

Reach, Treat, Cure Everyone



Annual Report

2014



National TB Control Programme
Ministry of National Health Services Regulations & Coordination
Islamabad, Pakistan



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Acronyms

ACD	Association for Community Development
ACSM	Advocacy, Communication and Social Mobilization
AIDS	Acquired Immunodeficiency Syndrome
AJK	Azad Jammu and Kashmir
AKHSP	Aga Khan Health Services Pakistan
ART	Antiretroviral therapy
ASD	Association for Social Development
BA/BE	Bioavailability and bioequivalence
BCC	Behavior Change Communication
BDN	Basic Development Needs
BSL	Biosafety Level
CBOs	Community-Based Organizations
CCM	Country Coordinating Mechanism
CNIC	Computerized National Identity Card, bearing a number used as unique identifier
CNR	TB case notification rate per 100,000 population
CPT	Cotrimoxazole preventive therapy
CXR	Chest X-ray
DCO	District Coordination Officer
DFID	Department for International Development
DHO	District Health Office
DLS	District Laboratory Supervisor
DMU	Drug Management Unit (Federal)
DOTS	Directly Observed Therapy short Course
DSM	Direct smear microscopy
DST	Drug susceptibility testing
DTC	District TB Coordinator
DUHS	Dow University of Health Sciences
ED(H)O	Executive District (Health) Office
EDO (H)	Executive District Officer-Health
EMR	Eastern Mediterranean Regional Office of WHO
ENRS	Electronic nominal registration system, Excel-based system to record MDR-TB patients
EQA	External Quality Assurance
FATA	Federally Administered Tribal Areas
FEFO	First Expired First Out
FLD	First-line anti-TB drugs
GB	Gilgit-Baltistan, formerly Northern Areas
GDH	Gulab Devi Chest Hospital
GF	Global Fund
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GIS	Geographic Information Systems
GLRA	German Leprosy and TB Relief Association
GMMCH	Ghulam Muhammad Mahar Medical College Hospital Sukkur
GP	General Practitioner
GS	Green Star
GTZ	Gesellschaft für Technische Zusammenarbeit



HCW	Health care workers
HDL	Hospital DOTS Linkage
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
IACC	Inter-Agency Coordination Committee
ICD	Ohja Institute of Chest Diseases, Karachi
ICT	Islamabad Capital Territory, formerly Federal CT (FCT)
IHK	Indus Hospital Karachi
IRD	Interactive Research and Development, Karachi
IUATLD	International Union Against TB and Lung Diseases
JATA	Japan Anti-Tuberculosis Association
JICA	Japan International Cooperation Agency
KPK	Khyber Pakhtunkhwa, formerly North West Frontier Province (NWFP)
LED	Light emitting diode technology for microscopy
LHW	Lady Health Worker (community care-giver)
LPA	Line probe assay (HAIN test)
M&E	Monitoring and Evaluation
MALC	Marie Adelaide Leprosy Centre, Karachi
MCI	Mercy Corps International
MDGs	Millennium Development Goals
MDR-TB	Multidrug-resistant TB
MOH	Ministry of Health
MoNHSR&C	Ministry of National Health services Regulations & Coordination
NACP	National AIDS Control Programme
NAs	Northern Areas
NFM	New Funding Model of the Global Fund
NRL	National Reference Laboratory
NSP	National Strategic Plan
NTP	National TB Control Programme
NTP	National TB Control Program
NWFP	North West Frontier Province (now KPK, see above)
OPD	Outpatients Department
PACP	Provincial AIDS Control Programme
PATA	Pakistan Anti-TB Association
PC-1	Planning Commission Form 1
PHC	Primary Health Care
PIMS	Pakistan Institute of Medical Sciences, Islamabad
PIU	Programme Implementation Unit of the Global Fund
PLWHIV	People living with HIV
PMDT	Programmatic Management of Drug-resistant TB
PPE	Personal Protective Equipment
PPHI	People's Primary Health Care Initiative
PPM	Public-Private Mix
PPP	Public-Private Partnership
PQ	WHO prequalification



PR	Principal Recipient
PTP	Provincial TB Control Programme
PTP	Provincial TB Control Program
PV	Pharmacovigilance
RR-TB	Rifampicin-resistant TB
SLD	Second-line anti-TB drugs
SSF	Single-Stream Funding of Global Fund
STP	Stop TB Partnership (Pakistan)
TAF	The Asia Foundation
TB	Tuberculosis
TB-DMIS	TB Drug Management Information System
TCH	Tertiary care hospital
TGF	The Global Fund
TOT	Training of trainers
TRP	Technical Review Panel of the Global Fund
UC	Union Council
UN	United Nations
UVGI	Ultraviolet Germicidal Irradiation
WHO	World Health Organization
WMS	Warehouse Management System
XDR	Extensively drug-resistant TB



We Pledge Zero TB Deaths till 2020

The landscape of public health in Pakistan is dotted with numerous challenges, Tuberculosis (TB) control being one of them. The country harbors the 5th highest burden of TB in the world, accounting for 65% of the total disease burden in the Eastern Mediterranean Region. According to National Prevalence Survey report, the annual incidence of TB in Pakistan is 270/100,000 population for all ages and forms.

Recognizing the enormous socioeconomic implications of the disease, the Government of Pakistan responded to WHO recommended Strategies for TB care and control. The adoption of the Islamabad Declaration and endorsement of the global TB control targets also demonstrate the country's resolve to continue the battle against TB, which in fact is a battle against time.

This annual report presents a snapshot of TB control activities undertaken during 2014. Our plan of action for the future focuses on key components of the Post 2015 Global TB Strategy as envisaged in NTP Strategic Plan "Vision 2020". NTP envisions "Universal Access to TB Care" and aspire for "Zero TB Death" in Pakistan.

I take this opportunity to acknowledge the commitment of the Ministry of National Health Services, Regulations & Coordination, the Provincial TB Control Programs, national and international community including bilateral and multilateral agencies and the private sector in strengthening our resolve against TB. The achievements made by NTP during the year under review would not have been possible without their support.

As we move forward in this struggle, we must concede that a lot still remains to be done, with greater momentum, precision and dedication, so that the suffering that comes with TB can be brought to a grinding halt.

Dr. Ejaz Qadeer

National Program Manager,
National Tuberculosis Control Program, Pakistan.



Message of National Program Manager

Executive Summary

Pakistan is home to 185 million¹ people, making sixth most populous country in the world.² Approximately 35% of the population is less than 15 years of age. More than 60% of the total population lives in rural areas. Pakistan includes: i) *five provinces*- Punjab (56% of the total population) is, population-wise, the largest province, followed by Sindh (23%), Khyber Pakhtunkhwa (17%), Balochistan (5%) and Gilgit-Baltistan (<1%); and ii) *three regions*- Azad Jammu Kashmir (AJK), Federally Administered Tribal Areas (FATA) and Islamabad Capital Territory (ICT).

Pakistan is lower Middle income country. The annual health expenditure per capita is estimated at US \$ 39.4³.

Tuberculosis (TB) continues to be a major public health challenge in Pakistan. Tuberculosis was declared as national emergency in 2001 and WHO recommended DOTS strategy was adopted.

TB DISEASE BURDEN: Pakistan ranks 5th among the 22 high TB burden countries. It accounts for approximately 2/3rd of the TB burden of the Eastern Mediterranean Region (EMR) of the World Health Organization (WHO).

A nationwide population-based **TB prevalence survey**⁴ was carried out in 2010/2011 and final results were obtained in 2013. Survey that involved nearly 106,000 persons and based on survey results, estimated TB prevalence rate (all forms and all ages) was 342 cases in 100,000 population (95% CI: 284- 406) and TB incidence rate was 275 TB cases per 100,000 populations. (95% CI: 205-357).

According to W.H.O estimates, mortality rate of TB was 26 deaths per 100,000 populations in 2014 (Global TB Report 2015).

First **National drug resistance survey**, which started in April 2012 was completed in Sept 2013. Data analysis was finalized with technical assistance of WHO and SRL (Antwerp Belgium), based on final analysis below is the disease burden of MDR cases;

Table : Proportion of MDR and disease burden in new and retreatment cases

	TB disease type	TB Cases notified, 2013	% MDR	% MDR low	% MDR high	No MDR	No MDR low	No MDR high
PTB	New	229,961	3.7	2.5	5.0	8509	5749	11498
	Retreatment	15,839	18.1	13.0	23.4	2867	2043	3690

TB CASE NOTIFICATION: Pakistan notified 316577 TB cases of all forms in 2014 (167 cases per 100,000 population)⁵, compared to 298,446 in 2013. Extra Pulmonary TB case notification comprised 19% of total. Among Pulmonary TB cases 52% were bacteriological positive.

Paediatrics TB case: 9% of total cases notified were children under 15 years of age

¹ National Institute of Population Studies, 2013-14 estimates. <http://www.nips.org.pk/> [Access: August 13, 2014]

² National Institute of Population Studies, Government of Pakistan, 2012

³ Global Health Observatory Data Repository

⁴ National TB Prevalence Report, NTP, Pakistan, 2010-11 Page #-11

⁵ Some statistics were revised upwards since they were reported to W.H.O earlier in 2013



Previously treated cases: General trend of case notification was followed in 2014, and this also comprised 5% of total case notification.

Public Private Mix (PPM) : PPM was implemented through four models including GP clinic, NGO run facilities , private hospitals and non-NTP public health sector, contributing around 20% of TB cases notification towards NTP. Total of 60,000 TB cases were notified during 2014.

NTP Pakistan has taken an initiative towards mandatory TB case notification. Legislation for TB notifications was achieved in the province of Sindh. The TB Notification act 2014 has been passed by the Provincial assembly and the development of bylaws and procedures of notification will be available in August 2015. The other provinces have also made a meaningful development in this regard.

Treatment Outcome: Treatment success rate in new cases registered in 2013 was 93% and 84% for retreatment cases.

MDR TB: Programmatic management of drug resistant TB (PMDT) which started with enrollment of 209 patient in 2010 increased to 2662 in 2014. Total enrollment by the end of 2014 was 5827 through 24 PMDT sites nationwide. Treatment Success rate for cohort of 2011 was 76%, death rate 13% and lost to follow-up 5%.

There are 4617 MDR-TB (78%) and 121 XDR-TB (3.6%) among enrolled DR-TB patients by the end of 2014.

Seven more hospital facilities were renovated and upgraded to PMDT treatment sites in year 2014. A training of trainers was organized in Nathiagali for MDR physicians in Nathiagali in May 2014. There is no waiting list in 2014 and all patient enrolled were put on Quality assured GLC drugs with provision of social support to all enrolled MDR TB patients.

TB Diagnostic services and laboratory Network: Number of functioning laboratories increased to 1483 (including 274 private labs). On average at end of 2014 one microscopy laboratory was serving a population of 128,744 population country wide, Roll out of FM microscopy to Sindh with improvement in sensitivity of microscopy was documented.

43 X-pert machines were functioning in centers supported by NTP and PTP-KP where an additional 25 were functional in Karachi through IRD/UNITAID project. Uptake of X-pert was increased further and total of 56000 test were performed (opposed to 17000 in 2013) including 36000 in NTP/PTP sites. Liquid Culture (MGIT) and DST performing laboratories increased to four (NRL, IHK, PRL-KP and PRL-Sindh) Culture and DST work volume is gradually scaling up and number of culture performed in 2014 was more than 38000 and 1380 DST. DRS analysis was completed with technical assistance of WHO consultants and results dissemination workshop was October 2014 (see above). Specimen transportation was piloted in four district and is now being scaled up. M&E activities further strengthened and 2400 visits conducted in 2014.

Infection Control Achievements during 2014

PMDT: 11 PMDT sites across Pakistan were up-graded and are operational in terms of application of Infection Control principles and practices. Supply of PPE for Infection control (N95, surgical masks and hand sanitizer) was sustained and regularly supplied to all operational sites. National Guidelines, monitoring tools & IEC materials for TB Infection Control for health care facility, congregate setting & households were developed and TBIC trainings (as MDR training plan) was imparted to all concerned.

Biosafety in Laboratories: Up gradation work was completed in 8 Labs (Six BSL-II & Two BSL-III) across Pakistan and handed over to local stakeholders.



Drug Management: Based on the successful implementation of R-8 activities, Drug Management was incorporated as an integral part in SSF grant, securing more than 59 Million USD grant for procurement of First Line Drugs (FLDs) for Core DOTS and Second Line Drugs (SLDs) for Multiple Drug Resistant TB Patients.

NTP was successful to get additional grant of 8 million USD from Global Fund for 100% buffer stock (300,000 pts courses) and became the first country to get GF interim funding. Furthermore WHO emergency grant of about 8 Million USD is approved for the provision of FLDs and Paediatric drugs to be used in year 2014.

For accurate and timely management of inventory, TB DMIS (drug management information system) is introduced and initiated a comprehensive training program of district staff for proper implementation.

Operation research: Operation Research:

NTP research unit have successfully published three articles in the “International Journal of Tuberculosis and Lung Diseases” (IJTLD) and two are also accepted for publication, one in IJTLD and the other in Plos-One Journal in 2014. The implementation of TB-Reach Wave III project “Effectiveness of widening circle of contact screening from within the household to 100 m around the house of index case on case finding through outreach using GIS” is successfully going on. Besides these two research studies on MDR (funded GF) are going on. In addition, one Oral and three Posters were presented in the 45th Union World Conference on Lung Health was held in Barcelona, Spain on 28 October – 1 November 2014.



1. National TB Control Program

MISSION: “A TB Free Pakistan”

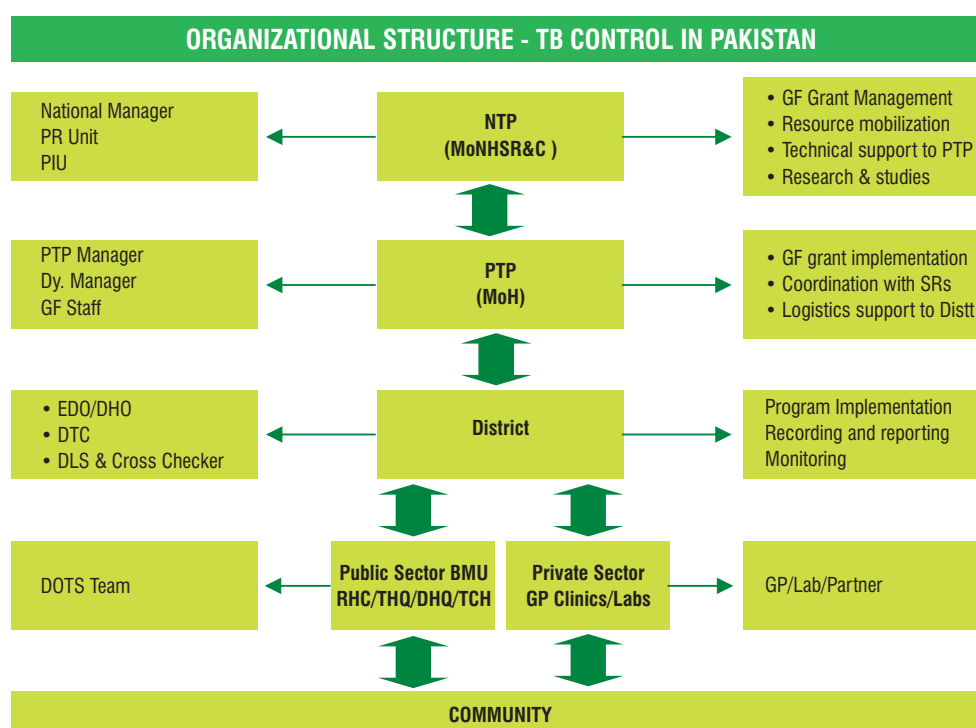
VISION: “Universal Access to TB Care achieving Zero TB Death”

GOAL: “To reduce 50 %, the prevalence of TB by 2025”

The overall objective of TB Control Program is to reduce mortality, morbidity and disease transmission, so that tuberculosis may no longer be a public health problem and also to prevent Multi-drugs Resistance TB (MDR-TB). NTP, working under the Ministry of National Health Services, Regulation & Coordination, provides national stewardship to fulfill global commitment towards the MDGs. In post-devolution scenario NTP acts as a central coordinating body rather than implementing unit and has a role of developing national policies and guidelines, monitoring, and reporting of the programmatic and financial achievements to The Global Fund and LFA. Additionally it plays role in liaison with international partners for resource mobilization to plug the resource gaps both at technical and financial levels as well as to facilitate the liaison with donor both at national and international levels. It also play role in coordination with Provincial / Regional TB Programs and other in-country players involved in TB control activities.

A. Organization of TB control activities in the country

NTP has the stewardship role in TB control efforts in the country. The figure below reflects the organization of TB control activities in the country.



B. Functional Units of NTP:

Table below list main functional units of NTP in 2013

Table 1: Functional Units of National Tuberculosis Control Programme

	Technical Units	Unit Head /Coordinator	COORDINATION/SUPERVISION
1	Technical/ Monitoring and surveillance	Dr Basharat Javed	Core DOTS, monitoring/surveillance
2	GF Project Implementation Unit	Dr Mohammed Ayub	All GF
2.1	• TB and HIV	Dr Amir safdar	TB and HIV co-Infection
2.2	• Pediatrics TB and Hospital DOTs linkages	Dr Ali Mirza	
2.3	• Infrastructure Up-gradation	Dr Mohammed Amjad	BSLII/III labs and PMDT sites
2.4	• Infection control	Dr Yasir Waheed	IC in PMDT sites
2.5	• Health system strengthening	Dr Fakhra Naheed	
2.6	• ACSM	Ammara Omer	HRD
3	MDR	Dr Zafar Toor	PMDT
4	National Reference laboratory	Dr Sabira Tahseen	TB Diagnostics and lab surveillance
5	Drug management	Dr Zia Dawar	
6	Operational Research	Dr Razia Fatima	
	ADMINISTRATIVE/SUPPORT UNITS		
1	Principal Recipient Unit	Dr Abdul Ghauri	
2	Finance Unit	Mr Khalid Rizwan	
3	Procurement supply Management (PSM)	Mr Nadeem Mir	
4	Human Resource	Mr Rizwan Anees	
5	Information Technology	Mr Mehdi Hemani	

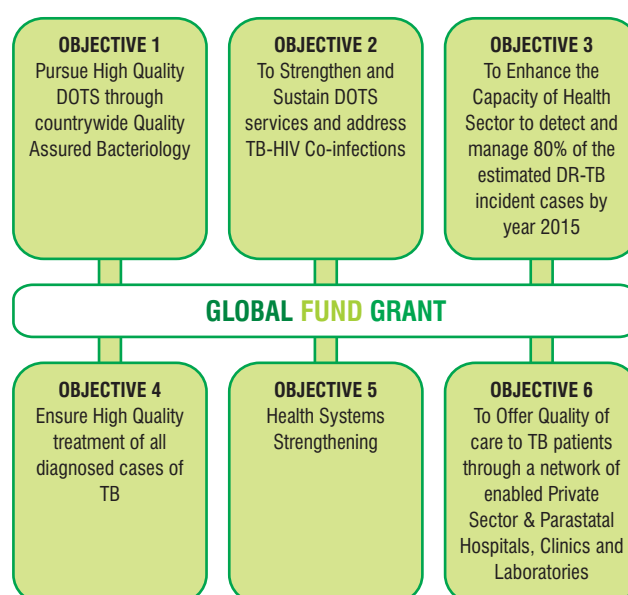
C. Global Fund Grant Management

The Global Fund support is critical to continue diagnosis and treatment of thousands of Patients suffering from TB, Malaria and AIDS in Pakistan. 12,300,000 New Smear-Positive TB Cases detected and treated till now through the support of GF by the implementation of 150 active grants

Current Grant:

The Grant titled “Reducing the burden of Tuberculosis in Pakistan by improving access to quality Directly Observed Treatment Short Course (DOTS) and Multi-Drug Resistance (MDR-TB) care services” is being implemented by NTP as public sector Principal Recipient (PR) for all of the 140 districts and territories across the country through its implementing partners as Sub-Recipients (SRs) i.e. (1)

GLOBAL FUNDS SUPPORTED INTERVENTIONS





Association for Community Development (ACD); (2) Association for Social Development (ASD) and (3) Indus Hospital Karachi.

Current SSF Grant also took into account the devolution of MoH at federal level and adapted the work-plan to fully address the new role of provinces as SRs (sub-recipients). The four Provincial TB Programs (PTPs) were taken on board as SRs from 1st January 2014 for implementation of TB activities. Additionally, Regional TB Control Programs under the umbrella of NTP also implement these activities in their areas of jurisdiction. NTP has developed a mechanism to review their progress and disburse funds on quarterly basis to ensure smooth functioning of grant all over the country without any interruption. PTP SRs are provided with adequate HR support at two levels; one for program management like program management, M&E, finance etc. and other, clinical support for which HR is provided for implementing hospitals and labs in each province/region. Trainings, Communication Material, monitoring & evaluation and other operational costs for Planning & Administration are also provided. Above all, half of first line and all second line anti-TB drugs to address the demand gap of the provinces/ regions along with diagnostic equipment like X-ray machines, Gene Xpert, microscopes, power generators & UPS etc. are also provided to the SRs. Its maintenance and running costs including cartridges, lab reagents etc. are also provided through GF grant support.

In post-devolution scenario NTP has a role of developing national policies and guidelines, monitoring, and reporting of the programmatic and financial achievements to The Global Fund and LFA. Additionally, NTP taps international funding to plug the resource gaps in the country both at technical and financial levels. It is also pertinent to mention that NTP plays a role of coordinating body rather than implementing agency. The outward coordination is made internationally with donors and partners and, inward coordination is made with Provincial / Regional TB Programs and other in-country players involved in TB control activities. NTP is continuing its supervisory and technical support role with no implementation except for federal administrative territories, and support / facilitate the provinces for international procurements and liaison with international partners for resource mobilization etc.

The current Single Stream Funding has been awarded for a period of two years and nine months i.e. from October 1, 2012 to June 30, 2015. Mercy Corps is also implementing Public Private Mix (PPM) component of this grant, in the capacity of Co-Principal Recipient from private sector.

The Objectives and implementation arrangements have been revised as under:

Objective 1: Pursue High Quality DOTS through countrywide Quality Assured Bacteriology - NTP PR

Objective 2: Strengthen and Sustain DOTS services and address TB-HIV Co-infections - NTP PR

Objective 3: Enhance the Capacity of Health Sector to detect and manage 80% of the estimated DR-TB incident cases by year 2015 – NTP PR

Objective 4: Ensure High Quality treatment of all diagnosed cases of TB – NTP PR

Objective 5: Drugs Management Systems Strengthening – Greenstar PR through Round-8

Objective 6: Offer Quality of care to TB patients through a network of enabled Private Sector and Other health sector Hospitals, Clinics and Laboratories – Mercy Corps PR

NTP as public sector Principal Recipient (PR) for Objectives 1, 2, 3 & 4 through Provincial and Regional TB Control Programs in all districts of the country. Objective 5 & 6 are being implemented through non-governmental private sector Principal Recipients.

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 External Quality Assurance (EQA) of sputum smear microscopy. To date 12 BSL-2 Labs and 3 BSL-3 Labs have been up graded to perform Culture and Drug Susceptibility Testing (DST) for diagnosis and follow up of MDR-TB cases.

Forty six tertiary care hospitals and 140 DHQs all over Pakistan have been enabled to provide TB care, to routine TB patients, and management of childhood TB as per national guidelines.

TB/HIV Co-infection is focused in the grant support. Collaborative planning and monitoring of interventions for TB-HIV co-infected patients have been established at 16 sentinel sites across the country and WHO technical guidelines for screening, counseling, diagnosis, treatment and support of patients co-infected with TB-HIV have been adapted in the country context.



MDR-TB patients will be managed through 30 hospitals by the end of grant period across the country. 13 hospitals have been up-graded to ensure appropriate infections control measures in place, while 17 hospitals are in the process of up gradation. Currently, registration and treatment of MDR-TB patients is underway at 24 designated hospitals.

Drug Management is an essential component of the grant and all the first and second line quality assured anti-TB drugs are being procured through international vendors. The drug storage and distribution system at national, provincial and district levels has already been improved through refurbishment of warehouses by providing a standard package and providing customized loader vehicles for transportation of drugs through Round-8 grant.

Human resource is the most precious asset of an organization. Dedicated staff would be available to implement the grant activities at various levels. The program addresses human resource development to strengthen the programs for effective management of the project and TB control activities. Co-PR Greenstar has imparted trainings on drug management to all relevant staff in all districts of the country.

Resource allocation:

NTP was successful in securing USD 121 million for the current SSF grant. Later, NTP was also provided with additional amount of USD 8 million to ensure appropriate buffer stock for First Line Drugs. The resources in terms of finances as well as commodities / products are distributed through the implementing partners. Significant amount of the budget (around 80%) has been allocated for anti-TB drugs both first and second line, up-gradation/ equipment and social/ food support, which are being managed by the PR as per GF Guidelines.

Major Achievements:

- ♦ Scaling up of MDR-TB intervention is underway through Global Fund grant enabling 30 hospitals to manage more than 11,000 patients
- ♦ Out of total 22 Labs, twelve have been upgraded at Bio-safety Level 2 & 3 to perform TB Culture and Drug Susceptibility Testing and remaining 10 labs are at different levels of up gradation
- ♦ 13 PMDT hospitals for MDR-TB management have been completed and handed over. Remaining 17 are at

different levels of up gradation

- ♦ NTP has also signed a MoU with Armed Forces of Pakistan standardized treatment of TB through its chain of hospitals. Pilot is due to take place in MH Rawalpindi
- ♦ MDR-TB intervention has been instituted in 24 hospitals
- ♦ Doctors, paramedics and program management staff have been trained on programmatic management of MDR-TB
- ♦ To date a total of more than 5827 Drug Resistant TB patients have been enrolled
- ♦ Mechanism for Food Support for MDR-TB patients has been developed and implemented through Utility Stores Corporation to ensure treatment adherence and increase treatment success
- ♦ Agreement has been signed with GDF/IDA for the procurement of GLC approved Second Line Drugs (SLDs)
- ♦ Warehouses at national, provincial and district levels have been upgraded for appropriate storage of anti-TB Drugs. The Drug Management system has been strengthened by provision of training to staff involved in drug management throughout the county
- ♦ Recording and reporting tools and systems have been improved besides strengthening of monitoring and supervision in this critical area
- ♦ Implementation of National Guidelines for management of First-line and Second-line anti-TB drugs
- ♦ Usage of Dispensing Manuals for First-line and Second-line anti-TB drugs
- ♦ Development Quality Assurance Plan for drug management has been completed



PERFORMANCE REPORT as per PF indicator – YEAR 2014 (January – December 2014)

INDICATORS	TARGETS	ACHIEVEMENTS
Number of New Smear Positive TB cases Notified to the National Health Authority (NTP)	133,980	122,542
Number of TB cases (all forms) Notified to the National Health Authority (NTP)	314,000	316,544
Laboratories showing adequate performance in External Quality Assurance for Smear Microscopy among the total number of Laboratories that undertake Smear Microscopy during the reporting period	75%	72%
Number of Laboratories Upgraded for BSL 2 and BSL 3	5	7
Number of Health Care Providers and Laboratory staff trained in TB Management	1,162	3,394
Number of Childhood TB Cases detected	22,320	14,747
TB Patients who had an HIV test result recorded in the TB Register	10,916	10,715
Number of Laboratory-confirmed DR-TB cases enrolled on second-line anti-TB treatment	4,215	2,541
Number of Hospitals currently managing DR-TB cases	10	6
Percentage of DR-TB patients on treatment receiving Social Support	90%	91%
Number of New Smear-Positive TB cases successfully treated (cured plus completed treatment) among the New Smear-Positive TB cases registered	108,410	107,465
Number and Percentage of Diagnostic Reporting Centers submitting timely reports on quarterly basis according to National Guidelines	1,207	1,175
Number and Percentage of Districts reporting No-Stock Out of First Line Anti-TB drugs in last week of quarter	90% (126)	108% (136)

Future Plan:

- NTP has developed its National Strategic Plan from year 2014-2020. This comprehensive document was finalized in the year 2014. The National Strategic Plan was used to develop Concept Note for Global Fund requesting for funds beyond June 2015 in the New Funding Model
- Provision of Human resource for drug resistant TB care
- Up-gradation of DRTB treatment sites and introduction of infection control
- Introduction of new diagnostic tools
- Establishment of bio-safety TB laboratory in public sector
- Strengthening referral linkages between different tiers of health care services

D. Health system strengthening:

The National Tuberculosis Control Program (NTP) is responsible i.e. Policy Guidelines, Technical Support, Coordination, Monitoring and Evaluation and Research whereas the provincial Tuberculosis Control Programs (PTPs) and Districts are responsible for the actual care delivery processes including program planning, training of care providers, case detection, case management, monitoring and supervision.

GFATM support addresses the key components of Stop TB Strategy. Intervention are contributing in Health System Strengthening which includes

- Human resource capacity building for Tuberculosis and drug resistant tuberculosis of project as well as public sector health staff.
- Development of training documents and R&R Tools aligned with “WHO recommended revised case definitions and recording reporting framework-2013”. i-e;
 - National Guideline on TB Case Management
 - Desk guide and Basic modules for Doctors on Core DOTS
 - Desk guide and Basic training modules for Paramedics on Core DOTS
 - Basic supervisory modules
 - National guideline on Childhood TB Management
 - Desk guide and Doctors modules on Childhood TB Management
 - Desk guide and Paramedics module on Childhood

Major Achievements

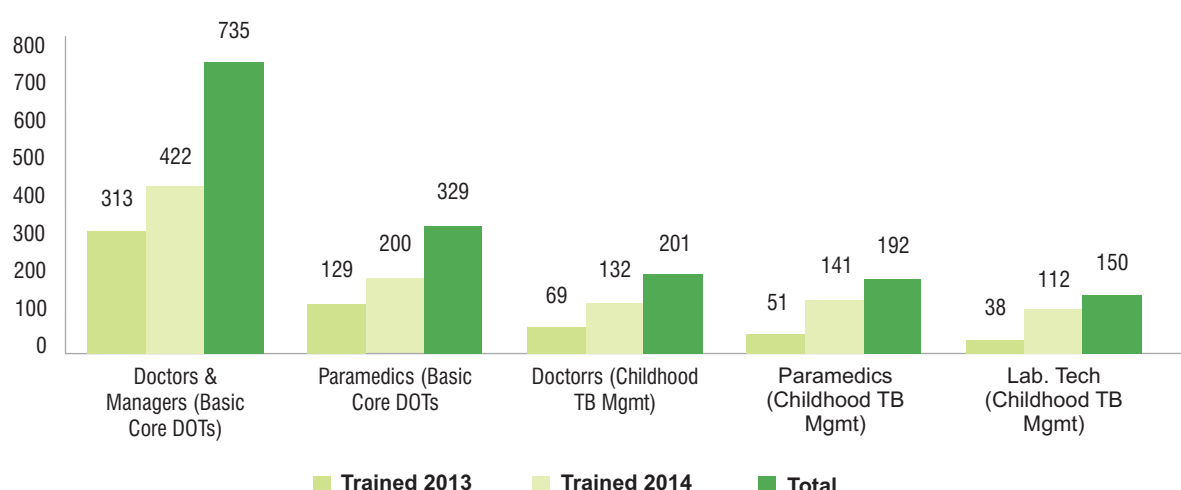
TB Management. The process of finalization of modules and printing will be completed soon.

- Under SSF grant, the following number of health care providers has been trained:
 - ❖ 735 Doctors (06 days) and Managers (02 days) have been trained on Basic Core DOTS.
 - ❖ 329 Paramedics (03 days) trained on Basic Core DOTS
 - ❖ 201 Doctors (02 days) are trained on Childhood TB Management
 - ❖ 192 Paramedics (02 days) has received training on Childhood TB Management
 - ❖ 150 Lab. technician (02 days) are also trained on Childhood TB Management

i.e. Policy Guidelines, Technical Support, Coordination, Monitoring and Evaluation and Research whereas the Provincial Tuberculosis Control Programs (PTPs) and Districts are responsible for the actual care delivery processes including program planning, training of care providers, case detection, case management, monitoring and supervision.

Involvement of multiple general cadre staff (i.e. Doctor, Paramedic, Managers) in the delivery of TB care at a public health facility implies the need for clear responsibilities, operations and capacity building of each staff. The role of managers (including NTP & PTP managers, DTC's, NPO, EDO's, DHO, MS) is enabling and functioning from National to district level for proper coordination and monitoring of TB care delivery processes, challenges related with technical competence, time-sharing and program support.

No. of HCP trained/Year under SSF Grant



Way Forward:

The intervention is in place in phase-2 according to original proposal. The indicator of objective-5 is the number of health care providers and laboratory staff trained in TB management will achieve its target before the closure of grant.

Revision of case management protocols on the recommendation of World Health organization has been implemented, successfully.

The National Tuberculosis Control Programme (NTP) is responsible for overall TB Control Activities in the country

Constraints / challenges

- Security Issues
- Tremendous Polio activities throughout the country

Lesson learnt

Still there is a need and more efforts are required on capacity building of Provincial Programs in the area of coordination, Program management, financial management, procurement and M&E. Through provision of trained HR and training of all PTP staffs on The Global fund grant management policies and procedures.



E. Hospital DOTS Linkage Intervention

Tertiary Care Hospitals (TCHs) are the largest and best equipped health facilities in Pakistan's health system. In these settings presumptive TB cases may often go unrecognized. If recognized and diagnosed, the case may not be reported to NTP or the treatment may not follow national guidelines. The duration of treatment creates issues for out-of-catchment patients seen in TCHs and a weak referral system to the periphery contributes to loss to follow up of TB cases. Hence, the benefits accrued by engaging these public sector facilities are multi-faceted; "missing cases" may be captured, ISTC/National Guidelines on TB care and management may be institutionalized, cases lost to follow up may be reduced.

To realize the above benefits, NTP expanded its coverage to the TCHs through the mechanism of Hospital DOTS Linkages (HDL); a "low input-high yield" intervention to include TCHs in NTP's activities. Begun in 2008 during Global Fund's Round 6 grant, the HDL mechanism was initially rolled out in 32 TCHs. Various supporting inputs were provided to the TCHs; logistic support to enable free diagnostics & provision of medicines, Human Resource (HR) support and relevant trainings. The intervention initiated DOTS protocol in the TCH setting along with Adult Difficult-to-Diagnose case management. Over time the HDL task mix has expanded to include Childhood TB management. In addition, some TCHs are also the venue for Programmatic Management of Drug-resistant TB (PMDT) as well as hosting TB-HIV sentinel sites. Viewed in this light, the HDL mechanism provides for coordinated TB control activities in the tertiary care setting, which may well allow for improved implementation efficiency.

HDL Objectives

1. To enhance and standardize TB case management in a tertiary care hospital (TCH) setting, in line with national guidelines
2. Reduce missing/loss to follow up cases by improving referral mechanisms within the TCH
3. Reduce loss to follow up and default rate by referring patients to peripheral management facilities

It should be noted that the prerequisites of establishing the HDL intervention in a TCH setting automatically entailed an element of capacity building. These prerequisites pertain to capability of TCH laboratory facilities, capacity to handle the logistics related to the intervention, commitment to providing HR and facilitating the intervention. Beyond this

HDL implementation can be envisaged as seeking to strengthen the following:

1. Internal Network/Hospital Coordination Mechanism - To identify and refer presumptive TB cases to the DOTS centre, and/or manage TB cases according to the NTP's standardized guidelines; thus reducing "missed" cases.
2. External Network - To refer patients to peripheral BMUs; easing accessibility and reducing loss to follow up and default cases.
3. Reporting & Monitoring - To monitor implementation and provide data for program improvement

The HDL mechanism's internal network in the TCH sensitizes key ward staff on NTP's standardized guidelines, thereby assisting in identifying presumptive TB cases and defining the mechanism by which such patients may be referred to the DOTS centre allowing increased enrolment. It further seeks to ensure that current standardized diagnostic and treatment practices, as advised by the NTP, are mainstreamed in the hospital setting. Meanwhile, the external network will ensure that enrolled patients remain on treatment by referring them to a management facility nearest to their place of residence. Breaks in treatment due to patient unavailability in TCH due to extended treatment time or travel constraints due to distant place of residence may be minimized by offering case management to be carried out locally, thus reducing accessibility issues. It is expected that this will assist in reducing 'loss to follow up' and 'default' cases, ultimately reducing the risk of MDR amplification. Apart from the application of NTP's standard R&R tools in these settings, a quarterly review meeting will review and recommend improvements for implementations

Way Forward

Over the course of 2014, the HDL intervention has expanded in both scale and scope; now featuring 48 TCHs and 140 District Headquarter Hospitals (DHQs) nationwide. The scale up in the districts has presented new operational challenges. To address these challenges, newly developed implementation guidelines seek to build on the experience gained thus far during implementation. Revised task lists and streamlined checklists for TCHs/DHQs are also being developed to streamline the expanded load. Increased integration of NTP's co-located interventions in TCHs is also being sought utilizing the HDL provided platform. The focus in the coming years will be to consolidate this expansion and ensure that the key objectives of reducing missing cases, mainstreaming NTP protocols and reducing loss to follow up in TCH settings are being met.



2. TB Care and Control (Core Dots)

Population and administrative units (provinces/regions):

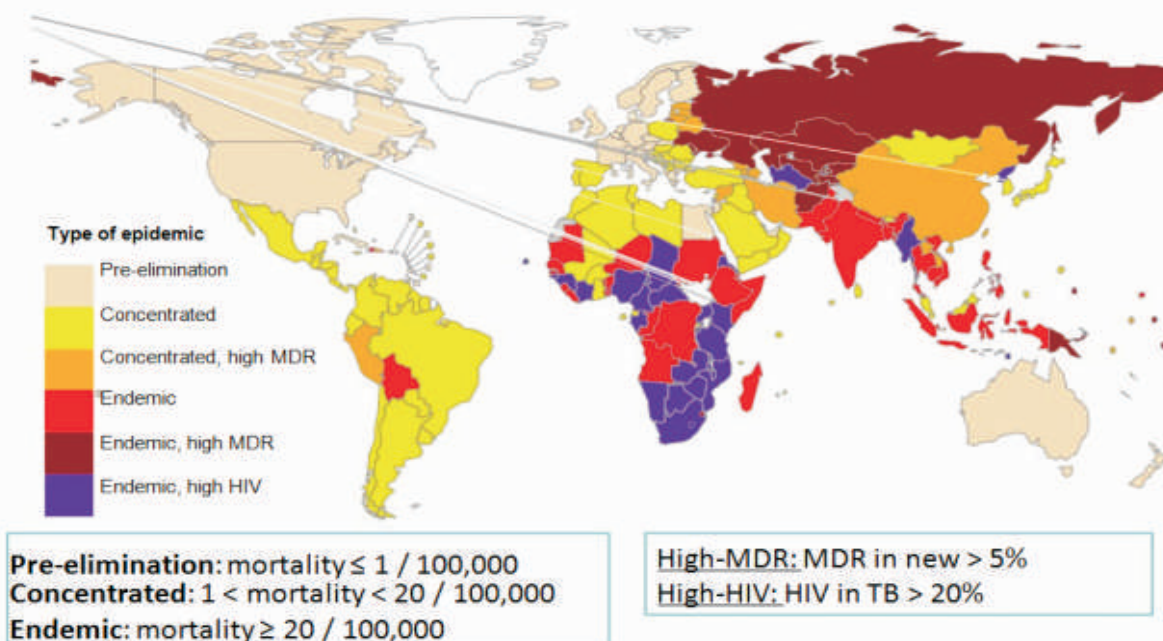
Pakistan is home to 185million people, making it the sixth most populous country in the world. Approximately 35% of the population is less than 15 years of age. More than 60% of the total population lives in rural areas. Pakistan includes; i) five provinces- Punjab is the largest province population wise (56% of total country), followed by Sindh (23%), Khyber Pakhtunkhwa (17%), Balochistan (5%) and Gilgit-Baltistan (<1%); and ii) three regions- Azad Jammu Kashmir (AJK), Federally Administered Tribal Areas (FATA) and Islamabad Capital Territory (ICT).



Global TB burden and TB situation in Pakistan:

Tuberculosis (TB) is a major problem of public health in Pakistan. TB is endemic in Pakistan and it ranks 5th among 22 high TB burden country for both susceptible and drug resistant TB globally.

TB-A GLOBAL EPIDEMIC



It accounts for approximately 2/3rd of the TB burden of the Eastern Mediterranean Region (EMR) of the World Health Organization (WHO). The estimated TB prevalence, incidence and mortality Per 100,000 population are 341, 270 and 26 respectively. The incident cases of DR-TB are estimated to be 4.3% and 19% among new and previously treated TB cases respectively.

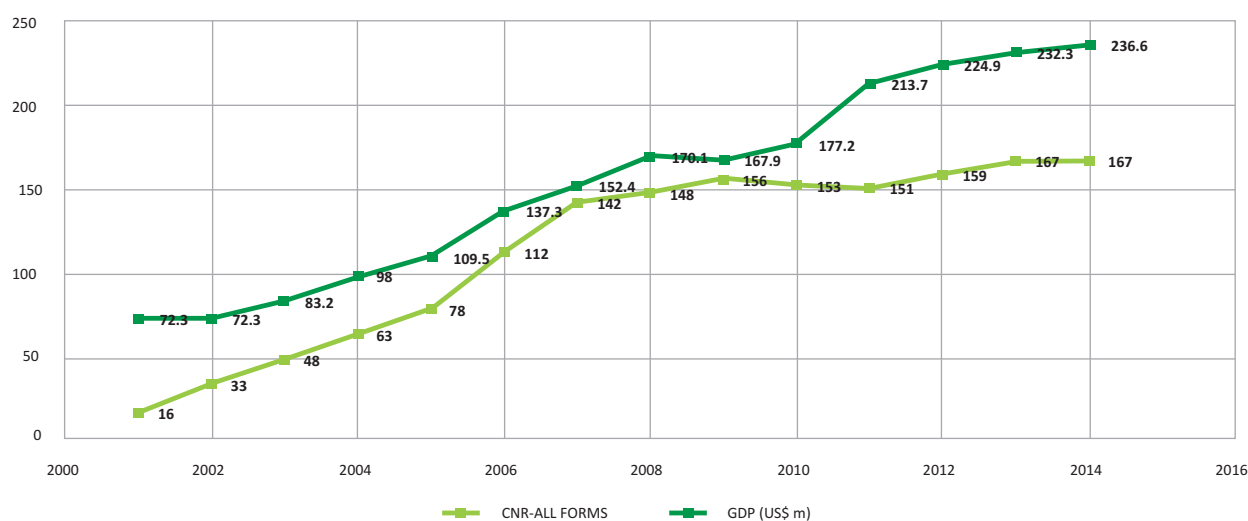
Determinants of TB:

Determinants of TB discussed in this section include demography, comorbidities, social determinants, changes in the economy, and the performance of health care systems and TB control efforts.

Economy:

Pakistan is a lower middle income country. The estimated gross domestic product (GDP) per capita was US\$1275.30 in 2013. The low GDP growth coupled with overall security condition and happening of natural disasters severely affects the country's economic growth. This in turn means

GDP & CNR



⁷ WHO Global TB Report 2014



that limited resources are available for important social sectors such as health and education. The annual health expenditure per capita is estimated at US \$ 39.4. The correlation between CNR and GDP over the last decade is depicted as below;

Health care systems:

Pakistan's health system is comprised of robust public and private sectors. In addition, there are many other public sector (para-statal) or autonomous institutions which provide healthcare to their employees and their families.

The government/public health sector in Pakistan captures a subset of healthcare facilities extending from tertiary, secondary and primary level care facilities. National TB Control Program is integrated in the primary health care system.

There is a significant presence of the private sector at all levels, and 70-80% of the population access healthcare from the private sector. TB patients are no exception to it. The private healthcare sector in Pakistan is composed of

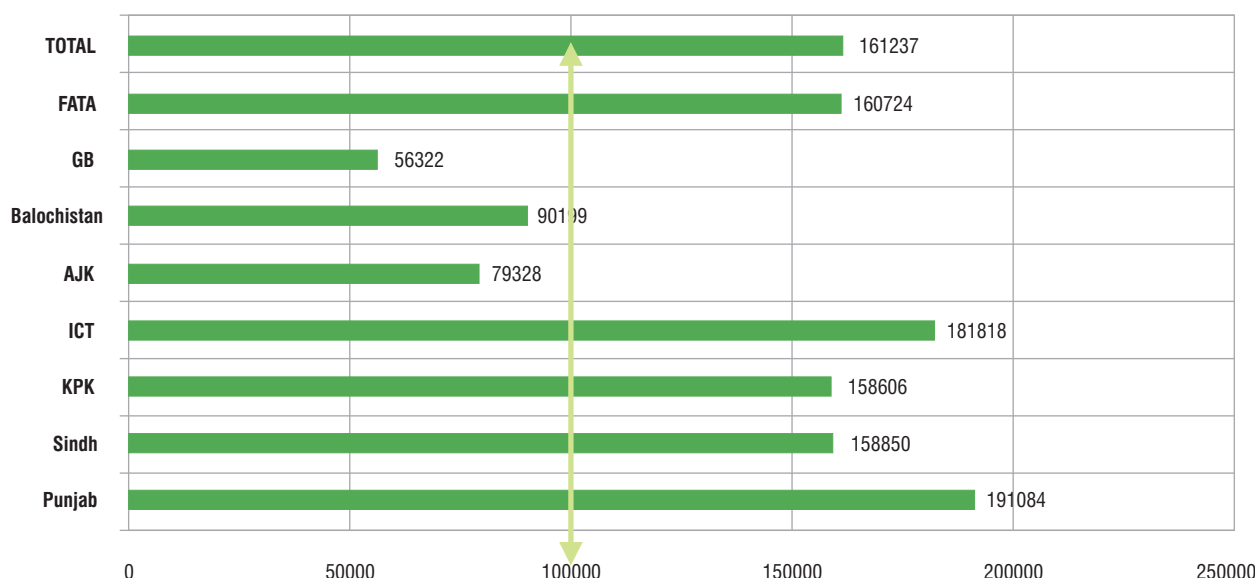
Private general practitioners (97,000 across the country). In addition numerous non-government organizations, [Pakistan Anti TB Association, (PATA), Aga Khan Foundation (AKF), Marie Adelaide Leprosy Center (MALC)] run their own health facilities and provide TB care and support besides other health services. Some organizations such as the National and Provincial Rural Support Programs (NRSP) provide community out-reach services through a network of volunteers and community resource persons (CRPs), especially in areas which are not covered by LHWs. Other NGOs such as the Provincial Rural Support Programs (NRSP & PRSP) and Public Primary Healthcare Initiative (PPHI) provide curative and preventive services through a network of primary care facilities in rural settings.

The other health sector or autonomous bodies are set up in the public sector as corporations, boards, institutes, authority, companies and so on. These can generally be classified into (i) commercial, (ii) promotional, (iii) research, (iv) training and (v) regulation. These mainly include Ministry of Defense, Social Security Services, prisons, Pakistan International Airlines (PIA), Pakistan Railways, and Water and Power Development authority (WAPDA) etc.

Profile - TB Care Facilities

Province/Region	Population	Districts	Public sector				PPM sector				PMDT Sites	TB HIV Sites
			Primary	Secondary	Tertiary	Total	PPM-1 (Gp Clinics)	PPM-2 NGO run BMU)	PPM-2 (Pvt Hpsp)	PPM-4 Other Health Sector		
Punjab	97,263,831	36	312	125	18	455	948	31	10	13	312	125
Sindh	43,365,989	23	124	91	8	223	488	37	6	7	124	91
KPK	24,742,592	24	83	40	5	128	201	17	0	11	83	40
ICT	2,000,000	1	3	2	2	7	22	0	2	2	3	2
AJK	4,363,069	10	44	10	1	55	8	0	0	0	44	10
Balochistan	9,561,060	30	56	35	3	94	59	10	0	2	56	35
GB	1,239,086	7	15	7	0	22	1	0	0	0	15	7
FATA	4,339,537	10	17	10	0	27	0	0	0	0	17	10
Total	186,873,124	141	654	320	37	1011	1727	95	18	35	654	320

Population per BMU



BMU versus population density:

The most peripheral service units of the TB care is called Basic Management Unit (BMU). There are also TB care facilities in private and non-NTP public sector. The average population coverage by one BMU and its correlation with population density in different provinces and regions is depicted below. The variation in number of BMUs amongst provinces explains much of the fluctuation in case notification (although the numbers of BMUs is also correlated with the population density in these provinces/regions).

Progress and achievements during 2014:

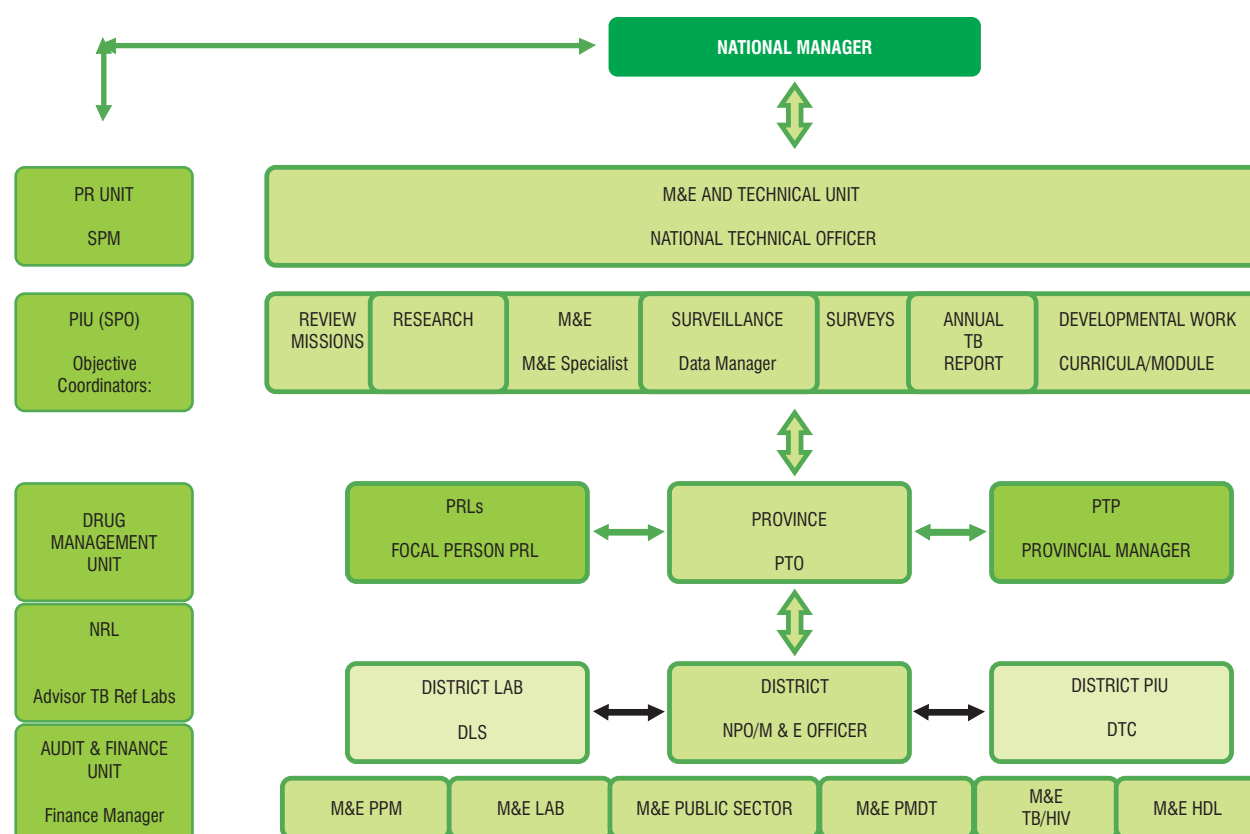
- *National Strategic Plan: "Vision 2020" developed, envisaging W.H.O endorsed Global TB Strategy.*
- *Core TB: free of cost diagnosis and treatment provided to more than 300,000 TB patients through a network*

of 1,306 TB care facilities and 91% amongst notified cases successfully treated.

- *Laboratory support: Ensured EQA and culture DST services in 1400 Peripheral (including > 200 centers in the private sector), 112 intermediate, 9 BSL-2, 4 BSL-3, 5 provincial and 1 national reference labs. 43 X-pert installed and 2,170 Lab staff trained.*
- *MDR-TB: 2446 MDR-TB cases managed in 18 PMDT sites and 100% of them were provided social support. 11 hospitals have been upgraded for infection control measures. Drug Resistance survey conducted.*
- *PPM: More than 2000 GPs involved in 66 districts contributing towards 20% of TB case notification.*
- *TB/HIV: TB/HIV co-infection managed at 16 sentinel surveillance sites with the collaboration of National AIDS Control Program (NACP).*
- *TB Drug Management: Ensured the country need for anti-TB drugs. District/provincial store upgraded/automated through e-based TB drug management information system.*

3. Monitoring and evaluation

The staff responsible for monitoring and evaluation (M&E) of the TB programs are organized in 4 layers from national to provincial to district to Basic Management Unit (BMU) level (Figure 1.1). There are 4 workers responsible for research and another 6 for M&E and surveillance within two separate units at the NTP in the capital, Islamabad. At provincial and district level the coordination of activities is mediated through quarterly meetings at which patient records are discussed and registers updated. The personnel of private clinics that collaborate with the public sector (public private mix; PPM) also attend the intra-district meetings.



TB surveillance

Standardized reporting & recording tools, used for TB data, have been revised and implemented during 2014 in line with WHO recommended “revised reporting and recording framework-2013”

The patient data are kept on standard TB treatment cards which are then also entered on a BMU-TB register. Quarterly reporting of TB cases and outcomes to the next higher administrative level is in place (BMU to district to province to central). Data from BMUs are collected on paper forms only and transmitted upwards to the successive administrative division in aggregated tabulations. Data from all over the country are then consolidated in worksheets (MS Excel) at the district, provincial and national levels. These data are also used by the M&E and Surveillance Unit of the NTP to generate the performance indicators for the Global Fund grants.

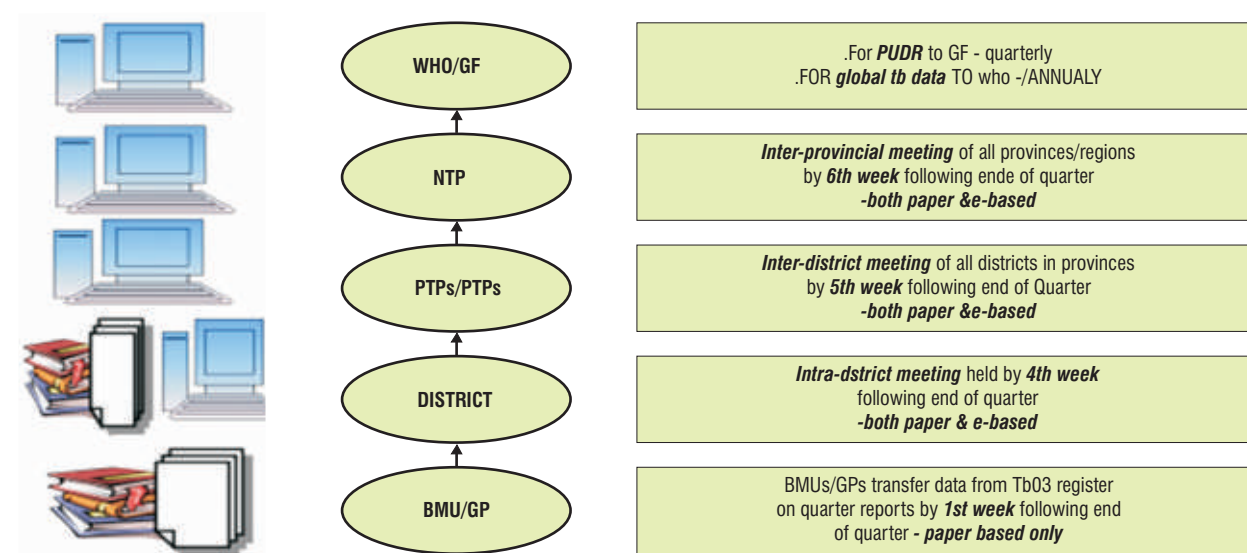
Online case based TB patients data entry also started in MIS-DOTS system through 12 digit unique identifier code at district level since 2012 with the technical support of Greenstar Social Marketing and scaled up to 90 districts so far in Punjab, Sindh, Balochistan provinces and ICT region. In KPK, the Electronic Reporting System (ERS) was developed through KfW support, replaced the Excel-based system of data collection in 24 districts. NTP plans to have MIS-DOTS expanded nationwide by the end of 2015. Its parameters will also be aligned to the revised definitions and reporting framework-2013. Evaluation of the system's performance would be crucial before moving on to full implementation.

Data on MDR-TB patients put on treatment at 24 PMDT sites, spread across the country are collected on individual format on a set of standardized Excel worksheets known as the Electronic Nominal Registration System (ENRS). Paper files are also kept for all patients on treatment in the same premises where the ENRS is maintained. The ENRS datasheets are emailed to the central DR-TB unit at NTP on monthly basis and collated there. The monthly review of ENRS has allowed enhancements in the patient care, through for instance the detection of missing test results or the misalignment of treatment regimen and patient history or strain resistance pattern. There is no online access to the ENRS data.

One private TB health care provider group in Sindh – Interactive Research and Development (IRD) based at the Indus Hospital in Karachi has developed their own systems to capture electronic medical records for TB and MDR-TB patients using OpenMRS2 and other open-source software adapted for mobile phone technology.

NTP intends to seek technical assistance to integrate TB data with district health information system (DHIS) in public sector as well as medical records system in tertiary care hospitals (TCH) in public and private sector. The data flow and timelines are illustrated as below;

DATA FLOW / TIMELINES-SINCE2001



Mandatory TB Case Notification:

TB is not a notifiable disease in Pakistan. NTP took the initiative to develop a legislative bill titled as “TB Notification Act-2015” and disseminated to all PTPs for enactment. PTP Sindh has got the approval from respective provincial assembly while it is in process of approval at federal level and in rest of the provinces. The enforcement of mandatory notification will require broad measures to inform the general public, practitioners and laboratory workers alike, and provisions to facilitate the reporting process.

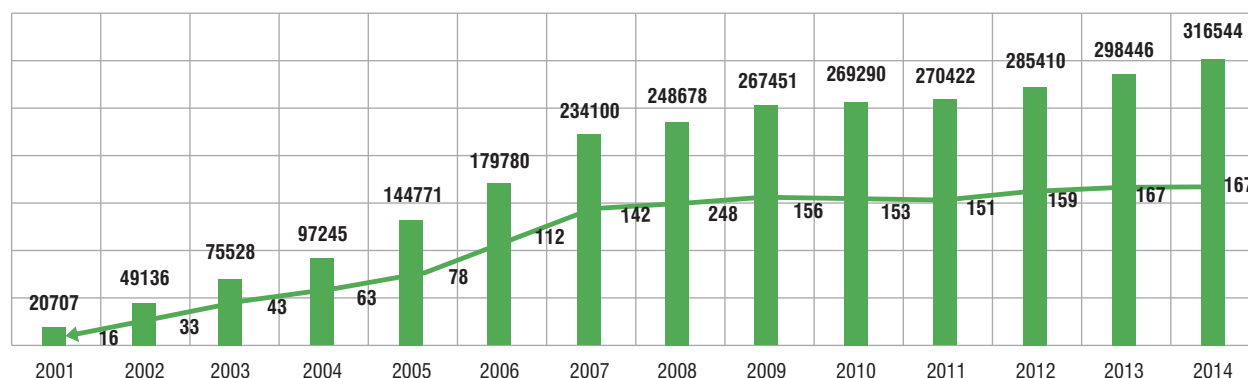


TB case notification and time trends

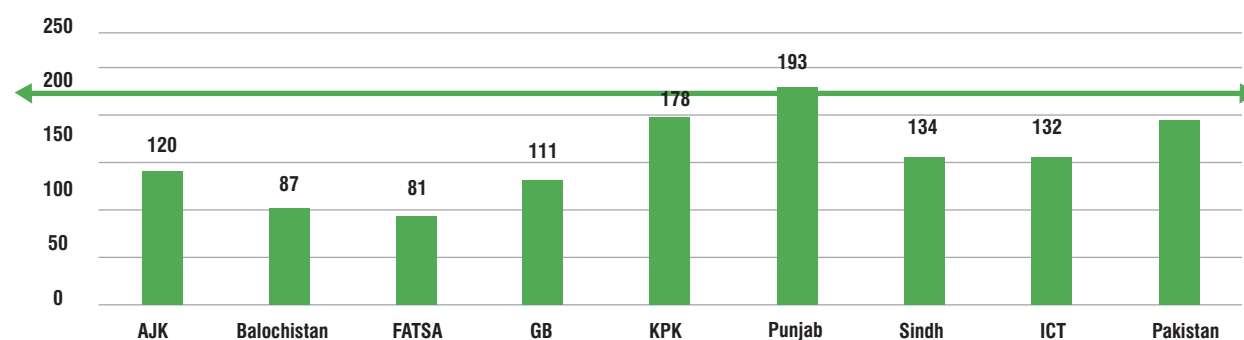
The notification of TB varies substantially across Pakistan both in terms of numbers and population rates.

- Pakistan notified 316,544 TB cases of all forms in 2014, the case notification rate (CNR) being at 167 cases per 100,000k population.

CASE NOTIFICATION -ALL FORMS

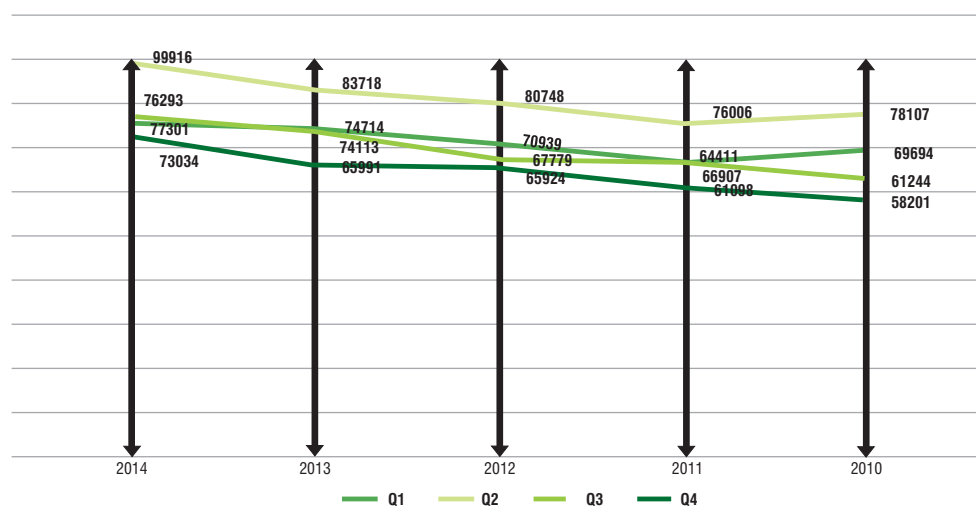


CNR-ALL FORMS 2014



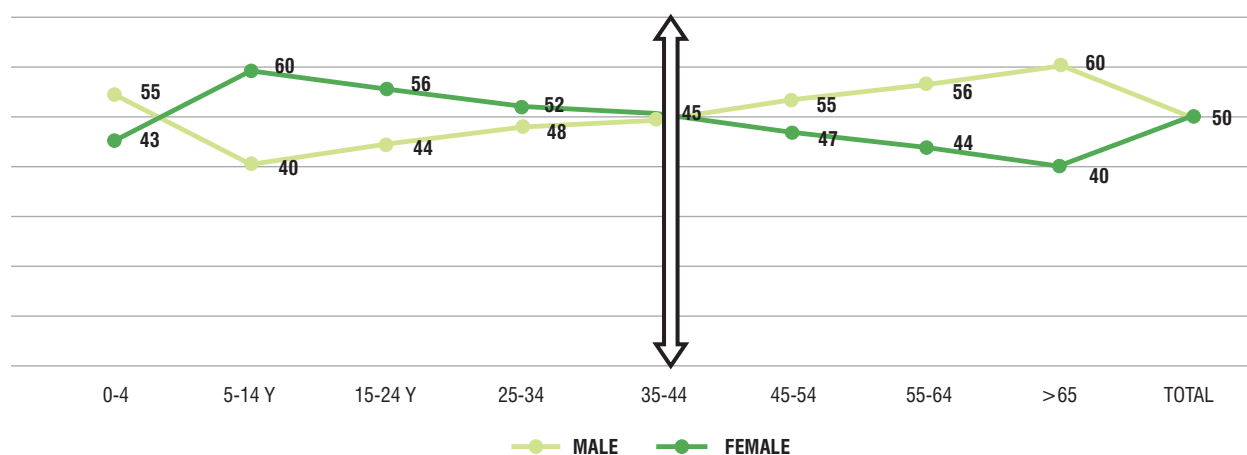
- Quarter wise trend of case notification over the years showed that case notification remains highest in Q2 and gradually decreasing to lowest in Q4 which necessitates operational research to explore this phenomenon.

TB CASE NOTIFICATION - QUARTER WISE TREND

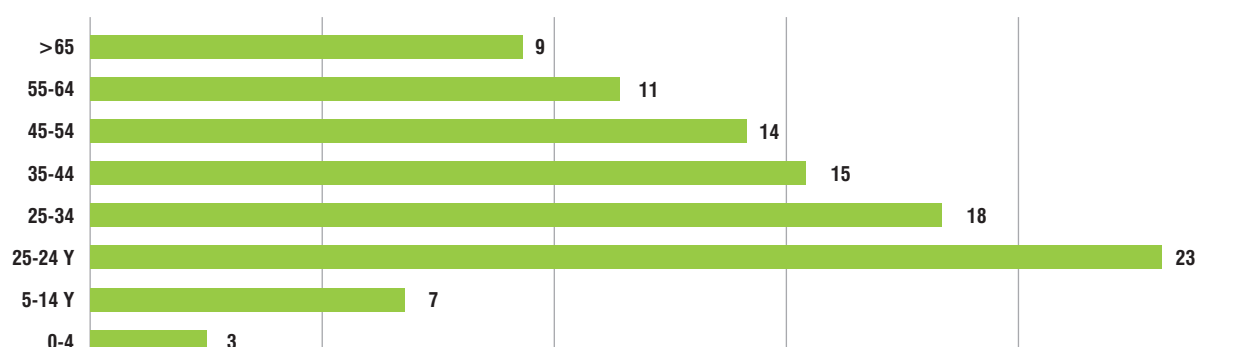


- Age and gender distribution reflects an interesting phenomenon at country level. During 2014, male to female childhood TB cases were 40:60. This ratio used to be reversed with increasing age and became 61:39 in the age group of >65, showing the epidemiological trends in treatment seeking amongst both sexes with increasing age.

PROP CASE NOTIFICATION BY AGE AND SEX - 2014

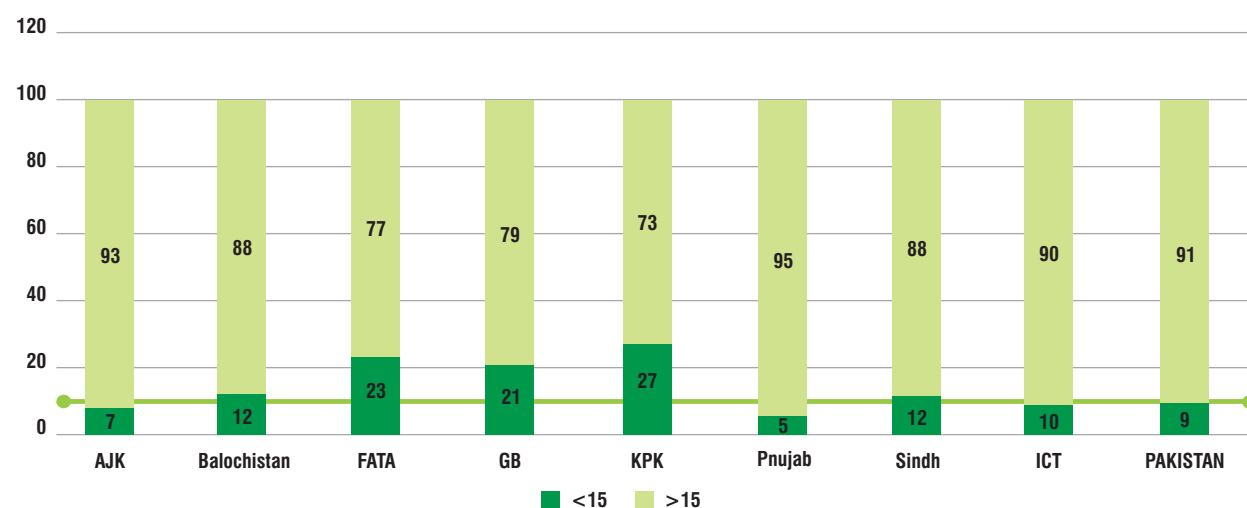


%AGE DIST



- Proportion of child to adult TB cases at national level is 9:91, with maximum in KPK (27:73) and minimum (6:94) in Punjab, ICT and AJK, showing low TB diagnosis, low case notification or unreported childhood TB cases vis-à-vis geographical population density of specific age groups mainly in Punjab. This needs further exploration.

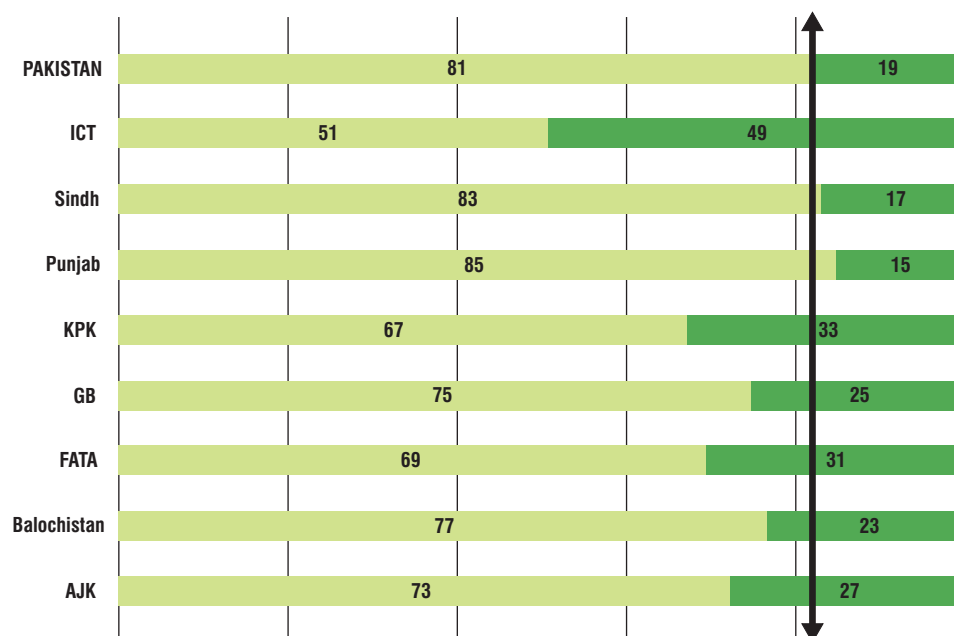
PROPORTION OF ADULT TO CHILDHOOD TB CASE - 2014





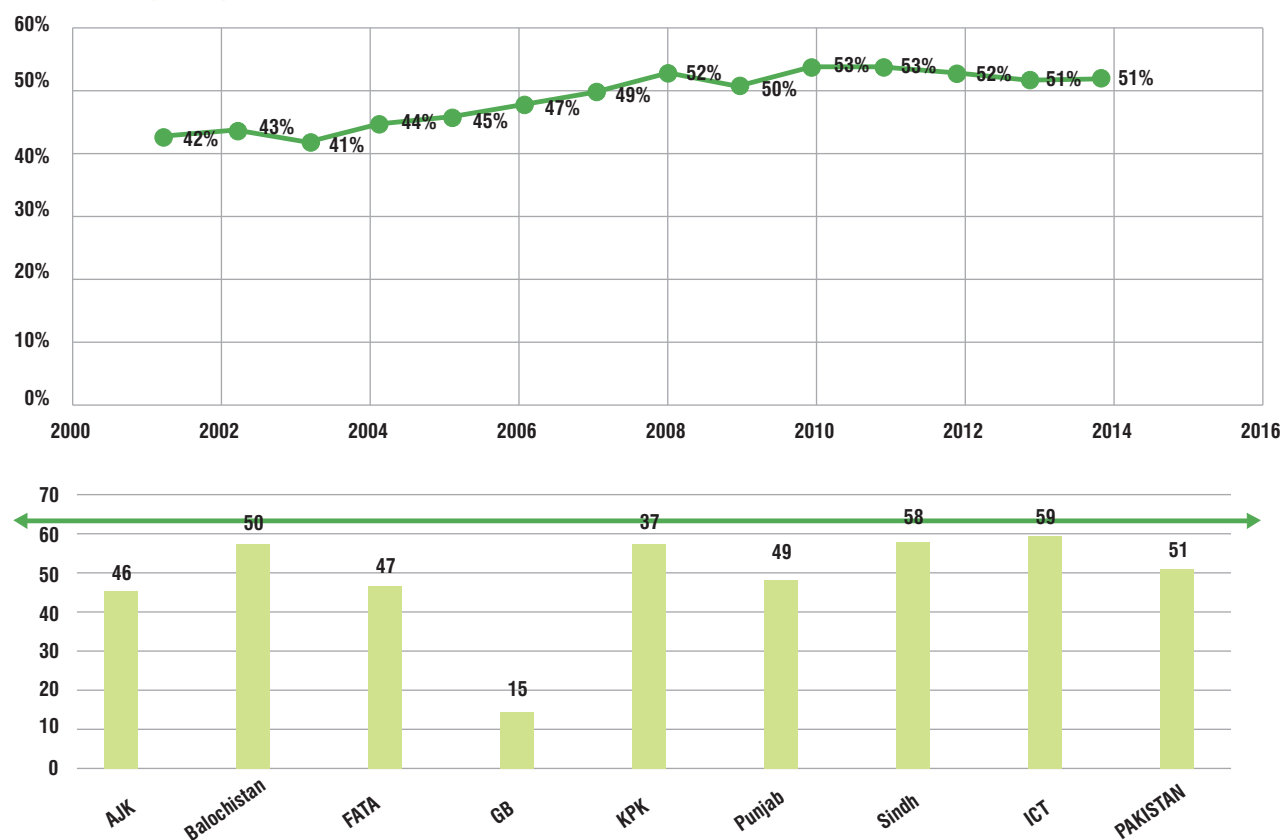
- Proportion of Pulmonary versus EP cases at national level is 81:19 but there is a great diversity at sub-national level being highest (49:51) in ICT and lowest in Punjab (85:15)

PULMONARY v/s EP - 2014



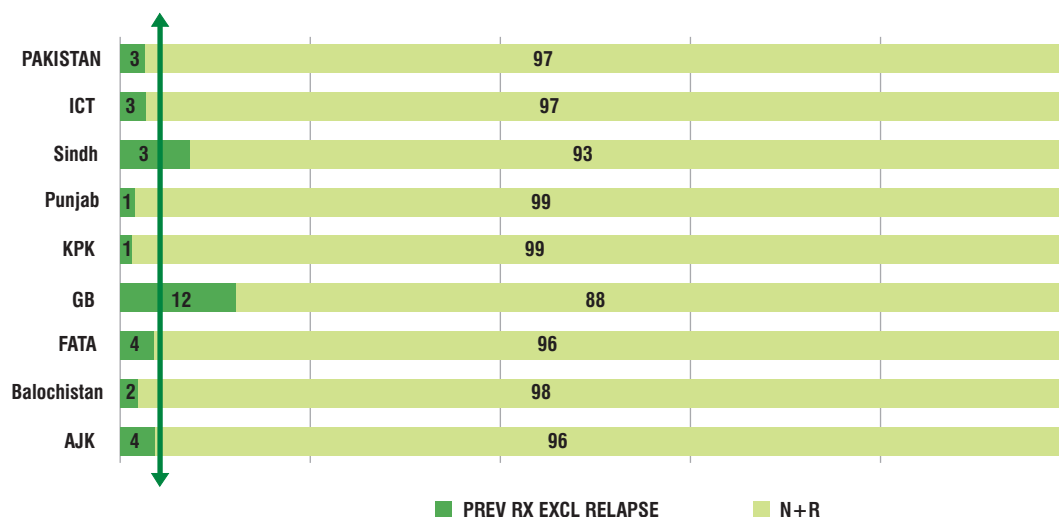
- Proportion of B+ to all Pulmonary TB cases at national level is 52% and reflects the performance of microscopy services.

PROP B+ (N+R) TO PULOMONARY TB CASES - 2014



- Proportion of Re-treatment to new cases at national level is 95:5 with highest in GB and Sindh whereas lowest in provinces including Punjab, Balochistan and KPK, showing that re-treatment cases are not being optimally notified. This greatly impacts the treatment outcome and emergence of MDR-TB.

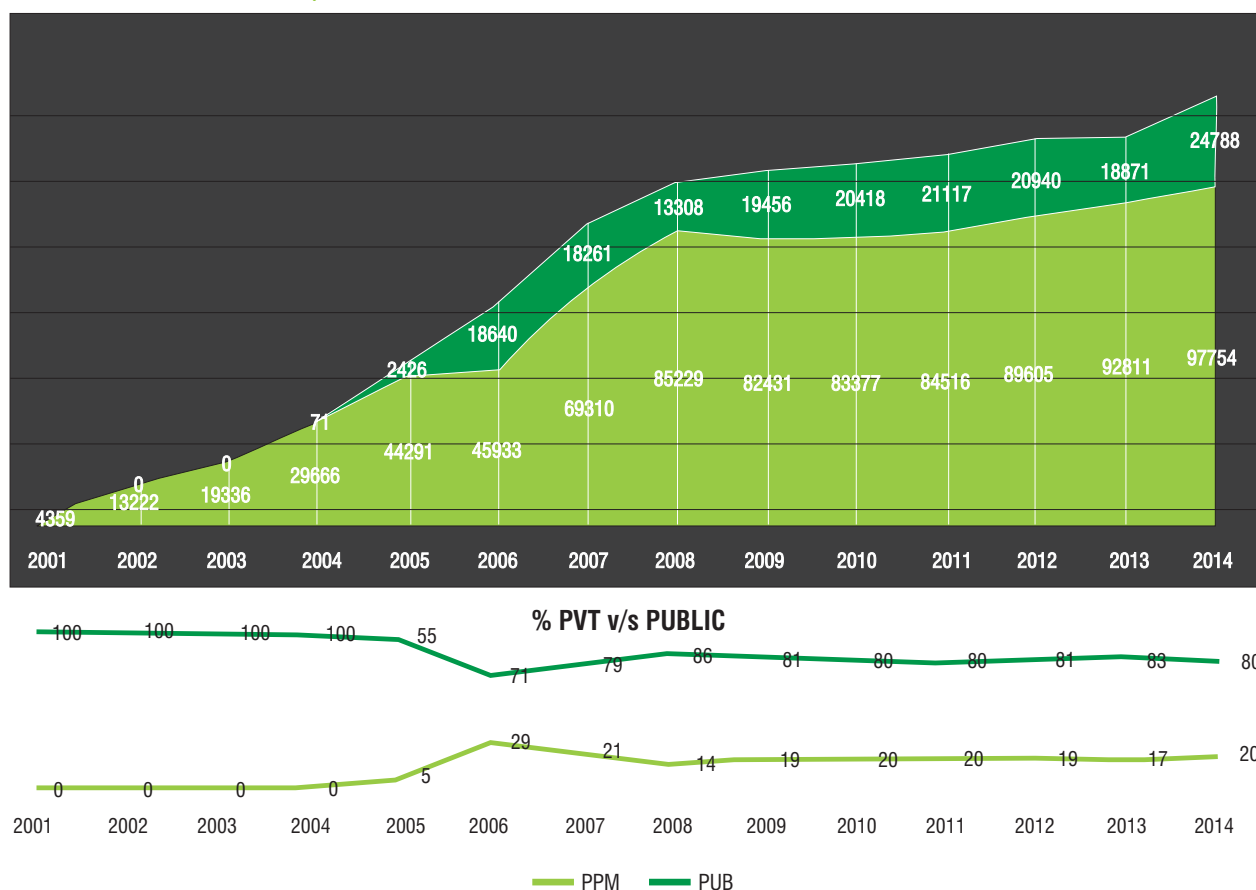
NEW v/s RE-TREATMENT - 2014



Public Private Mix:

There is a selected private sector mainly comprising of GP clinics, private hospitals and NGO based BMUs like Pakistan Anti TB Association, involved by NTP for TB care activities and contributing to about 20% of total case notification under NTP.

CONTRIBUTION - PPM v/s PUBLIC - NSS+

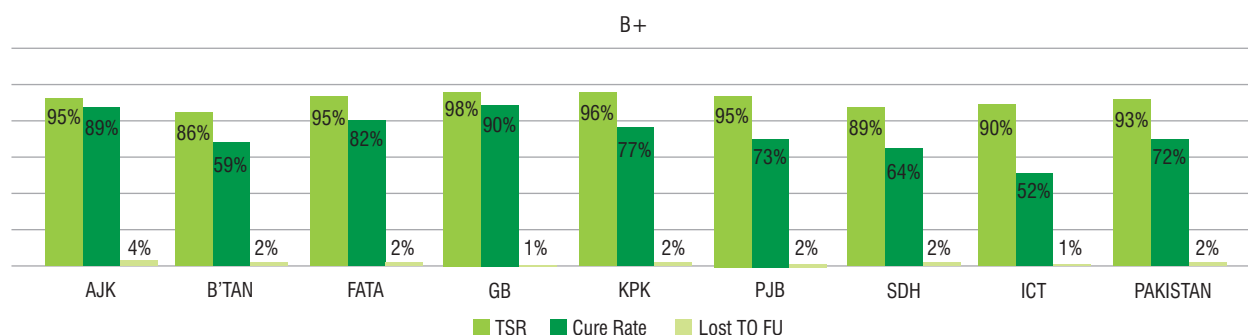




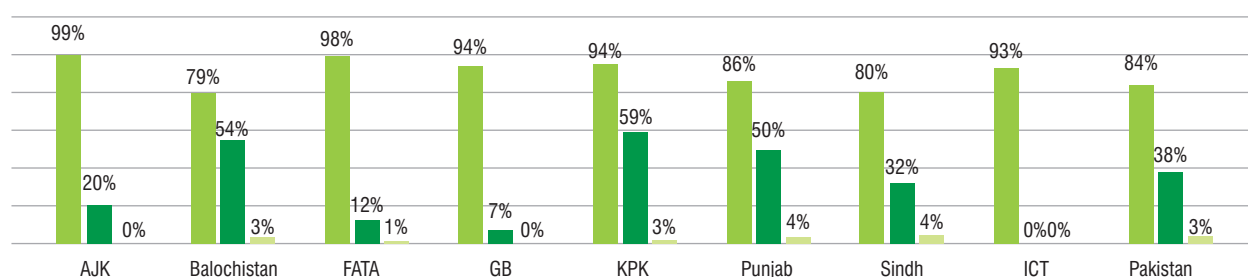
Treatment Outcomes:

Though the treatment outcome and lost to follow up rate are 93% and 2% respectively, but the point of concerns is that treatment outcome amongst re-treatment cases is not satisfactory with national figures of TSR, CR and DR at 75, 39 and 11% respectively. The low treatment outcome resulting from poor follow ups is adding towards emergence of MDR-TB and should be monitored.

TREATMENT OUTCOME 2014



PREVIOUSLY TREATED



HIV-associated TB

A sentinel surveillance system for TB/HIV, established by the NTP and involving 16 tertiary care sites throughout Pakistan, reported a prevalence of HIV infection among TB patients of 0.8% in 2014. This is based on the detection of 89 seropositive patients from among 10,715 TB patients screened. These would represent about 3% of TB cases notified that year. Screening for TB in HIV patients is also ongoing at the sentinel sites:

TB Patients Screened for HIV

Province	Year 2014
Punjab	4,744
Sindh	4,334
KPK	863
Balochistan	265
ICT	416
TOTAL	10,622
HIV Positive	90

TB mortality

There is no vital registration system in place across the country in a systematic way, although patchily implemented in big towns and major cities, to gather data on births and certified cause of death and to register deaths. Verbal autopsies have been used to inform the relative contribution of different diseases to overall mortality. The Federal Bureau of Statistics has undertaken several demographic surveys in the country and the latest Pakistan Demographic and Health Survey (PDHS) was undertaken in 2012-13.

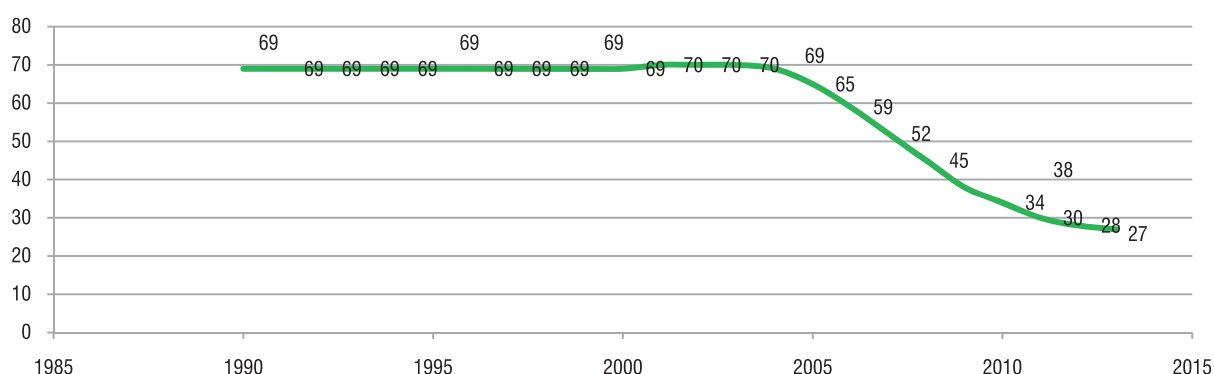
Information on deaths among TB patients is reported as part of the “cohorts” for basic (DOTS) and MDR-TB treatment. Deaths as enumerated in these patient groups can be from any cause. The death rate in Pakistan was calculated to be at 2% for cohort of TB cases registered during 2013. In the absence of a reliable vital registration system in the country, WHO has been using estimates of TB mortality, which also show a decline at 27 per 100,000 during 2014 Pakistan has achieved MDG targets regarding

and shift of responsibility regarding healthcare to provinces. The role of Central Unit of NTP is now limited to: i) defining national policies and strategies to control TB in Pakistan, ii) ensuring the surveillance of TB epidemiology, iii) monitoring the implementation of TB control strategies and evaluating of the outcomes and impacts of these strategies, iv) building NTP capacities, and v) ensuring coordination with the national and international partners, including the Global Fund.

These major changes entailed development and reformulation of strategic Plan for TB care and control. The New NSP covers a seven years period from 2014 to 2020. NTP initiated the process of the development of the NSP in the middle of 2013, and completed it by June 2014. The process involved a series of consultations with key stakeholders including provincial programs, implementing partners, WHO, development partners, and people affected by the disease.

a. Goal, objectives and priority program areas

TB Mortality/100,000



mortality of TB patients.

National Strategic Plan:

The previous national strategic plan (NSP) for TB control in Pakistan covered the period 2011-2015. The plan was in line with the national health plan and the Millennium Development Goals for TB as highlighted in the Global Plan to Stop TB 2006-2015. It focused on the implementation of the 6 components of the WHO Stop TB Strategy. In 2011, devolution of the Federal Ministry of Health under the 18th constitutional amendment led to major changes in roles

The goal of the national strategy to control TB in Pakistan is to “reduce by 50% the prevalence of TB in the general population by 2025 in comparison to 2012⁸”

The key objectives include:

1. To increase the number of notified TB cases from 298,446 in 2013 to at least 420,000 by 2020 while maintaining the treatment success rate at 91%.
2. To reduce, by at least 5% per year by 2020, the prevalence of MDR-TB among TB patients who have never received any TB treatment
3. Strengthen programmatic and operational management

⁸ National TB Strategic plan Vision 2020 (page 151-154)



capacity of the TB Control Program while enhancing public sector support for TB control by 2020

Objective 1: To increase the number of notified TB cases from 298,446 in 2013 to at least 420,000 by 2020 while maintaining the treatment success rate at 91%.

There are three key interventions under this objective:

1. Improve TB case diagnosis and management through: i) better identification of patients suspected of TB (increase the number of TB suspects who are assessed for TB from 839,371 in 2013 to 3,320,000 in 2020) by improving microscopy coverage from 1,396 in 2013 to 1,953 in 2020, ii) improving quality of diagnosis by increasing proportion of bacteriologically confirmed TB cases among notified pulmonary TB patients from 48% in 2013 to 72% in 2020, iii) ensuring uninterrupted availability of quality-assured drugs for all patients diagnosed, iv) maintaining critical mass of trained staff, and v) implementing effective monitoring and surveillance systems.
2. Expand partnerships with the private sector to engage all healthcare providers in delivering quality diagnostic and treatment services for TB control in Pakistan; increasing the contribution of private sector providers to the total national TB case notification from 20% in 2013 to 35% in 2017 and onwards.
3. Improve TB care in vulnerable and key affected populations using both active and passive case finding strategies and WHO endorsed new diagnostic tools. These populations include children, TB contacts, people residing in urban slums, refugees and internally displaced populations (IDPs), coal miners and people living with HIV (PLHIV).

Objective 2: To reduce, by at least 5% per year by 2020, the prevalence of MDR-TB among TB patients who have never received any TB treatment

There are three main strategic interventions under this objective.

1. Scale-up of programmatic management of drug-resistant TB (PMDT) by i) expanding screening of patients at risk of drug-resistant TB (DRTB) through use of X-pert MTB/Rif assay while increasing the sites from 43 to 186 by 2020, and ii) improving laboratory diagnosis and treatment monitoring through a network of 23 culture and Drug Susceptibility Testing (DST) laboratories.
2. Increase enrollment of DRTB patients from 1570 in 2013 to 14,316 in 2020, while i) improving DRTB care through establishment of 30 PMDT sites (of these 22 are already established), ii) implementation of social support, and iii) provision of sound infection control measures.
3. Establish a robust sentinel surveillance system through national and provincial reference laboratories to monitor trends over time of MDR-TB prevalence.

Objective 3: Strengthen programmatic and operational management capacity of the TB Control Program while enhancing public sector support for TB control by 2020

Key strategic Interventions include:

1. Strengthen and sustain the program management and operational capacity of the national and provincial TB control programs including 1) provision of appropriate human resources to improve technical and management capacity, ii) efficient monitoring, supervision and surveillance, and iii) improved supply chain management.
2. Enhance operations research activities to test and document successes and lessons learnt, and take course correction measures
3. Increase policy advocacy activities to i) build consensus on appropriate policies, practices and legislation, ii) bring about the required legislation changes and their implementation, and iii) enhance government's support for TB control activities including increases in financial allocation for TB programming.



4. Engaging All Health Care Providers (Public Private Mix)

A. Background

Tremendous progress has been made in Pakistan for tuberculosis control in recent years through implementation of DOTS. It has been acknowledged that TB control efforts are impressive but, not sufficient. The CDR remains 60% means missing at least 40% of the patients. As in most countries with a significant burden of TB, DOTS implementation is limited largely to public sector services under national tuberculosis programs (NTPs). In reality, however, many patients with symptoms of TB, including the very poor, do seek and receive care from a wide variety of health care providers outside the network of NTP services mostly not following National Guidelines. Thus the TB patients they serve are deprived of the benefits of DOTS and poses an obvious risk of drug resistant TB.

The private sector which has its stakes in TB control is much larger than perceived and not only limited to the health care providers only, a simple stake holder list includes NTP, PTPs, Technical Partners, implementing partners, Donors, philanthropists, pharmacists, chemists, insurance agencies, professional bodies, Researchers, large private hospitals, CBOs, community leaders, religious leaders, trade unions, chamber of commerce.

Public-Private Mix (PPM) for TB care and control is a crucial component of efforts to meet WHO and Stop TB Partnership targets for global TB control. Evidence suggests that failure to involve all care providers in TB programs hampers case detection and leads to lower rates of treatment success. In Pakistan, PPM interventions have achieved some promising initial results, but there is a critical need to enhance the degree of collaboration among those currently engaged and reach out to a greater number and range of providers. There are four basic models implemented in the country; the GP model, NGO's Model, Pvt Hospital model & Parastatal model. Very recently the pilot project with retail pharmacies has been started in 5 districts. The major achievements of PPM are

B. Program Activities

The main program activities are:

- Training of private healthcare providers and lab technicians on national TB DOTS guidelines
- Chest camps strategy in outreach to do active case finding
- Community gatherings and engagement of Community Based Organizations for community coalitions
- Engagement of private labs in EQA with promising results of over 67% labs working with adequate performance
- Regular quarterly meetings for data validation mostly monitored by the project staff and external stakeholders.
- Regular coordination meetings with active participation from all the implementing partners and other key stakeholders namely NTP and PTPs.

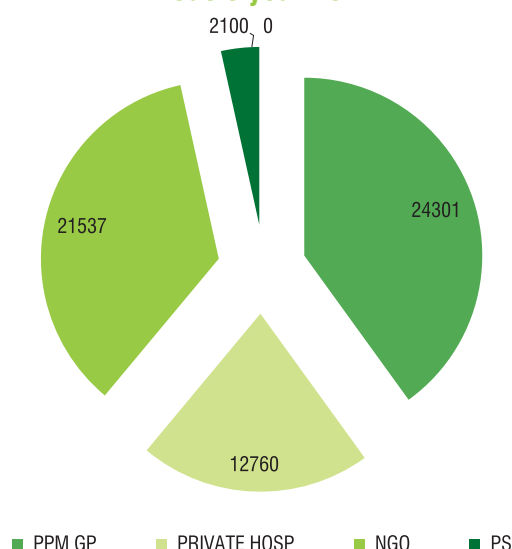
C. Program Achievements 2014

- Training of the trainers was conducted for 15 private sector health managers which has helped a lot for the backstopping

of the availability of master trainers for Gps

- Around 2,100 private and Parastatal health facilities are implementing DOTS. Around 475 new doctors have been trained on TB DOTS through PPM initiative in the year 2014 alone.
- Around 60,000 all types TB cases were notified through four models of PPM with a treatment success of over 90%, the GP model contributed maximum number of cases and surpassed the NGO model this year. The major contributors were Green star & EPOS, the other partners who have contributed to this are Pakistan anti TB association, Mercy Corps, ASD, ACD, PLYC, AKHSP, MALC, Indus hospital, Gulab Devi hospital and many other NGOs and private hospitals.

All types TB case contribution by models year 2014



Through the PPM initiative it is ensured that all private laboratories working under the PPM initiative are brought under External Quality Assurance (EQA). A total of 220 labs remained under EQA throughout the year and out of these and 72% of the private labs performing adequately under EQA.

Special Achievements

Legislation for TB notifications recommended by international and National partners has been achieved in the province of Sindh. The TB Notification act 2014 has been passed by the Provincial assembly and the development of bylaws and procedures of notification will be available in

August 2015. The other provinces have also made a meaningful development in this regard.

WTB Day has been commemorated at all districts under PPM interventions with the support of Provincial programs and GF. The activities included press conferences, walks, and awareness sessions with high risk populations

Coordination among partners

1. A national PPM workshop was held at Islamabad in May 2014, which gave a good opportunity to bring all stakeholders at one table, to share experience, analyze the different PPM models implemented in Pakistan, develop/modify appropriate PPM model/s for Pakistan in light of the international experiences and align the NSP 2020 in line with the findings of the workshop. This workshop also gave a strategic guidance for the development of PPM part of the proposal for new funding model. The recommendations of the workshop were incorporated at its best.
- An international workshop with the title of “ Reaching the “missing million” through enhancing private provider engagement as a part of scaling up public-private mix for TB care and control in “HIGH-IMPACT ASIA” was organized by WHO HQ in June with the objective to examine innovative approaches to engage private practitioners in diverse country- settings and ways to sustain, replicate and scale up these approaches & examine regulatory approaches to help scale up public-private mix for TB care and control. A high level mission led by Dr Syed Hussain Hadi ,National PPM Coordinator Pakistan actively contributed towards the proceeding . This learning experience also led to further modification in PPM-TB DOTs interventions in Pakistan.
- An international workshop was held at Bali Indonesia in September 2014 at “Engaging Professional Associations in Scaling Up Private-Public Mix for TB Care and Control: Progress, Problems and Prospects”. Dr Nisar Cheema President Pakistan Chest Society represented Pakistan and presented the current situation and way forward & strategies for the enhanced role of professional bodies like Pakistan Chest Society and Pakistan Medical Association in TB control at large and TB legislation in particular. The initiatives taken by Pakistan were highly appreciated by the participants.
- A research paper at PPM with the title of “Need for Public private mix approach as priority to reduce under-reporting in the country” was presented by Dr



Razia Fatima in IUTLD conference held at Barcelona in November'14

- A white paper – analyzing the current situation and challenges in PPM DOTs was prepared by Mercy Corps which provided insight to understand better and contributed towards development of concept note for NFM
- Development of National TB Management guidelines and training modules for all carders engaged in TB management was done through a consultative process led by NTP. The process was participated by all the relevant partners which produced revised National TB management guidelines and training modules in light of latest WHO guidelines.

NFM-CN and detail proposal

PPM is a high priority area for TB control. A series of consultative meetings were held with partners for the development of concept note for the new funding model during July –Nov 2015 for the development of PPM part of the CN for NFM. A comprehensive package of PPM interventions were designed which includes engaging GPs, NGOs, Pvt Hospitals, and Parastatal hospitals. In addition special attention was given to the National and international recommendations for accreditation and Legislation for TB notification. PPM is positioned to enhance its TB case contribution to National data from 20% to 32% contributing at least 220,000 all types cases in 2.5 years of NFM commencing from 1st July 2015.

Partnerships development:

- NTP sees an extended role of NRSP in TB control thus an MoU was signed with National Rural Support Program (NRSP) to support TB program at grass root level to mobilize communities and increase awareness among masses about TB.
- International Organization for Migrants (IOM) is a UN organization had a coordination meeting with the objective to have an MOU with NTP to make the TB services available to its clients. The draft MoU is under review.

Midterm evaluation of PPM GP Model:

- The consultancy for Midterm evaluation of the PPM interventions supported by GF was awarded to a local

consultant. The preliminary results of the MTE have been analyzed and the process of report writing will be available in the month of July 2015.

- The visit of Office of the Inspector General appointed by GF was done in 2014, the recommendations regarding PPM are being reviewed by the program for taking remedial measures.
- WHO review mission 2013 report, published in early 2014 pointed out very important and relevant issues and recommended to enhance the support & ownership of the public sector to PPM initiatives and adopt successful interventions through TB reach. The engagement of NGOs, GPs, Pharmacies and informal health sector proposed by WHO has mostly been addressed in NFM

C. Challenges

- Largely unregulated private sector which needs legislation for regulation
- Varying commitment of public and private sector at district level.
- Tedious documentation in TB DOTs program needs simplified recording and reporting tools.
- Inconsistent quality & old methodology of training which needs use of new technologies and methods for adult learning
- Implementation issues due to lack of incentives
- High rate of drop out of labs and GPs, non-functional GPs

D. Way forward

- Legislation for mandatory notification of TB cases all over the country.
- NTP will revise training methodology for private healthcare providers and their paramedics. This will make the training program more interactive and participatory, using the principles of adult pedagogy.
- Certification and accreditation of TB DOTs training provided in the private sector with Pakistan Medical & Dental Council.
- The geographical expansion of PPM initiative under NFM is in line with universal coverage of DOTs.
- An incentive scheme to be incorporated for private

healthcare providers and lab technicians under NFM.

- Enhanced engagement of NGOs like PATA, PPHI MALC, Al-Khidmat foundation and others.
- Simplify the recording and reporting requirements for private sector, an m-Health pilot and will conduct operations research alongside to demonstrate its effectiveness and impact
- Active case finding will be done with front loaded microscopy conducted through chest camps to ensure same day diagnosis. These chest camps will be supported by community gathering meetings in the vicinity, identified by communities itself.
- Large network of NRSP will be engaged for community mobilization and awareness about TB and free service availability.



Training of Trainers on TB-DOTS- 17-22 February, 2014, Islamabad



National PPM Consultative Workshop, 22-23 May, 2014, Islamabad



5. DRUG RESISTANT- TB

Programmatic Management of Drug-resistant Tuberculosis (PMDT)

Background:

The emergence of resistance to first line anti-tuberculosis drugs, and particularly of multidrug-resistant TB (MDR-TB), has become a major public health problem in a number of countries, and an obstacle to effective global TB control. National TB Control Program (NTP) with the support of The Global Fund through Round-6 started piloting of management of DR-TB cases on hospital-based and ambulatory models in following three hospitals and enrolled 200 patients;

- Gulab Devi Chest Hospital Lahore (hospital-based)
- Ojha Institute Hospital Karachi (hospital-based)
- Indus Hospital Karachi (Community based)

The intervention scaled up when The Global Fund Round-9 grant was approved and awarded which specifically addresses DR-TB management in 30 hospitals of the country.

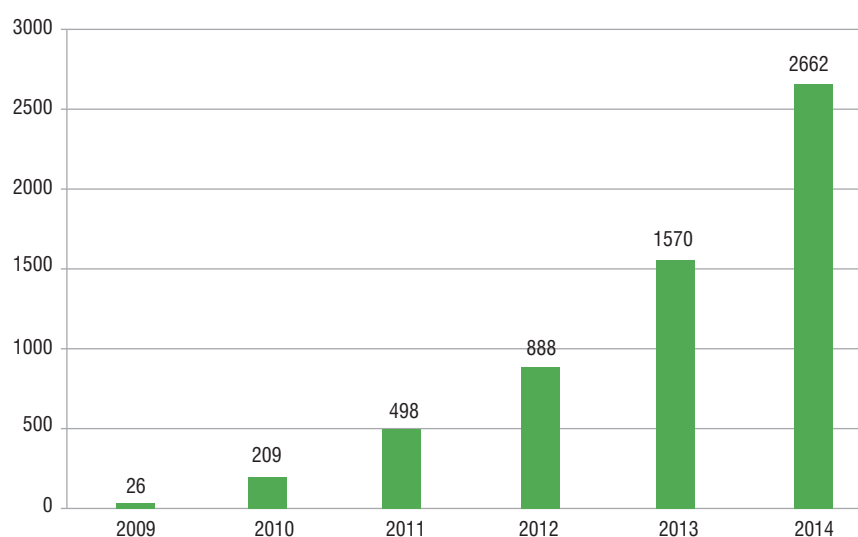
Epidemiology:

Pakistan is 4th among high burden countries for MDR-TB with estimated annual cases of 13000 among notified pulmonary TB cases. In the notified new pulmonary TB cases there are 9900 MDR TB cases (at the rate of 4.3% in new cases) having 3100 among notified retreatment cases (at the rate of 19% in retreatment cases). Pakistan shares 60% of the DR-TB burden in the EMRO region countries.

Achievements/Progress:

- 2662 Lab confirmed DR-TB patients were enrolled, Total enrollment by the end of 2014 was 5885 through 24 PMDT sites nationwide
- The analysis of 2011 cohort of DR-TB patients enrolled by NTP shows Treatment Success rate of 76%, death rate 12% and lost to follow-up 5%
- There are 4617 MDR-TB (78%) and 121 XDR-TB (3.6%) among enrolled DR-TB patients by the end of 2014.
- Total 24 Treatment Sites functional and reporting to NTP. The functional PMDT sites are Gulab Devi Hospital Lahore, Leprosy Hospital Rawalpindi, Nishtar Hospital Multan, Mayo Hospital Lahore, Samli Sanatorium Murree, Jinnah Hospital Lahore, DHQ Hospital Sargodha, Ojha Hospital Karachi, Indus Hospital Karachi, ICD Kotri, JPMC Hospital Karachi, CMC Hospital Larkana, GMM Hospital Sukkur, LRH Peshawar, ATH Abbottabad, MMMTH Hospital DI Khan, FJ Chest Hospital Quetta, PIMS Hospital Islamabad, DHQ Mirpurkhas, PMC Nawabshah, STH Swat, BVH Bahawalpur and SZH Rahim Yar Khan
- 7 Treatment Sites were renovated and up-graded for proper management of DR-TB to address Infection Control completed during the reporting period.
- A 6 days Training of Trainers' (TOT) Workshop had been conducted from 18-23 May in Nathiagali for Physicians and PMDT Staff on DR-TB Guidelines

DR-TB Enrolment



Challenges

Some of the major challenges in the implementation of the programmatic management of DR-TB are

- Uncontrolled over-the-counter prescription of unknown quality SLD,
- Lack of internationally standard bio availability/bio equivalence laboratory testing facilities in the country
- Peripheral linkage of DR-TB Ambulatory based model of care needs to be significantly strengthened.
- Low geographical coverage and sub optimal use of GeneXpert and kits
- involvement of private sector in referral and management of MDR-TB
- Plan to upgrade/establish 11 culture and 5 DST Laboratories in the country
- Enhancement of referral of DR-TB suspects for Xpert testing
- Improve geographical coverage of Gene Xpert sites in Punjab by installing new machines
- Piloting short course MDR TB regimen
- Training of BMUs Doctors and Paramedics on Ambulatory based model of care MDR TB by end of June 2015.
- Strengthening Linkages of BMUs with PMDT sites for follow-up
- Involvement of PPM, other Govt. hospitals for referral of DR-TB suspects
- Proactive collaboration with Professional organizations (PCS, PATA, ICS, etc)

Way Forward:

- Plan to expand PMDT treatment sites to 30 units by the June of 2015.



6. Drug Resistant- TB

Programmatic Management of Drug-resistant Tuberculosis (PMDT)

1- Background of objective (intervention)

In 2009, NTP stepped forward and started managing MDR/ XDR TB in line with the New Stop TB Strategy. The NTP has taken pivotal steps to handle this situation that includes constitution of a Technical Working Group, development of MDR scale up plan and National Guidelines and Strengthening of MDR-TB management Hospital sites for Programmatic Management of Drug Resistant TB (PMDT).

2-Epidemiology

TB infection control is a combination of measures aimed at minimizing the risk of TB transmission within populations. The foundation of such infection control is early and rapid diagnosis, and proper management of TB patients. TB infection control is growing in importance because of the association of TB with the emergence of multi drug resistant TB MDR-TB (Pakistan ranks 5th of 22 high burden countries in susceptible TB and 4th among the 27 high burden Drug Resistant TB countries). TB Infection Control measures needs to be prioritized at National & Sub National level.

2. Current Status

Progress Update for PMDT Up gradation:

PMDT up gradation is in place for 30 Hospitals for Infection Control. 11 Hospital up - gradations has been completed and handed over to local administration with provision of Infection Control Items (N95 & Surgical Masks). Currently, 6 PMDT sites are in up-gradation phase and shall be handed over by the end of first quarter of 2015. Most of the remaining sites are under tendering processes. Infection control items (N95, surgical masks and hand sanitizer) have been regularly supplied to all operational sites.

Progress Update for BSL Labs up gradation:

Under consolidated grant 22 Labs were proposed to be up graded to BSL2 (17) & BSL3 (5). To date, 8 Labs (6 BSL2 and 2 BSL3) have been completed and handed over to Hospitals. Remaining labs are in different phases of up-gradation, 3 among which shall be completed in 1st quarter of 2015 while rest by the end of 2015.

4. Constraints:

Unavailability of space at the district headquarters hospitals which are now being converted into medical colleges thus; a space is identified with lot of difficulties by the stakeholders.

Lack of ownership by the stakeholders

Interferences by the stakeholder's during the up gradation process

5. Lesson learnt

Regular Infection Control sensitization workshops are essentially required for health care worker's capacity building in order

for better implementation of infection control principles on site.

6. Success stories:

National Guidelines & monitoring tools for TB Infection Control for health care facility, congregate setting & households have been revised after collaboration with all national stakeholders addressing the needs keeping in view the essentials of TBIC at all levels where health care is provided.

New IEC materials for health care facility & laboratory have been developed and will be circulated to all concerned. An informative pictorial guide for MDR patients has also been published for free distribution to all MDR patients for better patient care.

TBIC trainings (as MDR training plan) have been conducted to all concerned.

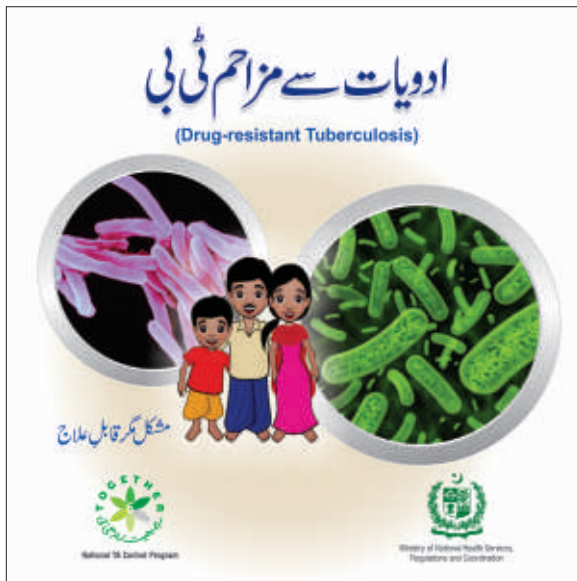
Recommended Actions:

1. Define TB Infection Control Committees at facility level to watch over roles and delegated responsibilities of infection control teams specifically working to prevent the spread of TB in health care facility.
2. Ensure monitoring of health care facilities at regular intervals to point out the gaps in the already operational TBIC plan and re-align according to the new evolving needs & demands.

7. Pictorial View:

Informative MDR guide for patients:

IEC Poster:



Handing over of up-graded BSL2 Lab at Gulab Devi Hospital Lahore & PMDT Sukkur:





7. TB-HIV Coinfection

A. Background:

Epidemiology:

HIV epidemic presents a major challenge to the control of tuberculosis (TB). Tuberculosis is one of the most common causes of morbidity and leading cause of mortality in people living with HIV/AIDS (PLWHA). In addition, there is a critical relationship between Tuberculosis and HIV, as the immune suppression induced by HIV modifies the clinical presentation of TB and hence its management. On the other hand, TB influences the prognosis of HIV infection. Therefore addressing TB/HIV co-infection is a high priority in most settings.

In Pakistan, the trend of HIV epidemic has shifted from a low prevalence state to concentrated state among the key populations at risk which is derived from the fact that HIV prevalence in some of the high risk groups has been found to be more than 5% (PWID). Existing behavior patterns signify it to be a high risk situation the estimated prevalence of HIV among the general population is less than 0.1%. However, Surveillance results clearly indicate that the epidemic has become established among certain key populations, thus shifting Pakistan from an initially 'low prevalence – high risk' category to a concentrated epidemic.

Activities carried out (in R 6, 9 & SSF) GF Grant

1. Established a Coordinating Mechanism between NTP & NACP
2. Development of Guidelines
3. HIV/AIDS prevention, care and treatment among TB patients
4. HIV Testing and Counseling of TB Patients
5. Introduce HIV Prevention Methods
6. TB Care among PLWHA

B. Progress and Achievements:

The project has been implemented in four provinces of Pakistan in order to control TB/HIV co-infection. A joint Coordinating Board for TB/HIV has been constituted under Federal Ministry of Health for policy guidance to address these challenges of TB/HIV co infection. The board is chaired by the Federal Health Secretary which is now replaced by MNHSR&C.

A technical working group adapted the WHO technical guidelines for screening, counseling, diagnosis, treatment and support of patients co-infected with TB-HIV.

16 Sentinel sites in 4 provinces were selected and strengthened, through collaborative efforts of disease control programs for screening, care and support of TB-HIV co-infected patients. SR's have worked since inception till December 2012 & the intervention was to be supervised by PTP's from January 2013. The transition took more time than anticipated resulting in delay in PTP's assumption of implementation responsibility. However in this period intervention activities were continued with help from NTP. Thus PTP's started to look after the TB/HIV Co-infection from January 2014. At present, requirements for the

sentinel sites fulfilled include;

- provision of HR at sentinel sites (Staff trained on counseling & testing),
- provision of Rapid testing Kits for screening,
- establishing a Referral mechanism between Sentinel site & ARV Center,
- provision of R & R Tools,

In year 2014 TB/HIV Co-infection activities continued , although number of total TB patient's screened at the established 16 sentinel sites increased to 10715 compared to 8306 tested in 2013 , but number of patient detected HIV positive on rapid diagnostic test increased considerably from previous year 49 in 2013 to 90 in 2014.

C. Constraints

At the end of Consolidation grant period in 2012 after R 6; new SRs were taken on board in R 9 which took longer than

expected time resulting in TB/HIV Coordination committee meetings being irregularly held throughout the year in 2014.

D. Way Forward/ Future Plans:

- Increase political commitment and involvement of all relevant stake holders to ensure the sustainability of the intervention.
- TB/HIV Co-infection is included as a full module for the NFM Grant.
- Strengthening the linkages and up scaling the intervention.
- To revise the training modules, revised guidelines for the health care provider (Managers, doctors and paramedics) in NTP
- To adopt and incorporate the revised reporting and recording tools according to WHO recommendation and incorporate in the refresher training modules

Figure 24 : TB patient screened for HIV (2008-2014)

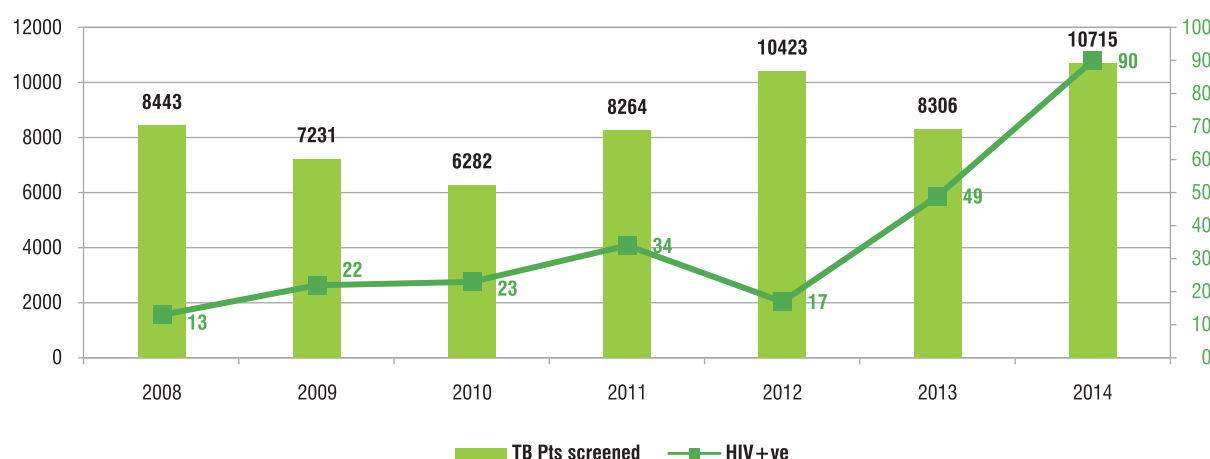


Table 10: Performance indicator TB/HIV co-infection

Indicator	Data Source	Target Jan - Dec 2014	Achievement Jan - Dec 2014	Number reported + ve.
No of registered TB Patients receiving testing and counseling for HIV after giving consent	NTP	10916	10715	90



8. TB diagnostics and Laboratory Network

National TB Reference Laboratory and laboratory network

1. Microscopy Network

The NTP continued to observe policy to diagnose pulmonary tuberculosis through direct smear microscopy. Two smear examined for diagnosis and monitoring of treatment is single smear examination is done at the end of 2nd, 5th and 6th month.

Microscopy coverage:- Microscopic network was expanded in 2014 with engagement of more Private sector under new PPM initiative supported by GF. Number of functioning laboratories increased to 1483 with (including 274 private labs). On average at end of 2014 one microscopy laboratory was serving a population of 128,744 population country wide, this varies from province to province /region depending on density population and geographical terrain from 42,821 in GB to 233,474 in ICT .

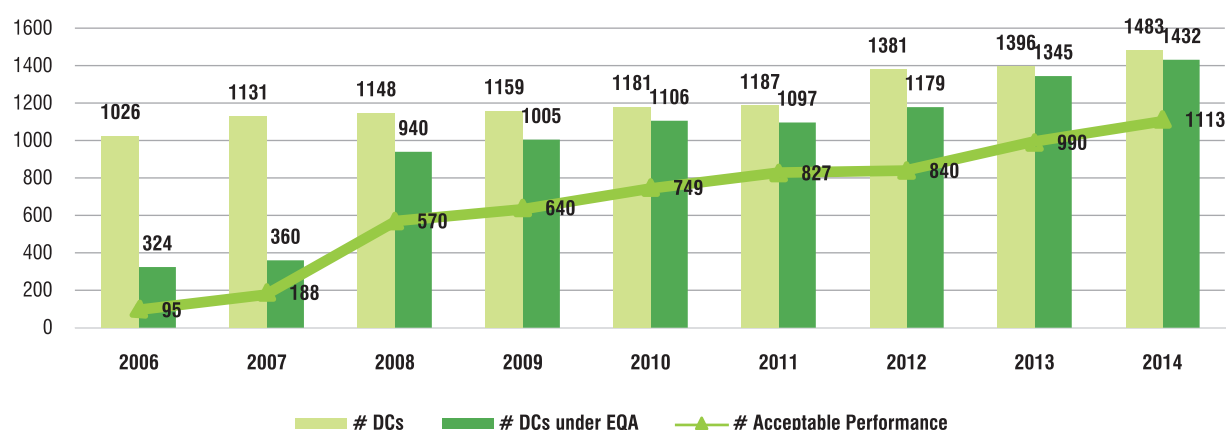
Table-1: - Microscopy services coverage

	DHQ	THQ	RHC	BHU	TCH	Others	NGO	PPM	Total	Population	Avg.pop/DC
Punjab	32	75	292	7	14	65	26	148	659	102,355,331	155,319
Sindh	15	48	96	20	9	40	43	55	326	42,515,676	130,416
KPK	24	16	74	9	5	51	25	47	251	24,797,145	98,793
B.Tan	28	1	40	29	1	10	2	8	119	9,187,195	77,203
FATA	7	2	5	0	0	15	0	0	29	4,355,636	150,194
GB	4	0	2	1	0	11	4	7	29	1,241,818	42,821
AJK	7	7	21	8	0	11	0	7	61	4,372,649	71,683
ICT	0	0	2	0	4	1	0	2	9	2,101,270	233,474
Total	117	149	532	74	33	204	100	274	1483	190,926,720	128,744

Quality Assurance of microscopy services: EQA by Blinded rechecking remained corner stone for quality assured microscopy services. 1432 DCs (including 274 DCs of PPM-GF) in 141 districts were covered by EQA by December 2014.

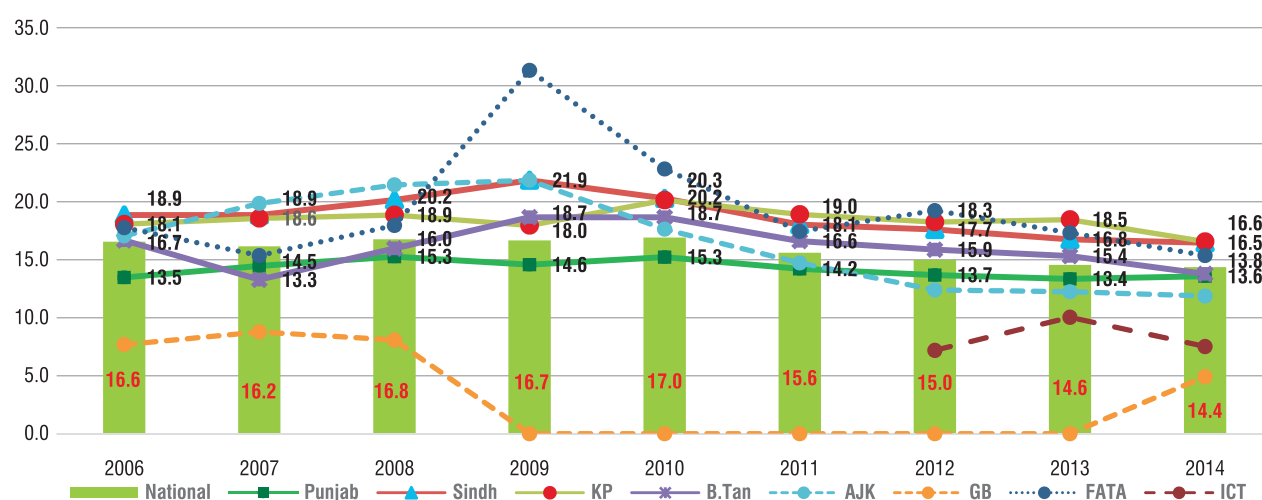
Continued support was provided for quality assured microscopy services for human resource development, quarterly surveillance meeting and provision of laboratory supplies (see annex)

Figure-1 : Microscopy services , EQA coverage and performance

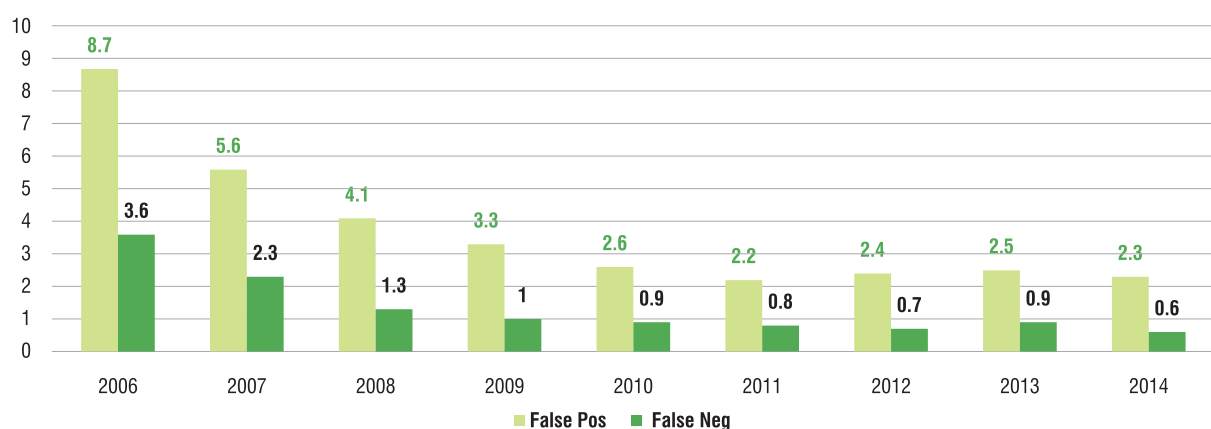
**Laboratory Performance indicators: -**

- i. **Positivity rate among TB suspects** is showing gradual decline from 17% in 2010 to 14.4% in 2014 .as total number of notified cases is improving this decline is assumed as an indicative of improved suspect referral to laboratories.

Figure 2: Trend Suspect positivity rate



- ii. **Positivity rate among follow-up examination** which is considered more sensitive indicator of quality of smear microscopy is still lower than expected. Positive among follow up examination has improved in Sindh, but still low in other provinces/regions despite the fact that number of reported errors in EQA are low in these provinces/regions. Laboratory performance was reported from 7 MC in GB after four yrs since 2009.
- iii. **Efficiency of microscopy services** is gradually improving with decline of proportion of false positive and false negative reporting. Decline in false positive error was seen between 2006-2011 but slight increase is seen again in 2012-13. Similarly decline in false negative error was seen 2006 to 2012 but an increase is observed in 2013 from 0.7% in 2012 to 0.9% in 2013, there is decline in both false positive and false negative in 2014. . However 23.3% of centers have yet to achieve level of acceptable performance. See annex II & III for details. However for district with low number of errors despite suboptimal routine laboratory performance indicator, there is need to critically review effectiveness of EQA


Figure 3: TREND Proportion of False Positive and Negative Error


2. GENEXPERT NETWORK:

After endorsement of *Xpert MTB/RIF assay* in December 2010 by World Health Organization (WHO) **in both HIV-negative and HIV-positive individuals**, Pakistan with financial support of US (DOS) successfully piloted implementation of GeneXpert in 2011 at eleven sites across country. Xpert was installed at more sites in subsequent years in KP and FATA (KFW), Sindh (UNITAID) and other districts however distribution of Xpert is not even due to specific donor support for specific province (KFW for KP and UNITAID in SINDH).

Table 2: GeneXpert partner support and distribution

Year	XPRT IMPLEMENTATION			Cartridges cost support	# TB LABS WITH XPRT								
	Donor	Province supported	# GX Equip		ICT	Punj	Sindh	KPK	B. Tan	FATA	AJ K	GB	Tot
2011	US	All	12	US(DOS)	1	3	3	1	1	0	0	0	11
2012	KFW	KP	10	KFW	1	6	3	4	1	0	0	0	15
	GF	All except KP	15	GF									
2013	KFW	FATA	6	KFW/TB REACH	2	9	15	10	1	4	0	0	43
	UNITAID	Sindh	25	UNITAID									

Patient group recommended for Xpert Testing includes

RETREATMENT PTB CASES
• Presumptive TB cases /ALL smear positive and smear Negative TB patient with history of previous treatment .
NEW PTB CASES
• Symptomatic contacts of known DRTB cases
• NEW PTB cases who are reported smear positive at end of intensive phase
PRESUMPTIVE TB CASES IN VULNERABLE POPULATION
• Children (<15yrs)
• Health Care workers (including Laboratory workers)
• PLWHIV (people living with HIV)
• Immuno-compromised /Hospitalized or seriously ill
• Biological specimen obtained through procedures (gastric aspirates, Tissue biopsy, CSF)

Xpert MTB/RIF utilization and performance in 2014:

More than 56000 cartridges were used in 2014 which was almost three times what was used in 2013. Out of total consumption, 36000 was used In NTP supported Xpert sites mainly of screening of patient at risk of MDR. The other 20,000 was used mostly for screening of Presumptive TB cases at UNITAID/TB reach supported Xpert sites in Karachi (IRD) .

Among all tested using Xpert 18000 were positive for MTB and 3019 rifampicin resistant cases were detected rifampicin resistant. In Punjab and Sindh number of rif. resistant cases doubled compared to 2013

No. of HCP trained/Year under SSF Table 3: Trend GeneXpert utilization and performance

Year	2011	2012	2013	2014
# Tested Using Xpert MTB/RIF assay				
NRL	163	4645	4896	7083
Punjab	239	2722	3120	10267
Sindh	409	4745	6270	33285
KP	96	2335	2497	4797
Balochistan	7	415	174	551
FATA			69	269
TOTAL	914	14862	17026	56252

#/% MTB Positive								
	MTB + ve		MTB + ve		MTB + ve		MTB + ve	
NRL	92	56.4%	3161	68.1%	2718	55.5%	1978	27.9%
Punjab	128	53.6%	1468	53.9%	1772	56.8%	4464	43.5%
Sindh	285	69.7%	3418	72.0%	2652	42.3%	9673	29.1%
KP	63	65.6%	1451	62.1%	1124	45.0%	2352	49.0%
Balochistan	3	42.9%	239	57.6%	164	94.3%	387	70.2%
FATA					35	50.7%	111	41.3%
TOTAL	571	62.5%	9737	65.5%	8465	49.7%	18965	33.7%

#/% Rif Resistant Detected								
	RR + ve		RR + ve		RR + ve		RR + ve	
NRL	34	37.0%	321	10.2%	375	13.8%	366	18.5%
Punjab	55	43.0%	438	29.8%	454	25.6%	840	18.8%
Sindh	73	25.6%	563	16.5%	628	23.7%	1353	14.0%
KP	24	38.1%	293	20.2%	257	22.9%	361	15.4%
Balochist	1	33.3%	76	31.8%	47	28.7%	89	23.0%
FATA					3	8.6%	10	9.0%
TOTAL	187	32.7%	1691	17.4%	1764	20.8%	3019	15.9%



3. TB Culture & DST laboratory network:

With support of Global fund grant TB culture /DST laboratory network expansion has made much progress in 2014.

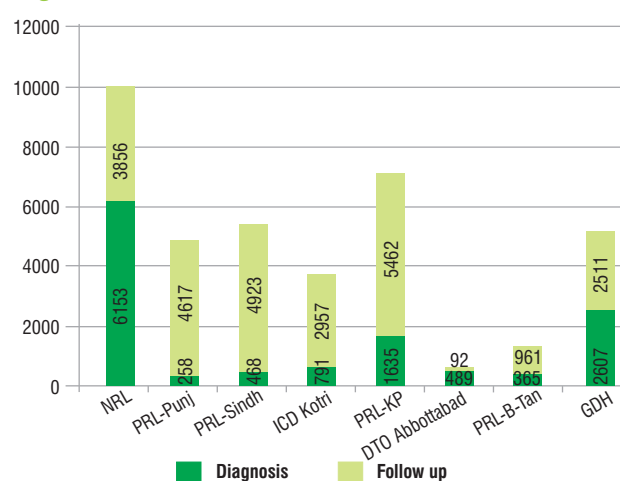
- i. **TB Culture Laboratories:** PRL Balochistan, ICD Kotri and DTO Abbottabad have been functionalized and started to provide MDR Follow up cultures for respective PMDT sites.

TB culture workload increased remarkably in 2014 number of cultures performed increased from 25480(2013) to more than 38000(2014). Treatment monitoring of patient on second line drugs was main reason for performing culture. However NRL performed majority of culture for diagnostic purpose as apposed other laboratories

Table 4 : TB culture workload 2008-2014

Lab	2008	2009	2010	2011	2012	2013	2014
NRL-ICT		285	4563	9754	5215	10668	1000
PRL-Punjab		164	1452	1577	1739	2567	4875
GDH				215	2339	3086	5118
PRL-Sindh	2725	3404	4307	4209	5356	5757	5391
ICT Kotri							3748
PRL-KPK		319	768	823	760	3402	7097
DTO Abbot							574
PRL-Bal	261	173	146	375			1326
Total	2725	4435	11263	16724	1578	25480	38

Figure 4 : TB culture -Annual workload 2014



- ii. **TB DST laboratories:-** In year 2014 plans to establish new DST laboratories has made significant progress, PRL Sindh and PRL KPK have started providing first and second line DST services for PMDT. Furthermore up-gradation work is in progress in PRL Punjab IPH Lahore and PRL NH Multan.

Contract with AKUH was not extended beyond October 2014, therefore, Indus Hospital TB laboratory and National Reference laboratory and PRL P and SINDH now provide DST services for PMDT.

Figure 5: TB DST- Annual work load

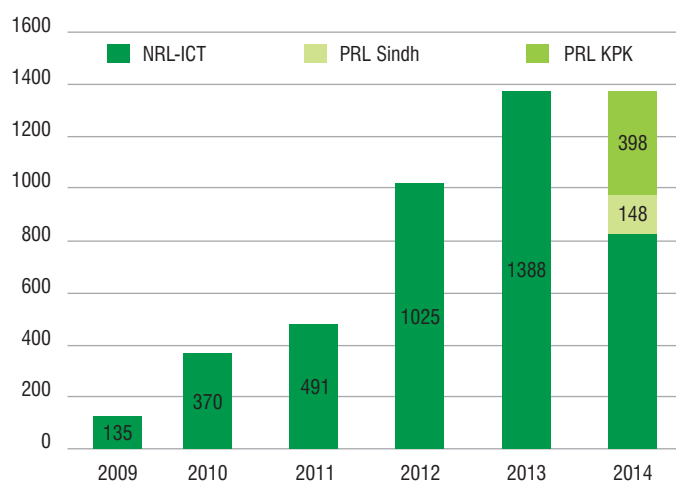


Table 5: TB DST- Annual work load 2009-2014

Lab	2009	2010	2011	2012	2013	2014
NRL-ICT	135	370	491	1025	1388	834
PRL-Sindh						148
PRL-KPK						398
Total	135	370	491	1025	1388	1380

4. National TB Reference Laboratory

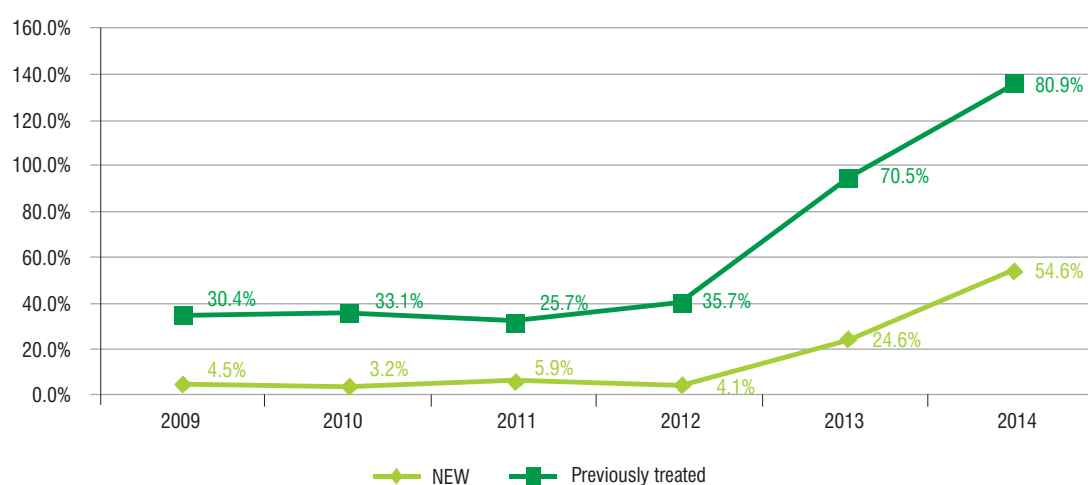
ROUTINE DIAGNOSTIC SERVICES: In year 2014 National Reference Laboratory with expansion of the coverage of DST services to Nishter Hospital Multan, DHQ Sialkot, SZH Rahim Yar Khan and BVH Bahawalpur providing DST services to eleven PMDT sites in country. Besides these NRL is providing services to various health facilities in Rawalpindi and Islamabad districts

Drug susceptibility Testing; Since 2009 NRL is providing drug susceptibility testing to various categories of patients , However with increase of work load and introduction of GeneXpert, phenotypic DST is now done mostly of patient reported Rifampicin resistant. As a result proportion of MDR has increased from 4.5% (2009) to 54.6% (2014) in New cases and similarly increased from 30.4% (2009) to 80.9% (2014) in retreatment cases.

Table 6: Health facilities linked with NRL for provision of diagnostic services

	Name referring Health facilities	Referring District	Province	# of sample received
	PMDT			
1.	PIMS-Islamabad	ICT	ICT	444
2.	Mayo Hospital Lahore	Lahore	Punjab	157
3.	Jinnah Hospital Lahore	Lahore	Punjab	110
4.	DHQ Sargodha	Sargodha	Punjab	71
5.	Leprosy Hospital Rawalpindi	Rawalpindi	Punjab	2425
6.	Samlee Sanatorium-Murree	Rawalpindi	Punjab	2356
7.	DHQ Sialkot	Sialkot	Punjab	9
8.	BVH Bahawalpur	Bahawalpur	Punjab	50
9.	Nishter Hospital Multan	Multan	Punjab	49
10.	SZH Rahim Yar Khan	Rahim Yar Khan		57
11.	Ayub Teaching Hospital-Abbottabad	Abbottabad	KPK	48
	NON PMDT			
1.	Federal General Hospital (FGH)-Islamabad	ICT	ICT	814
2.	PIMS-Pulmonology ward-Islamabad	ICT	ICT	1184
3.	PIMS-Children ward-Islamabad	ICT	ICT	617
4.	FGSH (Poly Clinic)	ICT	ICT	453
5.	Holy family hospital	Rawalpindi	Punjab	37
6.	Benazir Bhutto Hospital-Rawalpindi	Rawalpindi	Punjab	96
7.	DHQ Rawalpindi	Rawalpindi	Punjab	136
8.	Khayaban-e-Sir Syed (KSS)	Rawalpindi	Punjab	312
9.	Military Hospital Rawalpindi	Rawalpindi	Punjab	1564
10.	Combined Military Hospital	Rawalpindi	Punjab	321
11.	Fauji Foundation Hospital	Rawalpindi	Punjab	527
12.	TB Reach	-	-	861
13.	Others	-	-	1020

Drug susceptibility Testing; Since 2009 NRL is providing drug susceptibility testing to various categories of patients , However with increase of work load and introduction of GeneXpert, phenotypic DST is now done mostly of patient reported Rifampicin resistant. As a result proportion of MDR has increased from 4.5% (2009) to 54.6% (2014) in New cases and similarly increased from 30.4% (2009) to 80.9% (2014) in retreatment cases.


Figure 6: NRL DST trend. MDR reporting in New and previously treated cases

Table 7 : NRL drug susceptibility pattern routine surveillance

		New	Previously Treated	Unknown treatment History	Total
FIRST LINE DRUG RESISTANCE					
1.	-Number of patients with positive identification for M. tuberculosis complex (confirmed by culture and/or line probe assay)	493	1190	45	1728
2.	Among patients reported in (i) number of patients with available DST results for isoniazid(H) and Rifampicin (R)	97	723	14	834
3.	Among patients reported in (ii) number of patients with resistant to H but not R	3	21	2	26
4.	Among patients reported in (ii) number of patients with resistant to R but not H	1	16	0	17
5.	Among patients reported in (ii) number of patients with resistant to R and H (MDR-TB)	53	585	7	645
SECOND LINE DRUG RESISTANCE					
1.	Total number of pulmonary MDR-TB patients with DST results for any fluoroquinolone (FQ) and any second-line injectable agent (2LI)	52	585	7	644
2.	Among MDR-TB patients reported in (i) number of patients susceptible to both FQ and 2LI	18	193	3	214
3.	Among MDR-TB patients reported in (i) number of patients with any resistance to FQ	31	383	4	418
4.	Among MDR-TB patients reported in (i) number of patients with any resistance to 2LI	5	47	1	53
5.	Among MDR-TB patients reported in (i) number of patients with any resistance to both FQ and 2LI (XDR-TB)	2	38	1	41

EQA Scheme for DST:

NRL is linked with SNRL -Antwerp AND PARTICIPATES IN ANNUAL SCHEM OF EQA of DST is a regular activity organized by Supranational Reference Laboratory Network. NRL has sustained its proficiency in round 20th of annual panel testing coordinated by SNRL Antwerp Belgium.

Besides NRL, two laboratories AKU (SRL) and IHK regularly participate in EQA scheme. Both laboratories have sustained proficiency for FLDST and SLDST

Table 8: NRL Panel Testing for DST Results

		2009 R-16	2010 R-17	2011 R-18	2012 R-19	2013 R-20
First Line Drug	Rifampicin(R)	100%	100%	97%	100%	89%
	Isoniazid (H)	100%	100%	97%	100%	100%
	Ethambutol	100%	100%	96%	100%	100%
	Streptomycin	100%	80%	93%	100%	100% (PZA)
Second Line	Ofloxacin		93%	100%	100%	100%
	Amikacin		100%	100%	100%	100%
	Capreomycin		100%	93%	100%	100%
	Kanamycin		97%	97%	100%	100%

NATIONAL EQA SCHEME FOR DST: - NRL has been organizing National EQA scheme for DST since 2009, Subsets of Panel strains received from SNRL are sent to both public and private sector TB laboratories who express interest in participation.

In year 2014 2 public sector laboratories (PRL KPK and PRL Sindh) qualified in DST for both first and second line DST. Whereas four private sector laboratories participated and three qualified in Proficiency testing for first line DST

Table 9: Participating Laboratories in National EQA Scheme for DST

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

In 2014 altogether 6 laboratories participated (2public and 4 private) in EQA and 5 qualified proficiency testing for first line DST. Two reported second line DST result and achieved proficiency target. Although in country capacity for QA first line DST is gradually improving but with introduction of GeneXpert, only Rifampicin resistant are referred for DST thus making it important for DST laboratory to have capacity for both first and second DST.



5. Monitoring and Supervision (Laboratory Network):

Monitoring and Supervision remains the keystone of TB laboratory network. The M&E staff is supported by GF For the **microscopy network** the supervision and Monitoring is performed by the dedicated team at NRL central level as well provincial teams based at PRLs

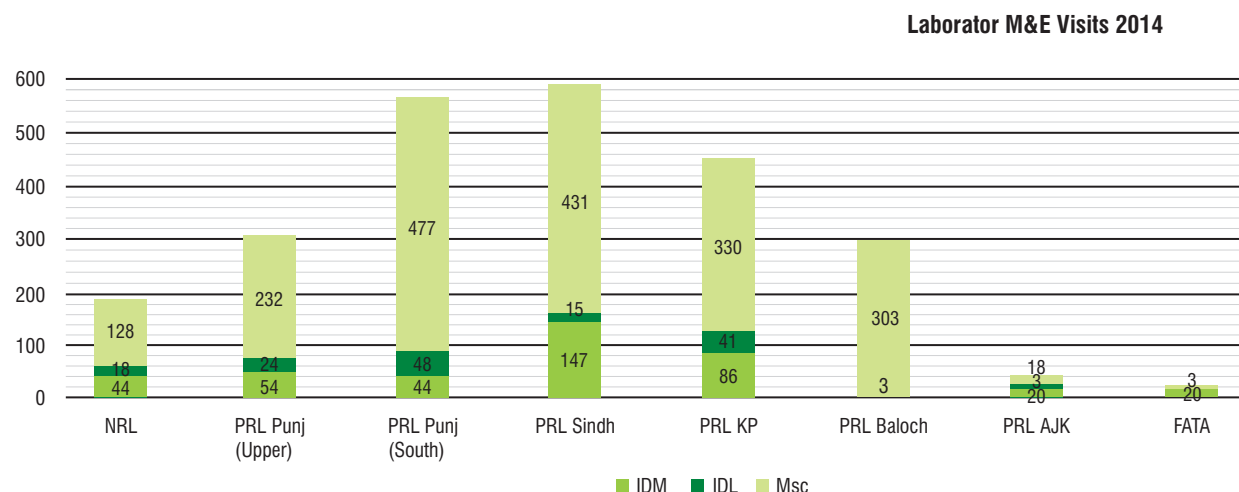
Table 10: M&E staff for TB laboratory Network

	NRL	PRL Punj_ (Upper)	PRL Punj (South)	PRL Sindh	PRL KP	PRL Baluch	AJK	GB	FATA	Total
*Senior /M&E Officer LAB	*2/2	1/1		1/1	1/1	1/1	-	-	-	6/6
Senior Laboratory Supervisors (SLS)	3/4	3/4	3/3	5/5	3/4	3/5	1/1	0/1	1/1	22/28

In 2014, three M and E officer (laboratory) position which remained vacant in 2013 were filled, however 6/28 approved position of senior laboratory supervisors remained vacant due to failure to induct suitable staff

Joint monitoring visit are conducted by Programme monitors and laboratory staff. For microscopy network Supervision and monitoring visits are conducted to cover the quarterly intra-district meetings (IDMs), Intermediate laboratories at district level (IDLs), peripheral microscopy centers and quarterly laboratory surveillance meetings held at provincial level. Supervision of Intra-district meeting (IDM) by Punjab team remain poor in 2014, whereas monitoring of IDL remained low by Sindh team.

Figure 7: Frequency of laboratory monitoring visit by National and Provincial Monitors



During 2014, collectively more than 2400 M&E visits were carried out country wide. However, intra-district meeting are key activities with regard to EQA as slide collection take place during these meeting at district level.

As system of slide collection during intra-district meeting is not yet established in Baluchistan province, therefore slides are collected during on site visit and therefore frequency of onsite visit to microscopy centers is higher in this province. Regular feedback was given by central and provincial M and E officer to field staff after review of report. **Monitoring of culture/DST and Xpert sites** includes both desk monitoring of performance indicators and on site visit by technical staff of NRL (Senior Microbiologist & Molecular Biologist). During on site visit to laboratories, National staff is accompanied by relevant provincial technical staff for purpose of capacity building and follow up of problem identified.



QMS Workshop-AKU-ASM-NTP



QMS Workshop-AKU-ASM-NTP



Culture and DST M&E Visits



Dissemination of DRS Report





9. Drug Management

Background:

NTP as a policy is implementing drug management activities all over the country with the support of its provincial counter parts.

At the National TB Control Program, Drug Management Unit has been established looking after all Anti TB drugs i.e. FLDs, SLDs, pediatric ATT medicines, Ancillary drugs and related issues.

Introduction:

National TB Control Program, as a policy ensures provision of regular quality assured, free of cost anti TB medicines to every registered patient in the country. It is essential that the country maintain a sufficient and well managed supply of WHO assured quality TB drugs to ensure the treatment of increasingly detected TB cases. Quality and uninterrupted supply of ATT Drugs is a core element of DOTs strategy which is being catered by NTP through Objective-4 in SSF grant of GF.

KEY ACHIEVEMENTS:

Some of the key achievements made by Drug Management Unit in year 2014:

Incorporation of ATT Drugs budget in the NFM budget:

Based on the successful implementation of R-8 & SSF activities (Drug Management) NTP is able to incorporate and secure more than 50 Million USD grant for procurement of First Line Drugs (FLDs, pediatric ATT drugs) for Core DOTs and Second Line Drugs (SLDs) for Multiple Drug Resistant TB Patients.

WHO Emergency Grant of 7 Million:

In collaboration with World Health Organization and Stop TB Partnership Geneva, NTP / DMU has conducted a GDF review mission in year 2013 and 2014 to assess the activities of Drug Management. On the valuable recommendations of GDF review mission a grant of about 7 Million USD is approved for the provision of FLDs and Paediatric drugs to be used in year 2014.

Availability of ATT Drugs/No Stock out:

The Drug Management Unit is ensuring the procurement of ATT drugs to meet the needs of the country as per the standard procedures set forth by NTP, WHO and GF through WHO prequalified manufacturers. This is worth to mention that no drug shortage or stock out is recorded in any district or BMU of the country which is a very big achievement.

Timely approval/NOCs/Waiver to import Indian origin TB Drugs:

The Drug Management Unit has established a proper coordination mechanism for the timely approval/NOCs/Waiver from Ministry of Commerce and Drug

Regulatory authority of Pakistan (DRAP) for custom & shipment clearance. The NOCs/waiver for the import of TB Drugs are sought from the office of the Prime Minister of Pakistan for every shipment as these drugs fall in the "appendix G" of Ministry of Commerce. This was a very cumbersome process which has now streamlined and no demurrages have been incurred now.

PMDT Sites Management:

NTP is managing 18 PMDT sites with more than 3000 MDR patients in the country. The DMU is providing regular technical guidance, drug management support & uninterrupted costly second line drugs to these sites and patients which is worth 5000 USD/patient.

Drug Management Information System:

The Drug management information system (DMIS) serves as the engine for supply chain management programs. 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.

The implementation of TBDMIS across the district was an uphill task but with the close supervision of DMU and commitment of our provincial counterpart, more than 111/141 districts started implementation in 2014 which comes to about 80 %.

ISO Certification of Lab/WHO pre-qualification of TB Pharmaceutical Companies:

NTP DMU was in regular correspondence, and upon

concerted efforts, vigorous follow-up and technical support CBSR Lab/HEJ and GetZpharma quality lab Karachi has got accreditation of ISO 17025 by PNAC and WHO Certification which is the first ISO 17025, ISO 9001 & WHO accredited facilities in the country. The National TB Control Program has initiated a process and entering into MOU with these certified labs for the implementation of quality assurance plan for quality testing of TB drugs across the supply chain.

Successful Conduct of International/GDF review mission in the country:

The DMU in 2014 conducted very successful GDF Review mission in the country and facilitated the mission in Sindh, Punjab and KPK. The mission thoroughly evaluated the drug management component of NTP and expressed extreme satisfaction on the implementation arrangement. Based on the recommendations of these missions, NTP secured emergency grants of worth millions of US \$ for the procurement of ATT drugs and secured Pediatric ATT drugs grant for Pakistan apart from the regular Global fund grant for procuring Anti TB drugs.

TBDMIS & Drug Management trainings and GDF/OIG Review missions:





10. Operational Research

A. Background:

Research is a key strategic area identified in the National strategic and operational (PC1) plans as well as the new stop TB strategy. The strategy describes operational research as a core component of NTP work. Designing and conducting locally relevant operational research can help in identifying problems and workable solutions, testing them in the field and planning for the scaling up of activities.

- Providing research leadership to establish National research/development agendas, attracts resources, new researchers and research groups, and develops Institutional networks;
- Providing management capacity for carrying out specific research projects to ensure relevance, quality, timeliness, efficiency and accountability;
- Developing Critical mass of personnel with Up-to-date R&D skills;
- Enabling the Means and opportunities for participating in international R&D;
- Developing road maps for new researches based on need and priority of NTP.
- Develop Collaborations with international academic institutes to perform international standard Quality Research.

B. Main Achievements (2014)

1. Effectiveness and feasibility of 2 months hospitalization (hospital based) and 1 week hospitalization (community-based delivery of care) for multi-drug resistant tuberculosis (MDR-TB) in Pakistan: A randomized controlled trial

NTP is conducting a randomized controlled trial study entitled: Effectiveness and feasibility of 2 months hospitalization (hospital based) and 1 week hospitalization (community-based delivery of care) for multi-drug resistant tuberculosis (MDR-TB) in Pakistan:

The aim is to enable the program to effectively implement multi-component MDR TB management. Two types of service delivery models namely community based (1 week hospitalized and early discharge to peripheral care) and hospital-based (2 months hospitalized and late discharge to peripheral care) will be studied for its effectiveness and cost-effectiveness in the low resource settings of Pakistan. In 2014, 95% of the sample (patients) has been enrolled in the study in three tertiary care hospitals i.e. Gulab Devi Lahore, OJHA Karachi and Samli Sanitarium Murree.

2. Good quality, locally procured drugs can be as effective as internationally quality assured drugs in treating multi-drug resistant tuberculosis. A retrospective cohort study in Pakistan.

A retrospective cohort study was conducted in three hospitals across Pakistan. Data on baseline characteristics and treatment outcomes during first six months of treatment were extracted from hospital records of adult culture-positive pulmonary MDR-TB patients starting treatment between January 2011 and June 2012. Two cohorts were defined: patients receiving IQA drugs and patients receiving locally procured non-IQA drugs. Data were analyzed using Kaplan-Meier curves and Cox proportional hazards regression. The primary outcome compared between cohorts was time to culture conversion. Of 231 patients, 90 were in the IQA and 141 in the non-IQA cohorts. Baseline characteristics were similar except for higher frequency of quinolone resistance in the IQA cohort. Overall, 193 patients (84%) culture converted. Culture conversion was not faster in the IQA cohort; the median time was 81 and 68 days in the IQA and non-IQA cohorts, respectively. Unadjusted and adjusted hazard ratios for culture conversion in IQA verses non-IQA cohorts were 0.82 (95%-CI, 0.62-1.10) and 0.91 (95%-CI, 0.62-1.35)

respectively.

The article has been submitted in Plos-one Journal for publication.

3. Improving the Prevention of Drug-Resistant TB: A Randomized Controlled Smoking Cessation Trial and Prospective Cohort Study of TB Treatment Outcomes.

Indus Hospital Research Centre / Interactive Research and Development (IRD) with the collaboration of John Hopkins Bloomberg School of Public Health, USA have initiated this project with the coordination of NTP, Pakistan. The objective of the study is to assess the relationship of cigarette smoking with negative treatment outcomes of TB patients in Karachi, Pakistan, with an emphasis on MDR-TB. The project will be implemented in the start of 2015 after the ethical approval from Jons Hopkins Bloomberg School of Public Health, USA

The Implementation of TB REACH Wave 3 Project

National TB Control Program and TB REACH signed a Grant agreement in February 2013 for the study “Effectiveness of widening circle of contact screening from within the household to 100 m around the house of index case on case finding through outreach using GIS”. The project introduces active contact investigation into 3 cities in Punjab Province and the Capital Territory utilizing all SS+ notified cases as index cases. The evaluation population

districts are Islamabad, Lahore, Faisalabad and Rawalpindi, while the control populations are Multan, Hafizabad, Kasur and Jhelum. Household contacts, i.e. those normally resident or sharing the same airspace, are verbally screen initially, followed by a widening circle of close community contacts. The project test additional yield by Gene-Xpert among smear negatives and chest X-ray suggestive for which the evidence available in published articles suggest there is 60% increase expected. The project has started the contact tracing from 1st July 2013. All the data is being entered in GIS enabled mobile phone. The data of evaluation population will be compared with that of the control population. Quarterly online report is being sent at the end of each quarter. This activity will continue till the end of August 2015.

Participation in Conferences:

In 2014, Research Unit, NTP remained actively involve to disseminate research findings of the different projects in form of Oral and poster presentation at national and international forums.

International Conference:

The 45th Union World Conference on Lung Health was held in Barcelona, Spain on 28 October – 1 November 2014. Research Unit presented the published article i.e. “Success of active tuberculosis case detection among high-risk groups in urban slums in Pakistan”. Three posters were also presented on the following topics:





1. Need for Public private mix approach as priority to reduce under-reporting in the country.
2. Good quality, locally procured drugs can be as effective as internationally quality assured drugs in treating multi-drug resistant tuberculosis. A retrospective cohort study in Pakistan.
3. Effectiveness of Community contacts screening in addition to household contact screening to limit TB Transmission in community.

National Conference:

5th Annual Public Health Conference 2014 was held at Health Services Academy, Islamabad on 12th & 13th December 2014. Research Unit, NTP had actively participated in this conference. One stall was established in the conference by the NTP and also one scientific session was organized from the NTP. Moreover, two posters were also presented on TB-REACH project and Capture–Recapture study.

Published Article in 2014

1. Success of active tuberculosis case detection among high-risk groups in urban slums in Pakistan. [Published: INT J TUBERC LUNG DIS 18(9):1099 - 1104 (c) 2014 The Union]
2. Investigation of presumptive tuberculosis cases by private health providers: lessons learnt from a survey in Pakistan. (Published: PHA 2014; 4(2): 110 - 112, The Union)
3. Estimating Tuberculosis burden and case detection in Pakistan. (Published: INT J TUBERC LUNG DIS 18(1):55 - 60 The Union)

Submitted Article

1. Good quality, locally procured drugs can be as effective as internationally quality assured drugs in treating multi-drug resistant tuberculosis. A retrospective cohort study in Pakistan, Plos One Journal
2. Can the number of patients with presumptive tuberculosis lost in the general health services in Pakistan be reduced? INT J TUBERC LUNG DISEASE

C. Way Forward

The future activities of the Research Unit in 2014 will be as follows:

- Successful completion of TB REACH wave 3 Project on GIS based Active TB case finding.
- Report writing of TB REACH wave 3 project
- Successful Implementation of "A Randomized Controlled Smoking Cessation Trial and Prospective Cohort Study of TB Treatment Outcomes"
- Monitoring and data processing of "Effectiveness and feasibility of 2 months hospitalization (hospital based) and 1 week hospitalization (community-based delivery of care) for multi-drug resistant tuberculosis (MDR-TB) in Pakistan: A randomized controlled trial"
- International Publications, articles of the Prevalence Survey 2010-11, TB REACH Wave 3 and Loss to follow up project.
- To collaborate with international institutions such as University of Bergen, London school of hygiene, John Hopkins University to enhance capacity at National level.





11. Advocacy Communication and Social Mobilization (ACSM)

ACSM is a key determinant of the outcomes of Pakistan's TB control Interventions. It is through the use of ACSM tools that agendas are set, public awareness on specific health issues is raised and communities are mobilized to adopt early health seeking behavior and treatment adherence.

ACSM Unit has demonstrated leadership in designing, planning and executing ACSM interventions and further institutionalizing health communications for TB in the country. Vision of eliminating differential of quality of "health communication" products, services and information between public and private sectors has been introduced. NTP, Pakistan is being recognized as a leader on producing high quality advocacy, communication and social mobilization products.

Numbers of national strategic/policy documents have been produced under ACSM, including National ACSM Strategy and Operational Guidelines; National M&E Framework; Quality Assurance Manual (Trainer and Trainee guide) for IPC; Social Marketing Plan; ACSM Resource Center Development Guidelines; and National Logistic & Management Information System.

Advocacy seminars with the media

Advocacy seminars was arranged at the national level to inform media and health professionals, as well as other key stakeholders, about the current situation on TB in Pakistan and to share the initiatives being taken by NTP at the national and provincial levels.

One of the objectives of the seminars held in 2014 was to motivate the participants to prioritize TB control on their reporting agendas in order to help create a conducive environment for implementation of ACSM activities.

Development and dissemination of ACSM resource material

The ACSM Unit developed various types of ACSM resource material including newsletters, posters and brochures, fact sheets, badges, T-shirts, key chains, pens, caps and bags. These materials and mementos were widely distributed at the national, provincial and district levels during different activities including World TB Day 2014.

Exhibition booth on Health Services Academy: Like other health programs of the Ministry of NHR&C, NTP also participated in a two-day seminar organized by HSA on December 11-12, 2014. The occasion presented an excellent opportunity to raise awareness on TB among people from different walks of life and age groups. To this end, NTP set up an exhibition booth, where a variety of ACSM material including brochures, guidelines, posters and handouts were available for the public to benefit from. The event offered a unique chance for NTP to establish direct interaction with health experts and to answer their queries.

The TB Song, as well as TB-related commercials, was aired on a huge screen put up at the exhibition booth.

People turned up in good numbers to get information about TB. The overall impact of the activity was positive.

Exhibition booth on 44th IUTLD, Barcelona: NTP also participated in the 45th Union World Conference on Lung Health held in Barcelona, Spain on 28 October – 1 November 2014. The occasion presented an excellent opportunity to raise awareness on TB among people from different walks of life and age groups at international level. NTP set up an exhibition booth, where a

variety of ACSM material including brochures, guidelines, posters and handouts were available for the public to benefit from.

World TB Day 2014

World TB Day is commemorated worldwide in March every year. This year's international theme for the observation was 'Reach the 3 Million – A TB test, treatment and cure for all.' As highlighted in the WHO 2013 Global TB Report, three million people are missed every year by health systems. This has been the case for six years now.

For World TB Day 2014, partners called for a global effort to find, treat and cure all people with TB and accelerate progress towards the bold goals we expect to see in TB strategies post-2015 and a world with Zero TB deaths, stigma and infections.

Messages were tailored by region, sub-region and country with relevant figures, and focussed on particular vulnerable groups among the three million, for example women, children, impoverished communities, migrants or prisoners.

The campaign, which put a spotlight on TB patients who have embraced cure upon completion of treatment, utilized innovative means to raise awareness.

Some of the key activities carried out in connection with World TB Day 2010 have been summarized in subsequent paragraphs:

Consultative Meeting with Partners: In order to develop a national plan to implement special activities to commemorate World TB Day, a consultative meeting with partners including Mercy Corps, ASD, ACD and Provincial TB Control Programs was organized.

The objective of the meeting was to develop strategies for the implementation of activities on World TB Day. The meeting also helped in the development of uniformed message for the campaign, IEC material, development of a comprehensive work plan to commemorate World TB Day.

A National Seminar on Tuberculosis: Like every year a national event to commemorate World TB Day has been organized. Mrs. Saira Afzal Tarar State Minister for National Health services Regulations & Coordination was the chief Guest on the occasion. Mr. G. N National Professional Officer WHO, Dr. Warner Buehler Senior Fund portfolio Manager Global Fund, Ms. Nancy Estes Acting Mission



Director USAID Pakistan, Dr. Ejaz Qadeer, National Manager, National TB Control Program, Mr. Ateeb Sadiq Assistant General Secretary Pakistan Red Crescent Society, were also present on the event. Key stakeholders including bilateral and multi-lateral donors, National and International NGOs, policy makers, development partners, academia and media actively participated in the seminar.

MoU signing between NTP, STP and McDonalds: The National TB Control Program, the Stop TB Partnership Pakistan and McDonalds entered into a long-term public-private partnership, which was formalized through signing of a Memorandum of Understanding in Lahore.



Speaking on the occasion, the managing director of McDonalds pledged all-out support in lending impetus to the fight against TB. He committed that all outlets of the international fast food chain would be branded with TB messages during World TB Day 2014 campaign, and that a special corner would be designated for display and distribution of TB-related advocacy material among clients.

Quiz Competition at McDonald's Islamabad: The National TB Control Program is making determined efforts to control TB in Pakistan with the support of different partners and actors.



National TB Control program in alliance with McDonalds launched a substantial campaign during World TB Day Campaign 2014. The contributions of McDonalds as partner in the fight against TB were valuable for the cause of TB awareness during the World TB Day Campaign in Pakistan.

The following activities were carried out at McDonalds, F9 Park, Islamabad. McDonald's outlet, Islamabad was branded with banners. In addition streamers/X stands have been displayed at various visible parts of the branch. For chain of awareness regarding Tuberculosis, information material (Having messages of TB) have been distributed among all the visiting customers and participants of the quiz competition.

While quiz competition, a questioner comprising questions related to symptoms and general information about TB has been developed and shared among the costumers at the branch. Those participants with correct answers have been provided with a free a meal. The outlet granted a total number of 15 free meals and supported NTP team with human resource while branding and distribution.

Islamabad Traffic Police as a partner: The National TB Control Programme in collaboration with Islamabad Traffic Police launched a massive campaign during World TB Day Campaign 2014. Islamabad Traffic Police (ITP) as partner in the fight against TB contributed valuable services for the cause of TB awareness during the World TB Day Campaign.

The branding float moved around the famous/prominent places of Islamabad. The messages on TB were displayed on the electronic screen on the float. They distributed information material among general population (Having

messages of TB and ITP together in one leaflet)

A special program was on aired on ITPs official radio station on TB throughout the World TB Day on March 24, 2014.

Symbolic Walk: On 26 March, 2014 at 12:00pm a TB walk was held from Football Ground to Press Club F6 Markaz, Islamabad an effort to raise awareness of tuberculosis.

The foundation of TB Walk seeks to raise awareness on the tuberculosis burden in the country. This effort has offered the opportunity to mobilize the political, economic and social commitment for the prevention and control of TB in Pakistan.

The walk was headed by MNA Tariq Fazal Chudri, representative of the movement partners Green Star, Mercy Corps, ASD, Pakistan Girls Guide Association, Pakistan Scouts and Islamabad Traffic Police participated in the walk. In addition, the representatives from all the concerned units of the National TB Control Program also took part as fighters against TB worldwide. All the participants of the TB Walk have been provided with TB caps and shirts with logo, streamers, banners and play cards.

City Branding: All major areas of the Federal capital city were branded with streamers and banners comprising of TB messages. The diverse streamers all around the city broadened the voice of National TB Control Program "join hands together for a TB free Pakistan".

Following are some snaps of the city branding:



Visit of High Level Mission: A high level mission of Global Fund and Stop TB Partnership, comprising Mr. Mark Dybul, Executive Director, Global Fund and Dr. Lucica Ditiu, Executive Secretary, Global Stop TB Partnership, visited Pakistan on 28th and 29th April 2014.

The High Level Mission visited the office of NTP Pakistan, on Monday 28 April 2014.



with MDR and other forms of TB). More than 100 TB Patients (people with TB) attended the Symposium from all five provinces of Pakistan including Azad Jammu and Kashmir and FATA. Symposium was organized to celebrate TB patient's success and efforts in fighting against TB, develop and provide a national network/platform to TB patients for patient friendly environment advocacy and share and learn from the challenges faced by TB patients



Empowering TB patients: national symposium

National TB Control Program organized first ever in the history of Pakistan a one-day National TB Patient Symposium at Margalla Hotel Islamabad on October 23, 2014. The Symposium was a historic event in Pakistan by bringing TB Patients (people with TB) from all over Pakistan. Ministry of National Health Sciences, Regulations and Coordination, National TB Control Program, Stop TB Partnership - Pakistan and Global Coalition of TB Activists mobilized its partners, grass root communities and other national and international implementing organizations to identify people with TB (cured, under treatment suffering

during their fight against TB. The Symposium also highlighted the importance of engagement of people with TB by launching National TB Patient Ambassador and National Coalition of TB Activists. TB Patient Success Stories and problems faced during treatment were the main theme of the symposium. Special audio message was also developed by Ms. Ditu Lucica of Stop TB Partnership Geneva to encourage and acknowledge the efforts of TB Patients in the fight against TB.

A declaration of TB Patients was also launched at the end of the symposium. All the participants signed the declaration and made commitments to fulfil the responsibilities mentioned in the declaration.





Picture Gallery







Annexes

Annex-1: Lab Training Support in 2014

		Fed	Punjab	Sindh	KPK	B-Tan	AJK	NA	FATA	Total
	Peripheral lab staff	5	52	38	38	15	2	-	-	150
	Gene Xpert	-	-				-	-	-	-
	District lab supervisors	0	0	6	0	9	4	-	4	23
Initial	Non Lab supervisors	3	-	-	24	7	4	-	-	38
training	MLT Student	-	-	-	-	-	-	-	-	-
	6 Training for IT Staff for Lab	-	-	-	-	-	-	-	-	-
	Culture	1	3	2	-	-	-	-	-	6
	DST	3	2	2	1	-	-	-	-	8
	Panel Testing	-	-	-	-	-	-	-	-	
Refresher	Peripheral lab staff	0	85	17	48	19	0	0	0	169
	DLS	0	9	5	8	0	0	0	0	22
	Culture	1	2	2	-	-	-	-	-	

Annex –II: Microscopy: EQA coverage and performance of centers

Microscopy		Punjab	Sindh	KP	B.TAN	AJK	GB	FATA	ICT	Total
Network	2005	445	237	163	63	35	11	28		982
	2006	445	237	181	80	35	18	28		1026
	2007	472	259	199	102	57	18	24		1131
	2008	473	262	203	102	62	22	24		1148
	2009	473	264	199	108	67	22	26		1159
	2010	486	270	202	108	67	22	26		1181
	2011	487	274	203	108	67	22	26		1187
	2012	494	274	204	107	52	22	17	7	1177
	2012(PPM-GF)	103	56	29	11	2	0	0	3	204
	2013	497	267	204	111	52	22	23	7	1183
	2013(PPM-GF)	113	57	30	6	5	0	0	2	213
	2014	511	271	204	111	54	22	29	7	1209
	2014(PPM-GF)	148	55	47	8	7	7	0	2	274
EQA coverage	2006	111	84	71	29	18	11	0		324
	2007	118	91	81	40	18	12	0		360
	2008	420	234	200	57	13	2	14		940
	2009	441	262	191	91	0	0	20		1005
	2010	482	268	200	93	48	0	15		1106
	2011	480	268	199	98	53	0	14		1112
	2012	491	270	201	60	53	0	17	3	1095
	2012(PPM-GF)	33	45	5	0	1	0	0	0	84
	2013	493	267	204	91	52	0	18	7	1132
	2013(PPM-GF)	113	57	30	6	5	0	0	2	213
	2014	509	269	203	90	54	0	27	6	1158
	2014(PPM-GF)	148	55	47	8	7	7	0	2	274
# of Centers with acceptable result	2006	20	15	31	22	2	5	0		95
	2007	42	61	49	21	4	11	0		188
	2008	257	125	124	43	7	2	12		570
	2009	282	138	127	75	0	0	18		640
	2010	319	149	149	85	34	0	13		749
	2011	361	167	133	89	25	NA	13		788
	2012	368	165	132	48	38	NA	17	3	771
	2012(PPM-GF)	28	36	4	NA	1	NA	NA	NA	69
	2013	395	142	151	73	43	NA	12	4	819
	2013(PPM-GF)	106	25	27	6	5	NA	NA	2	171
	2014	422	158	157	87	47	0	17	3	891
	2014(PPM-GF)	133	26	40	7	7	7	0	2	222



Annex-lab-III: TB laboratory performance indicators

Suspect		Punjab	Sindh	KP	B.Tan	AJK	GB	FATA	ICT	National
positivity rate		13.5	18.9	18.1	16.7	17.1	7.7	17.8		16.6
		14.5	18.9	18.6	13.3	19.9	8.8	15.4		16.2
		15.3	20.2	18.9	16.0	21.5	8.1	18.0		16.8
		14.6	21.9	18.0	18.7	21.9	NA	31.4		16.7
		15.26	20.33	20.18	18.7	17.67	NA	22.88		16.95
		14.24	18.06	18.95	16.64	14.76	NA	17.49		15.64
		13.71	17.65	18.29	15.90	12.43	NA	19.28	7.2	15.03
		12.9	19.2	35.9	NA	2.77	NA	NA	NA	18.9
		13.37	16.79	18.5	15.35	12.27	NA	17.36	10.06	14.59
		17.7	19.9	23.0	26.0	8.1	NA	NA	NA	18.7
	2014	13.6	16.5	16.4	13.7	12.1	NA	15.4	7.8	14.4
	2014(PPM-GF)	14.1	16.8	21.4	16.3	9.2	4.9	NA	2.6	15.0
Follow up Smear positivity rate		0.9	3.7	2.6	1.7	0.8	3.3	0.7		2.4
		2.8	4.6	2.3	1.8	0.7	2.1	2.1		3.2
		1.4	5.6	3.3	1.7	1.1	1.7	4.4		2.7
		1.7	6.0	3.6	1.5	1.4	NA	5.9		3.0
		2.16	5.79	3.58	1.70	1.58	NA	4.28		3.15
		2.55	5.29	3.94	1.96	2.50	NA	6.30		3.37
		2.39	5.04	4.42	1.60	1.89	NA	6.08	1.4	3.28
		2.0	2.2	3.1	NA	50	NA	NA	NA	2.3
		2.94	5.34	4.09	2.15	2.05	NA	4.38	1.23	3.58
		1.64	3.1	1.89	0	0	NA	NA	NA	2.29
	2014	3.2	6.3	4.0	3.7	1.9	NA	4.0	3.6	4.0
	2014(PPM-GF)	2.6	3.1	3.7	0.0	0.7	5.9	NA	12.5	2.8
Proportion false positive		9.0	10.4	7.8	2.1	7.8	8.6	0		8.7
		6.5	6.5	2.4	7.3	6.9	9.5	0		5.6
		4.4	4.6	3.1	2.0	8.8	0	2.2		4.1
		2.5	5.5	3.2	1.76	NA	NA	0.0		3.3
		2	3.7	2.9	1.1	4.7	NA	0.60		2.6
		1.50	1.8	3.8	2.4	6.2	NA	0		2.2
		1.7	2.9	2.8	3.5	3.8	NA	0.5	0	2.4
		5.9	16.5	2.8	NA	0.0	NA	NA	NA	11.8
		1.5	3.3	2.9	4.1	2.1	NA	3.7	3.5	2.5
		0.60	6.52	2.0	0	0	NA	NA	0	3.08
	2014	1.2	3.6	2.4	1.9	2.3	NA	4.1	4.2	2.3
	2014(PPM-GF)	1.6	4.7	1.2	0.0	4.8	0	NA	0.0	2.3
Proportion false Negative		3.0	5.9	2.6	2.5	5.0	1.7	0		3.6
		2.2	3.2	1.5	3.1	6.1	1.3	0		2.3
		1.2	1.9	1.0	0.9	4.1	0	1.1		1.3
		0.7	2.0	1.0	0.9	NA	NA	0.4		1.0
		0.8	1.4	0.7	0.3	1.1	0	0.7		0.9
		0.5	1.4	0.8	0.3	1	NA	0.5		0.8



	2012	0.5	1.1	0.8	0.6	0.2	NA	1.1	2.6	0.7
	2012 (PPM-GF)	0.4	1.3	1.6	NA	0	NA	NA	NA	1.02
	2013	0.6	1.6	0.6	0.9	0.1	NA	1.8	0.4	0.9
	2013(PPM-GF)	0.32	2.8	0.17	0	0	NA	NA	0	1.35
	2014	0.6	0.9	0.6	0.2	0.2	NA	0.4	0.4	0.6
	2014(PPM-GF)	0.4	1.4	0.5	0.3	0.0	0	NA	0.0	0.6
Efficiency of microscopy (agreement rate)	2006	95.4	91.4	95.2	96.9	93.5	97	0		94.5
	2007	96.7	95.4	98	93.2	91.7	96.9	0		96.6
	2008	97.9	97.2	98.5	98.1	95	100	98.8		97.9
	2009	98.7	96.7	98.5	97.8	NA	NA	99.3		98.2
	2010	98.8	97.7	97.8	99.3	96.9	NA	98.4		98.4
	2011	99	98.3	97.9	99.1	97.5	NA	98.7		98.6
	2012	98.9	98.1	98.3	98.8	98.7	NA	96.5	97.3	98.5
	2012 (PPM-GF)	97	92	98	NA	100	NA	NA	NA	95
	2013	99	97.8	98.7	98.1	99.3	NA	97.2	97.6	98.5
	2013 (PPM-GF)	99	95.9	98.2	99.3	99.2	NA	NA	100	97.7
	2014	98.8	98.3	98.9	98.9	98.6	NA	97.7	98.0	98.7
	2014 (PPM-GF)	99.1	97.8	98.9	99.3	93.4	100	NA	96.0	98.6



Annex-IV GeneXpert performance from 2011 to 2014

S.#	Xpert Site	Total Test				# MTB Detected				#RR			
		2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
1	NRL Islamabad	163	4645	4896	7083	92	3161	2718	1978	34	321	375	366
Punjab													
2	SZH RYK	22	201	467	1013	20	148	338	745	3	16	35	67
3	PRL-Multan	109	689	640	2381	37	272	263	897	18	97	68	201
4	AH- Fsd	28	391	585	1836	8	120	136	291	0	19	27	46
5	GDH-Lahore	59	1160	928	2218	48	810	712	1413	27	289	230	310
6	Jinnah Lahore	21	268	243	1080	15	112	126	356	7	13	23	55
7	PMRC-Lahore		13	257	801		6	197	489		4	71	87
8	DHQ Sargodha				295				127				42
9	BVH Bhawalpur				572				124				26
10	DHQ Sialkot				71				22				6
SUB TOTAL PUNJAB		239	2722	3120	10267	128	1468	1772	4464	55	438	454	840
SINDH													
11	PRL Karachi	295	3535	1077	2118	186	2496	881	1264	36	278	190	186
12	ICD Kotri	94	717	790	1997	84	578	697	1587	32	200	273	397
13	CMC Larkana	20	493	373	1247	15	344	264	632	5	85	69	129
14	GMMMH Sukkur				618				448				96
15	CH Mirpurkhas				695				521				112
16	LMUH Hyderabad				289				219				38
17	PMCH Nawabshah				230				182				54
18	Indus Hospital ,Karachi			1266	7600			317	1707			41	186
19	Jinnah Post graduate medical centre			354	4376			67	964			9	62
20	Sindh Government Hospital			53	1481			34	485			3	25
21	Sindh Government Hospital Korangi			50	1816			15	230			0	12
22	karachi X-ray and ultrasound Hospital			254	1052			57	224			3	10
23	Civil Hospital				1140				222				17
24	Sindh Government Hospital Orangi Town				192				59				6
25	Screening centre ,Korangi (Ground floor No,N_40, Korangi-3) Karachi			235	6505			27	643			2	13
26	CHS 608			1765	0			289	0			38	0
27	Screening Centre Nazimabad (Shop No,15-21 ,3C -1/1 Nafis Market),Karachi			53	1932			4	286			0	10
SUB TOTAL SINDH		409	4745	6270	33285	285	3418	2652	9673	73	563	628	1353
KP													
28	PRL KP Peshawar		956	975	1477		416	327	562		56	53	72
29	LRH Peshawar	96	1379	726	870	63	705	461	584	24	208	139	128
30	MMC Mardan			63	362		48	18	148		8	4	20
31	KTH Peshawar			425	501		282	139	171		21	12	15
32	ATH Abbotabad			226	724			117	294			33	43



33	DTO Lab D. I. Khan			40	234			33	192			9	35
34	DTO Lab Swat			29	305			19	139			5	24
35	DTO Lab Batagram			4	81			2	65			0	5
36	DTO lab L. Dir			7	61			7	35			2	2
37	DTO Lab Banu			2	182			1	162			0	17
SUB TOTAL KP		96	2335	2497	4794	63	1451	1124	2352	24	293	257	361
BALUCHISTAN													
38	PRL Baluchistan Quetta	7	415	174	551	3	239	164	387	1	76	47	89
FATA													
39	TBC AHQ Hospital, Parachinar,			19	64			7	24			0	2
40	AHQ Bajaur Agency			41	60			20	34			3	5
41	ATH Hospital Landi Kotal,			9	110			8	43			0	1
42	AHQ Mohmand Agency				35				10				2
SUB TOTAL FATA				69	269			35	111			3	10
Total		1828	2972	3398	5625	1142	1947	1689	1869	374	3382	3525	3019



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