

## Reviewing a model of public-private mix employed for tuberculosis control in Pakistan



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### Abstract

This narrative review of the public private mix (PPM) TB plan by comprehensively evaluated the performance of this initiative in case reporting, management, treatment outcome, affordability, and accessibility from the district health system data to the TB Control Programs. Comprehensive literature review was done from the peer-reviewed journals; reports including global and national TB control programs along with technical guidelines on PPM were reviewed.

This paper focusses on PPM model in the TB case notification since its establishment in Pakistan based on the data reported by national TB control mechanisms by reviewing the involvement of and TB case contribution by private health care providers, active case finding through chest camps, TB case finding through enhanced case findings in large private hospitals, and case finding through lady health workers. PPM is a promising strategy for TB care and control and scaling up of PPM should include financial support in addition to material inputs. Moreover, improving program governance and training for the health care providers with the help of integrated collaborative mechanisms is warranted. There should be a standard reporting system for private practitioners for setting up standard guidelines for the Tuberculosis treatment.

**Keywords:** Public private mix, health care workers, active case finding, TB, case notification, out-of-pocket spending, GeneXpert, TB Control Pakistan.

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### Introduction

Public-private mix (PPM) interventions for TB control are being promoted and enhanced in Pakistan and other high burden countries as an innovative strategy for strengthening of health systems. These alliances are considered particularly significant for expansion of essential health services for pioneering the national and global visions espoused for healthcare systems (1). Although Pakistan is a major high TB burden country, barely 65% of TB cases were notified in 2019 leaving a gap of over one third undetected cases. "Big Seven" priority countries including Pakistan accounts for greater than 60% of the global gap between the number of individuals diagnosed with TB, estimated incidence and those reported to National authorities. The yearly number of notifications associated with PPM increased from 225,000 in 2010 to 1.8 million cases in 2019 (2).

Public private mix creates linkages among the health system that fosters TB patient detection, treatment, referral and service availability particularly in the poor resource settings. Although the majority of programs have increased TB care utilization and improved case management but PPM approaches are very effective due to financing and governance issues. Pakistan accounts for 5% of global new infections of TB with regard to the

caseload of both drug-sensitive and drug-resistant patients. The country has an estimated 562,000 new TB cases each year as of 2019 (3). However, the total cases of TB notified during 2019 were 360,472 that constitute only about 65% of the estimated prevalent cases.

Since the devolution of health function to the provinces in 2011, health expenditure as a percent of government expenditure (excluding debt servicing) rose from around 4.5% in 2012-13 to nearly 9% by 2018-19. Despite this increased provincial health spending, however, Pakistan compares poorly with similar lower-middle-income countries on indicators for public financing of health, and the contribution of public financing of health systems needs is limited to approximately 7%. As regards TB care, domestic spending contributes only 3% of the overall national tuberculosis control budget (2), with out-of-pocket (OOP) expenditure reaching very high – levels of over 64% of the total health expenditure is funded through the private sector and 89% of this is household OOP expenditure (4), leading to an increasing proportion of households facing catastrophic health costs (5). The weaknesses in the otherwise huge health system have persisted since the birth of country, however, the situation has become much more grave due to rapid population growth, especially during the last two decades.

To bridge the gaps in the funding to control tuberculosis, the country has largely been dependent upon international funding agencies, particularly The Global Fund (TGF) to Fight AIDS, Tuberculosis and Malaria that was established in January 2002. In Pakistan, TGF has been investing since 2004 and has gradually transitioned into the main source of financing of the TB program in Pakistan, enabling it to strengthen health systems by improving the infrastructure, uninterrupted supply of Anti-TB drugs, supporting drug management system, MDR-TB management, TB-HIV collaboration, strengthening public private mix, and enhancing the capacity of those engaged in delivering TB care services, while conducting monitoring & supervision at all levels. The GF has adopted a dual-track financing mechanism, having both public and private sector partners involved as Principal Recipients and Sub-Recipients.

The National TB Control Program (NTP) adopted a Public Private Mix (PPM) approach in 2010 to identify the missing TB cases in the community by involving private sector in TB control efforts because improvements in public sector health-care delivery alone would not have been sufficient to achieve the World Health Organization (WHO) goals of a 95% reduction in tuberculosis (TB) deaths and a 90% reduction in TB incidence rates by the year 2035. Engaging all relevant care providers in TB care and control is an essential component of the WHO's End TB Strategy<sup>2</sup>. Private-public mix (PPM) approaches create health system linkages that can facilitate TB patient detection, treatment, referral and service accessibility, especially in resource-constrained settings (6).

A patient centered approach is highly necessitated for ensuring quality assured and affordable TB services. Failure of the health care providers in providing quality care results in delayed diagnosis and treatment, increase in morbidity and mortality, increased drug resistance, high out of pocket expenditures, with only partial monitoring and evaluation of TB facilities. Involving the private and other health care providers assists in relieving the NTP burden including drug resistance, variations in diagnostic and treatment protocols and operational demands of large-scale service delivery (7). Mercy Corps (MC) is currently implementing three approaches for detecting the missing TB cases and their notification through the general practitioners (GP) model and enhanced active case finding. Following these interventions MC registered 55,000 Tb cases in January 2018 along with 94% success rate. In general, the districts in which MC is working TB case notifications rose from 8% in 2015 to 24% in 2018.

There are four main models of Public-Private Mix (PPM) for TB in Pakistan: PPM 1 for General Practitioners, PPM 2 for non-governmental organizations (NGOs), PPM 3 for private hospitals, and PPM 4 for parastatal or other public hospitals. The national and provincial TB control programs have been overseeing the PPM 2, PPM 3 and PPM 4 models while the private partners, Mercy Corps and The

Indus Hospital Network were mainly responsible for implementing PPM 1 model, until the latter was discontinued in 2020.

The paper aims to review the contribution of PPM model in overall TB case notification since its inception in the country based on the reported data by the district health system to the national and provincial TB Control authorities.

## Methodology

This was narrative review conducted through extensive literature review by using the MeSH words like; public private, mix model, tuberculosis and disease etc. Different resources like; published papers in peer-reviewed journals, National TB control annual reports and programmatic data, Global TB reports as well as technical guidelines on PPM were reviewed and synthesized this report according to the objectives of this paper. Findings were analyzed and presented in frequencies and percentage in the result.

## Results

Tuberculosis cases data reported by Mercy Corps and Indus Hospital Network for the specific rounds of funding from Global Fund were reviewed from 2010 till 2020. This includes the Consolidated Grant (Oct 2010-Sept 2012) in 60 districts, Single Stream of Funding (Oct 2012-Jun 2015) in 62 districts, New Funding Model (Jul 2015-Dec 2017) in 75 districts and the previous New Funding Request (Jan 2018-Mar 2020) in 66 districts. The latest funding request is yet under consideration. The reviewed data is further analyzed according to the specific interventions conducted under the PPM 1 model by Mercy Corps. A brief detail of the interventions is described below.

### Involvement of Private Health Care Providers

The backbone of PPM 1 model is the engagement of private health care providers (PHCPs) in the TB control program. These PHCPs are taken on board after a thorough mapping exercise in each district, and subsequently trained on the National Guidelines for the management of Tuberculosis. A cluster of eight to ten PHCPs clinics are then linked to a PPM laboratory whose lab technician is trained on sputum smear microscopy. The trained PHCPs then offer their services free of cost to TB patients, however, they are incentivized for each registered TB patient to retain their motivation. The record of all the patients is maintained on the specially designed tools developed by the National TB Control Program and is validated in the quarterly data review meetings held in each district. The reviewed data is then collated into the provincial and finally into the national database. Trained District Field Supervisors (DFS) remain in coordination with the PHCPs and help their staff in maintaining the patient records. These supervisors are also responsible for conducting the contact investigation of all bacteriologic positive TB patients.

**Active Case Finding through Chest Camps**

The Active Case Finding (ACF) intervention is designed to identify ‘missing TB cases’ in peri-urban and rural areas, especially the areas from where the local community cannot reach to PHCPs due to certain access related barriers. A field team comprising of a trained doctor, paramedic and lab technician organize the chest camps in pre-identified areas and provide TB services. The diagnosis is conducted either through the traditional sputum smear microscopy in ‘conventional camps’ or through the WHO recommended rapid diagnostics (GeneXpert machines) installed in mobile vans in ‘mobile screening camps. The mobile vans are also equipped with digital x-ray facilities to support the diagnosis.

**Enhanced Case Finding in Large Private Hospitals**

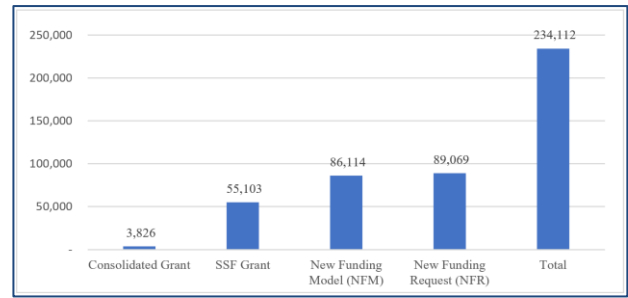
Under this intervention, large private hospitals are selected in some districts and the hospital medical officers and paramedical staff are trained on the TB case management. These hospitals are equipped with dark field microscopes or GeneXpert machines for providing TB services to the patients under one roof. Trained TB screeners are also placed in the OPDs of these hospitals to screen the asymptomatic or patients with less severe symptoms. The diagnosed patients are registered with the same hospital using the standardized tools and the management is started as per the set protocols.

**Involvement of Lady Health Workers**

In Pakistan, Lady Health Workers (LHWs) are the frontline outreach community health workers living within their catchment communities in rural areas and urban slums. Their involvement in the TB control program was conceived much earlier and actually implemented by Mercy Corps to address the issue of missing TB cases, diagnostic delays and loss to follow up of already diagnosed TB patients. The LHWs in selected districts are trained on the identification of TB presumptive cases and their referral to the nearby public and private health facilities. The LHWs conduct the screening during their routine visits to the households in their catchment population. The identified presumptive cases are then referred to the health facilities for diagnosis and further management. Each LHW is incentivized on the registration of one TB patient. The LHWs are also responsible for contact investigation and periodic visits of the registered TB patients residing in their catchment population to ensure treatment adherence and reduce loss to follow-up.

Mercy Corps has been able to register 234,112 TB patients under the PPM model since 2010. Grant wise case detection is shown in the Figure 1.

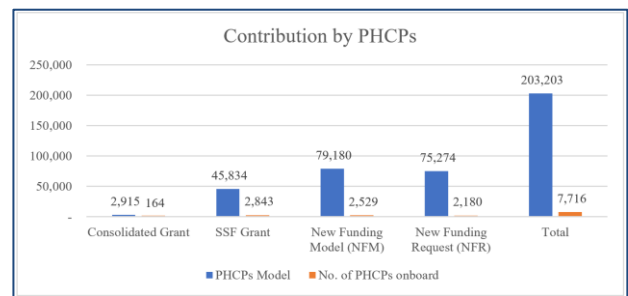
The overall case contribution in the districts where Mercy Corps implement TB activities has gradually increased from 5% in 2013 to 29% in 2019.



**Figure 1: PPM Case Detection in GF Grants**

**TB Case Contribution by Private Health Care Providers**

A total of 7,716 PHCPs has contributed to register 203,203 TB patients during the last four rounds of TGF funding. However, the number of districts and selected PHCPs has been varying in each grant. The Consolidated Grant was implemented in 60 districts with 164 PHCPs mostly in the large cities. The network of PHCPs has gradually expanded to sub-district (tehsil/taluka) level and currently Mercy Corps is working with 2,180 PHCPs in 66 districts.



**Figure 2: TB Case Contribution by PHCPs**

**Active Case Finding through Chest Camps**

Active Case Finding (ACF) intervention through chest camps has proved to be a successful strategy to identify missing TB cases. Through the organization of 10,179 chest camps Mercy Corps has been able to identify 14,077 TB cases. The overall case yield per camp thus, comes to be 1.3 TB cases per camp. Mercy Corps also conducted community gathering in 46 districts and around 455 chest camps and several camps were conducted through mobile vans, a total of 1624 patients suffering from TB were registered raising the average yield to about 2.4 cases per camp. Mercy Corps was able to successfully organized 7,569 conventional chest camps in the last four rounds of funding and have been able to identify 8,610 cases that would otherwise be missed from the system.

The mobile screening camps is an innovative intervention started in the previous grant. The organization of chest camps using the state-of-the-art mobile vans equipped with GeneXpert and digital x-rays machines have enabled Mercy Corps to find 5,467 cases from 2,610 camps. The case yield through this type of chest camp is 2.09 which is higher as compared to the conventional way of conducting chest camps.

### **TB Case finding through Enhanced Case Finding in Large Private Hospitals**

The Enhanced Case Finding (ECF) is another novel intervention that was started during the New Funding Model grant. This intervention is being implemented in 15 private hospitals in 06 districts of the Punjab province. Through this intervention Mercy Corps has been able to identify 6,493 additional cases.

### **TB Case Finding through Involvement of Lady Health Workers**

Mercy Corps has piloted this intervention through TB REACH Funding in three districts of Sindh (Sanghar, Umerkot and Ghotki) for one year from September 2017-September 2018. The intervention was carried out through 806 LHWs who were able to register 1,165 TB cases. The intervention model proved successful, and Mercy Corps was able to secure funding for this model from Global Fund in the next Funding Request grant in two districts of Sindh (Sanghar and Umerkot). Till March 2020, Mercy Corps has been able to register 340 TB cases leading to a total of 1,505 cases through this intervention.

## **Discussion**

The aim of the PPM is to expand the engagement of the TB control mechanism beyond the public sector in order to accelerate efforts towards attaining universal health coverage, while enhancing the demand for health services, including those for TB control by the communities. PPM creates prolonged, task orientation, and relationships between public and private sector by sharing finances and main competencies. Creative interactions and making of decisions provide sustainable improvements in providing upgraded utilization of health care services. At present Pakistan is not strategically aligned to address the health care problems of PPM. Although the public sector is trying to provide health services to all individuals yet due to limited financial and human resources, it is unable to reach all the people, underlining the need to casting the net more broadly. It has been estimated that around 70% of the overall health services are offered by the private sector, placing an enormous burden on the patients' pocket (8).

PPM interventions under the GF grant have been scaled up to 75 districts since July 2015, with a new voucher system for consultation and fee for laboratory testing and the main focus of the interventions was on case detection through innovative approaches like mobile health (mHealth) technology. Parallel and vertical systems supported by GF programs has often resulted in inefficiencies in the supply chain and support systems. Since the devolution in 2011, the country is facing a lot of problems related to human resources for health including unequal distribution of urban/rural health workers, weak management system, shortage of skilled health care workers, a non-regulated private sector that operates specifically in urban areas. However, organizing the HRH functions and establishing the linkages and coordination

among the provinces and Federation for developing and implementing HRH policies and decisions is complicated (9). The public sector is the prime provider for preventive and hospital care to urban and rural populations. The public sector contributes to 25% of the curative services. Multiple health care facilities are under the control of the provincial and district departments of health (10). The private sector caters to the majority of the population in Pakistan, with people preferring it due to their suitability, availability, shorter waiting times, flexibility in timings and staff availability. TB cases managed by private practitioners are neither recorded nor reported in the National database. Moreover, most of the private practitioners lack sufficient knowledge for managing TB cases. The national TB control authorities have employed four models to establish linkages between public and private sector for improving the diagnostic and treatment facilities for enhancing TB control.

PPM 1 has been implemented in 88 districts out of 149 and around 3,500 private healthcare providers and 435 private laboratories are reporting cases to the national case reporting networks. The district TB control programs provide ATT drugs to the GPs and the equipment and reagents to the labs and incentives are also being given. Efforts for active case findings are being promoted for diagnosis, registration, treatment, reporting, follow up and screening of TB patients. PPM 2 includes 116 BHUs including doctors, paramedical staff and laboratory staff under NGOs are trained on national TB guidelines. Incentives are being provided to paramedics and lab technicians for reporting the patient data. PPM 3 includes 45 private hospitals running all around the country. Large hospitals are linked with the private sector. Hospital staff are trained on national guidelines and all the facilities are provided through district health departments. PPM4 includes 70 parastatal hospitals and the national control program supports Railways, Military, Social security, prisons and other areas for providing TB care facilities. A fifth PPM 5 model includes Hospital DOTS Linkage being implemented since 2008 for upgrading DOTS coverage to tertiary hospitals. Lack of implementation of TB DOTS protocols, deficiency of resources, and heavy patient load results in missing cases and loss to follow up. There is a huge patient load on tertiary care hospitals and there is a need for expansion of TB care facilities. The lack of execution of proper TB DOTS protocols, inadequate resources, and mixing of patients among various departments resulted in missing of cases and treatment failure. All tertiary care hospitals and teaching hospitals in private as well as in public sector, TB care facilities under four PPM models are involved in TB care services, including PMDT sites for Dr-TB patients and TB/HIV sentinel sites, while providing routine diagnostic facilities.

Private sector pharmacies play a critical role in the diagnosis and treatment of TB. Pakistan, Philippines, Indonesia, and India have largest sale volume of around 65% to 117% of first line ATT drugs (12) so there is a need of

appropriate policy and market response through greater PPM facilities, availability, administrative and quality pursuance. The principal challenges that PPM faced in implementation of TB case notification are that the private providers have neither recorded nor reported the data at national level. Majority of the NGOs and private hospitals are engaged with public sector and the practitioner have insufficient knowledge for managing the TB cases on standard guidelines. Barely 4% private healthcare facilities are engaged with National TB Control Program and PPM is only limited to 88 out of 157 districts. The involvement of Hakeems, traditional healers, homeopaths, spiritual healers and pharmacies for referral of presumptive TB cases to the DOTS trained facilities for managing the disease (9). Only 13 out of 88 PPM implantation districts are providing facilities for coverage of childhood TB treatment (10). Majority of the PPM facilities are still relying on traditional techniques of AFB microscopy and there is absence of proper mechanism for electronic recording and reporting at facilities. There is a high priority need for expanding the PPM model interventions to all districts and health care facilities across the board through enhanced domestic funding. Establishing childhood TB management network facilities by engaging competent health professionals, development of referral mechanism for the informal sector (qualified hakeems and homeopaths), formal sector (pharmacies, LHW, LHV) and establishing the proper reporting and recording tools. Integration with other management programs, Provision of modern diagnostic tools for collaborating with private sector facilities by ensuring the availability of GeneXpert machines and digital x rays and training of concerned individuals for proper working of operations. For reducing burden of notification through utilization of reporting systems including the electronic recordings. Establishment of online learning portal for HCP providers and that could be included in the national database. For reducing the burden of documentation through electronic recording and reporting system with the help of online software and mobile application for TB patient registration. Development of smart phone applications for entering the patient data collected through private general practitioners.

## Conclusion

There is a need for extending the PPM coverage to all districts and health care facilities through involvement of private sector GPs, NGOs, private and parastatal hospitals for upgrading the lab facilities as well as involvement of pharmacies for referral of TB presumptive from informal to formal sector mapping of health care facilities. There is also a need for setting up standard guidelines for anti-tuberculosis treatment. PPM is a promising strategy for strengthening TB care and control and there is an immense need for further replicating it through better program governance and capacity building of the health care providers involved through integrative mechanisms.

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