blinded rechecking, is the cornerstone of quality assured microscopy services. A total of 1,375 DCs (including 271 DCs of PPM-GF) in 146 districts were covered by EQA by December 2015.

EQA of peripheral laboratories is performed by district intermediate laboratories. Each district has designated district laboratory supervisor and cross checker. Logistic and supply management is also performed by the district which is performance of district laboratories is monitored by respective provinces.

Figure 21. EQA Performance of TB Diagnosis by Laboratory Networks under NTP (2011-15)



Xpert Laboratory Services

All Xpert machines are procured with extended warranties. Calibration is performed annually but formal mechanisms for EQA of Xpert testing is not yet implemented.

Culture Services

Performance of culture is monitored regularly with use of performance indicators.

DST Services

The NRL is linked to the Supra National Reference Laboratory in Antwerp in Belgium that has participated in annual EQA activities for first- and second-line DST since 2010. In addition, the TB laboratory AKUH and Indus hospital also participate in EQA conducted by Antwerp. The NRL has arranged for national EQA for

DST since 2009. Sub-sets of panel strains received from SNRL are sent to supportive public and private sector laboratories. Table 23 shows results of EQA of public and private laboratories in the country.

Table 21. EQA DST Results Participation and Qualification

	2010		2011		2012		2013		2014		2015	
	# Participated	# Qualified	# Participated	# Qualified	# Participated	# Qualified	# Participated	# Qualified	# Participated	# Qualified	# Participated	# Qualified
Public												
FLD	1	1	2	2	3	1	2	2	0	0	0	0
FL+ SL	2	1	2	1	2	1	2	1	3	3	4	3
Private												
FLD	2	1	3	2	3	2	4	3	4	3	4	1
FL+SL	2	2	3	2	3	2	2	2	2	2	2	2

Human Resource Development

All microscopy training is conducted by the Provincial Reference Laboratory whereas culture and DST training is provided by the NRL. During initial DOTS implementation, trainings were mostly supported through public sector funding but with passage of time and most training is funded with GF grants.

Table 22. Training Categories for Microscopy Network Staff

	Training Category	Initial	Refresher	Participants	Venue
1	AFB microscopy	10 Days	3 Days	Lab staff BMU, IDL, PRL	PRL/NRL
2	QA microscopy	10 Days	3-Days	DLS	PRL/NRL
3	Laboratory supervision for NON lab programme supervisors		3-Days	DTC	PRL/NRL
4	Xpert	5-Days	3-Days	Lab staff -Xpert	PRL/NRL
5	Culture	13 Days	5-Days	Staff culture and DST lab	NRL
6	DST	13-Days	5-Days	Staff DST lab	NRL

Referral Linkages and Specimen Transport System

Specimen transport has been successfully used to move specimens from PMDT sites to culture laboratories. However, the transport system is poorly established and not suitable to transport specimens from BMUs to Xpert sites or culture and DST laboratories. Local courier services are hired for specimen transport but most of the districts are not satisfied with these services and coverage at sub-district level is poor. With scale up of Xpert to every district, a specimen transport from peripheral centre to Xpert sites will be required.

Logistics and Supplies

Microscopy services are partially funded domestically, and supplemented with GF grants. All cartridges for Xpert testing are also supported through GF and by KFW for KP and FATA (2012 – 2015) while kits and supplies for culture and DST laboratories are funded only through GF. All GF-supported procurement is coordinated by NTP, and supplies are then distributed according to workload and disease burden.

Equipment Maintenance

Certification of biological safety cabinets (BSC) is done on needs basis as the annual contract has not yet been finalised. Maintenance of equipment installed in culture and DST laboratories is also problematic. Although funds were available, the contract could not be finalised due to limited in-country capacity and lack of interest from qualified and skilled vendors in the private sector.

Table 23. Contribution of Public and Donor Support for TB Diagnostic Services

Service category	Infrastructure support	Equipment	Equipment Maintenance	REAGENT/KITS	Staff
Sputum Smear Microscopy	Public	Donor	Donor	Donor/Public	Public
X-pert MTB/RIF	Donor/Public	Donor	Donor	Donor	Donor/Public
Culture	Donor/Public	Donor	Donor	Donor	Donor/Public
DST	Donor/Public	Donor	Donor	Donor	Donor/Public

INFECTION CONTROL

TB infection control (TB-IC) includes a spectrum of activities, from the straight forward education of HCWs and patients about cough etiquette, to the more time intensive and complex creation of SOPs related to clinic operations and comprehensive needs assessments on which to base a fully fledged TB-IC plan. However, TB-IC activities can be scaled up, starting from the simplest activities, even as country programs are working on the more complex components.

At present, there is no designated funding for the implementation of TB-IC practices in Pakistan and the country lacks a national committee and staffing to move this along. This has affected the spread of TB in the community, household, health care facilities, and public events.

A comprehensive TB-IC plan was launched in 2013 with GF-9 grant and by 2015, 27 PMDT sites had been upgraded. The TB-IC plan is focused on the PMDT sites and not on facilities managing DS-TB or TB/HIV co-infections. Thirty PMDT hospitals' infrastructures were upgraded and nurses and doctors trained on TB-IC. Informational materials were disseminated at these sites. TB-IC guidelines for households, monitoring tools, videos for patients and communities, guidelines for DR-TB patients, and posters are used to communicate preventive measures depending on the target audience.

Pakistan's TB-IC programme relies on global funding for the implementation of TB-IC activities at 30 PMDT hospitals and at tertiary care hospitals across Pakistan.

TB-IC is one of the integral components of TB prevention together with Intensified Case Finding (ICF) and Isoniazid Preventive Therapy (IPT). The Pakistan NTP has aligned their TB-IC guidelines to WHO recommendations, adopting the following principles:

1. *Administrative control* to reduce HCW and patient exposure to infection.
2. *Environmental control* to reduce the concentration of infectious droplet nuclei.
3. *Personal respiratory protection* to protect HCWs in areas where the concentration of droplet nuclei cannot be adequately reduced by administrative and environmental controls.

DRUG MANAGEMENT

The NTP pledges to provide uninterrupted, quality-assured, and free anti-TB drugs to every notified patient in the country. The NTP, with the support of the GF, is implementing a multi-dimensional programme to procure essential anti-TB drugs, upgrade and refurbish national, provincial and district warehouses, train public and private health care providers on TB drug management, and strengthen the drug management information system for TB across the country.

TB drugs are included in Pakistan's national essential medicine list and registered in the country. Anti TB medicines are selected in accordance with the latest National Model List of Essential Medicines, particularly in the form of fixed drug combinations, and the latest TB treatment guidelines.

Quantification and forecasting of drugs is based on case notification. However, other factors are also taken into consideration like available stock position, consumption pattern, expiry of the drugs, and pipeline supplies.

DRUG PROCUREMENT

Procurement of ATT medicine is assured through selecting appropriate procurement methods, managing tenders, establishing contract terms, ensuring adherence to those terms, and assuring pharmaceutical quality. At federal level, with donor support, the NTP procures selected medicines through the WHO/GDF mechanism from WHO prequalified manufacturers and suppliers. Regulations are followed to ensure transparent and cost-effective procurement of quality goods and services. Provinces procure ATT drugs from their provincial allocations as per the rules set forth by Provincial Procurement Committee.

The NTP is mobilising resources for the provision of free, quality-assured drugs to the patients. The GF supports the NTP to bridge the financial gaps through NFM grants for 50% of the country's needs until 2017. USAID, KFW, GIZ, MALC also contribute to the procurement of FLDs and SLDs to bridge the gap of ATT drugs and to secure and uninterrupted supply of ATT drugs until 2015. The Drug Management Unit shall conduct a comprehensive gap analysis of FLDs in country and on the basis of this gap analysis aim to secure more than 50% of FLDs through domestic support.

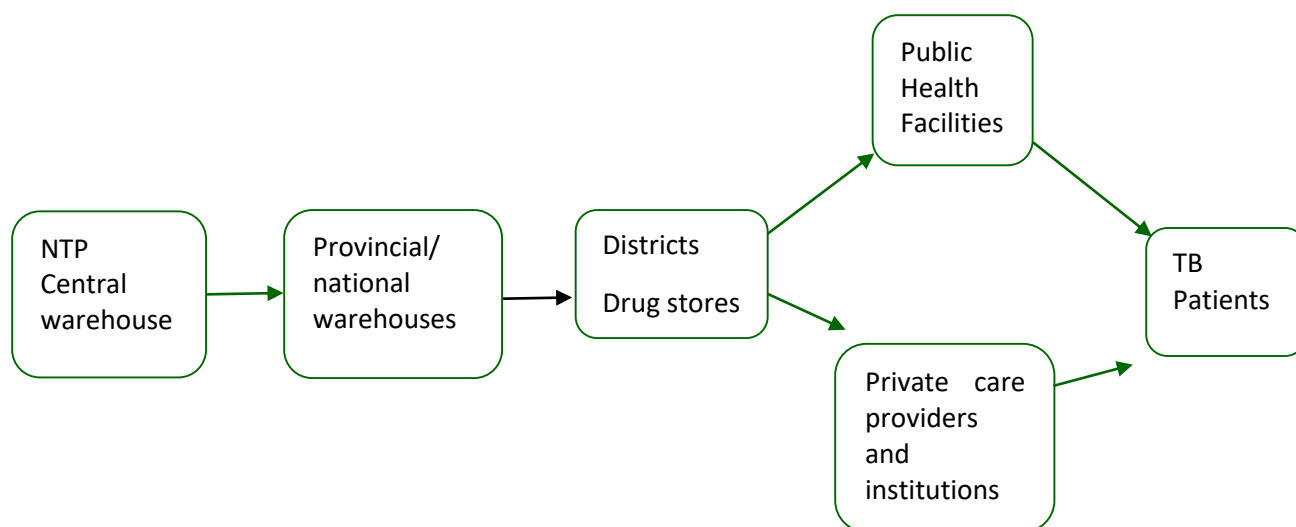
STORAGE OF DRUGS

The procured anti-TB medicines are distributed to and stored by the service delivery points using inventory control. One of the considerable achievements of the NTP, with the Round-8 GF Grant, was a successful refurbishment of its warehouses and stores across the supply chain. To achieve optimal storage conditions, the NTP has provided and installed supplies and equipment that establish a conducive environment for drug storage. These include air conditioners, pallets, racks, exhaust fans, hygrometers, and fire-extinguishers, which have been installed in 141 central, provincial and district warehouses across the country. Currently all the drugs and laboratory supplies are stored at the central, provincial, district and MDR-TB sites' warehouses and stores. At the central level, the NTP has leased a warehouse, with sufficient storage space and that adheres to WHO good storage practices.

DISTRIBUTION AND SUPPLY CHAIN

The FLDs are supplied in standard blister and defined pack size and does not require re-packaging when distributing to provinces and districts. These TB drugs are distributed to each provincial and NTP according to the need communicated by the respective PTPs/ RTPs to NTP. The consignment from supplier arrives at the NTP central warehouse, where physical inspection is done, and quantities are verified and recorded for inventory management. All relevant information like supplier name, quantity, batch information, and shelf life are entered in store stock register and samples are collected for quality testing. The stock is delivered to the provincial and national warehouses, as per their requirements. Drugs are stored and distributed to districts based on their consumption pattern along with observance of case notification and stock positions. District stores follow the same practice of supply to BMUs, both in public and private sectors.

Figure 22. Distribution of Drugs from Central Warehouse to End User



Road transportation is used to distribute drugs from the central warehouse to provinces and districts, but a few items (SLDs) are distributed by air. The drugs are then transported through official vehicles from districts to SDPs.

TRANSPORTATION OF COMMODITIES

The NTP solicits bids from Goods Forwarding Agencies annually, through an open competitive bidding procedure. It is clearly outlined in the bid document that “... complete and secure transportation of commodities is the responsibility of Goods Forwarding Agency, failing to which the agency is liable to reimburse NTP for the total cost of commodity (s) in case of damage, theft or loss”. In addition, the NTP has procured five mini-loader trucks installed with special containers for transportation of drugs and other commodities. The truck at the Central Warehouse is used for transportation to provincial and national

warehouses of KP, AJK and FATA, whereas transportation to Punjab, Sindh, GB and Balochistan is done through hired services of GFA. Large quantities of ATT drugs are transported over a large geographical spread, thus the NTP would benefit from additional loader trucks.

TB DRUG MANAGEMENT INFORMATION SYSTEM

The Drug Management Information System (DMIS) serves as the engine for the supply chain management programmes. A functioning DMIS is the key to programmatic success. Accessing web-based technology to enhance DMIS timely reporting and accuracy creates the ability to make prompt supply decisions using accurate data. A fully functional and developed TB DMIS is being developed and handed over to NTP by Green Star through GF funding; TB DMIS training across the country and accordingly implementation national/provincial/district level are in progress to develop a pool of skilled personnel for smooth functioning and execution of this task.

NTP management is confident that with the implementation of TB DMIS, robust analysis of inventory management, consumptions patterns of drugs, monitoring stock outs, over stocking and timely availability of precious drugs to patients will be done on regularly basis.

PHARMACEUTICAL MANAGEMENT

Proper diagnosis, prescription, dispensing, administration, and proper consumption by the patient are all critical elements of correct use of drugs. Each function builds on the next, forming the pharmaceutical management cycle. Correct medicines must be given to TB patients in correct dosages to maximise their efficacy. TB patients are encouraged to take their medicines for the prescribed periods through direct observation to achieve a cure and to prevent the development of multidrug-resistant TB.

The NTP Drug Management Unit has developed the following guidelines providing details of selection of medicines, their quantification, procurement, storage, distribution and usage across the supply chain:

- First- and Second- Line Anti-TB Drug Management Guidelines.
- Drug Dispensing Manual.
- SOPs for pharmaceutical management.
- Quality assurance plan.

Private sector pharmacists are crucial partners in increasing the number of people who receive proper diagnosis and treatment of TB. Pharmacists often have close ties to the community and frequently serve as the first point of contact with the health system. Private markets in four countries (i.e., Pakistan, the Philippines, Indonesia, and India) have the largest relative sales volumes; annually, they sell enough first-line TB drugs to provide 65% to 117% of the respective country annual incident cases with a standard 6-8 months regimen. (52) This calls for appropriate policy and market response (i.e., expansion of PPM, greater reach, flexibility, and regulatory and quality enforcement).

Recently the NTP, in collaboration with Pakistan Pharmacists Association and DEV-NET, supported by USAID-funded initiative of “Engaging Pharmacists in TB Care and Control in Pakistan” conducted an impact evaluation study in Pakistan. This study found that training lay people in the community to screen for TB in private clinics and then linking patients to free diagnoses and treatment from NTP-approved private facilities increased case detection two-fold as compared to a control area. However,

Pakistan cannot afford to ignore retail pharmacies given their ease of accessibility, presence of few qualified staff, and lack of knowledge of TB and the NTP. The NTP can benefit from engaging private pharmacies for rationale use of drugs (good prescribing habits), screening and referrals (case detection), supervised treatment, counselling, education, and awareness creation.

Second-Line Drug (SLD) Management

Since the start of the National MDR-TB programme in 2010, Second Line Drugs (SLDs) have been procured through the GDF mechanism. Drugs are shipped and stored at the central warehouse in Islamabad and then distributed on a quarterly basis to the various PMDT sites. Quantities are based on the National MDR Programme Enrolment Plan for new cases as well as the needs of patients who are already on treatment. The Drug Management (DM) Cycle is properly managed through the Central DMU in close collaboration with the International MDR Consultant, Central MDR unit, Provincial Officers and PMDT site managers.

Reporting and recording tools have been developed for regular monitoring and evaluation of SLD throughout the entire programme which include, but are not limited to, the following reports:

- Monthly computerised Central Warehouse inventory, bin card and stock balance report.
- Monthly PMDT stock balance and matrix reports reflecting the monthly consumption rate and stock balance at each treatment site.
- Monthly updates of the DR-TB Register (ENRS) for monitoring new and current enrolled patients' treatment and follow up progress.

The NTP receives these reports each month for rigorous analysis, verification, early detection and immediate management of any possible stock out or drugs with short expiry dates. The NTP uses the following combined SLD procurement methods: An Excel based calculated sheet reflecting the various treatment regimens and the percentage of the new cohort using these regimens.

REGULATORY FRAMEWORK

Legislation on TB provides an enabling environment for TB control and care. Many countries have declared TB as a notifiable disease. In Pakistan, health is in the provincial domain and all Pakistani provinces have prioritised legislation to declare TB as a notifiable disease. Sindh has pioneered this notion, and the provincial assembly has passed an act for mandatory TB notification, known as the Sindh TB Notification Act, 2014. The bylaws for the implementation of the bill have been prepared and sent to the ministry of health for approval of the Chief Minister. According to the Sindh TB Notification Act, copies of relevant TB notification forms will be distributed to every registered medical practitioner, private clinic, private hospital, community leader, and those in charge of covered premises operating within the province. Within a week of examining the patient, a registered medical practitioner must submit a completed notification form to the District Health Officer or to a local public health facility. Medical practitioners conduct contact tracing and are responsible for informing the patient about the availability of free diagnostic and treatment services.

In KP, the provincial health care commission has declared TB as a notifiable disease and has banned over-the-counter (OTC) sales of ATT. The notification is expected to get legal cover through endorsement of the KP Provincial Assembly. Punjab Government declared TB as a notifiable disease on World TB Day, 24th March 2017 on the premise of The Epidemic Diseases Act of 1958.

Balochistan has drafted a bill mandating case notification that has been sent to the Ministry of Law. The Federal Ministry has submitted the draft bill for mandatory notification to the cabinet division for further process that is likely to be raised at National Assembly.

DATA MANAGEMENT AND SURVEILLANCE

Surveillance is integrated in the M&E plan and based on national indicators to measure performance. Pakistan's NTP has adopted "WHO recommended Revised Reporting & Recording Tools-2013" for data collection to strengthen the national surveillance system for TB control activities. The previous National TB M&E Plan was developed in conjunction with the NSP, 2011-2015. It was developed with the context of internationally accepted theoretical framework for M&E. This framework fostered the systematic collection of information on the input, process, output, outcome and impact indicators and the tracking of progress towards set targets.

The objectives of the National TB M&E Plan, 2011-2015 include:

- Contribute to strengthening TB M&E systems in Pakistan.
- Monitor/track progress of the implementation of planned activities.
- Evaluate the outcomes and impact of the control interventions.
- Coordinate the dissemination of M&E information.

Strategies to achieve these objectives were:

- Improving routine data collection,
- Strengthening surveillance at supported sites,
- Improving data reporting through data quality audits,
- Improving monitoring of TB Drugs and other commodities, and
- Strengthening partnerships and collaboration for outcome and impact evaluation.

The NTP's routine data collection system is used to track TB episodes at public and some private health facilities. The data is collected through TB MIS, but a review and analysis is planned for the surveillance systems in Pakistan.

A national plan for recording and reporting tools and an electronic recording and reporting system were implemented. Routine data collection is taking place at district and provincial levels.

Historically in Pakistan, data surveillance and the TB M&E data management system been reported from the provinces and regions through data generation systems suggested by NTP. It has evolved from routine TB surveillance systems or MIS through TB-03, TB-07 and TB-09 recording and reporting tools. The District Health Information System (DHIS) also captures some data on TB. The routine data is reported through the DHIS reporting system from the primary and secondary health care facilities. Moreover, the DHIS has become the most widely used system in the country and its importance is hard to ignore. The integration of the two data reporting systems has not progressed at the desired level. The IRC (International Rescue Committee) has set up DHIS2 for project reporting. Pakistan was one of the pilot countries selected to start the implementation. It is implemented at national and district level and used by many NGOs.

Moreover, routine data quality has not reached an optimal level and some private sector health providers do not show much interest in data collection and reporting. There is also weak capacity for data collection,

analysis, and use at district and regional levels. This is compound by a lack of information on routine TB ACSM indicators.

A number of strategies to address the weaknesses in M&E were initiated. These include basic and refresher training on TB DOTS, with a specific focus on data management, SOPs, data collection, and reporting tools. The private sector was also involved in the training.

In addition, relevant SOPs on data collection were developed and distributed. The unit provided registers and other logistics for data collection. TB-DMIS and LMIS were introduced to strengthen routine data generation on pharmaceuticals and drug flows from public/private facilities. The unit also called monthly coordination meetings to discuss data retrieval from district health facilities. The establishment of a team of provincial M&E officers supervised by National Programme Officers (NPOs) strengthened participation. The monthly visits aimed to monitor the use of the M&E tool for data collection and to identify any deviation in the use of this tool. This provided the opportunity for supervisors to correct any wrong practices encountered at the lower level and thereby strengthen the system. Finally, the M&E team at NTP closely monitors data for quality improvement.

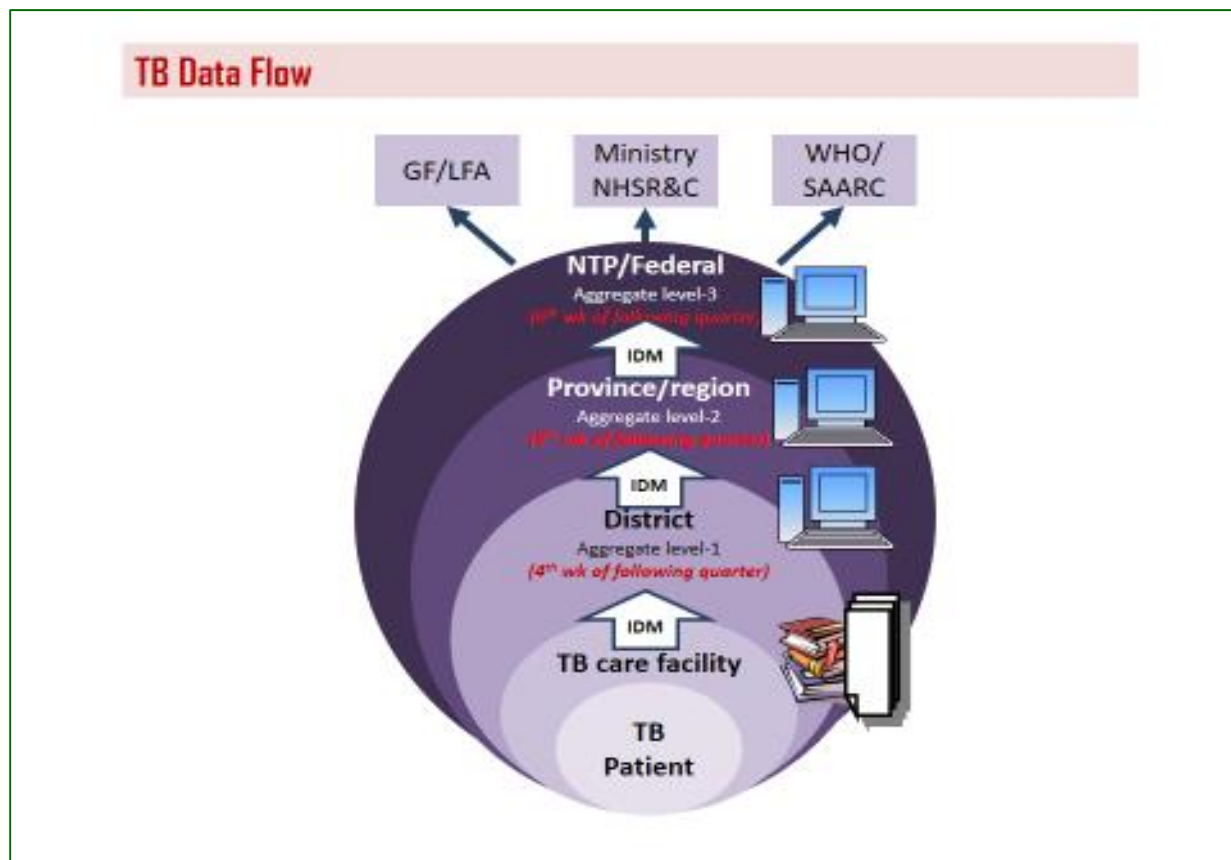
However certain weaknesses have persisted as highlighted in M&E System Strengthening Tool exercise conducted in September 2015. The strengths, weakness, opportunities for strengthening the M&E system can be seen in the MESST Report.

As a first major initiative to support strengthened TB surveillance and the effective use of data, a national workshop was co-organised by WHO (the TB monitoring and evaluation unit in the Global TB Programme at WHO headquarters and the WHO Country Office Pakistan) and the NTP in April 2017. The workshop was attended by representatives from the Pakistani provinces and regions. The aim of the meeting was to improve capacity to track the TB epidemic by using subnational routine TB surveillance data to inform policy and programmatic action at provincial level in Pakistan. The objectives of the workshop were to:

1. Document the current performance of TB surveillance at the provincial level using the WHO TB surveillance checklist of standards and benchmarks;
2. Undertake provincial-led analyses of TB surveillance and other data based on the guidance provided in the WHO handbook on analysis and use of TB data;
3. Promote the use of a DHIS2 solution for the safeguarding, analysis and visualisation of historical, sub-national, aggregated TB surveillance data; and
4. Discuss and identify key areas for action required to strengthen the performance of provincial TB surveillance and improve the direct measurement of burden, based on the findings of the TB surveillance checklist, and results from the analysis of data.

During the workshop, the WHO TB surveillance checklist was completed for each province; standard provincial-led analyses of key indicators for TB, TB/HIV and MDR-TB were conducted and documented; and provincial M&E investment frameworks were developed with required corrective actions. The WHO recording and reporting framework and safeguarding historical TB data was entered into the DHIS2.

Figure 23. Routine TB Data Flow in Pakistan



PARTNERSHIPS AND COMMUNITY DEVELOPMENT

TB continues to be a significant challenge for global public health. In 2016, TB is still a major cause of death and suffering worldwide. TB control is a global public health issue and must be conceived and carried out along with the basic principles of equity, human right to health and social protection. Despite the efforts being done in the health programmes in the form of treatment and care, experience and research has shown that Advocacy, Communication and Social Mobilisation (ACSM) creates positive behaviour change, influences decision-makers, and engages and empowers communities to change resulting in increased case detection, treatment and overall awareness about TB. It is critical to note that advocacy efforts put pressure on policy makers to increase the supply side of TB services while communication and social mobilisation efforts generate demand for services.

NTP secured funding from GF in 2006 and a fully fledged ACSM component was implemented in selected districts of the country which included development of Behaviour Change Communication (BCC). In 2007, funding from GF was secured for ACSM strategy which included mass media communication, social mobilisation and public relations. In the current GF grant (2013 onwards), ACSM activities include orientation of policy makers at government level, community coalition meetings, capacity building session with TB patients, print and electronic media involvement, Information, education, and communication (IEC) material development, and dissemination and World TB day activities. To increase utilisation of TB services, NTP has created a TB slogan “together hey jeet zindagi ki”. This slogan, along with the TB brand, has been widely publicised through social marketing.

ACSM has been an integral component of the NTP right from the beginning of the programme but gained momentum in 2005 when 100% DOTS coverage was introduced in the public sector.

Two national assessments of ACSM have been conducted (Haq et al. 2013 and Turk et al. 2013). The major findings showed ACSM campaign activities was associated with improved TB knowledge and more positive attitudes about TB treatment options. These findings highlight knowledge gains that may be attributable to the campaign. Of particular concern was the finding that TB transmission occurs through touching personal items or sharing dishes. It also showed that exposure to the ACSM campaign across multiple communication platforms have an additive effect with respect to TB knowledge.

Another key finding of the assessments was the presence of poor levels of TB knowledge, attitudes and practices in both urban and rural communities. This finding is particularly worrisome given the relatively large rural population in Pakistan. ACSM campaign awareness was also lower among respondents reporting that they were illiterate. Self-reported illiterate respondents were also less likely to prefer to receive information about TB through broadcast media, suggesting that they may be ill-served by a mass media-centric campaign alone.

The assessments indicated areas where further work needs to be done, and these include:

1. Conducting communication campaigns targeted to address deficits in TB understanding, particularly among rural and illiterate Pakistanis;

2. Leveraging the preferred media channels of key demographic segments and exploring the degree to which exposure to multiple channels of communication may have an additive effect on health knowledge;
3. Implementing BCC strategies involving physicians to foster empathy and respect for patients; and
4. Conducting context-specific social mobilisation based on identification of key and vulnerable populations.

Furthermore, the results of these ACSM assessments recommend that evaluations should be built into the design of ACSM campaigns from the beginning to generate robust evidence for assessing their effectiveness.

PARTNERSHIPS

To support Pakistan's TB control interventions, the NTP has developed a partnership network with a diverse range of partners that include national, multilateral and bilateral agencies; international NGOs, Pakistan Paediatric Association, Pakistan Chest Association and national NGOs. Recently, NTP has also partnered with media outlets and telecommunications companies in this expanding partnership network.

Stop TB partnership Pakistan has established an office in Karachi, Sindh. On the recommendation of the Joint Review Mission 2015, Stop TB Pakistan has also increased its presence at the provincial level by establishing strategic working groups in all four provinces.

Table 24. Stop TB Partnership Pakistan Thematic Areas of Activity

THEME	ROLE & RESPONSIBILITY
Policy and Advocacy	Provide high quality assistance to the National and Provincial TB Control Programs and partner organizations in advocating for policies (or change in policies), legislation and regulatory frameworks that support universal coverage of TB services.
Patient-centered Care and Support	Advocate for and promote wider engagement with communities, CSOs and all public and private care providers with a focus on gender and human rights, and patient-centered care and support.
Multi-sectoral Approach	Build bridges across health and non-health sectors and disciplines to leverage their capacities to end TB in Pakistan.
Enhanced Political Commitment	Advocate for enhanced political commitment at all levels specifically for mobilising financial and technical resources for TB control in the country.
Research and Evidence Generation	Collaborate with partners to generate a base of evidence to improve TB care in resource-constrained settings.

RESEARCH

Research is a key strategic area in the national strategic and operational (PC1) plans as well as the End TB Strategy. The Strategy describes researchers as a core component of NTP work. Designing and conducting locally relevant research can identify problems and workable solutions, testing them in the field and planning for the scale up of activities.

The NTP established a Research Unit in 2009. In the last few years, the NTP has designed and implemented several research projects and national level surveys on priority programme needs. This included disease burden studies for measurement of TB transmission (National TB Prevalence Survey, 2010-11) and two national inventory studies (adults in 2012 and children in 2016). The TB REACH Wave 2 study recently examined the “Effectiveness of widening the circle of contact screening from within the household to 100 people around the house: index case on case finding through outreach using GIS”. The project introduces active contact investigation in four cities. Household contacts (i.e., those normally resident or sharing the same airspace), will initially be verbally screened, followed by screening a wider circle of close community contacts. The project will use Gene-Xpert among smear negatives TB cases and chest X-rays for those suggestive of TB.

The Indus hospital project TB REACH was conducted in Karachi Indus Hospital using community lay people, mobile phones, and awareness campaigns to screen people for TB at 54 private clinics and a large hospital. The results demonstrated that case detection doubled in one year and the Indus hospital became the second largest reporting center in Pakistan.

Research capacity has increased dramatically in 2014-16. Notable efforts have been made by the Union, WHO, in collaboration with GF and NTP, to conduct the first internal SORT IT course at Pakistan in 2016. Additional research capacity development workshops were also conducted at national level.

HUMAN RESOURCE DEVELOPMENT (HRD)

Health services cannot be delivered effectively and efficiently without trained human resources. Attaining, training, and retaining human resources are challenges in developing country. HRD (for comprehensive TB control) refers to the process of planning, managing and supporting the health workforce involved in delivering comprehensive TB control services, within the development of the overall health workforce.

Coordinated efforts are made by the Pakistan NTP to address HRD, involving ministries of health, local governments, representatives of provincial and local staff and the private sector. The following trainings are offered by the NTP: initial training in all aspects of basic DOTS implementation for existing staff and new hires; initial training on TB-HIV and MDR-TB; management of childhood TB; training/orientation of all public and private providers in TB control; pre-service training (basic training) for physicians, nurses, laboratory technicians, and other health workers involved in the implementation of the Stop TB Strategy; monitoring and evaluation and recording and reporting.

Through the GFATM grant support all functional levels of laboratory networks are being enhanced in terms of staff trainings, infrastructure development, laboratory equipment, lab supplies and activities have been scaled up for nationwide EQA of sputum smear microscopy.

The training of health-care providers is an on-going process, that includes regular refresher courses. Moreover, in order to incorporate new interventions and recommendation in TB control, updating of the training modules and guidelines is also an on-going process.

STRATEGIC DIRECTION

INTRODUCTION

Global development has entered a new era where world leaders are committing to end poverty, promote prosperity and people's well-being while protecting the environment by 2030. The SDGs build on the MDGs, but with a broader scope and more ambitious targets. Seventeen new SDGs were adopted at the UN Summit in September 2015. The SDG era began on 1 January 2016; at the same time WHO launched their END TB Strategy to prevent, control and end the TB epidemic came into action.

This means that TB incidence and death rates should be reduced by 80% and 90%, respectively, in 15 years. The End TB Strategy has a longer timeline than the SDGs, up to 2035. Although the 80% to 90% reduction represents 2030 milestones in the END TB Strategy, the targets are 90% incidence and 95% death rate reduction by 2035, which means that the global burden of TB should be similar to the burden in low incidence countries today. (52)

Many of the interventions required to reach the END TB targets must be addressed. These include addressing the social and economic determinants of TB. The END TB Strategy indicator on “catastrophic costs due to TB” could complement monitoring of the progress towards social protection too. TB diagnosis and treatment were listed among the most cost-effective health interventions in the SDGs, and also one that directly contributes to improved productivity and, therefore, overall societal development. (52) Examples of actions that would address key TB determinants are clear-cut in the new goals: ending poverty in all its forms everywhere; ending hunger, achieving food security and improved nutrition, and promoting sustainable agriculture; ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all; achieving gender equality; ensuring access to affordable, reliable, sustainable and modern energy for all; reducing inequality within and among countries; and making cities and human settlements inclusive, safe, resilient and sustainable. (53)

The current NSP, (2016–2020) describes the future directions and focus of the work towards TB elimination. It aims to support all provinces/regions in reducing TB mortality and incidence in line with global targets as set in the World Health Assembly (WHA) resolution WHA67.1. The NSP guides the country in addressing persisting and emerging epidemiological and demographic challenges and advancing universal health coverage and robust health systems. The current plan focuses on implementation of the End TB Strategy in the coming five years within the overall scope of the 20-year strategy covering 2015–2035.

NTPs need to review and modify, as needed, the NSP in line with the new strategy and the new SDGs. This will require defining the status of the various interventions listed under the strategic directions and subsequent strategies of the NSP.

Implementation of the NSP requires intensified actions elaborated under the three strategic directions of the strategy from three levels of governance in close collaboration with all stakeholders. The three levels include the NTP, the national health ministry, and higher levels in the national government responsible for setting the social Development agenda, resource allocation and inter-ministerial coordination.

REVIEW MISSIONS

The Government of Pakistan, along with the Stop TB Partnership, WHO, and other technical and donor partners concluded two joint monitoring missions to review Pakistan's NTP in 2015. The team focused its efforts on reviewing Pakistan's progress in the implementation of the NSP. The monitoring team also reviewed the country's progress towards improving access to TB care, challenges and plans for TB efforts and advising the government and partners on the path towards strategies in line with the set targets. The mission recognized the substantial progress made by the Pakistan TB programme, the great political commitment of the government and the hard work of the National TB Programme teams at both federal and provincial levels.

The interventions listed in Table 25 are based on the joint insight from the End TB Strategy and recommendations of international review missions conducted in recent past.

Table 25. Achievements on the Recommendations made after the International Reviews of 2015

COMPONENT	RECOMMENDED INTERVENTIONS	ACHIEVEMENTS/PROGRESS
GENERAL	<ol style="list-style-type: none"> 1. Integrate TB control with Poverty Alleviation Strategies. 2. Involve all tertiary hospitals in interventions for MDR-TB, PPM and Childhood TB. 3. Ensure that contact investigation is systematically conducted so that it would contribute to late detection of cases. 4. Curb widespread over-the-counter sales of anti-TB Medicines outside the NTP which might lead to increased drug resistance. 	<ol style="list-style-type: none"> 1. Poverty reduction strategy paper (http://www.finance.gov.pk/poverty/PRSP-II.pdf) 2. DR-TB, PPM, CHTB interventions and hospital DOTS linkage in tertiary care hospitals are scaled up and are included in future strategies. 3. Remained a gap but included as an important component in revised strategic plan. 4. Bill passed in KP, other provinces to follow.
PPM/ISTC	<ol style="list-style-type: none"> 1. The role of each partner and stakeholder must be clearly defined for the quality and effective implementation of the PPM. 2. Provide joint supervision (partners and NTP including PRL) and include PPM on routine basis. 3. Compile and share best practices across the country; encourage replication of successful approaches. 4. Expand the PPM approach to pharmacies, laboratories and parastatals. 5. Simplify existing M&E tools. 6. Strengthen PPM activities by introducing community-based referral mechanism for the presumptive TB cases. 7. Lead a comprehensive review of the PPM models, including those for PMDT to describe their method of work and structure, determine their effectiveness, and propose how to scale up these models. 8. Formalise public sector linkages with small private providers (GPs, labs, pharmacies, informal practitioners) through intermediary partners 	<ol style="list-style-type: none"> 1. Needs further improvement. 2. Inter PR and PR SR meetings (NFM) 3. Done on forum of quarterly surveillance meetings 4. Addressed through mandatory TB Notifications , PPM -4 has engaged Parastatal and pharmacy engagement is in plans .2000 pharmacies engaged and expansion plan in new grant. 5. Revision of tools planned in context of End TB strategy 6. Included in strategy (LHWs and Community workers) 7. Included in future plans. 8. In progress / and strengthening in future plans.

POLITICAL COMMITMENT	<ol style="list-style-type: none"> 1. Gradually increase the financial support from the domestic resources at both national and provincial level. 2. Coordinate with donor and technical agencies such as World Bank, JICA, USAID, KfW, DFID, UNICEF at national and provincial levels. Enhance coordination by revitalising the IACC at federal level and sub-committees at provincial level. 3. Increase awareness about TB care and ensure political commitment at provincial and district level 4. Strengthen the provincial managerial, technical and supervisory capacity (vacant positions of Project Managers and the M&E Officers must be filled urgently). 5. Ensure approval and implementation of PC-1s to avoid interruption of TB care activities in the provinces 6. Develop capacity of the provincial programme (qualified and skilled human resource at provincial level). 7. Ensure timely initiation of the process of preparing case for the releases of the PC-1 funds 8. Develop a structured plan to lobby with the decision makers (involving patient coalition, STOP TB partnership, political leaders, etc.) to ensure optimum releases and utilisation of PC-1 budget. 	<ol style="list-style-type: none"> 1. Revised NSP to include an advocacy tool for ensuring domestic funding 2. Part of future plans. 3. TB awareness is included in the strategic directions (PSPs). 4. Capacity building of SRs by NTP-PR. (Grant management and Finance units) & technical capacity building through TOTs on Basic DOTS , DR TB , M&E/Surveillance. 5. Revised NSP serves as advocacy tool for political commitment by Provincial TB Control Programs and to increase government allocations. Support Stop TB partnership is included in the new NSP. 6. Done both for managerial as well as technical capacity, part of future plans. 7. PTPs taking the lead, NTP support available. 8. STOP TB partnership (National & Provincial chapters) active to support the cause.
DIAGNOSIS	<ol style="list-style-type: none"> 1. Improve ACSM to increase the number of patients with active TB who present for diagnosis 2. Improve systematic TB suspect identification that requires refresher training of health care workers. 3. For a presumptive TB patient, the first line of testing should still be a smear microscopy. CXR can also be done at the same time. 4. Re-examine the role of X-pert MTB/RIF in future for case finding of TB, especially in the ascertainment of smear-negative cases and extra-pulmonary cases, beyond its 	<ol style="list-style-type: none"> 1. Part of current and future strategies and a wing is established under policy unit that takes care of Partnership , Community development & Communications Special strategies for HRGs through partnership is planned, School health service and other inter-sectorial collaboration is suggested. 2. Identification of Presumptive TB cases is included in the training materials for health care workers. 3. CXR added into the revised algorithms as a screening tool. Procurement of 55 digital X-Rays in in pipeline 4. Role of X-pert MTB/RIF enhanced in revised diagnostic algorithms in line with END TB Strategy.

	<p>current use in retreatment patients and other cases at risk of drug-resistance.</p> <p>5. Active case finding in line with WHO recommendations need to be adopted and applied in clinics to improve case detection</p>	<p>5. Piloted under current grant with expansion plan in NSP/PSP.</p>
DS-TB	<ol style="list-style-type: none"> 1. More efforts are required to increase case notification by including systematic screening and active case finding in routine TB care 2. Data validation exercise at national level is required to conform the reported case notification and treatment outcomes 3. Out of box thinking is required to address lost to follow-up (e.g. rapid SMS in tracing lost to follow-up patients) 4. All the specialties in tertiary and district hospitals should be involved in systematic TB screening. In each hospital a "TB control board" may be considered to be formulated to be chaired by the in-charge hospital and participated by representative of all specialties to discuss TB care progress in the hospital on regular basis 5. Duplication (i.e. sputum smear microscopy and parallel Xpert) should be avoided. 6. Contact screening should be done actively. It should be considered that the accompanying person(s) with the TB patient should be systematically screened for TB. Better counselling and incentive for poor family members of TB patients should be encouraging for contact screening 7. Case finding must be increased by ensuring more effective involvement of laDeputy health workers in TB especially for referral of presumptive TB cases and provision of DOT in line with community-engagement approach. 8. Develop in-country capacity to produce WHO prequalified anti-TB drugs in ample quantity to meet the country's needs and beyond. 	<ol style="list-style-type: none"> 1. Part of current and future strategies in NSP/PSP. 2. Done through forum of Quarterly surveillance meetings at district level. 3. Effective involvement of LHWs is a planned strategic intervention for referrals and retrieving patients. 4. Strengthening of Hospital DOTS linkage through screeners at TCH /DHQs is being implemented. 5. Revised algorithms address the point 6. Remained a gap , addressed as priority strategic intervention in revised strategic plan 7. Included as an important strategic intervention 8. Still a gap , however, NTP & STOP TB Pakistan are trying to follow up with pharmaceutical companies to get WHO prequalification. 9. Still a gap, although two labs have attained the ISO 17025 certification , however TB drugs are not tested. 10. 25% buffer stock is maintained at district level by the provinces. 11. Being implemented 12. In process 13. FLDs are being reported on TB-DMIS, where as SLDs are reported in ENRS. Lab reagents are reported in WMS. Efforts are being made to implement ERP 14. Redistributuon is being made at inter & intra district levels to avoid expiries. 15. To be discussed with technical teams and implementors.

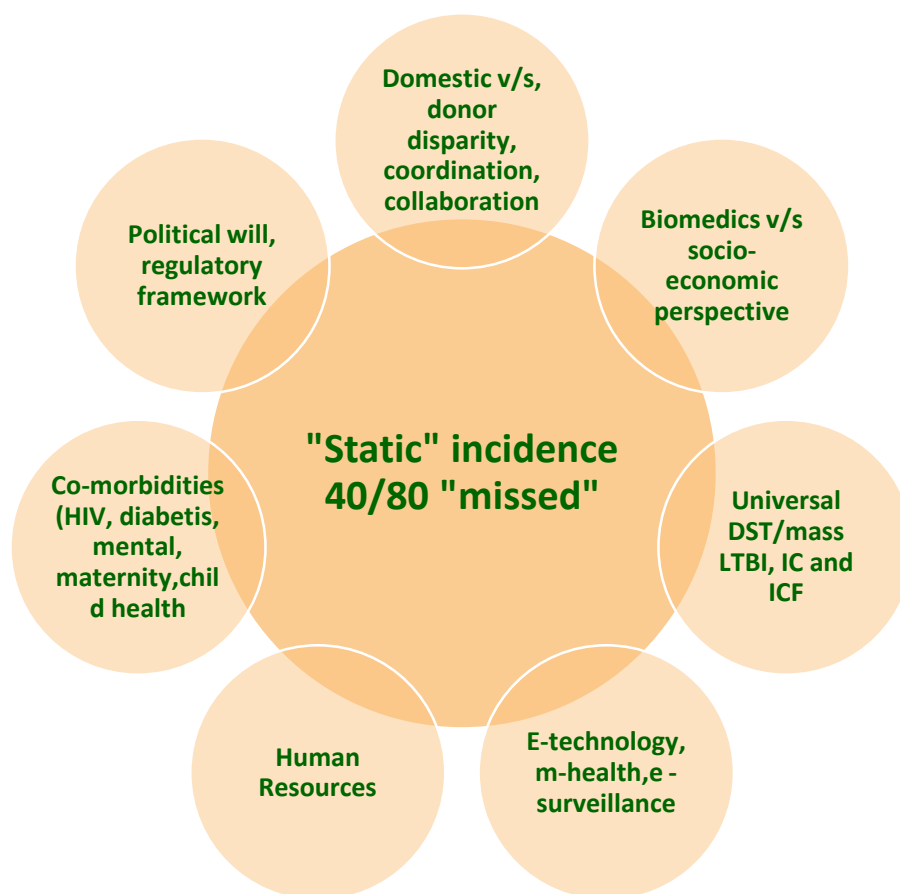
	<ol style="list-style-type: none"> 9. Enhance capacity of in-country labs to obtain ISO 17025 certification for testing anti-TB drugs for quality assurance 10. Considering at least 25% buffer stock at district level (enough for one quarter), to ensure that no shortage or stock outs occur 11. Keep district buffer stock sufficient for one quarter 12. Stock cards and dispensary register need to be revised to be in line with the standard programme practice. 13. Electronic TB-DMIS and WMS to be expanded throughout the country to improve management of FLD, SLD and also laboratory reagents 14. Better coordination of the transfer of drugs about to expire between warehouses 15. Adopt TB patient kit method. TB patient kits should be prepared according to the treatment category and weight of the patient in order to ensure availability of a full course drugs for a patient. Such a system helps health centers and drug managers to manage drugs better. 	
HIGH RISK GROUPS	<ol style="list-style-type: none"> 1. Active case finding be implemented for all vulnerable groups (children, elderly and females).groups (children, elderly and females). 2. Systematic and comprehensive implementation of Childhood TB activities in line with WHO recommendations is urgently needed. Ensure availability of PPD for diagnosis of TB in children 3. Improve systematic contact screening (through active case finding method) and isoniazid prophylaxis 4. Provide a formulation of 100mg isoniazid tablets will be needed for the prophylaxis of pediatric contacts 5. Improve the diagnosis of extra-pulmonary TB in children through the use of X-pert MTB/RIF and of gastric aspirate examinations 	<ol style="list-style-type: none"> 1. Emphasised in revised strategic planning 2. CHTN working group established, CHTB friendly formulations introduced, PPD procurement in process. 3. Contact tracing/IPT is emphasized in revised strategic planning 4. Included in the demand by PSM 5. Piloted with plans for expansion. 6. Considered as Part of future planning. 7. TOTs conducted on revised CHTB materials 8. The Prevalence Survey 2010-11 showed high TB prevalence among males while routine data shows regional differences needs further investigations. 9. Currently 4% with plans to improve as per the End TB indicators 10. Implementation in collaboration with NACP 11. National Algorithms Revised 12. Guidelines updated 13. Improved coordination and joint M&E is included

	<ol style="list-style-type: none"> 6. Schools and madrassas must include simple symptom screening at entry and high index of suspicion during schooling (engaging staff from school medical services) 7. Improve childhood TB management through wider training of HCW on Childhood TB 8. The high level of TB in young women may reflect specific vulnerabilities or else issues of access for males. It deserves closer investigation 9. HIV testing and counseling to be offered to all TB patients 10. 1Evaluate all PLWHIV for TB and provide IPT for PLWHIV after ruling out active TB 11. Use CXR in the testing algorithm for patients with HIV infection with clinical manifestations suggestive of active TB, as well as X-pert MTB/RIF as per the national guidelines 12. Update the TB/HIV guidance and develop the mechanisms for delivering integrated TB and HIV services in line with the recent WHO TB/HIV guidelines 13. Improve coordination and data sharing between NTP/PTP and NACP as well as at local level through more regular coordination meetings 14. Measures to limit the possibility of TB transmission in HIV sites need to be ensured. 	<ol style="list-style-type: none"> 14. Infection control measures at all TB treatment sites is included in NSP
PMDT	<ol style="list-style-type: none"> 1. Regional GLC should ensure one yearly PMDT monitoring mission 2. MoH/NTP should continue increasing national funding for TB including DR-TB and use the current GF project period as an opportunity to prepare for an eventual phase-out 3. NTP should enter all diagnosed RR/MDR cases in ERNS, so it becomes a national RR/MDR register, making it possible to monitor the number of RR/MDR cases registered, proportion of RR/MDR patients who are started on MDR treatment, and the delay in treatment start. This is in line with WHO recommendations 	<ol style="list-style-type: none"> 17. The funds are secured in grant and the activity is budgeted annually. 18. Domestic funding for DR TB is part of future plans 19. Policy decision is under consideration 20. Paper based registers in place at All PMDT sites 21. Done 22. PPM expansion is planned both for DS and DR TB, taking advantage of mandatory notifications. 23. Policy alreaDeputy in place 24. This is alreaDeputy part of NTP policy. 25. Plans there for customized Sputum transportation system

	<ol style="list-style-type: none"> 4. NTP/PTP should design quarterly printouts of selected variables in the ENRS, similar to the WHO recommended MDR register. These printout may serve as the paper-based backup and facilitate on site analysis and use of data for management. 5. Introducing a paper-based MDR register in the PMDT sites, to facilitate supervisory visits and strengthen quality of data. 6. Bring the private sector into the NTP, taking advantage of the new laws on notification and sale of TB drugs over the counter 7. Introduce routine rapid testing of 2.line drugs (quinolones and injectable) of all RR/MDR patients 8. Ensure that all retreatment cases have GeneXpert testing done. NTP should strengthen the initial interview/counseling with the TB patient to scrutinise if treatment has been received previously 9. DTP/NTP/PTP expanding transport of sputum of DR-TB suspects from primary health care units to Rural health centers (with microscopy) and further to GeneXpert centers 10. NTP/PTP/DTP should ensure quick communication of GeneXpert results 11. Introduce short course MDR regimen in line with WHO guidance 12. Strengthen basic DOTS to reduce delay in diagnosis and treatment start of TB and MDR-TB, including in private sector 13. Strengthen the link between PMDT site and BMU. TB treatment coordinator should be enabled to visit homes of DR-TB patients regularly and take action in case of patients not coming 	<ol style="list-style-type: none"> 26. GX alert implementation will address the issue 27. Linked with 2nd line LPA implementation alreaDeputy in pipeline. 28. Part of NTP plans. 29. AlreaDeputy implemented , needs further strengthening 30. System has been modified as it is switched over from April 2017 to cash disbursement through Tameer bank (easy paisa) 31. AlreaDeputy taken care of. 32. For DR TB it is alreaDeputy in place through home visits by treatment coordinator. Contact investigation is prioritized intervention in revised NSP.
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	<ul style="list-style-type: none"> 14. Ensure uninterrupted social support/enablers (food packets, travel cost), with increasing national funding to ensure sustainability 15. Ensured that all tests of presumptive TB cases, DR TB cases should be done free of cost and the issue should be taken up with Health Department Balochistan 16. Contact investigation should be systematically implemented and should cover all contacts of TB and DR-TB cases 	
M&E	<ul style="list-style-type: none"> 9. A proper framework for the supervision of BMU work is needed. 10. Strengthening of the DHIS2 11. The number of vacancies in key positions needs to be addressed by provincial TB programs to take on more of the supervision responsibilities 12. Electronic data management should extend to the laboratory diagnostic services 13. The current Excel-based ENRS should be converted into a proper national database. 14. The pharmaco-vigilance (PV) recording system needs to be used for all MDR-TB patients on 	<ul style="list-style-type: none"> 1. M&E module / Check lists exist and revision is planned in context of devolution and End TB strategy 2. DHIS-2 is planned for implementation, national data analysis workshop done. 3. Recruitment on M&E positions done by provinces. 4. NRL has a web based system for microscopy network, Xpert alert is soon planned for implementation. 5. DHIS-2 is planned for implementation 6. PV is part of DR TB management.
HUMAN RESOURCES DEVELOPMENT	<ul style="list-style-type: none"> 1. The National Guidelines, Training Modules, Desk Guide, Ambulatory Based Model of Care and any other relevant materials are needed to be update in view of WHO recommendation and local learnings. 2. Human resource development in terms of keeping relevant tiers of implementation up to date and train according to new recommendations and guidelines. 	<ul style="list-style-type: none"> 1. Revised in line with WHO revised definitions 2013, further revision planned in context of End TB strategy 2. Training materials revised in line with WHO revised definitions, revisions/addendums planned to align with End TB strategy

Figure 24. . Major Challenges for TB Control in Pakistan

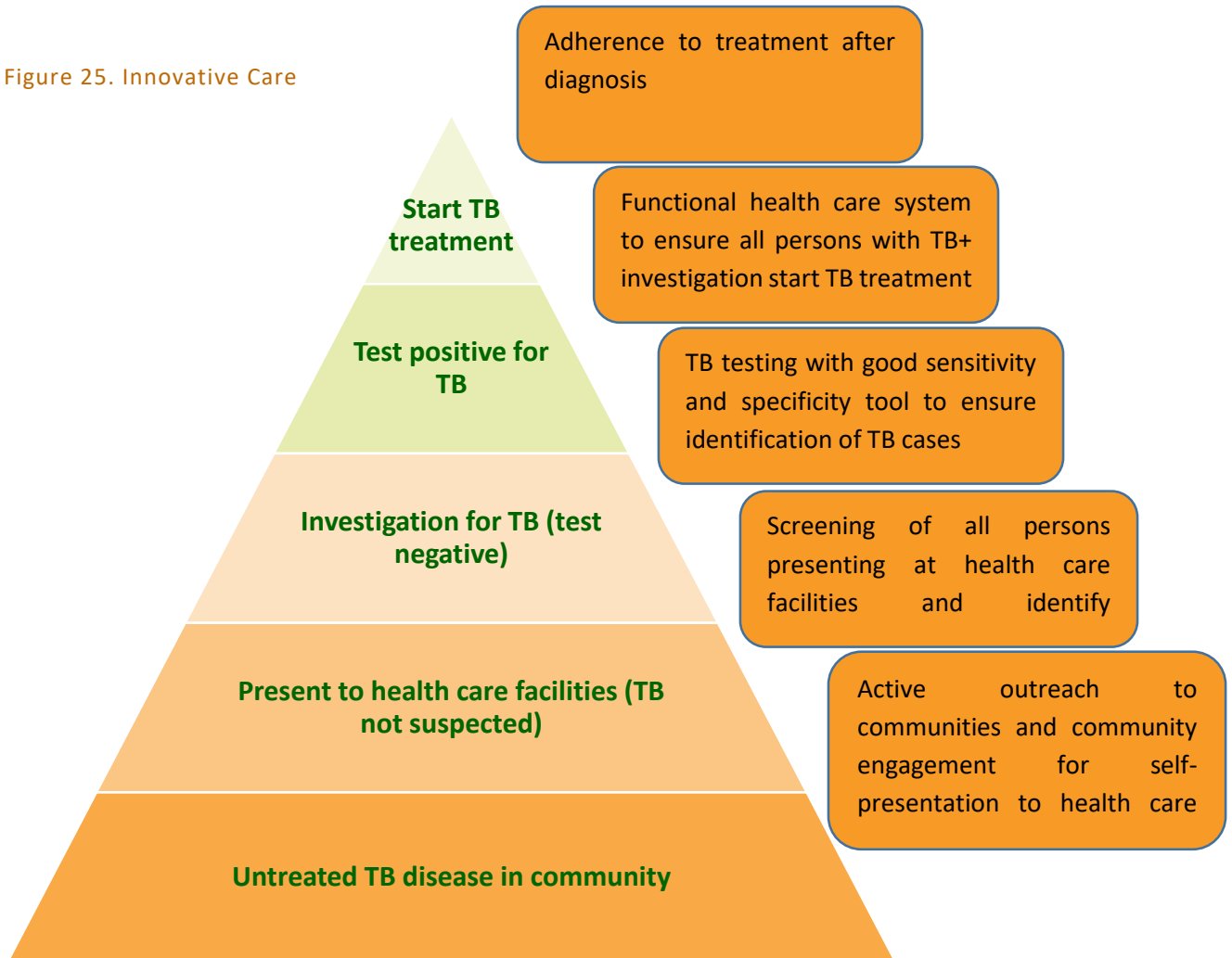


PILLAR 1 (INNOVATIVE CARE): SEARCH, TREAT, AND PREVENT

STRATEGIC DIRECTION

- Ensure early identification of presumptive TB cases (private, public).
- Provide universal access to quality TB diagnosis (including DR TB).
- Build capacity to HCW on existing screening methods for LTBI.
- Ensure early initiation of treatment to all patients diagnosed with TB.
- Improve TB treatment adherence.
- Prevent TB in key effected persons such as prisoners, miners, HCWs, children, injecting drug users, and PLHIV.
- Implement of behavioural support interventions developed through TB and tobacco trials in routine settings.

Figure 25. Innovative Care



Pillar 1: SWOT Analysis

Table 26. Pillar 1 - SWOT Analysis

	STRENGTHS	WEAKNESSES
	<ol style="list-style-type: none"> 1. TB diagnostic network with availability of investigations (sputum microscopy, X-ray chest, WRD, Culture & DST) 2. 100% coverage of TB care facilities in public sector with rapid expansion in PPM sector. 3. Increase in TB case notification (CDR 71% in 2016) with treatment outcome of >90% 4. Provision and availability of free, uninterrupted anti-TB drugs. 5. Increased domestic funding 6. Screening and intensified TB case finding for the vulnerable and high risk community 7. Outreach community workers available to ensure linkage to care 8. TB/HIV collaborative activities at 40 sentinel sites in place 9. Quality assured first & second line drugs available through domestic & donor funding 10. Social support for DR TB patients 11. Scale-up of PMDT sites with good treatment outcomes sites. 12. New DR TB drugs, introduced at 6 PMDT sites 13. Bedaquiline introduced into the DR TB treatment regimen 	<ol style="list-style-type: none"> 1. Limited availability of WRD and diagnostic facilities at basic level for early diagnosis. 2. Poor utilization of X-pert testing (load management mechanism not in place). 3. Inefficient sputum transport system for WRD 4. Delayed DST/ Culture results 5. 1/3rd missed TB cases for notification 6. Locally produced medicines are of unknown quality 7. No WHO pre-qualified drug lab for B/AB/E 8. High pre-treatment loss to follow up among diagnosed TB cases. 9. Insufficient purchasing of quality assured FLD ATT drugs at provincial level 10. Insufficient space storage space of ATT Drug s at provincial level 11. Inadequate arrangements for transportation of drugs 12. Weak presumptive and contact management 13. Poor access of TB care services for vulnerable and high risk groups in hard to reach areas 14. Most of the poor patients seek health care from GPs who are not enable to manage childhood TB 15. Limited intra hospital linkages with DOTS due to low priority of NTP/PTPs and independent status of TCH&DHQs 16. High proportion (80%) of missed cases among incident DR-TB 17. Non-availability of domestic funding for WHO pre-qualified drugs testing, pharmaco-vigilance, linkages of PMDT site with peripheral treatment sites, palliative care and ancillary drugs. 18. Data management for DS TB and DR TB at excel sheet with inbuilt risks and inability for analysis 19. Screening of HCW for TB and HIV, working in high risk environment 20. Compliance to preventative therapy for Children and PLHIV

		21. Unexpected delays in establishing Line Probe assay for second line drugs Delayed availability of equipment and other requirement to establish LPA for 2nd line drugs
EXTERNAL FACTORS	OPPORTUNITIES	THREATS
	<ol style="list-style-type: none"> 1. Presence of public sector healthcare programmes/partners/outreach workers and PPM sector for effective referral, screening and follow up. 2. Availability of support from NGOs and professional bodies in healthcare sector (PMA, PCS, PPA, PPMA and academia (medical college and institutions and academia). 3. High clientage at OPD of TCH, DHQ and selected THQs as screening sites. 4. Technical support from USAID available 	<ol style="list-style-type: none"> 1. Free X-ray facilities not available in TB care facilities. 2. Inadequate Maintenance services for Xpert machines 3. Short expiry of ATT drugs through GF 4. Refusal from private sector to get engaged with NTP to follow the National Guidelines. 5. Barrier to access health care due to high cost of travel for presumptive/contacts/HRGs and vulnerable population 6. Resistance to implement intra hospital linkages 7. Compromised District ownership for TB 8. TB data not integrated in DHIS 9. irrational use of antibiotics leading to high level of quinolones resistance in Pakistan 10. Discontinuation of donor support 11. Provincial programs not prepared to absorb the responsibility in devolved context 12. Shortage of health care provider/ health facilities in hard to reach areas (Public/private),

DIAGNOSIS

The diagnosis of TB depends on numerous factors namely, self-presentation of persons with TB symptoms to health care facility, high index of TB suspicion among health care professionals, TB screening practices in health facilities, sensitivity and specificity of diagnostic tests, turnaround time for delivery of laboratory results, and the capacity to trace people with positive results and start them on treatment.

Challenges (GAPS)

1. Limited availability of WRD and latest diagnostic facilities at basic level for early diagnosis.
2. Poor maintenance of services for WRD.
3. Inefficient sputum transport system for WRD.
4. Frequent shifting and transfer of trained staff.
5. Uninterrupted and free X-ray facilities not available in TB care facilities.

6. Weak linkages between the laboratories and the BMUs, resulting in new diagnostics tools not being used optimally.
7. Low detection of bacteriologically confirmed cases (RR cases).
8. Impact of EQA is not reflected in lab performance indicators like FSPR and proportion of B+ among PTB cases.
9. EQA in private sector is insufficient.
10. Delayed DST/Culture results.
11. All Xpert machines are procured with extended warranty. Calibration is performed annually but formal mechanism for EQA of Gene-Xpert testing is not yet implemented.
12. Poor utilisation of Gene-Xpert testing (load management mechanism not in place).
13. Unexpected delays in establishing Line Probe assay for second line drugs.

Activities

1. All Xpert machines are procured with extended warranty. Calibration is performed annually but formal mechanism for EQA of Xpert testing is not yet implemented and will be implemented during the next three years.
2. Although specimen transport has been successfully used for transportation of specimens from PMDT sites to culture laboratories, most of the districts are not satisfied with their performance and coverage at sub-district level is poor. Implementation of an effective transport system between peripheral facilities Xpert sites will be implemented. This will be done by using transport or postal services or paying for transportation to patient attendant.
3. Certification of biological safety cabinets (BSC) is done on needs basis and annual contract is not yet established as desired for these BSC. Maintenance of equipment installed in culture and DST laboratories is also an issue. Although GF resources were available, a service contract could not be obtained due to limited in-country capacity and lack of interest of by qualified and skilled vendors in private sector. An annual plan for BSC and maintenance of equipment in culture and DST laboratories will be established.
4. Mechanisms for better EQA in the public and private sector will be implemented
5. The WHO has provided several key guidance documents for national TB control and laboratory programmes for the use of light-emitting diode (LED) microscopes to improve the sensitivity of and turnaround time for the front-line assay, sputum smear microscopy, and for improving the accuracy of TB detection and drug susceptibility testing through the use of liquid culture and molecular line probe assays (LPAs). Pakistan has limited availability of WRD and the latest diagnostic facilities at basic level for early diagnosis. This will be scaled up according to WRD requirements.
6. Uninterrupted and free chest X-rays are not available at all TB care facilities. More facilities will have access to chest X-rays. For patients seeking care in the private sector the services will be made available free of charge in the government facilities. Linkages between the laboratories and the BMUs will be strengthened/established to ensure new diagnostics tools are used in provinces.
7. Expansion of GeneXpert and establishment of load management mechanisms for GeneXpert testing will be implemented.

8. Molecular tests for TB diagnosis will be scaled up and delays will be addressed by establishing Line Probe assay for second line drugs.
9. Ensure prompt availability of DST/culture result.
10. Recruitment of additional human resources for laboratories.

CONTACT MANAGEMENT AND CASE FINDING

Early identification of people with a high probability of having active TB (presumptive TB) is the most important activity of the case finding strategy.

Challenges (GAPS)

1. Household contact management is low (<10%).
2. HR for field contact tracing at public health facilities is not available.
3. TB contact do not visit health facilities due transport challenges and consultation fees in private sector.
4. Lack of awareness in the community on available free TB diagnostic facilities in the public and private sectors.

Activities

1. Identify TB contacts with active TB (and MDR TB) disease and initiate early treatment at facility level and in the community by linking patients to the nearest TB diagnostic facilities to ensure confirmation of diagnosis.
2. Active case finding through chest X-rays and on the spot sputum microscopy in high burden areas (peri-urban and rural areas). Prior to the camp community mobilization and awareness raising activities will take place to ensure maximum participation in chest camps.
3. Map high risk / vulnerable population in local areas. If additional information is available locally, it can be used for prioritization of target groups. Systematically perform active screening of vulnerable individuals attending hospitals and other health care institution by using rapid screening tools (X-ray machines mounted at mobile vans for active contact screening
4. Develop and implement SOPs for contact management (passive and active) and revise the National TB Guidelines through TA.
5. Prevent LTBI through IPT and Rifapentine for household and close contacts as per National Guidelines.
6. Provide better counselling and incentives for poor family members of TB patients.
7. Implementation of preferred and interim algorithms for universal patient access to rapid testing to detect MTB and RR.

Figure 26. Preferred Algorithm for Universal Patient Access to rapid Testing to Detect MTB and RR – Algorithm 1

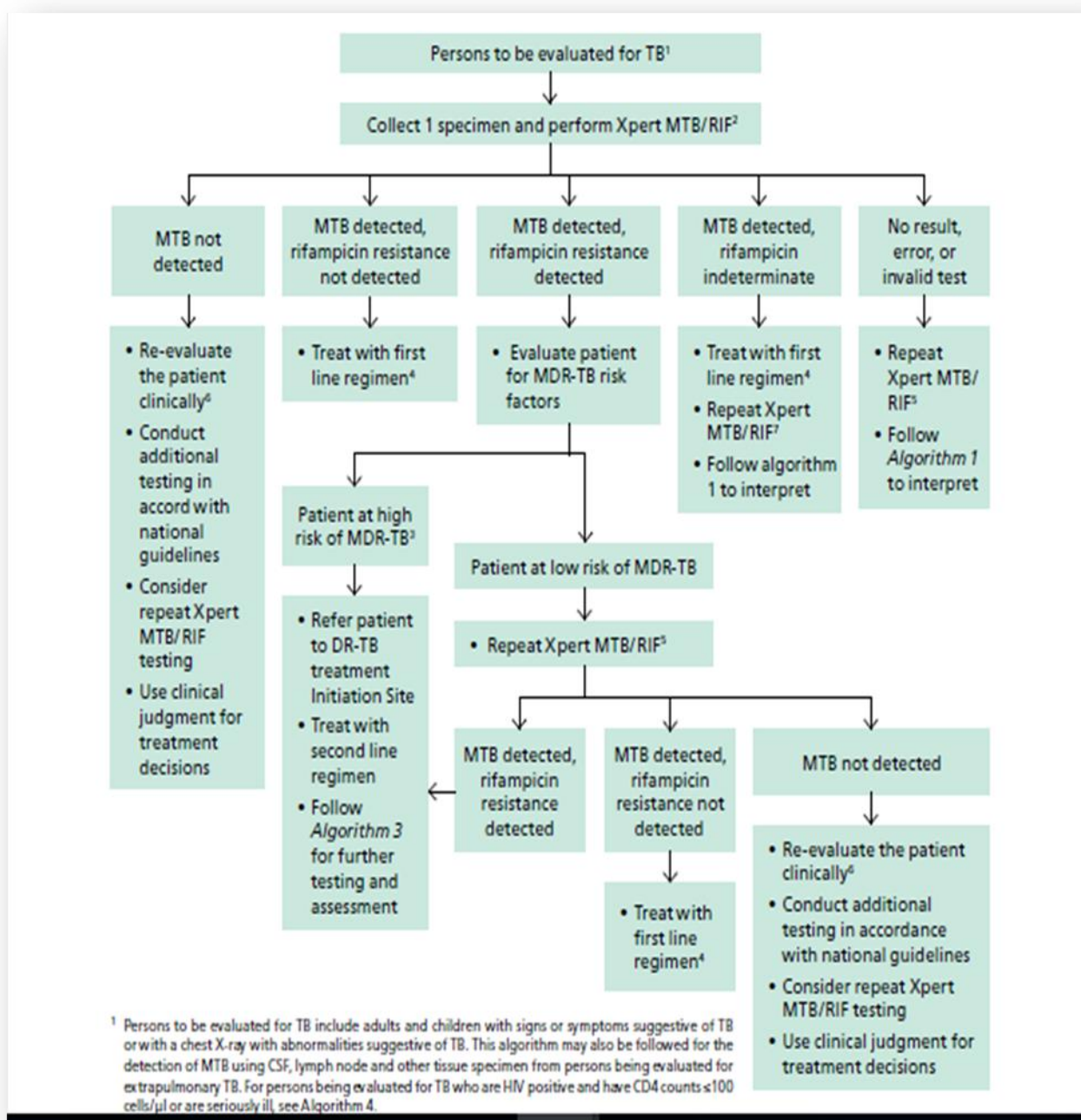
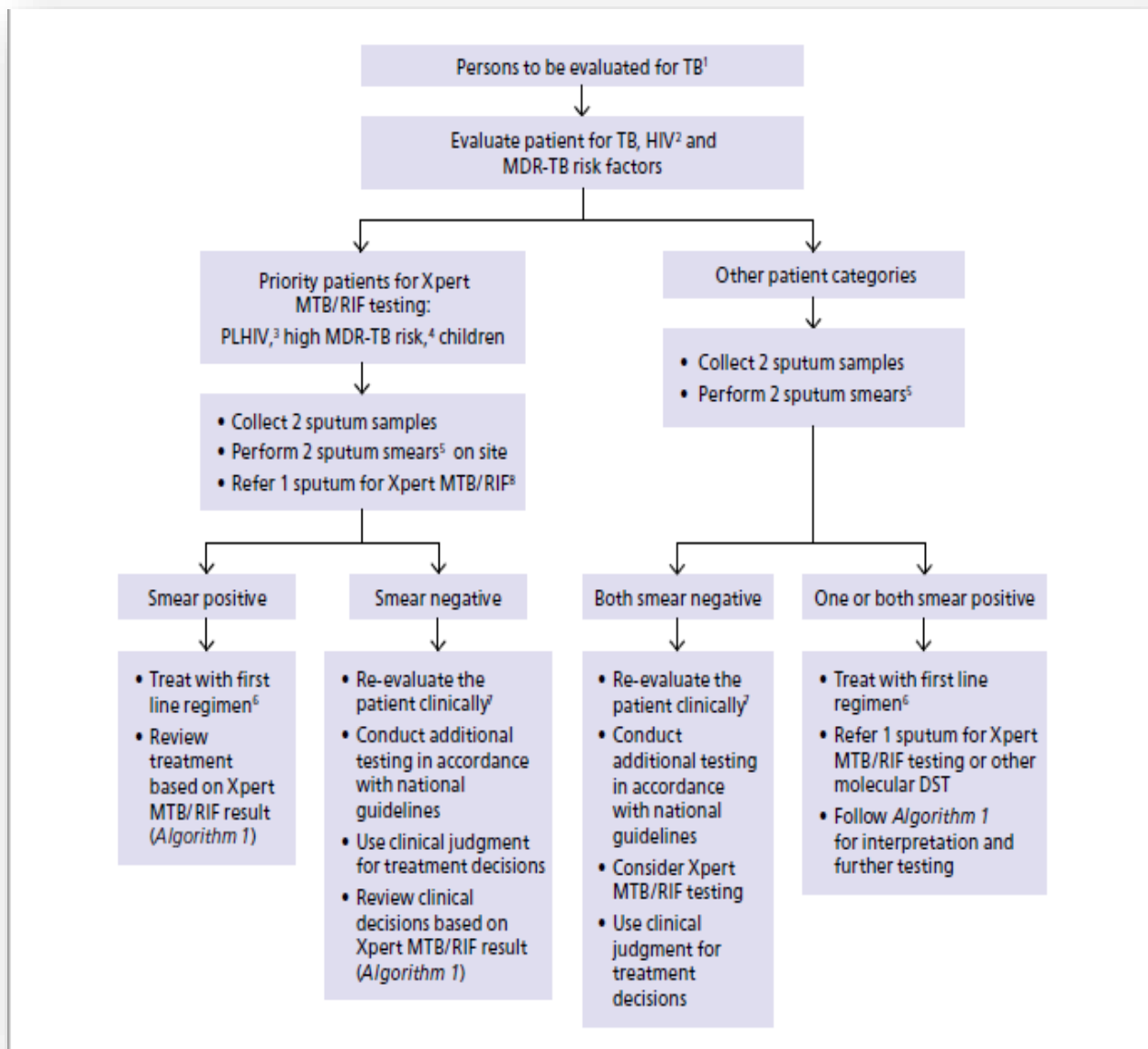


Figure 27. Interim Algorithm shifting to Universal Access, with Rapid Testing for Priority Populations – Algorithm 2



MANAGEMENT/TREATMENT OF DS-TB

Challenges (GAPS)

1. Quality assured drugs are not procured at local level.
2. Short expiry date of ATT drugs.

3. Insufficient purchases of quality assured FLD ATT drugs at provincial level.
4. Insufficient space storage space for ATT drugs at provincial level.
5. Inadequate arrangements for transportation of drugs.
6. Large number of locally produced anti-TB drugs of unknown quality, as a result of absence of WHO pre-qualified manufacturers in Pakistan.
7. Treatment failure due to the lack of implementation of standardised TB DOTS protocols and patients being scattered across various departments at tertiary care hospitals.
8. Insufficient involvement of large hospitals (public and private), lung clinics, and other specialised facilities in TB management.
9. Primary LTFU of diagnosed cases.
10. Weak M&E at district level.
11. Shortage of health care providers/health facilities in hard to reach areas (public/private).
12. Poor patient referral mechanisms among health facilities in Punjab, Pakistan.
13. Poor HDL at provincial and district level.
14. No designated TB staff at district level.
15. Delayed diagnosis and treatment of patients.
16. The reported cases represent only 63% of the estimated TB cases in Pakistan (i.e., 200,000 estimated TB cases are missed annually).
17. In view of the increased post devolution demands, gaps in managerial, technical and supervisory capacity were identified at the provincial/district level.
18. TB presumptive identification rate is very low (average is <2%)
19. There is a suboptimal involvement of the existing LHW in TB control activities.
20. National TB case management guidelines are not followed, especially by consultants and private sector.
21. Low compliance to preventive therapy.

Activities

1. Expand TB treatment at basic PHC services, especially to hard-to-reach populations (slums).
2. Initiate appropriate treatment for all diagnosed TB patients at public and private levels.
3. Empower HCWs on TB treatment and adherence to treatment through formal and in-service training.
4. Incentivise private health care providers through a adherence/continuity of the HCP
5. Treat LTBI bacteriologically-confirmed contact cases.
6. Implement/strengthen the procurement of drugs, ensuring sufficient space for storage of drugs and arrange adequate transportation of drugs.
7. Employ designated human resources at district level, focusing on slums.
8. Train staff on TB management (including the private and consultants).
9. Expand LHW roles in TB control activities to do active case finding through screening programmes, tracing of loss to follow-up patients and defaulters.
10. Implement an effective M&E system at district level.
11. Integrate TB data in the hospital medical records system.

MANAGEMENT OF DR-TB

Challenges (GAPS)

1. The NTP and partners enrolled 2,881 DR-TB cases in 2016, which is 21% of the estimated DR-TB cases. Among these cases, only 4% were new. Low (<20%) detection of incident MDR cases.
2. Currently there is no standardised, routine implementation of household or community-based contact tracing.
3. Increased number of primary MDR-TB cases diagnosed.
4. The UN Prequalification Programme managed by WHO ensures that medicines procured with international funds are assessed and inspected for quality, efficacy, and safety. These QC laboratories are not yet operational in Pakistan.
5. Limited TB-IC measures at BMU level; TB-IC and prevention measurements were only partially implemented at some DR-TB hospitals.
6. The BMU staff have not been fully sensitised to identify presumptive DR-TB patients, resulting in low referral of presumptive cases.
7. Weak sample transport infrastructure from BMU to X-pert sites.
8. Poor maintenance of rapidly growing pool of X-pert machines at the placement sites.
9. Weak linkages between X-pert and PMDT sites, 15% of RR/MDR detected cases leading to low enrolment of DR-TB cases for treatment.
10. Delayed referrals from peripheral health care units is one of the reasons for the high number of deaths among enrolled MDR-TB patients.
11. The adverse event management is done at PMDT sites through a system of pharmaco-vigilance, which is not up to the desired level as guidelines are not followed
12. Palliative care for MDR-TB patients who fail treatment does not exist.
13. MDR-TB programme is donor dependent, there is no public sector funding to support the programme. Reduction in donor funding will adversely affect the progress of the programme..
14. Inadequate number of culture and DST labs to meet increased load.
15. Ownership of the public sector is inadequate at all tiers and there is insufficient monitoring of PMDT sites.
16. Coordination between NTP and implementing partners is weak, results in delays in implementation and timely delivery of services.
17. High burden PMDT sites and specialised chest hospital are overcrowded with patients flow, making triage of DR-TB a challenge.
18. The data recording and reporting is done on excel based sheet and there is risk of data manipulation and miss reporting.
19. Over-the-counter sales of second line drugs open market.

Activities

1. Increase screening of pulmonary notified cases through universal DST and Gene X pert to detect RR cases and strengthen linkages of Gene Xpert, culture and DST labs with PMDT through Gene Alert, m-health, participation of PMDT and staff through quarterly meetings.

2. Strengthen active pharmacovigilance (monitoring, recording and reporting of ADR through TIBU and PPB platforms) and their management
3. Provide uninterrupted SLDs to enrolled DR-TB patients.
4. Strengthen the ambulatory based model of DR TB care through the development of linkages to care with a strong network of functioning DOTS clinics in public as well as the private sector.
5. Develop a comprehensive structure for contact screening and management by the implementation of a system of incentives to TB patients to cover travel expenses and visits to the patients by treatment coordinators as well as nutritional support. Each DR-TB patient and his/her treatment supporter should be provided cash incentives for travel and nutrition at every monthly follow-up visit to the PMDT site. Shift current social support mechanism to cash incentive and enhance the social support package.
6. Implement preventative therapy to contacts where TB is ruled out.
7. Revise the DR TB guidelines and training HCPs on DR TB.
8. Upgrade DR TB facility infrastructure.
9. Upscale TB-IC at DR-TB facilities and in the community through implementation of community infection control programs, training of staff on the ICP guidelines, and scaling up of personal protection through surgical masks for patients and N95 respirators for staff.
10. Develop a comprehensive plan for a DSM through guidelines and SOPs developed through a consultative process.
11. Develop a comprehensive structure for preventing and retrieving LTFU by working with districts and community based organisations to support by expanding the roles of the LHWs. Include active case finding through screening programmes, tracing of loss to follow-up patients and defaulters.
12. Implement a comprehensive strategy for palliative care for DR-TB patients .
13. Develop online recording and reporting system for PMDT sites and programme instead of excel based ENRS.

HIGH RISK GROUPS

Challenges (GAPS)

Childhood TB

1. Childhood TB is often overlooked due to non-specific symptoms/difficulty in diagnosis.
2. Children with vulnerable immune systems (very young, HIV-infected or severely malnourished) are most at risk for falling ill or Deputying from TB.
3. New-born children of women with TB and/or HIV are at increased risk of contracting TB.
4. There is a TB under-reporting, mostly from the private sector (as high as 27%).
5. Childhood treatment is limited to TCH and DHQ.
6. Childhood TB management is not implemented in a systematic way in provinces and districts.
7. PPD is not available everywhere. Some of the pediatric cases were reported with no BCG scar.

TB in the Elderly

1. About 10% of annually reported cases (NTP data 2012) are among elderly patients (those older than 65 years).

2. No specific interventions addressing TB in elderly as vulnerable population.

TB and Diabetes

1. Pakistan is faced with an increasing prevalence of diabetes in addition to its existing high burden of TB.
2. A limited number of health providers have experience regarding TB-Diabetes joint management.

TB and HIV

1. Not all TB patients are screened for HIV at the TCH & DHQ level.
2. Not all PLHIV are Screened for TB.
3. Untrained staff with respect to HIV guidelines
4. Pakistan has a concentrated epidemic of HIV with HIV prevalence rates higher than 5% in most-at-risk populations including people who inject drugs (PWID), followed by Hijra transgender sex workers (HSW)s
5. Service delivery quality varies between facilities.
6. Linkages between the TB and HIV programmes are not well established, resulting in weak coordination between the two programmes, especially at facility level.
7. Data on TB/HIV co-infection is also not readily available (as segregation by age, gender and risk group identification).
8. Although guidelines for management of TB-HIV Co-infection are available it needs to be updated.
9. Isoniazid (INH) Preventive Therapy (IPT) as recommended by WHO is not implemented.
10. There are not enough health care facilities to manage TB/HIV co-infection patients.
11. Social support programmes are not adequate for TB/HIV co-infected patients needed for the HIV/TB co-infected patients for timely diagnosis.

Activities

Childhood TB

1. Improve childhood TB management through training HCW on Childhood TB (including the private sector).
2. Ensure active case finding to identify TB in children.
3. Conduct systematic and comprehensive implementation of Childhood TB activities in line with WHO recommendations.
4. Ensure availability of PPD for diagnosis of TB in children.
5. Improve the diagnosis (including extra-pulmonary) TB in children through the use of X-pert MTB/RIF and of gastric aspirate examinations.
6. Expand TB childhood management to more types of facilities in district (not only at TCH and DHQ level).
7. Engage private providers to enhance Child TB notifications.

TB in the Elderly

1. Identify TB contacts in the elderly with active TB (and MDR TB) disease and initiate early treatment at facility level and in the community by linking patients to the nearest TB diagnostic facilities to ensure confirmation of diagnosis.

TB and Tobacco

1. Develop strategies to address TB and tobacco use.
2. Implement BCC interventions developed through the TB and Tobacco trial in routine settings.

TB and Diabetes

1. Screening patients with TB with fasting blood sugar estimation will help in early detection of diabetes.

TB and HIV

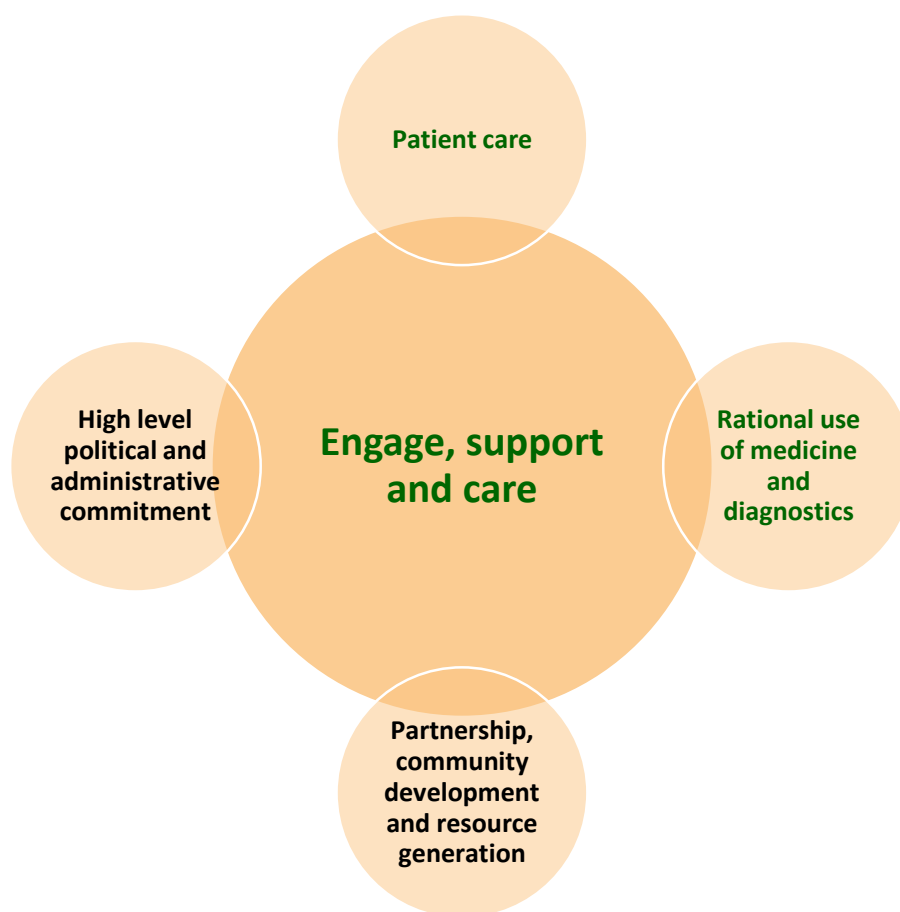
1. Offer HIV testing and counseling to all TB patients.
2. Screen PLHIV on rapid diagnosis with Xpert MTB/RIF.
3. Evaluate all PLHIV for TB.
4. Provide IPT for PLHIV after ruling out active TB (as recommended by WHO).
5. Update the TB/HIV guidelines.
6. Train staff (including private) on the TB/HIV guidelines.
7. Strengthen collaboration between the TB and HIV programmes (especially at facility level).
8. Expand health care facilities to manage TB/HIV coinfection.
9. Improve data capturing on TB/HIV co-infection (as segregation by age, gender and risk group identification).
10. Implement social support programmes to TB/HIV co-infected patients.

PILLAR 2 (BOLD POLICIES AND SUPPORTIVE SYSTEMS): ENGAGE, SUPPORT AND CARE

STRATEGIC DIRECTION

1. Secure high level political commitment and mobilise domestic resources towards ending TB.
2. Link TB patients and households with social support schemes to reduce catastrophic out-of-pocket expenditure to the patients.
3. Increase number of private health care providers engaged with NTP and enhance scope of services provided in line with ISTC standards of quality of care.
4. Target behaviour change to generate demand for health services and empower communities to play a role in accountability of health care provision.
5. Prevent the loss of TB cases in the cascade of care within health system by HDL (treatment supporters and linkage to care between primary and tertiary level).
6. Legislate and implement regulatory mechanisms for mandatory TB disease notification and rational use of ATT.
7. Minimise the risk of disease transmission within populations through effective TB infection control.
8. Advocate for establishing a vital registration system in Pakistan.
9. Strengthen partnerships within the health sector to enhance case detection and address co-morbidities.
10. Capitalise on inter-sectoral partners' strengths for TB care and support.

Figure 28. Engage, Support and Care



SWOT ANALYSIS FOR PILLAR 2

Table 27. Pillar 2 - SWOT Analysis

	STRENGTHS	WEAKNESSES
INTERNAL FACTORS	<ol style="list-style-type: none"> 1. Mechanisms for securing public funds for TB (PC-1) established with gradual increases in public funding for TB. 2. Legislation to make TB notifiable and ban OTC sale of ATT are in various stages of approval in the provinces. 3. Experienced PPM models with 3,700 health facilities and 600 laboratories. 4. Partnership development has remained a cornerstone of TB control, which includes technical partners, NGOs, professional bodies, donors and media outlets. 	<ol style="list-style-type: none"> 1. Public sector funding is not proportionate to the burden and the funding scenario is further compromised due to fractional releases. 2. The bylaws and SOPs of TB legislation not yet prepared for three provinces. 3. Existing PPM models do not include informal sector (e.g., hakims and other areas such as Childhood TB management and DR-TB). 4. Poor interest from private sector in PPM interventions due to burdensome notification mechanisms.

	<ul style="list-style-type: none"> 5. Social determinants are being addressed by providing social support to DR-TB patients. 6. TB-IC guidelines developed and implemented at 30 PMDT sites. 7. IEC/ACSM resource material developed. 	<ul style="list-style-type: none"> 5. Partnership development has remained limited to MOU signing without any productive outcome. 6. Advocacy efforts have not been targeted to enhance service utilisation, engage corporate sector, private philanthropy. 7. Poorest of the poor who are suffering from DS-TB have not been provided with social support. 8. TB has not been prioritised at hospital level infection control committees. 9. Communication barrier still exists between the programme and the ties targeted communities. 10. The awareness campaigns are not designed to address stigma in the population, for enhanced case detection and for community engagement for referral. 11. Partnerships with other vertical programmes has been very limited.
EXTERNAL FACTORS	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> 1. TB can be featured in the government's priorities and schemes such as the National Health Insurance Schemes. 2. Leveraging commercial organisations' spending under Corporate Social Responsibility (CSR) for resource mobilisation. 3. Parliamentarians who are engaged in the cause of TB (and have signed the Barcelona declaration) can be involved for advocacy to promote legislation. 4. Drug inspectors at district level can support coordination with retail pharmacies and GPs for case notification and identification of prescribers of ATT. 5. Institutions NADRA and local bodies functioning at Union council level which can create awareness for Vital Registration systems. 6. LHWs and other community health care providers conduct outreach within 	<ul style="list-style-type: none"> 1. Donor dependence threatens sustainability of the programme interventions and diverts public sector funding. 2. Acceptability of regulatory framework (mandatory case notification and ban on OTC sale of ATT) among private sector. 3. Cultural and economic barriers resulting in poor compliance to community awareness campaigns. 4. High trust of community on informal health care sector which is unregulated. 5. Stigma, misconceptions, poverty and low health literacy cause delay in health care seeking. 6. Unable to determine the cause of death in most cases, as autopsies are refused due to cultural and religious reasons.

	<p>communities can support community activities for TB awareness and care.</p> <p>7. Collaboration with other vertical health programmes like HIV, MNCH, Nutrition, EPI.</p> <p>8. Intersectoral collaboration with education, commerce, social welfare, agriculture, labour, interior and other departments for TB awareness, care and support.</p> <p>9. Pakistan has committed health care provision pool at all levels which could be taken into loop for provision of IPC Programme implementation.</p> <p>10. Revision of National Strategic plan is an opportunity to align ACSM with the END TB strategy and the Global Plan to End TB.</p>	
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POLITICAL COMMITMENT AND RESOURCE GENERATION

Challenges

1. The high dependence on donor inputs (85%) is a caution to NTP/PTPs to work in parallel and access an equitable contribution from the public sector funding.
2. Almost no funds have been allocated in the new provincial and federal PC-1s for activities related to management of DR-TB. Procurement of SLDs, GeneXpert machines and its cartridges, and social support for patients have been neglected. All these components have been supported through GF grants, creating a cycle of donor dependence.
3. More than 95% of HR provided through public sector resources is support staff; in contrast, more than 95% of HR provided through donor support is technical staff which has also high cost implications as far as sustainability is concerned.
4. Lack of political commitment for TB management at all levels of care.
5. Resource generation efforts have not tapped philanthropy and private sector companies' CSR schemes.

Activities

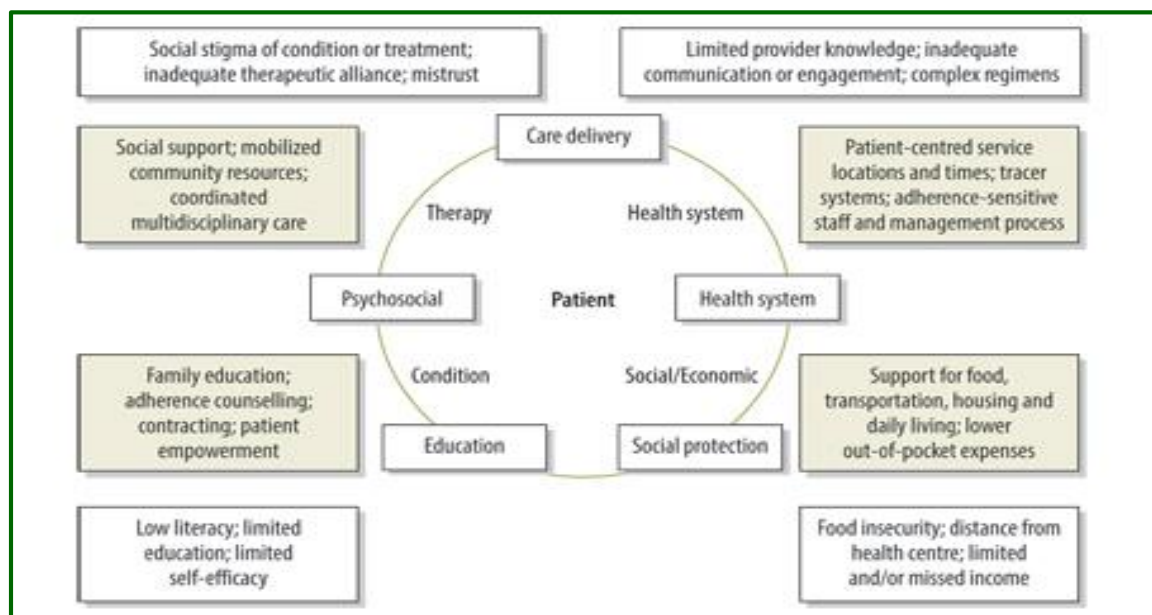
1. Develop and implement a plan to share the responsibilities of management, leadership and accountability
2. Secure political commitment to ensure TB's status as national health priority.
3. Implement quarterly meetings with administrative, political and financial decision makers to ensure the TB status as national and provincial priorities and obtain political commitment for the provision

of the necessary resources for TB control. Dissemination meeting for regulation and enhanced public sector funding with stakeholders and parliamentarians (3 meetings at national level).

4. Mobilise public resources by sourcing TA for PC-1 development by TA for the developing PC-1
5. Establish a donor coordination forum.
6. Secure PC-1 funding at provincial and federal level for activities related to management of drug resistant TB such as SLDs, GeneXpert machines and its cartridges and social support for patients.
7. Participate in donor coordination meeting through IACC (2 meetings each year depending upon availability): One meeting would be conducted to orient them about TB achievements, second would be utilized to mobilise resources from the relevant bodies, and subsequent follow-up.
8. Participate in Stop TB Partnership advocacy meetings to provide an opportunity to engage the with various stakeholders (NTP, MCH, NGOs, pediatric association, Pakistan Chest Society, the provincial TB Programmes and PGs) and to jointly plan for the scale-up of TB activities.

SOCIAL DETERMINANTS OF TB

Figure 29. Social Determinants of TB



Challenges

1. Most of the Pakistani population belongs to lower middle class, and direct and indirect costs associated with TB have far-reaching economic and social consequences for the TB patients, their families and communities.
2. The productivity loss due to TB is further compounded by the fact that most of the TB patients belong to the economically productive age group. Social support is not being provided to DS-TB patients in Pakistan.
3. In Pakistan TB control is made difficult rapid urbanisation and migration, increasing socioeconomic disparities, social and financial insecurities that affect tuberculosis patients. The high prevalence of

malnutrition and tobacco smoking adversely affects treatment outcomes as these factors have established linkages with TB deaths.

4. Intersectoral collaboration between NTP and other departments, ministries, agencies and civil society organisations involved in social support is not yet established.
5. Despite the availability of free-of-charge anti-TB drugs, TB patients are suffering from out-of-pocket payments with catastrophic consequences with income loss a large financial risk for patients
6. Most of the Pakistani population belongs to lower middle class thus direct and indirect costs associated with TB treatment is a concern
7. Patients are spending a lot of money on treatment from conventional under-qualified general health practitioners and conventional medicine practitioners.
8. Intersectoral collaborations between NTP and other departments ministries, agencies and civil society organisations are not yet established

Activities

1. Map key and vulnerable populations in Pakistan to identify context specific knowledge on geographical and socioeconomic determinants through TA for mapping, consultative meetings with stakeholders (provincial programmes, district authorities, DTC EDO, NGO's, CBO's) and dissemination of findings
2. Develop intersectoral collaborations with other departments including agriculture, education, housing, social welfare, mining, interior, corporate sector as a part of their CSR activity, philanthropists and others through convening coordination meetings to identify possible areas of collaboration, signing MoUs to mobilise relevant resources from various departments; and generating relevant resources from their area of expertise e.g. access to schools from education department for TB awareness in schools and colleges, screening of mine workers in their vicinities, TB related messages disseminated through telecommunication companies free of cost
3. Leverage the potential of using existing socioeconomic programmes such as microfinancing institutions, Bait-ul-mal, Social Security department and Prime Minister's Health Card scheme to support the TB programme's initiatives and address economic barriers patients face in seeking healthcare
4. Provide social support (food at PKR 5000/rupees per patient) to 100% DS-TB patients (i.e. 4 lacs patients) Provide food baskets and covering out of pocket travelling expense of TB patients through social support to reduce the catastrophic cost related to TB.
5. Support the TB programme's initiatives and address economic barriers through existing socioeconomic programmes such as microfinancing institutions, Bait-ul-mal, Social Security department and BISP Systematically identify and select patients eligible for micro financing (10% of the total poorest of the poor TB cases: approximately 50,000) and establish a link with relevant department.
6. Include TB as part of package of services provided through Prime Minister's Health Card scheme, throughcConvening an advocacy meeting with concerned department (3 meetings) and providing awareness to TB patients regarding availability of TB treatment through health insurance card (cost of awareness campaign).

7. Provide targeted service delivery for migrants and refugees through partnerships with other stakeholders such as health providers in the private sector and multilateral organisations engaged in health provision e.g. International Organisation for Migration (IOM) and UNHCR through coordination meetings in KP and Balochistan (3 meetings in each province); and SOPs for Cross border follow up mechanism to be established between Afghanistan and Pakistan (3 meetings).

PUBLIC PRIVATE MIX

Challenges (GAPS)

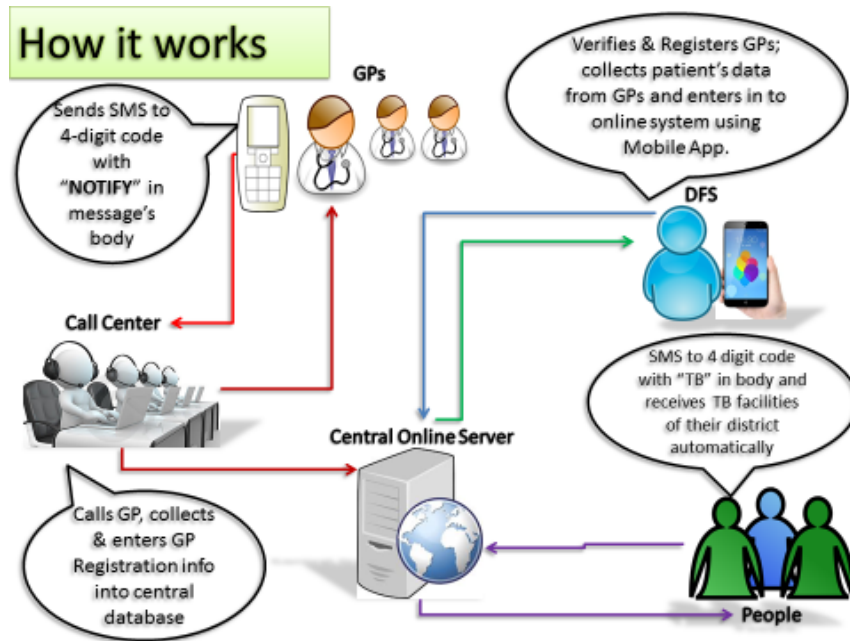
1. TB cases managed by private providers are neither recorded nor reported and so are not consolidated into national data
2. A large number of GPs and laboratories in the country still need to be involved in partnership with the NTP.
3. Many NGO-run clinics and private hospitals are not yet engaged with public sector.
4. Privately practicing physicians in Pakistan lack sufficient knowledge to manage a typical case of tuberculosis
5. Less than 4% of private health facilities are estimated to be engaged with National TB Control Programme.
6. The spread of PPM model interventions is limited to a few districts (88 out of 157).
7. There is negligible engagement of informal sector including Hakeems, homeopaths, traditional healers, spiritual healers and pharmacies, for referral of TB presumptive patients to the DOTS trained facility for standardised disease management.
8. Only 13 out of 88 PPM implementation districts provide childhood TB management services through selected trained providers. In the remaining districts, childhood TB patients do visit the PPM facilities but are not provided standard treatment.
9. MDR diagnosis and referral is not the mandate of all PPM partners.
10. PPM interventions in Pakistan are rooted on follow up at private healthcare facilities with incentivising the provider for his/her participation with the programme, which has limitation on sustainability.
11. Most of PPM facilities still have to rely on the traditional techniques like AFB microscopy
12. There is no mechanism for electronic recording and reporting at facility level. The intensive recording and reporting system is a deterrent for private practitioners to engage with the public sector.

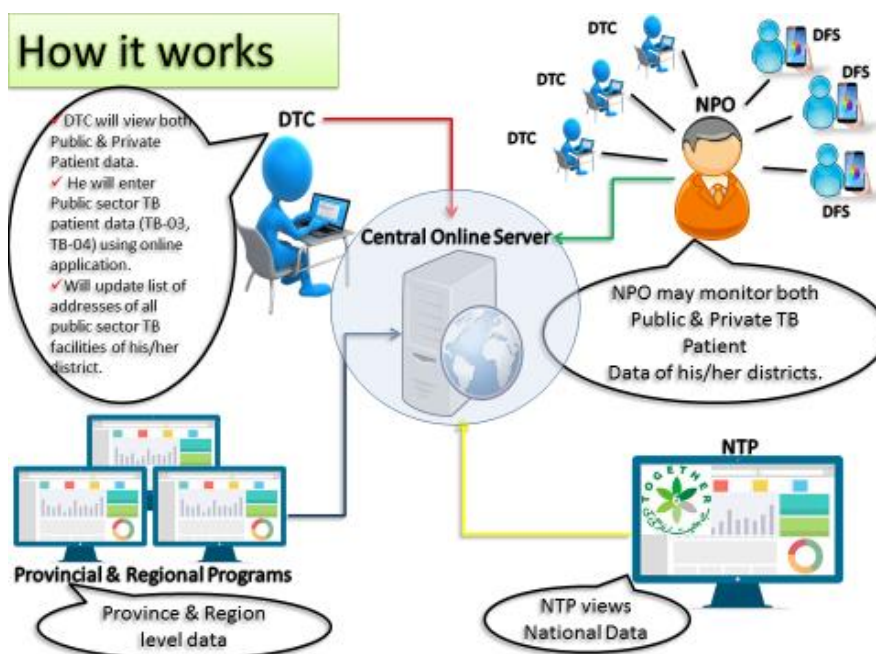
Activities

1. Extend coverage of PPM model interventions in terms of number of districts and health facilities through engagement of private GPs for PPM-1 (from 3500 to 6,000), engagement of health facilities run by NGOs for PPM-2 (from 258 to 450), engagement of Private Hospitals for PPM-3 (from 70 to 120); engagement of Parastatal Hospitals for PPM-4 (from 70 to 120) Collaboration with Labs for AFB Microscopy (from 435 to 685) on basis of provider, engagement with pharmacies for referral of TB presumptive (from 2000 to 6000), development of a referral mechanism of TB presumptive from informal sector (Hakeem, spiritual healers, homeopaths) to formal sector (2000), mapping of private health care facilities

2. Establish childhood TB management at all private networking facilities through engagement of paediatricians, chest specialists, consultants, GPs for childhood interventions; collaboration with Labs for childhood TB diagnostics; engagement of non-medical providers for referral of childhood TB presumptive patients; and development of referral mechanisms for childhood TB presumptive from informal sector (Hakeem, spiritual healers, homeopaths) to formal sector,
3. Ensure MDR identification and referral mechanism through the development of a referral mechanism development and laboratory facilities for DR TB suspects.
4. Develop a referral mechanism with informal sector (including homeopaths, Hakeem, spiritual healers), pharmacies and LHW programme through engagement of informal sector, LHV/LHW and pharmacies and the development of reporting and recording tools.
5. Integrate with other comorbidities with integrated data management programme through mechanism development for integration with in programmes and the development of an integrated database.
6. Provide advanced diagnostic tools for all collaborating private sector facilities through the procurement of gene Xpert machines and digital X rays and the training of human resource for smooth operations of equipment.
7. Utilise electronic recording and reporting systems to reduce burden of notification through the development of software, procurement of portable equipment for data entry at field level and the training of staff on data entry and management.
8. Develop and implement an online learning portal for training HCP as private providers. The trained HCP will be included in NTP's database of trained providers. TA will be provided by hired consultants. Logistic support will be given to the providers for completion of trainings with certification. Registration of the providers once the training is completed will be done with auto generation of provider's code as according to the national policy of coding.
9. Establish an electronic recording and reporting system to reduce the administrative burden of paper-based notification forms by implementing an online software and mobile application for TB patient registration (increase new GP registration, case notifications and registration from private sector and central management of TB patients' records). This web application will be enabled to receive SMS messages for GP registration and send responses via SMS after processing the requests.
10. Develop smart phone application to allow District Field Staff to enter patient data collected from GPs. The services of a professional call center will be hired. The call center staff will use the web-based application to view new registration requests submitted via SMS and call them to get the GP's information and enter them in web application. This registration information will be verified by the district staff of the respective district. The verified GPs will then be able to send notification requests via SMS which will be visible on mobile app of relevant DFS. Telecom services will be sourced for SMS messaging.

Figure 30. SMS messaging system





PARTNERSHIP AND COMMUNITY DEVELOPMENT

Challenges

Although the DOTS coverage has reached 100% in public and selective private facilities, public awareness and knowledge of the TB screening and free treatment remains low. Mass media campaigns are not organised regularly and IEC material is not distributed on a large scale. Communication campaigns are not targeted to address deficits in TB understanding, particularly among rural and illiterate populations. Messaging is not geared towards key and vulnerable high risk groups such as healthcare workers, children, miners, prisoners, PWID, and PLHIV.

Community feedback indicates continuing high levels of stigma, especially among high risk, low income groups. There is limited funding to support community engagement, partnership development, advocacy and social mobilisation at provincial (except in Punjab), district and community levels.

Empowerment and involvement of TB patients/former patients and affected communities in TB control activities is still an underdeveloped area in the fight against TB. Community representatives and civil society are not enabled to engage actively in programme planning and design, service delivery and monitoring.

No strategy builds on lessons learnt from previous ACSM activities and none focuses on generating demand for TB services, empowering patients and reducing stigma. Evaluation of ACSM activities has not been incorporated into the design of interventions and ACSM activities have not been monitored with clear outcome and impact indicators.

Activities

1. Develop a comprehensive partnership, community development and resource generation strategy by providing TA for strategy development, consultative meetings with stakeholders, provincial programmes and partners (1 at each region and 1 at national level), dissemination of final strategy (1 at national level) and linkage to relevant department for further implementation at the NTP
2. Strengthen national and international partnerships through establish meaningful partnership within public health programmes such as LHW Programme, Tobacco Free Initiative, HIV and AIDS, MNCH Programme and corporate sector coordinate and organise meetings with above mentioned and other concerned organizations to develop SOPs for developing meaningful partnerships (10 meetings per year), conduct awareness and orientation sessions at each organisation (4 each year), train health unit staff if available at partners' organisation through PPM screen employees (100 Chest camps or mobile van screening each year) develop referral mechanism and specific tools.
3. Create general public awareness through electronic (include cable television), print and social media. (400 TV spots each year, 400 cable ads each year, 400 radio spots each year, 50 insertions on print media), awareness campaigns through faithbased communication channels such as Friday sermons in mosques (khutba), orientation session with religious leaders (25 to 50 mosques depending upon the size of district).
4. Hire additional staff, train staff recruits, and procure software.
5. Conduct awareness raising sessions in schools and colleges, sponsoring sports activities, quiz competition for children and give key messages of TB during the events. Awareness session in schools and colleges to orient them regarding TB symptoms, treatment and stigma (25 to 50 session each year depending upon the size of district); 500 little doctors trained each year for further dissemination of TB messages including stigma in their respective communities, (Through this intervention 2500 more people will get awareness on TB); Printing and distribution of IEC material.
6. Support World TB Day events and other occasions (4 at provincial level, 3 at regional level, 1 and national level) and setting up stall and participation in different festivals like spring gala, family galas etc to disseminate information regarding TB (3 stalls per year)
7. Conduct media engagement with field visits of journalists/reporters from major daily newspapers and TV channels at TB facilities to improve reporting on TB, image of NTP and soliciting a healthy debate on TB in Pakistan (1 each year) and media mpartnerships with 5 major TV channels (yearly) these TV channels will air TB related talk shows, documentaries, interviews.
8. Conduct community mobilisation for demand generation like extensive distribution of print materials at health care facilities, peer education at community or interest group meetings for TB care, control and stigma removal; community Coalition Meetings (112 each year) and print IEC material for distribution
9. Build capacity of ACSM units at provincial & district level by sensitising existing staff about ACSM and the need of dedicated ACSM staff at provincial level and capacity building workshop on communication skills and resource generation (1 at national level)
10. Update existing database of TB patients who can actively engage in community activities as champions and arrange sessions with TB patients (cured or under treatment) on TB control, care and

stigma (56 sessions per year), these TB advocates will further disseminate information regarding TB in communities (approximately 5,600 people get TB information (20 advocates x 5 people x 56 sessions))

REGULATORY FRAMEWORK AND POLICIES FOR RATIONAL USE OF DRUGS

Challenges (GAPS)

1. Uniform legislation and implementation mechanisms for mandatory case notification and ban on over the counter ATT drugs have still not been achieved in all the provinces of Pakistan.

Activities

1. TA to support legislation and implementation for mandatory case notification and banning over-the-counter sale of ATT. Five consultative advocacy meetings at federal meeting (2 at Federal, GB, FATA and AJK) with parliamentarians, assembly members and secretariat (20 participants each). Enable (train and incentivise) data entry operator at every district office to enter the notification forms in the database and coordinate with private partners working in district to follow up with GPs.
3. Enable DTC and drug inspector for monitoring and supervision of legislation (collect information from drug sale points and follow up). Rs. 2000 per visit of pharmacy.
4. Print notification forms with pre-paid postage stamps (20,000 additional notifications expected in ICT and allied regions).
5. Disseminate legislative notification through mass media and printing of legislative notification for distribution to GPs and pharmacies.

VITAL REGISTRATION

Challenges (GAPS)

1. Despite the well-documented benefits of CRVS, Pakistan do not have an adequate systems in place.
2. Current TB information system captures the information on TB mortality death due to any cause of TB patients registered in a cohort. The case fatality ratio (included in the top ten indicators of End Tb strategy) cannot be measured in true sense.

Activities

1. Develop and pilot a system of vital statistics in 2 districts
2. Develop and pilot a hospital TB minimally invasive autopsy stuDeputy.

INFECTION PREVENTION AND CONTROL

Challenges (GAPS)

1. TB-IC activities should be scaled up, starting from the easier to implement activities and working towards more complex complex components.

2. At present, there is no designated funding for the implementation of TB-IC practices. This has an impact on the spread of TB in the community, household, health care facilities, and congregate settings.
3. The TB IC plan is focused on the PMDT sites and not on facilities managing DS-TB or TB/HIV co-infections.

Activities

1. Establish a National and Provincial Infection Control committee
2. Select sites for ICP implementation (primary, secondary healthcare level, congregate settings and communities)
3. Secure funding for ICP activities
4. Hire staff for planning and implementation of IPC at identified sites
5. Build capacity through training on IPC
6. Procure and distribute ICP supplies
7. Implement a monitoring and evaluation strategy for infection control

STRATEGIC DIRECTION: PILLAR 3 (INTENSIFIED RESEARCH AND INNOVATION): SEEK, KNOW, AND APPLY

1. Build supportive structures for surveillance, research and innovations at national and provincial level
2. Identify and prioritise research gaps
3. Strengthen research capacity at local level
4. Share research evidence and emerging best practice to strengthen policy and practice
5. Strengthen the stewardship role of governments at all levels for research and knowledge management systems
6. Build institutional capacities to promote, undertake and utilise research for evidence based policy making in health at all levels

SWOT ANALYSIS FOR PILLAR 3

Table 28. Pillar 3 - SWOT Analysis

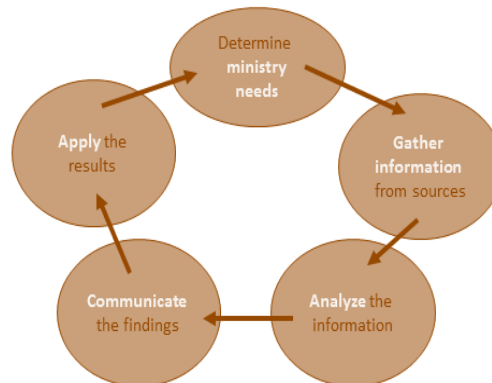
	STRENGTHS	WEAKNESSES
INTERNAL FACTORS	<ul style="list-style-type: none"> • Expertise available for research • Data available in electronic format. • Identification of priority research areas • National TB Prevalence Survey conducted in 2011 • Established linkages with national universities 	<ul style="list-style-type: none"> • Provincial Research Unit does not exist at present. • Data has not been properly analysed and utilized to generate Programmatic guidelines • Weak linkages with partners/Institutions for Research • Prevalence survey did not include children

	<ul style="list-style-type: none"> • International collaboration with University of Bergen, University of Leeds, University of Edinburgh, University of London, London School of Hygiene & Tropical Medicine, John Hopkins University • National collaboration with Health Services Academy , Quaid-e-azam University, University of Bahawalpur and Agha Khan University 	
EXTERNAL FACTORS	OPPORTUNITIES	THREADS
	<ul style="list-style-type: none"> • Collaborative research with academia/partners as potential Research units available with the partners. • The published research led to policy change (e.g., scale up of active case finding, scale up of hospital DOTS linkages and interventions to reduce missing TB cases from private sector through PPM) • National Prevalence survey scheduled in 2019 to re-estimate the TB prevalence • The national academia and other government programmes for research support activities/scholarships/funding opportunities. 	<ul style="list-style-type: none"> • Conducive environment for policy change at provincial level • Operational difficulties in implementing surveys in areas with natural disaster and effected with law and order situation • Political commitment

RESEARCH TO OPTIMISE IMPLEMENTATION AND IMPACT

Figure 31. Cycle of Research

Cycle of Research Process



Challenges (GAPS)

1. Provincial Research units have not been established.
2. Data has not been properly analysed and utilised to generate programmatic guidelines.
3. Weak linkages with partners/Institutions for research.
4. Prevalence survey did not include childhood population.
5. Poor conducive environment for policy change at provincial level.
6. Operational difficulties in implementing surveys in areas with natural disaster and effected with law and order.

Activities

1. Conduct Sort IT Courses at federal level by involving provinces and other health programmes /organisations as a continued activity from 2016 onwards.
2. Conduct capacity building research workshops at provincial level.
4. Strengthen electronic surveillance system through DHIS2 software in collaboration with WHO and NTP M&E team (cross cutting with data and M&E activities)
5. Conduct periodic assessments and operations researchers to assess the burden of TB in key populations including street children and Orphans
6. Pilot m-health intervention for DOTS, Community outreach and engaging private providers
7. Promote national and provincial researches on priority research areas such as PPM Interventions MDR TB and child TB interventions.
7. Pilot GIS based contact screening for DR- and DS-TB.

8. Conduct National Prevalence Survey to re-estimate the disease burden in the country through technical assistance from WHO.
9. Sustain and expand linkages with other international institutions.
10. Publish in international peer reviewed journals.

REFERENCES

1. WHO: Pakistan Health Profile 2015. [Online] 2015. [Cited: 6 4 2017.] http://applications.emro.who.int/dsaf/EMROPUB_2016_EN_19266.pdf?ua=1.
2. *Global Tuberculosis Report*. WHO. Geneva : WHO, 2016. Global report.
3. *Pakistan*. Geneva : WHO, 2016.
4. Implementing the ENDTB Strategy. [Online] 2015. [Cited: 19 4 2017.] http://www.who.int/tb/publications/2015/end_tb_essential.pdf.
5. Nations, United. A new sustainable development agenda. [Online] 2015. [Cited: 6 3 2017.] <http://www.pk.undp.org/content/pakistan/en/home/post-2015.html>.
6. Sustainable development Goals. *United Nations*. [Online] 12 03 2017. <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>.
7. NTP, Pakistan. *Annual Report 2015 Pakistan: National TB Control Program*. Islamabad : Ministry of National Health Services Regulations & Coordination, 2015.
8. *Healthcare Delivery and Public Private Partnership in Pakistan*:. Qidwai, Waris. 4, s.l. : J Liaquat Uni Med Health Sci., 2016, Vol. 15, pp. 162 - 163.
9. WHO. Pakistan Stop Tuberculosis. [Online] 2017. [Cited: 6 3 2017.] <http://www.emro.who.int/pak/programmes/stop-tuberculosis.html>.
10. *Twelfth SAARC Summit*. Islamabad : s.n., 2004. ISLAMABAD DECLARATION.
11. *Tuberculosis control in Pakistan: reviewing a decade of success and challenges*. P. Metzger, 1 N.A. Baloch, 2 G.N. Kazi¹ and K.M. Bile¹. 2010, EMHJ, Vol. 16, p. Supplement.
12. *Population Based National Tuberculosis Prevalence Survey among Adults (>15 Years) in Pakistan, 2010–2011*. Sabira Tahseen, Mahboob Ul Haq, Abdul Ghafoor,. 10 2 2016, Plos One.
13. WHO. Documentation WHA 67. *WHO*. [Online] 13 3 2017. http://apps.who.int/gb/e/e_wha67.html.
14. Health, Pakistan Human Resources for. Establishing the Country Coordination and Facilitation Process in Pakistan with a Decentralized System, 2010). [Online] [Cited: 14 4 2017.] <http://www.who.int/workforcealliance/countries/pak/en/>.
15. Economics, Trading. Pakistan Gross National Product. [Online] 2017. [Cited: 7 3 2017.] <http://www.tradingeconomics.com/pakistan/gross-national-product>.
16. Investopedia. Gross Domestic Product (GDP). [Online] 2017. [Cited: 7 3 2017.] <http://www.investopedia.com/terms/g/gdp.asp>.

17. Economics, Trading. External Debt Pakistan. [Online] 2017. [Cited: 7 3 2017.] <http://www.tradingeconomics.com/pakistan/external-debt>.
18. Encyclopedia, Infoplease. Pakistan economy. [Online] 2017. [Cited: 7 3 2017.] <http://www.infoplease.com/encyclopedia/world/pakistan-economy.html>.
19. UKEssays. The Infrastructure Of Pakistan Economics Essay. [Online] 2015. [Cited: 7 3 2017.] <https://www.ukessays.com/essays/economics/the-infrastructure-of-pakistan-economics-essay.php>.
20. Pakistan, Government of. *Pakistan 20125. One Nation, One Vision*. Islamabad : Ministry of Planning and Development, 2015.
21. Spencer, Alexandra. *Humanitarian funding analysis: Pakistan heat wave*. 2015.
22. Belete Getahun, Moges Wubie, Getiye Dejenu, and Tsegahun Manyazewal. Tuberculosis care strategies and their economic consequences for patients: the missing link to end tuberculosis. 5, 2016, Vol. 93.
23. Worldbank. Pakistan GDP. [Online] 17 4 2017. [Cited: 2017 4 2017.] <http://www.tradingeconomics.com/pakistan/gdp>.
24. Pakistan death rate and birth rate. *Index Mundi*. [Online] 10 2016. http://www.indexmundi.com/pakistan/death_rate.html.
25. WHO. [Online] 2015. [Cited: 12 3 2017.] http://apps.who.int/maternal_child_adolescent/epidemiology/profiles/neonatal_child/pak.pdf.
26. WHO. *World Health Statistics 2015*. Geneva : WHO, 2015.
27. Pakistan. *Health and Nutrition*. Finances, Pakistan. Islambad : Finance Division, Government of Pakistan, 2015.
28. WHO. Global health Observatory (GHO data): Health Force. [Online] 2017. [Cited: 3 4 2017.] http://www.who.int/gho/health_workforce/en/.
29. Junaidi, Ikran. DAWN. [Online] <https://www.dawn.com/news/1281107>, 31 8 2016. [Cited: 8 3 2017.]
30. Junaisi, Ikram. DAWN. [Online] 2016. [Cited: 7 4 2017.] <https://www.dawn.com/news/1300512>.
31. *Analysis of the health care system of Pakista. Lessons learned*. Zohra Kurji, Zahra Shaheen Premani*, Yasmin Mithani. 3, 2016, J Ayub Med Coll Abbottabad 2016, Vol. 28, pp. 601-4.
32. *Health reform in Pakistan: a call to action*. *Lancet* 2013;381(9885):2291–9. Nishtar S, Bhutta ZA, Jafar TH, Ghaffar A, Akhtar T, Bengali K, et al. 9885, 2013, *Lancet*, Vol. 381, pp. 2291-9.
33. *Health system financing in Pakistan: reviewing resources and opportunities*. Fazal Ather, Akhtar Sherin. 2, 2014, KMUJ, Vol. 6.

34. Fatima, Razia Kain. *Assessng the burdenof missing TB cases in Pakistan*. s.l. : University of Bergen, 2015.
35. GF. *Audit Report*. Geneva : Global Fund, 2015. p. 7.
36. WHO. Pakistan. [Online] 2016. [Cited: 14 4 2017.]
<http://www.who.int/workforcealliance/countries/pak/en/>.
37. NTP, Pakistan. *International Joint Review Mission, TB Control Program Pakistan*. Islamabad : Pakistan NTP, 2015.
38. *Public Health.Investigation of presumptive tuberculosis cases by Private health providers: lessons learnt from a survey in Pakistan*. . R Fatima, E Qadeer, D A Enarson, S G Hinderaker, R Harris, A Yaqoob, A Bassili. 2, s.l. : Public health Action, 01/2014, Vol. 4.
39. *Success of active tuberculosis case detection among high-risk groups in urban slums in Pakistan*. R. Fatima, E. Qadeer, D. A. Enarson, J. Creswell, R. Stevens, S. G. Hinderaker, M. ul Haq. 9, s.l. : The International Journal of Tuberculosis and Lung Disease, 09/2014, Vol. 18.
40. *Population Based National Tuberculosis Prevalence Survey among Adults (>15 Years) in Pakistan, 2010–2011*. Qadeer, Ejaz. 10 2 2016, PlosOne.
41. *PopulationBasedNationalTuberculosis Prevalence Survey among Adults(>15Years) inPakistan,2010–2011* . Qadeer E, fatima R, Yaqoob A, Tehseen S ,ul Haq. s.l. : PLos One, 2/2016.
42. *Estimating tuberculosis burden and case detection in Pakistan*. R Fatima, R J Harris, D A Enarson, S G Hinderaker, E Qadeer, K Ali, A Bassilli. 1, s.l. : The International Journal of Tuberculosis and Lung Disease, 1/2014, Vol. 18, pp. 55 - 60.
43. *Public health Action: Can the number of patients with presumptive tuberculosis lost in the general health services in Pakistan be reduced?* R Fatima, E Qadeer, D A Enarson, S G Hinderaker, 6, s.l. : The International Journal of Tuberculosis and Lung Disease, 3/2015, Vol. 19, pp. 654–656 .
44. AIDSProgram. MESSAGE OF NATIONAL PROGRAMME MANAGER, NACP. [Online] 2015. [Cited: 6 4 2017.] <http://www.nacp.gov.pk/howwework/message-npm.html>.
45. *Diabetes mellitus increases the risk of active tuberculosis: a systematic review of 13 observational studies*. Jeon CY PLoS Medicine, 2008, 5:e152. 152, 2008, PLoS Medicine,, Vol. 5, p. 152.
46. *Cohort profile: the diabetes-tuberculosis treatment outcome in Pakistan*. Fatima Mukhtar, Zahid A Butt. 2016, BMJt , pp. 1-2.
47. *Diabetes mellitus and tuberculosis in country with high tuberculosis burdens: individual risks and social determinants*. Goldhaber-Fiebert JD, et al. 2011, International Journal of Epidemiology, Vol. 40, pp. 417-428.

48. Fatima, Razia. Underreporting of childhood tuberculosis in. [Online] [Cited: 19 4 2017.] http://www.who.int/tb/advisory_bodies/impact_measurement_taskforce/meetings/sep14indonesia_inventory_studies_pakistan.pdf?ua=1.
49. *Yield of facility-based verbal screening amongst household contacts of.* Qadeer, Ejaz. 2017, Journal of Clinical Tuberculosis and Other, Vol. 7, pp. 22-27.
50. NTP/WHO. *International Joint Review Mission.* s.l. : NTP/WHO, 2015.
51. *Unmasking childhood tuberculosis in Pakistan: efforts to.* F Amanullah, A. A. Malik. 12, 2015, INT J TUBERC LUNG DIS, Vol. 19, pp. 47- 49.
52. Qadeer, Ejaz. PlosOne. [Online] 10 2 2016. [Cited: 15 4 2017.] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4749340/>.
53. Siddiqi, Kamran. Tobacco and TB: The deadly duo claiming thousands of lives in South Asia. *University of York.* [Online] 6 1 2015. [Cited: 2017 4 20.] <https://www.york.ac.uk/research/themes/tobacco-and-tb-in-south-asia-pakistan/>.
54. Wn.Com. TOBACCO NAUSHI IN PAKISTAN AND THE WORL. [Online] 2016 9 2016. [Cited: 20 4 2017.] https://wn.com/tobacco_naushi_in_pakistan_and_the_world.
55. Siddiqi, Kamran. *Tobacco and TB: The deadly duo claiming thousands of lives in South Asia.* [Online] 25 1 2015. [Cited: 21 3 2017.] <https://www.york.ac.uk/research/themes/tobacco-and-tb-in-south-asia-pakistan/>.
56. William. A. Wells, et al. *Size and usage pattern of private TB drug market in the high burden country.*
57. *The WHO's new End TB Strategy in the post-2015 era of the Sustainable Development Goals.* Lonnroth, Knut and Raviglione, Mario. 3, 2016, Trans R Soc Trop Med Hyg 148-15, Vol. 110, pp. 148 - 55.
58. *Tuberculosis 2015: Burden, Challenges and Strategy for Control and Elimination.* Sulis, Mario Raviglione and Giorgia. 24 6 2016, Infect Dis Rep. 2016 Jun 24; 8(2): 6570, p. 6570.
59. Wikipedia. List of countries by GNI (nominal, Atlas method) per capita. [Online] 2017. [Cited: 7 3 2017.] [https://en.wikipedia.org/wiki/List_of_countries_by_GNI_\(nominal,_Atlas_method\)_per_capita](https://en.wikipedia.org/wiki/List_of_countries_by_GNI_(nominal,_Atlas_method)_per_capita).
60. Fatima, Dr Razia. *Child TB Inventory StuDeputy.* s.l. : NTP, 2016.
61. *Systematic review: the impact of diabetes on tuberculosis treatment outcomes.* MA, Baker. 81, 2011, BMC Medicine accepted 2011, Vol. 9.
62. Malhi, Waleed. Pakistan's tobacco consumption: The most in South Asia! [Online] 7 2 2013. [Cited: 17 4 2017.] <https://www.pakistantoday.com.pk/2013/02/07/pakistans-tobacco-consumption-the-most-in-south-asia/>.

APPENDICES

APPENDIX-1: NATIONAL M&E TARGETS NSP 2017-20

	Indicator	2015 Baseline	2016	2017	2018	2019	2020
1	TB treatment coverage						
	DS TB	63%	72%	80%	85%	88%	90%
	TB Treatment Coverage - DR TB	19%	21%	30%	40%	50%	60%
2	TB treatment success rate (all forms)						
	DS TB	93%	93%	93%	93%	93%	93%
	Treatment Success Rate -DR TB	69%	71%	72%	73%	74%	75%
3	Percentage of TB-affected households that experience catastrophic costs due to TB	NA			Base line after patient cost survey		
4	Percentage of new and relapse TB patients tested using WHO recommended rapid diagnostic	NA	20%	30%	40%	50%	60%
5	Latent TB Infection (LTBI) treatment coverage	NA	NA	10%	20%	35%	50%
6	Contact investigation coverage	NA	15%	20%	30%	45%	60%
7	Drug susceptibility testing (DST) coverage for TB patients	1% New cases , 84% Previously treated	8%	10%	25%	35%	50%
			86%	88%	90%	90%	90%
8	Treatment coverage, new TB drugs	NA	5%	10%	20%	40%	80%
9	Documentation of HIV status among TB patients	4%	20%	30%	40%	50%	60%
10	Case fatality ratio (CFR)	9%	<8%	<7%	<6%	<5%	<5%

APPENDIX-2: EPIDEMIOLOGICAL PROJECTIONS NSP (2017-20)

Obj-1	To increase the number of notified TB cases (all forms) from 63% in 2015 to 90% and maintain Treatment Success Rate at 90% by 2020.							
Obj-2	To increase notification of MDR from 20% in 2015 to 60% of the estimated incident pulmonary TB cases and Treatment Success Rate from 72 to 75% by 2020							
Obj-3	To ensure that TB remains on high political agenda and all TB related policies are developed by all stakeholders and implemented by TB control program by the end of 2020							
Obj-4	To establish the institutional collaboration on TB regarding research priorities in the country by 2020.							
Component	Epidemiological Indicator	2015 (Baseline* End TB)	2016*	2017	2018	2019	2020	Data source
Population	Increase in projected Pop @ 2% till 2020	186073622	189795094	193590996	197462816	201412073	205440314	Population Census Organization
Incidence	Reduction in TB Incidence @ 5% annually upto 20% by 2020	270	270	257	243	230	216	End TB Strategy
Mortality	Reduction in Mortality @ 7% annually upto 35% by 2020	23	21	20	18	17	15	End TB Strategy
PILLAR-1: Innovative TB care								
Treatment Coverage								
DSTB	Est, Incident Cases (all forms)	502399	512447	497529	479835	463248	443751	WHO Global TB Report 2016
	TB Case notified -all forms	323856	360790	373147	383868	393761	399376	NTP Pakistan data
	(CDR) all forms	63%	70%	75%	80%	85%	90%	Top 10 M&E Indicators End TB Strategy
	Total EPTB Cases notified	61896	72961	79904	86470	86312	91332	NTP Pakistan data

	% EPTB Cases notified	19%	20%	21%	22%	21%	22%	NTP Pakistan data
	New Total PTB	252577	273794	277758	283915	288733	280088	NTP Pakistan data
	New PTB B+	124900	128667	149,259	191934	216,550	224,070	NTP Pakistan data
	% New PTB B+	49%	47%	54%	68%	75%	80%	NTP Pakistan data
	New PTB clinically diagnosed	127677	145127	128499	91981	72183	56018	NTP Pakistan data
	%	51%	53%	46%	32%	25%	20%	NTP Pakistan data
	No. of Previously treated	17336	19278	22829	27878	32613	41269	NTP Pakistan data
	% of Previously treated	5%	5%	6%	7%	8%	10%	NTP Pakistan data
	Total TB cases notified	331809	366033	380491	398263	407658	412689	NTP Pakistan data
	Childhood TB cases							NTP Pakistan data
	0-14	34370	41759	44778	49903	55126	59906	NTP Pakistan data
	%	11%	12%	12%	13%	14%	15%	NTP Pakistan data
	0-4	10122	14486	11194	11516	11813	11981	NTP Pakistan data
	%	3%	4%	3%	3%	3%	3%	NTP Pakistan data
	5-14 Y	24248	27273	33583	38387	43314	47925	NTP Pakistan data
	%	7%	8%	9%	10%	11%	12%	NTP Pakistan data
	TSR all forms	95%	93%	>90%	>90%	>90%	>90%	Top 10 M&E Indicators

								End TB Strategy
DR-TB	PMDT (Total) sites established	27	29 (27+2)	35 (29+6)	40 (35+5)	45 (40+5)	45 (45+0)	NTP Pakistan data
	Public sector	25	27	30	35	40	40	NTP Pakistan data
	Private sector	2	2	5	5	5	5	NTP Pakistan data
	(a) Est. DR-TB case (@4.2% of New)	10,608	11,499	11,666	11,924	12,127	11,764	NTP Pakistan data
	Number previously treated PTB case notification	17336	19278	19471	19665	19862	20259	*NTP Pakistan data
	(b) Est. DR-TB cases (@16% of Re-treatment)	2,774	3,084	3,653	4,461	5,218	6,603	*NTP Pakistan data
	Est. Incident DR-TB cases	13,382	14,584	15,319	16,385	17,345	18,367	*NTP Pakistan data
	Total DR-TB cases notified and enrolled	2,621	2,881	4,596	6,554	8,672	11,020	*NTP Pakistan data
	% DR-TB cases notified/enrolled among incident DR-TB cases	20%	20%	30%	40%	50%	60%	Top 10 M&E Indicators End TB Strategy
	No. of DRTB cases notified out of New cases	247	397	943	2,093	3,454	4,417	*NTP Pakistan data
	% of DRTB cases notified out of New cases	2%	3%	8%	18%	28%	38%	*NTP Pakistan data
	DRTB cases notified out of Re-treatment cases	2374	2484	3,653	4,461	5,218	6,603	*NTP Pakistan data
	% DR-TB cases notified out of Re-treatment cases	86%	81%	100%	100%	100%	100%	*NTP Pakistan data
	No. of XDR-TB patients notified and treated	99	115	230	328	434	551	*NTP Pakistan data
	% of XDR-TB patients notified and treated	4%	4%	5%	5%	5%	5%	*NTP Pakistan data

	No of patients on Short Course MDR	0	0	689	1966	3903	6612	*NTP Pakistan data
	No of patients on new drugs	0	58	250	1311	2602	4408	*NTP Pakistan data
	TSR among MDR-TB cases notified	72%(2013)	61%(2014)	67%(2015)	70%(2016)	72%(2017)	75%(2018)	*NTP Pakistan data
	No. of NTM cases notified	NA	NA	1%	2%	3%	5%	*NTP Pakistan data
Microscopy	TB presumptive to be assessed bacteriologically	1186811	1035145	1865733	2495140	3150085	3594384	*NTP Pakistan data
	No of sputa to be examined, including follow up	2425630	2128124	3799955	5073915	6398008	7312574	*NTP Pakistan data
	No of sputa examined per microscopy center per day (provincial calculations)	6	5	9	12	15	17	*NTP Pakistan data
	Microscopy laboratories (Total) established	1550	1805	2059	2312	2634	2975	*NTP Pakistan data
	Public sector	1035	1126	1138	1143	1149	1154	*NTP Pakistan data
	PPM Sector	515	679	921	1169	1485	1821	*NTP Pakistan data
WRD	No. of N+R TB cases tested using WRD	NA	NA					*NTP Pakistan data
	TB presumptive to be screened through WRD	NA	NA					*NTP Pakistan data
	No. of TB cases found MTB+	22832	35475					*NTP Pakistan data
	% TB cases found MTB+	#VALUE!	#VALUE!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	*NTP Pakistan data
	TB cases found RR+ out of MTB+	2971	3279					*NTP Pakistan data
	% RR+ out of MTB+	13%	9%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	*NTP Pakistan data

	% of CHTB cases diagnosed using X-pert among total CHTB notified	NA	NA					*NTP Pakistan data
	Total number of X-pert sites	51	74	403	#VALUE!	#VALUE!	#VALUE!	*NTP Pakistan data
	Xpert Omni	0	0	0	NA	NA	NA	*NTP Pakistan data
	Public	0	0	0	NA	NA	NA	*NTP Pakistan data
	Private sector	0	0	0	NA	NA	NA	*NTP Pakistan data
	Xpert sites-4 modules (Total) established	68	73	335	#VALUE!	#VALUE!	#VALUE!	*NTP Pakistan data
	X-pert sites Public sector	60	61	323	323	323	323	*NTP Pakistan data
	X-pert sites Private sector	8	12	12	NA	NA	NA	*NTP Pakistan data
	Xpert sites-16 modules (Total) established	1	7	68	NA	NA	NA	*NTP Pakistan data
	X-pert sites Public sector	1	7	68	NA	NA	NA	*NTP Pakistan data
	X-pert sites Private sector	0	0	0	NA	NA	NA	*NTP Pakistan data
Culture & DST	Total TB Culture Laboratories*	8	8	13	17	17	17	*includes DST labs.
	Public sector	7	7	12	16	16	16	*NTP Pakistan data
	Private sector	1	1	1	1	1	1	*NTP Pakistan data
	Total TB DST Laboratories	4	8	9	NA	NA	NA	*NTP Pakistan data
	Public sector	3	6	7	NA	NA	NA	*NTP Pakistan data
	Private sector	1	2	2	NA	NA	NA	*NTP Pakistan data

	No of DST tests carried out	4044	NA	NA	NA	NA	NA	*NTP Pakistan data
LPA	Total LPA laboratories	4	6	7	15	NA	NA	*NTP Pakistan data
	Public sector	4	5	6	14	NA	NA	*NTP Pakistan data
	Private sector	0	1	1	1	NA	NA	*NTP Pakistan data
	No of tests to be done on LPA (FLD)	NA	NA	13900	NA	NA	NA	*NTP Pakistan data
	No of tests to be done on LPA (SLD)	NA	NA	NA	NA	NA	NA	*NTP Pakistan data
CAD4TB	No. of CAD4TB installed	0	0	55	62	69	75	*NTP Pakistan data
	Public sector	0		55	55	55	55	*NTP Pakistan data
	Private sector	0	0	NA	7	14	20	*NTP Pakistan data
Household (HH) Contact Management	No. of eligible household to be screened	269,913	280,478	291,697	306,282	325,667	341,950	*NTP Pakistan data
	No. of eligible HH contacts screened (6 contacts/HH)	1619478	1682869	1750184	1837693	1954002	2051703	*NTP Pakistan data
	Number of household contacts <5 years eligible for LTBI	242922	252430	262528	275654	293100	307755	*NTP Pakistan data
	No. of LTBI given to all eligible children<5	NA	NA	78758	137827	205170	276980	*NTP Pakistan data
	% of LTBI given to all eligible children<5	NA	NA	30%	50%	70%	90%	*NTP Pakistan data
TB/HIV	TB/HIV (Total) sentinel established	16	17	20	17	22	30	*NTP Pakistan data
	Public sector	15	16	19	15	20	28	*NTP Pakistan data
	Private sector	1	1	1	2	2	2	*NTP Pakistan data

	Total notified TB patients	323856	366033	377014	392095	411699	436401	*NTP Pakistan data
	No. of TB cases screened for HIV	12162	13092	114147	156838	203829	261841	*NTP Pakistan data
	% of TB patients screened for HIV	0	0	0	0	0	1	*NTP Pakistan data
	No. of HIV screening kits required	13378	14401	125562	172522	224212	288025	*NTP Pakistan data
	Number of People living with HIV eligible for IPT	287	282	5500	9000	10000	15000	*NTP Pakistan data
	No. of People living with HIV given IPT	287	282	5500	9000	10000	15000	*NTP Pakistan data
	HIV patients +	59	71	571	797	1019	1238	
PILLAR-2: Bold policies and supportive system								
PPM	Total no. of TB cases (including prev. treated) notified at NTP	323856	366033	377014	392095	411699	436401	*NTP Pakistan data
	Total no. of TB cases (including previously treated) contributed by PPM	72144	91508	105564	117628	131744	152740	*NTP Pakistan data
	% of TB cases (including previously treated) contributed by PPM	22%	25%	28%	30%	32%	35%	*NTP Pakistan data
	TB Case notified to NTP all forms (N+R)	323856	360790	371821	382504	392362	397957	*NTP Pakistan data
	No. of N+R contributed by PPM	70367	90198	104110	114751	125556	139285	*NTP Pakistan data
	% N+R contributed by PPM	22%	25%	28%	30%	32%	35%	*NTP Pakistan data
	Total PTB cases notified by PPM	56759	80825	93699	103276	113000	125357	*NTP Pakistan data
	No. PTB (B+) cases contributed by PPM .	25057	34755	41228	55769	72320	92764	*NTP Pakistan data
	% B+ cases contributed by PPM	44%	43%	44%	54%	64%	74%	*NTP Pakistan data

	# Clinically diagnosed TB cases among total TB cases notified by PPM	30696	45970	52471	47507	40680	32593	*NTP Pakistan data
	% of Clinically diagnosed among total PTB cases notified by PPM	54%	57%	56%	46%	36%	26%	*NTP Pakistan data
	No. TB case notified by Passive case finding among TB cases notified by PPM	70444	88708	100286	109394	118569	132884	*NTP Pakistan data
	% TB case notified by Passive case finding among TB cases notified by PPM	98%	97%	95%	93%	90%	87%	*NTP Pakistan data
	No. TB case notified by Active case finding among all TB cases notified by PPM	1700	2800	5278	8234	13174	19856	*NTP Pakistan data
	% of TB case notified by Active case finding among all TB cases notified by PPM	2%	3%	5%	7%	10%	13%	*NTP Pakistan data
	TSR (all forms)	93%	93%	>90	>90	>90	>90	*NTP Pakistan data
	TSR B+	93%	93%	>90	>90	>90	>90	*NTP Pakistan data
	TSR previously treated excl. relapse	93%	93%	>90	>90	>90	>90	*NTP Pakistan data
	% of deaths among notified (all forms)	2%	2%	<2%	<2%	<2%	<2%	*NTP Pakistan data
Infection Control	No of TB Care facilities with a written TB IC plan as per the national guidelines	10	20	378	378	378	368	*NTP Pakistan data
	No of facilities where Health workers are trained in TB infection control practices.	10	20	378	378	378	368	*NTP Pakistan data
	No of Health facilities with documented check done and actions taken for adequate ventilation prescribed by facility TB IC plan.	10	20	378	378	378	368	*NTP Pakistan data

	Number of facilities with relevant workers using N95 masks.	10	20	378	378	378	368	*NTP Pakistan data
	Number of facilities with relevant workers using N95 mask having a fit test done with in the past year .	10	20	378	378	378	368	*NTP Pakistan data
Regulations	TB case notification is mandated by law (Yes/No)	Sindh	Sindh +KP	Sindh + KP + Punjab	All Provinces + NTP allied	100%	100%	*NTP Pakistan data
Funding GAP	Proportion of NSP budget that is funded	71%	61%	70%	85%	90%	100%	NSP 2013-15
	Domestic Funding	<1%	<1%	10%	15%	20%	30%	PC-1 data
	Donor Funding	70%	60%	60%	70%	70%	70%	GF data
	Unfunded	29%	39%	30%	15%	10%	0%	
Investment in health	Public health spending per capita (US \$)	36	37	39	41	43	45	World Bank forecast
OOP	Out of pocket expenditure as a percentage of total health expenditure	68%	68%	68%	40%	20%	0%	NHA 2012 Survey/Top 10 M&E Indicators End TB Strategy
Community Referrals	Proportion of total TB notifications coming from community referrals	NA	NA					*NTP Pakistan data
Nutritional Status	Prevalence of under-nutrition in Pakistan	>40%						National Nutrition Survey 2011
PILLAR-3: Intensified research and innovation								
Research Training and Capacity Building	No. of researchers trained	3	9	8	12	12	12	*NTP Pakistan data
Publications	The number of publications in international peer-reviewed journals	2	3	11	12	13	15	*NTP Pakistan data

APPENDIX 3. BUDGET PLAN NSP 2017-20:

PAKISTAN	2017	2018	2019	2020	TOTAL
1.1 Improving diagnosis	\$ 25,319,695	\$ 29,514,002	\$ 34,020,365	\$ 37,952,403	\$ 126,806,465
3.1 Patient support	\$ 4,739,016	\$ 4,708,446	\$ 4,673,651	\$ 4,620,255	\$ 18,741,369
2.1 First-line drugs procurement and management	\$ 6,676,942	\$ 6,633,871	\$ 6,584,847	\$ 6,509,616	\$ 26,405,275
6.1 M&E	\$ 2,732,560	\$ 2,712,006	\$ 2,689,342	\$ 2,791,268	\$ 10,925,176
2.2 Programme management and supervision	\$ 1,741,811	\$ 1,730,575	\$ 1,717,786	\$ 1,698,161	\$ 6,888,333
2.3 HRD: Staff	\$ 6,202,437	\$ 6,162,427	\$ 6,116,887	\$ 6,047,002	\$ 24,528,754
7.1 HRD: International technical assistance	\$ 1,451,509	\$ 1,442,146	\$ 1,431,489	\$ 1,415,134	\$ 5,740,277
2.4 HRD: Training	\$ 2,496,289	\$ 2,470,163	\$ 2,436,067	\$ 2,395,074	\$ 9,797,592
4.1 Collaborative TB/HIV activities	\$ 208,497	\$ 211,048	\$ 213,479	\$ 216,937	\$ 849,961
3.2 MDR-TB drugs and management	\$ 27,002,951	\$ 39,723,256	\$ 50,621,065	\$ 66,102,109	\$ 183,449,380
5.1 High risk groups	\$ 2,841,861	\$ 2,812,203	\$ 2,772,584	\$ 2,724,342	\$ 11,150,990
7.2 Infection control	\$ 575,321	\$ 575,321	\$ 575,321	\$ 575,321	\$ 2,301,284
5.2 Systematic screening	\$ 479,000	\$ 502,500	\$ 531,000	\$ 567,000	\$ 2,079,500
1.3 Involving all care providers: PPM/ISTC	\$ 5,663,643	\$ 7,843,802	\$ 9,756,398	\$ 10,822,764	\$ 34,086,607
7.3 Partnering initiatives	\$ 1,451,509	\$ 1,442,146	\$ 1,431,489	\$ 1,415,134	\$ 5,740,277
2.5 Community involvement	\$ 1,451,509	\$ 1,442,146	\$ 1,431,489	\$ 1,415,134	\$ 5,740,277
6.2 Operational research	\$ 1,451,509	\$ 1,442,146	\$ 1,431,489	\$ 1,415,134	\$ 5,740,277
Hospitalization	\$ 5,374,607	\$ 7,506,316	\$ 9,318,337	\$ 11,943,373	\$ 34,142,633
Outpatient visits	\$ 1,758,377	\$ 1,837,438	\$ 1,901,791	\$ 1,994,050	\$ 7,491,657
Total costs for TB control	\$ 99,619,044	\$ 120,711,957	\$ 139,654,876	\$ 162,620,209	\$ 522,606,086

BUDGET SUMMARY

	2017	2018	2019	2020	TOTAL	%
BAL	\$ 3,506,923	\$ 4,783,908	\$ 6,391,671	\$ 8,622,660	\$ 23,305,161	4%
KP	\$ 10,552,542	\$ 12,759,308	\$ 15,389,730	\$ 18,194,870	\$ 56,896,449	11%
NTP	\$ 4,657,579	\$ 5,699,536	\$ 7,144,154	\$ 8,427,396	\$ 25,928,665	5%
PJB	\$ 52,738,030	\$ 66,035,460	\$ 75,639,486	\$ 89,290,482	\$ 283,703,458	54%
SND	\$ 28,163,970	\$ 31,433,745	\$ 35,089,836	\$ 38,084,802	\$ 132,772,353	25%
TOTAL	\$ 99,619,044	\$ 120,711,957	\$ 139,654,876	\$ 162,620,209	\$ 522,606,086	100%

APPENDIX 4. TECHNICAL ASSISTANCE PLAN NSP (2017-20):

COMPONENT	INTERVENTION	TA NEEDS	HOW WOULD TA ADDRESS AN IMPLEMENTATION CHALLENGE	EXPECTED DELIVERABLE	TYPE OF EXPERT	TIME INPUT/ EST. COST	COST	SOURCE OF FUNDS	FUND GAP
Pillar 1: Innovative TB Care									
Objective 1: To increase the case notification of estimated incident TB cases (all forms) from 63% in 2015 to at least 90% by 2020.									
1.1 Diagnosis & Treatment of DS-TB	Improve microscopic/radiological diagnosis	National guidelines (END TB strategy)	Orientation for implementation of the End TB strategy at management and operational levels in all provinces across the country	Training modules for doctors & paramedics on TB case management including new diagnostic algorithms and treatment regimens.	International /national expert	20 working days = 04 days x 05 batches (one batch of 20 in each 04 provinces and 01 NTP allied)	15,000		
	High Risk Groups	Updated national guidelines for management of high risk groups (TB in children and elderly, TB in immune-compromised (malnourished, diabetic and PLHIV) TB and smoking), TB in penitentiary settings and TB in urban slum dwellers and coal miners.	Early diagnosis and effective management of HRGs	National guidelines for key affected population and HRGs	International/national expert	45 working days	25000		
			End term evaluation of TB-DM	Evaluation report on PPM models in Pakistan	International/national expert	45 working days	100,000		

COMPONENT	INTERVENTION	TA NEEDS	HOW WOULD TA ADDRESS AN IMPLEMENTATION CHALLENGE	EXPECTED DELIVERABLE	TYPE OF EXPERT	TIME INPUT/ EST. COST	COST	SOURCE OF FUNDS	FUND GAP
		Implement electronic database to for Establish e-technology to connect	Use of e-technology to develop fool proof referral linkages for prevention of loss to follow up among diagnosed DS and DR TB cases	mHealth networking mechanism available linking all X-pert sites, TB care facilities and PMDT sites	International/national expert	45 working days			
	e-Surveillance	Real time online case based TB notification at facility level	Prevention of high loss to follow up and prevention of dual registration. Easy tracking of patients	DHIS model from facility to NTP level	International/national expert	45 working days	20000		
		Training of HR on e-surveillance	Capacity development	Trained HR available to implement e-surveillance	National expert	90 working days	10000		
		TA for DHIS-2 software updates/adds up with support from University of OSLO	Data analysis and use	DHIS-2 software in country context	International		20000		
	Latent TB Infection	Situational analysis of IPT and use of WHO recommended innovative preventive therapy for LTBI in country	Introduction of LTBI therapy among HH contacts and HRGs	National case management guidelines for LTBI	International/national expert	45 working days	20000		

COMPONENT	INTERVENTION	TA NEEDS	HOW WOULD TA ADDRESS AN IMPLEMENTATION CHALLENGE	EXPECTED DELIVERABLE	TYPE OF EXPERT	TIME INPUT/ EST. COST	COST	SOURCE OF FUNDS	FUND GAP
		Estimation of TB prevalence and Incidence (2018)	Reduction in disease burden of DS-TB	National TB prevalence survey Report	International/national expert	280 working days	1000000		
	Monitoring and evaluation	Development of M&E software for M&E staff in the country	Monitor the quality of implementation.	M&E software	International/national expert	45 working days	10000		
		MESST exercise for development of National M&E Plan	Effective and efficient implementation of the End TB strategy	National and Provincial M&E Plans	National Consultant	45 days each i.e. Provinces (5), region (3) and NTP(1)	50000		
		International Review Mission	Evaluation of National/Provincial TB control Programmes	Programmatic evaluation based on SWOT analysis	Report Review Mission	International/national expert	10,000		
	HR development	Development of online training material and certification for all cadres of healthcare staff on all components of TB care	Availability of skilled HR for TB care	Online courses available for training of National TB case management guidelines	International/national expert	90 working days	10000		

Obj.2: To increase notification of MDR from 20% in 2015 to 60% of the estimated incident pulmonary TB cases and Treatment Success Rate from 72 to 75% by 2020

COMPONENT	INTERVENTION	TA NEEDS	HOW WOULD TA ADDRESS AN IMPLEMENTATION CHALLENGE	EXPECTED DELIVERABLE	TYPE OF EXPERT	TIME INPUT/ EST. COST	COST	SOURCE OF FUNDS	FUND GAP
2.1. Programmatic management of Drug Resistant TB	Introduction of new drugs for DR TB	Piloting and scale up of Delamanid at PMDT sites in Pakistan	Implementation of short term regimen	Preparation of PMDT sites according to WHO recommended pre-requisites	International/national expert	45 working days	10000		
				Training / enabling healthcare staff of PMDT sites to manage patients with short term regimen.	International/national expert	45 working days			
		Piloting and scale up of Bedaquiline at all PMDT sites in the country	Implementation of effective regimen for pre-XDR-TB patients	Preparation of PMDT sites according to WHO recommended pre-requisites	International/national expert	45 working days	10000		
				Training / enabling the healthcare staff of PMDT sites to manage patients with short term regimen.	International/national expert				
Pillar-2: Bold Policies and Supportive System									
Obj.3: To ensure that TB remains on high political agenda and all TB related policies are developed by all stakeholders and implemented by TB control program by the end of 2020									

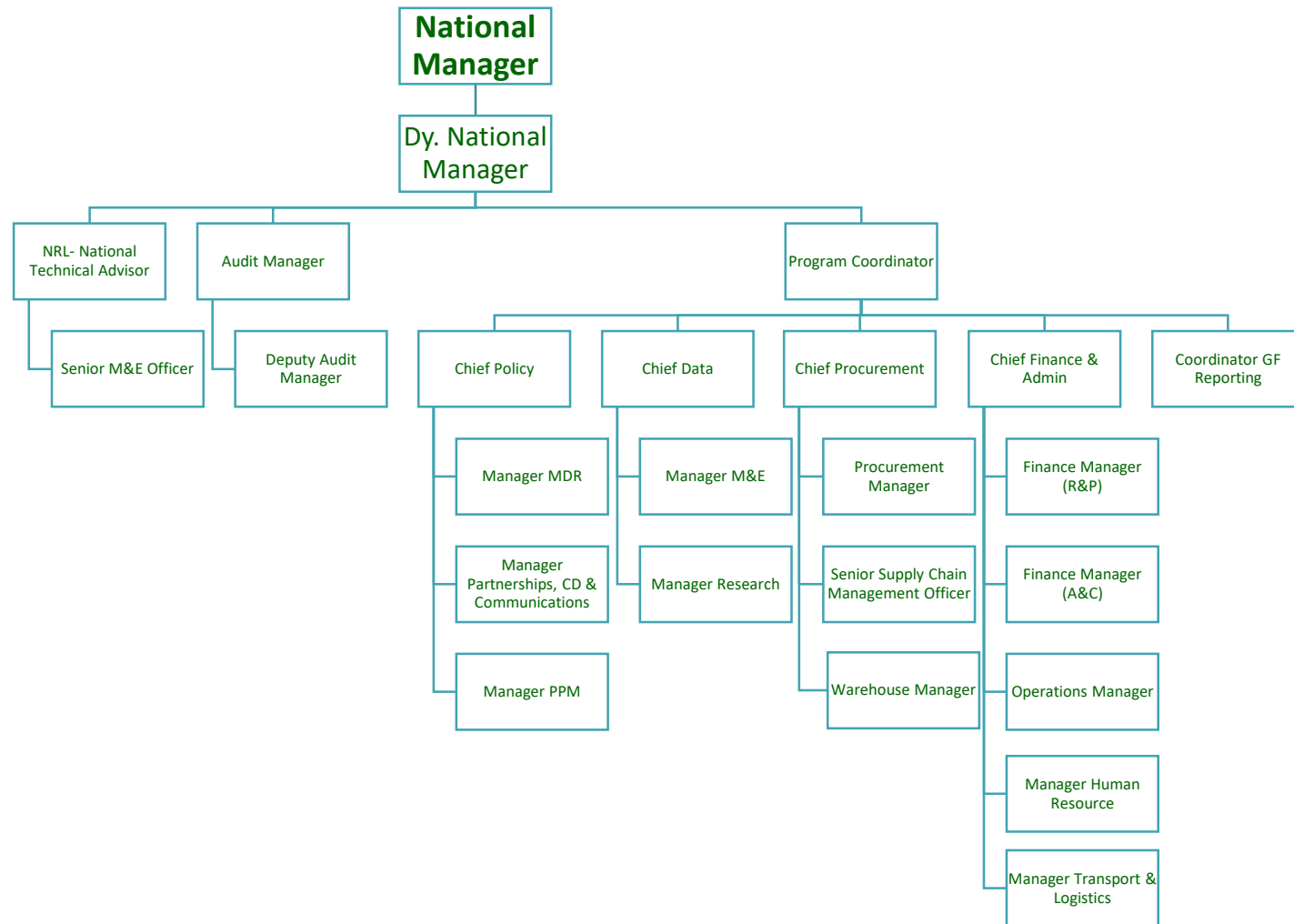
COMPONENT	INTERVENTION	TA NEEDS	HOW WOULD TA ADDRESS AN IMPLEMENTATION CHALLENGE	EXPECTED DELIVERABLE	TYPE OF EXPERT	TIME INPUT/ EST. COST	COST	SOURCE OF FUNDS	FUND GAP
3.1. Political Commitment	NTP/PTP to secure public sector support through PC-1	Develop PC-1 (2017-20) to support development and implementation	Overcoming donor dependence and disparity between donor v/s domestic funding for TB care and control in Pakistan	PC-1	National Consultant	15 days for each entity (i.e. 4 provinces, 03 regions)= 15x7=105 working days	15500	Donor assistance	
3.2. Social determinants of TB	Key affected population	Develop Strategy to address TB in key population in Pakistan **	Politically supported interventions for enhanced accessibility to key affected population	Guideline on enhanced case finding among key affected population	National Consultant	15 days for each entity (i.e. 4 provinces, 03 regions)= 15x7=105 working days	11422		
	Integrate nutrition and housing with TB in the country	Mechanism of inter sectoral collaboration for nutritional assessment and support for TB patients	To improve treatment outcome of diagnosed TB patients	National Implementation Plan for integration of National/Provincial TB control Programs with Nutrition Program and for food support to TB Patients	National Consultant	45 days each i.e. Provinces (5), region (3) and NTP(1)	10000		
	Prevalence of under-nutrition among TB patients in Pakistan	Initiative of National Nutrition Program for assessment of malnourished population and provision of food fortification for	To lower the morbidity and mortality due to TB among malnourished population	National nutritional need assessment survey among high risk/vulnerable groups for TB	National Consultant	45 days each i.e. Provinces (5), region (3) and NTP(1)	100 000		

COMPONENT	INTERVENTION	TA NEEDS	HOW WOULD TA ADDRESS AN IMPLEMENTATION CHALLENGE	EXPECTED DELIVERABLE	TYPE OF EXPERT	TIME INPUT/ EST. COST	COST	SOURCE OF FUNDS	FUND GAP
		target population							
	Catastrophic cost of TB	Patient cost survey	To address the factors in reducing the catastrophic cost of TB	Survey report on catastrophic cost of TB in Pakistan	National Consultant	45 days each i.e. Provinces (5), region (3) and NTP(1)	50 000		
	Prevalence of TB urban in urban slums	Situational analysis of Urban Slums in provinces		Prevalence survey of TB among urban slum dwellers of top 10 high burden major cities in Pakistan	National Consultant	45 working days	10 000		
	To reduce catastrophic cost on TB patient	Evaluation of catastrophic cost for TB patients	To implement social protection plan for reduction of catastrophic cost of TB	National survey on Catastrophic cost for TB patients in Pakistan	National Consultant	45 working days	10 000		
	Public Private Mix models for enhanced case finding	Evaluation of PPM models	The comparative analysis of different incentive based PPM models for effectiveness	PPM evaluation Report	National Consultant	45 working days	25 000		

COMPONENT	INTERVENTION	TA NEEDS	HOW WOULD TA ADDRESS AN IMPLEMENTATION CHALLENGE	EXPECTED DELIVERABLE	TYPE OF EXPERT	TIME INPUT/ EST. COST	COST	SOURCE OF FUNDS	FUND GAP
Partnership & Community development	Inter sectoral coordination	Develop strategy for community engagement** *, review and revise current ACSM strategies based on bio-social model	Strengthening socio-political networking to address TB burden	National ACSM strategy for community engagement	International/national expert	45 working days	11422		
Vital Registration	Inter sectoral coordination	Piloting NTP/NADRA collaborative mechanism for TB death registration	Introduction of vital registration for reporting cause of death among notified TB patients	Software to be piloted in selected urban cities	National Consultant	90 working days	20000		
Pillar-3: Intensified research and innovation									
Obj.4. To establish the institutional collaboration on TB regarding research priorities in the country by 2020									
Operational research	Empirical measurement of TB mortality	Pilot- system in 1-2 districts	estimation of case fatality rate		National Consultant	45 days	10000		
		Pilot hospital TB minimally invasive autopsy			National Consultant	45 days	10000		
Miscellaneous	M&E	MESST exercise for development of National M&E Plan	Effective and efficient implementation of the End TB strategy	National and Provincial M&E Plans	National Consultant	45 days each i.e. Provinces (5), region (3) and NTP(1)	50000		

COMPONENT	INTERVENTION	TA NEEDS	HOW WOULD TA ADDRESS AN IMPLEMENTATION CHALLENGE	EXPECTED DELIVERABLE	TYPE OF EXPERT	TIME INPUT/ EST. COST	COST	SOURCE OF FUNDS	FUND GAP
	Impact on incidence	TB Prevalence survey	Determination of reduction in impact as per the End TB Strategy	National TB prevalence survey Report	International/national expert	180 days each i.e. Provinces (5), region (3) and NTP(1)	300,000		
<p>* TA for developing advocacy strategy for PC-1, aims to have TB declared as a national health priority and to educate local and community authorities to encourage them to contribute to TB control efforts.</p> <p>**Mapping of vulnerable populations in Pakistan to identify context-specific geographical and socio-economic determinants and developing a relevant strategy to address these affected communities</p> <p>***Develop a strategy that aims to improve communication, mobilise resources, generate demand for TB services, empower patients, and reduce stigma.</p>									

APPENDIX 5. NTP ORGANOGRAM:



APPENDIX 6. WHO GLOBAL TB REPORT PAKISTAN 2016

Pakistan

Population 2015

189 million

Estimates of TB burden*, 2015	Number (thousands)	Rate (per 100 000 population)
Mortality (excludes HIV+TB)	44 (9.3–110)	23 (4.9–56)
Mortality (HIV+TB only)	1.6 (1.1–2.1)	0.83 (0.6–1.1)
Incidence (includes HIV+TB)	510 (330–730)	270 (175–386)
Incidence (HIV+TB only)	8.8 (5.4–13)	4.6 (2.8–6.9)
Incidence (MDR/RR-TB)**	27 (16–39)	14 (8.5–21)

Estimated TB incidence by age and sex (thousands)*, 2015		
	0–14 years	> 14 years
Females	25 (13–36)	230 (150–310)
Males	21 (14–28)	230 (180–290)
Total	46 (30–61)	460 (360–570)

TB case notifications, 2015	
Total cases notified	331 809
Total new and relapse	323 856
- % tested with rapid diagnostics at time of diagnosis	
- % with known HIV status	4%
- % pulmonary	81%
- % bacteriologically confirmed among pulmonary	51%

Universal health coverage and social protection	
TB treatment coverage (notified/estimated incidence), 2015	63% (44–98)
TB patients facing catastrophic total costs	
TB case fatality ratio (estimated mortality/estimated incidence), 2015	0.09 (0.02–0.23)

TB/HIV care in new and relapse TB patients, 2015	
Number	(%)
Patients with known HIV-status who are HIV-positive	59 <1%
- on antiretroviral therapy	59 100%

Drug-resistant TB care, 2015	
New cases	Previously treated cases
Estimated MDR/RR-TB cases among notified pulmonary TB cases	14 000
Estimated % of TB cases with MDR/RR-TB	4.4% (3.1–5.7)
% notified tested for rifampicin resistance	1% 84%
MDR/RR-TB cases tested for resistance to second-line drugs	2 292
Laboratory-confirmed cases	MDR/RR-TB: 3 059, XDR-TB: 99
Patients started on treatment ****	MDR/RR-TB: 2 553, XDR-TB: 68

Treatment success rate and cohort size	
Success	Cohort
New and relapse cases registered in 2014	93% 308 327
Previously treated cases, excluding relapse, registered in 2014	82% 8 005
HIV-positive TB cases, all types, registered in 2014	56% 90
MDR/RR-TB cases started on second-line treatment in 2013	69% 1 484
XDR-TB cases started on second-line treatment in 2013	30% 64

TB preventive therapy, 2015	
% of HIV-positive people (newly enrolled in care) on preventive therapy	
% of children (aged < 5) household contacts of bacteriologically-confirmed TB cases on preventive therapy	

TB financing 2016	
National TB budget (US\$ millions)	62
Funding source: <1% domestic, 65% international, 35% unfunded	

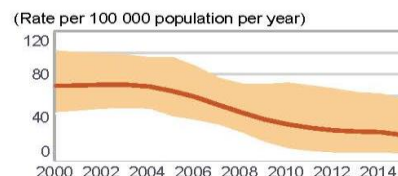
* Ranges represent uncertainty intervals

** MDR is TB resistant to rifampicin and isoniazid; RR is TB resistant to rifampicin

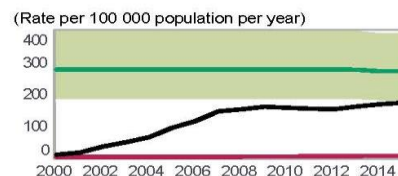
*** Includes cases with unknown previous TB treatment history

**** Includes patients diagnosed before 2015 and patients who were not laboratory-confirmed

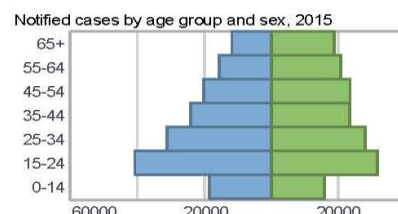
-Draft- Tuberculosis profile



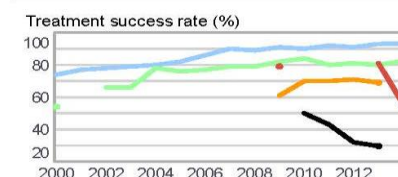
Mortality (excludes HIV+TB)



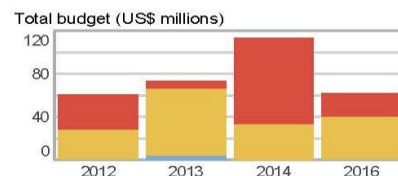
Incidence
Notified (new and relapse)
Incidence (HIV+TB only)



Females Males



New and relapse
Retreatment, excluding relapse
HIV-positive MDR/RR-TB XDR-TB



Unfunded
Funded internationally
Funded domestically

Data are as reported to WHO. Estimates of TB and MDR-TB burden are produced by WHO in consultation with countries.
Generated: 2016-07-31

Data: www.who.int/tb/data

NSP Meeting on 28 - 29 March 2017

Date: 28-29 March 2017

Venue: Marriott Hotel, Islamabad

Focal Person NSP :

Dr. Khawaja Laeeq Ahmad - Manager M&E NTP

Consultants

Ms. Anna Catherina Peter - Inter-national Consultant

Dr. Basharat Javed - National Consultant

Ms. Fariyah Malik - National Consultant

Contributors

S #	Name	Designation	S #	Name	Designation
NTP			AJK		
1	Dr. Nasir Mahmood Khan	National Manager	28	Dr. Mahboob Ahmad	Program Manager AJK
2	Dr. Aurangzaib Baloch	Dy National Manager	FATA		
3	Dr. Ayesha Rasheed	Program Coordinator	29	Dr. Muhammad Riaz	Program Manager
4	Dr. Razia Kaniz Fatima	Chief Data Officer	ICT		
5	Dr. Abdul Ghafoor	Consultant MDR	30	Dr. Muhammad Tahir	DHO ICT
6	Dr. Syed Hussain Hadi	Chief Policy Officer	31	Dr. Najeeb Durrani	DTC ICT
7	Dr. Sabira Tehseen	Advisor NRL	PTP Balochistan		
8	Dr. Raja Ayub	MDR Manager	32	Dr. Sultan Ahmad Lehri	PTP Manager Balochistan
9	Mr. Zaheer Ahmad	CF&AO	33	Dr. Irfan Raisani	Dy Manager Balochistan
10	Mr. Tanveer Ahmad	Transport/Liaison Officer	34	Dr. Ahmad Wali	NSP Focal Person Balochistan
MoNHSR&C			PTP KP		
11	Dr. Syed Karam Shah	Advisor CDC	35	Dr. Abdul Khalique	Project Director KP
CCM			36	Dr. Maqsood Ali Khan	Dy Project Director KP
12	Dr. Sajid	CCM Coordinator	37	Dr. Abdul Raheem	NSP Focal person KP
Partners			PTP Punjab		
13	Dr. Qutbuddin Kakar	TB Focal Person WHO	38	Dr. Ahmad Nadeem	Add Director PTP Punjab
14	Dr. Akmal Naveed	ACD	39	Dr. Zubair Hafeez	PTP Punjab
15	Dr. Nayyar Ghias	ASD	PTP Sindh		
16	Dr. Shahina Qayyum	Bridges	40	Dr. Aijaz Hussain Ursani	Director PTP Sindh
17	Dr. Khalid Farough	Green Star	41	Dr. Abdul Khalique Domki	Dy Director PTP Sindh
18	Dr. Sobia Faisal	Green Star	42	Dr. Amanullah Ansari	NSP Focal Person Sindh
19	Dr. Arif Noor	Mercy Corp			
20	Dr. Farhah Noreen	Mercy Corp			
21	Dr. Jaffar Ilyas	Mercy Corp			
22	Dr. Adeel Tahir	Mercy Corp			
23	Dr. Irum Fatima	Mercy Corp			
24	Ms. Aamna	Mercy Corp			
25	Dr. Naveed	PATA, Lahore			
26	Dr. Nauman Safdar	Indus Hospital			
27	Dr. Waqas Rabbani	Indus Hospital			
28	Dr. Iqtidar Ahmad	Stop TB Partnership			

RSP Meeting on 21 - 22 March 2017

Date: 21 -22 March 2017

Venue: Ramada Hotel, Islamabad

Focal Person NSP :

Dr. Khawaja Laeeq Ahmad - Manager M&E NTP

Consultants

Dr. Basharat Javed - National Consultant

Ms. Fariyah Malik - National Consultant

Contributors

S #	Name	Designation	S #	Name	Designation
Regions			NTP		
1	Dr. Zakir Hussain	Program Manager GB	25	Dr. Nasir Mahmood Khan	National Manager
2	Mr. Ali Muhammad	Health Dept GB	26	Dr. Aurangzaib Baloch	Dy National Manager
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4	Dr. Shahin Shah	DHO Nagar GB	28	Dr. Abdul Ghafoor	Advisor MDR
5	Mr. Muhammad Rasheed	LFO GB	29	Dr. Ayub Raja	Manage MDR
6	Dr. Shabbir Ejaz	Director CDC Ajk	30	Dr. Col Amjad	Coordindaor Lab upgradation
7	Dr. Mahboob Ahmad Shaikh	Health Dept AJK	31	Dr. Fakhra Naheed	M&E Officer
8	Dr. Zafar Iqbal	DTC Muzaffarabad	32	Dr. Najeeb	M&E Officer
9	Dr. Nasreen Akhtar	DTC Rawalkot AJK	33	Dr. Yasir Waheed	M&E Officer
10	Mr. Shabbir Akhtar	Provincial TB Officer AJK	34	Tanveer Ahmad	Liaison Officer
11	Dr. Muhammad Riaz	Program Manager FATA	35	Mr. Zia Samad	DATA Surveillance Officer
12	Dr. Yousaf Khan	ATO Mohammad Agency FATA			
13	Mr. Wakeel Khan	Admin Officer FATA			
14	Dr. Muhammad Tahir	DHO ICT			
15	Dr. Najeeb Durrani	DTC ICT			
Partners					
16	Dr. Irum Fatima	MC			
17	Dr. Adeel Tahir	MC			
18	Ms. Aamna Rashid	MC			
19	Dr. Sobia Faisal	GSM			
20	Mr. Azadar Gillani	GSM			
21	Dr. Nayyar Ghias	ASD			
22	Dr. Jalal Khan	MALC			
23	Dr. Nauman Safdar	TIH			
24	Dr. Waqas Rabbani	TIH			

List of Contributors of PSP Meeting Balochistan

Date: 16 - 17 Mar 2017

Venue: Usmania/Serena Hotel Quetta

Participants from Balochistan				Participants from NTP	
S #	Name of Contributor	Organization / Designation	S #	Name of Contributor	Organization / Designation
Ministry			1	Dr. Aurangzaib Baloch	Dy Program Manager
1	Dr. Maqbool Ahmad	Health Department	2	Dr. Khawaja Laeeq Ahmad	Focal Person NSP
2	Mr. Shoukat Ali Malik	Act DGHS Balochistan	3	Dr. Sabira Tahseen	Advisor NRL
3	Mr. Shahjhan (Chief of Section)	Ministry of Planning & Development	4	Dr. Syed Hussain Hadi	Chief Policy
4	Mr. Abdul Rauf	AS (H)	5	Dr. Furqan Ahmad	GF Reporting Coordinator
PTP			MoNHSR&C		
5	Dr Sultan Ahmed Lahri	PTP Manager	1	Dr. Syed Karam Shah	MoNHSR&C
6	Dr Irfan Ahmad Raisani	Deputy PTP Manager	Consultants		
7	Dr Ahmad Wali	Focal Person PSP	1	Dr. Basharat Javed	National Consultant
8	Dr Shaihak Riaz	Project Manager - (GF)	2	Ms. Fariyah Malik	National Consultant
9	Dr Ashraf Chaudry	Provincial Reference Lab - In charge			
10	Dr Azam Babar	MDR Coordinator (GF)			
11	Dr. Taj Muhammad Khosa	NPO			
12	Dr. Muhammad Younas	M&E Officer			
13	Dr. Muzahir Ai	NPO			
14	Dr. Zeenat Shahwani	NPO			
15	Dr. Farooq Sarwar	NPO			
16	Dr Shoaib Kurd	M&E Officer Lab (GF)			
17	Dr. Saeed	Pharmacist			
18	Mr. Bakht Nasir	Data Analyst			
19	Mr. Fareed Ahmad	Finance Person (GoB)			
20	Mr. Azhar Hussain	Finance Officer (GF)			
21	Mr. Zaheer Ahmed	Liaison Officer (GF)			
Other organization					
22	Dr Shahjhan Panezai	DHO - Resident (Quetta)			
23	Dr Arbab Tariq	DTC - Resident (Quetta)			
24	Dr Qadir Bux	DTC - Non Resident (Naseer Abad)			
25	Dr. Saeedullah	Mercy Corps			
26	Dr. Jaffar Ilyas	Mercy Corps			
27	Dr. Irum Fatima	Mercy Corps			
28	Dr Khalid Farough	Green Star Social Marketing			
29	Dr Nauman Safdar	The Indus Hospital			
30	Dr Saeed Ullah Khan	Stop TB Partnership			
31	Mr. Imdad Ali	SPO			
32	Dr Mukhtiar Zheri (PHS)	PPHI			
33	Mr. Amman Ullah Khan Kakar	(SOCIO Pakistan) & Pakistan Youth			
34	Dr. Fahim	Provincial WHO Office Quetta			
35	Haji Muhammad Qahir	Balochistan Chamber of Commerce, Quetta			
36	Dr. Atta -u- Rehman	Inter Faith Religious council on Health (IRCH)			
37	Ms. Rabia Baloch	Taraqee Foundation			

List of Contributors of PSP Meeting KP

Date: 13 - 14 Mar 2017

Venue: PC Hotel Peshawar

Participants from KP				Participants from NTP	
S #	Name of Contributor	Organization / Designation	S #	Name of Contributor	Organization / Designation
1	Dr. Abdul Khaliq	Project Director	1	Dr. Aurangzaib Baloch	Dy Program Manager
2	Dr. Maqsood Ali	Dy. Project Director	2	Dr. Khawaja Laeeq Ahmad	Focal Person NSP
3	Dr. Qasim Abbas	PPM Coordinator	3	Dr. Sabira Tahseen	Advisor NRL
4	Dr. Abdul Raheem	Focal Person PSP	4	Dr. Syed Hussain Hadi	Chief Policy
5	Dr. Taj ul Haq	Microbiologist I/C	5	Dr. Abdul Ghafoor	Advisor MDR
6	Dr. Muhammad Dost Khan	MDR coordinator	6	Mr. Tanveer Ahmad	Liaison Officer
7	Dr. Sabir Rehman	M&E Officer Lab	Consultants		
8	Dr. Maqsood A Bangash	PTP KP	1	Dr. Basharat Javed	National Consultant
9	Mr. Noman	Planning Officer Health Dept	2	Ms. Fariyah Malik	National Consultant
10	Mr. Umer Hayat	Health Department			
11	Mr. Khair ul Bashar	ACSM Coordinator			
12	Mr. Jamil Ahmad Durrani	Finance Person			
13	Dr. Basit Saleem	DHO Mardan			
14	Dr. Rafiq Tanoli	DTC Haripur			
15	Dr. Muhammad Tariq Barki	Focal Person - TB, Peshawar			
16	Dr. Zahir Shah	Focal Person - TB, Swat			
17	Dr. Faisal Khanzada	Focal Person - TB, Abbottabad			
18	Dr. Bilal	WHO			
19	Dr. Umair Qazi	Prime Institute of Health Public			
20	Dr. Nauman Safdar	The Indus Hospital			
21	Dr. Saeed Anwar	Peshawar Medical College			
22	Dr. Akmal Naveed	ACD			
23	Dr. Abdul Latif	ACD			
24	Dr. Khalid Farugh	GreenStar Social Marketing (GSM)			
25	Dr. Irum Fatima	Mercy Corp			
26	Mr. Ghulam Haider	GreenStar Social Marketing (GSM)			
27	Dr. Jalal Khan	Coordiantor			
28	Mr. Sohail	Lab. Technologist			
29	Dr. Khalil Akhtar	HSRU			

List of Contributors of PSP Meeting Punjab

Date: 2 - 3 Mar 2017

Venue: Avari Hotel Lahore

Participants from Punjab				Participants from NTP	
S #	Name of Contributor	Organization / Designation	S #	Name of Contributor	Organization / Designation
1	Dr. Zarfishan Tahir	PTP Manager	1	Dr. Aurangzaib Baloch	Dy Program Manager
2	Dr. Muhammad Asif	Dy PTP Manager	2	Dr. Khawaja Laeeq Ahmad	Focal Person NSP
3	Dr. Ahmed Nadeem	Project Manager - GF	3	Dr. Sabira Tahseen	Advisor NRL
4	Dr. Abid Usman	Provincial Technical Officer	4	Dr. Syed Hussain Hadi	Chief Policy
5	Dr. Afifa Zuhra	Focal Person PSP	5	Mr. Zubair Ahmad Shad	Manager Communication
6	Dr. Lalarukh	Provincial Reference Lab - Incharge	6	Mr. Tanveer Ahmad	Liaison Officer
7	Dr. Zubair Hafeez	HDL Coordinator	MoNHSR&C		
8	Dr. Bedar Bakht	M&E Officer Lab	1	Mr. Mudassir Ahmad	MoNHSR&C
9	Dr. Umer Farooq	DHA Nankana sahib	Consultants		
10	Dr. Asima Asif	DTC Lahore	1	Ms. Anna Catherina	Inter-national Consultant
11	Dr. Jawad Ahmad	EDO Jhelum	2	Dr. Basharat Javed	National Consultant
12	Dr. Iqtidar Ahmad	Stop TB Partnership	3	Ms. Fariyah Malik	National Consultant
13	Dr. Bilal Saleem Khan	Provincial AIDS Control Program			
14	Dr.Naveed Iqbal	PATA			
15	Dr. Jaffar Ilyas	Mercy Corps			
16	Dr.Farkhanda	Mercy Corps			
17	Dr. Nayyer Ghiaz	Association of Social Development			
18	Dr. Qasim Mehmood	Pakistan Lions Youth Council			
19	Dr.Asif Akhtar	Pakistan Lions Youth Council			
20	Mr.Zafar Malik	Aagaz Foundation			
21	Dr. Khalid Mehmood	Health Sector Reform Unit (HSRU)			
22	Dr. Abbasi	Green star Social Marketing			
23	Dr. Sobia Faisal	Green star Social Marketing			
24	Ms. Safia Bano	LHW Program			
25	Ms. Sehar Ijaz	ACSM Coordinator			
26	Mr. Omair Shahid	Finance Person			

List of Contributors of PSP Meeting Sindh

Date: 28 Feb - 1 Mar 2017

Venue: Avari Hotel Karachi

Participants from PTP Sindh				Participants from NTP	
S #	Name of Contributors	Organization / Designation	S #	Name of Contributors	Organization / Designation
1	Dr. Aijaz Hussain Ursani	Director PTP-Sindh	1	Dr. Aurangzaib Baloch	Dy Program Manager
2	Dr. Abdul Khaliq Domki	Add: Director PTP-Sindh	2	Dr. Khawaja Laeeq Ahmad	Focal Person NSP
3	Dr. Kaleem Ahmad	Dy Director PTP Sindh	3	Dr. Sabira Tahseen	Advisor NRL
4	Dr. Wali Muhammad Lighari	AMS TH-Qasimabad Hyderabad	4	Dr. Syed Hussain Hadi	Chief Policy
5	Dr. Abdul Aziz Memon	DHO TMK.	5	Mr. Tanveer Ahmad	Liaison Officer
6	Dr. Younis Asad Shaikh	National Program LHW Hyderabad		Consultants	
7	Dr. Sohail Bin Saeed	Govt of Sindh	1	Ms. Anna Catherina	Inter-national Consultant
8	Mr. Ibrahim	Rep Health Dep Sindh Secretrat	2	Dr. Basharat Javed	National Consultant
9	Mr. Tariq Hussai	Rep Finance Deptt: Ministry Karachi			
10	Mr. Javed	Rep Education Deptt: Karachi			
11	Mr. Mudasir	Rep - DG-Health Office Hyderabad			
12	Mr. Muhammad Hassan Panhwar	Ex-Nazim Dadu			
13	Dr. Sharaf Ali Shah	STOP-TB			
14	Dr. Iqtidar Ahmad	STOP-TB			
15	Dr. Javed Ahmed Shaikh	STOP-TB			
16	Dr. Ziaullah Khan	Prison Hospital Karachi			
17	Dr. Toufeeq Choudhry	Director Health Services Karachi.			
18	Dr. Hazoor Shaikh	Dy: Director PTP-Sindh			
19	Dr. Khaled Hussain	Program Officer - WHO			
20	Dr. Mazhar Khamesani	P & D Karachi			
21	Dr. Aftab Ahmad	AIDS Control Program Karachi			
22	Dr. Khalid Memon	District TB Coordinator Mir pur Khas			
23	Dr. Salman Khan	TIH			
24	Dr. Jaffar Ilyas	MC			
25	Dr. Irum Fatima	MC			
26	Dr. Khaliq Farough	Green Star			
27	Dr. Qasim Mahmood	PLYC			
28	Dr. Amanullah Ansari	PTO-Sindh			
29	Dr. Ismat Ara Khurshid	Project Manager TGF			
30	Dr. M. Yahya Noori	Incharge - PRL-Sindh			
31	Dr. Srichand Batra	M&E Officer PTP-Sindh.			
32	Dr. Afshan Khurshid	HDL-Coordinator PTP-Sindh.			
33	Dr. Shahid Butt	MDR-Coordinator PTP-Sindh.			
34	Dr. Javeria Shamsi	PPM-Coordinator PTP-Sindh.			
35	Mr. Abdul Hafeez Shahani	HR/Admin Officer PTP-Sindh.			
36	Mr. Samiullah Dayo	Finance Officer PTP-Sindh.			
37	Dr. Syed Saleem Hassan Kazmi	NPO Sukkur PTP-Sindh.			
38	Dr. Tarique Hussain Memon	NPO - PTP-Sindh.			

Preparatory Meeting on NSP

Date: 17th Feb 2017

Venue: Conference Room NTP

Focal Person NSP :

Dr. Khawaja Laeeq Ahmad - Manager M&E NTP

Consultants

Ms. Anna Catherina Peter - Inter-national Consultant

Dr. Basharat Javed - National Consultant

Ms. Fariyah Malik - National Consultant

Contributors

S #	Name	Designation/Organization
NTP		
1	Dr. Nasir Mahmood Khan	National Manager
2	Dr. Aurangzaib Baloch	Dy National Manager
3	Dr. Razia Kaniz Fatima	Chief Data Officer
4	Dr. Abdul Ghafoor	Consultant MDR
5	Dr. Ayesha Rasheed	Program Coordinator
6	Dr. Syed Hussain Hadi	Chief Policy Officer
7	Dr. Sabira Tehseen	Advisor NRL
8	Dr. Raja Muhammad Ayub	Manager MDR
9	Dr. Furqan Ahmed	Coordinator GF Reporting
10	Dr. Col Amjad	Coordinator Infection Control
11	Mr. Ammara Omer	ACSM Coordinator
12	Mr. Tanveer Ahmad	Liaison Officer
13	Mr. Zia Samad	Data Surveillance Officer
MoNHSR&C		
14	Dr. Karam Shah	Advisor CDC
Provincial Focal person		
15	Dr. Ahmad Wali	PSP Focal Person Balochistan
16	Dr. Abdul Raheem	PSP Focal Person KP
17	Dr. Afifa Zuhra	PSP Focal Person Punjab
18	Dr. Saleem Hassan	NPO Sindh