SCHOOL OF PUBLIC HEALTH,

COLLEGE OF HEALTH SCIENCES,

UNIVERSITY OF GHANA

FACTORS AFFECTING PUBLIC-PRIVATE MIX STRATEGY FOR TB CARE AND CONTROL IN URBAN AREAS IN GHANA

BY

MELVIN KATEY AGBOGBATEY

(10162288)

A DISSERTATION SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GHANA, IN PARTIAL FULFILMENT OF REQUIREMENTS FOR THE AWARD OF THE MASTER OF PUBLIC HEALTH (MPH) DEGREE.

JULY, 2019

DECLARATION

I, Melvin Katey Agbogbatey, make a declaration that the content of this research thesis, save for cited references which have been duly acknowledged, resulted from my original work under academic supervision, and has not been submitted elsewhere for another degree either in whole or in part.

Melvin Katey Agbogbatey (MPH Candidate)

Signature……

Date……

Patricia Akweongo; PhD (Academic Supervisor)

Signature……

Date……

DEDICATION

Dedicated to my family; Avery-Melissa in particular. Aspire to greater heights.

ACKNOWLEDGEMENT

I am deeply grateful to the following for their diverse contributions to the conduct and successful completion of this work:

Dr. Patricia Akweongo, my academic supervisor for the astute technical guidance on the research process and art; and for her unrelenting scrutiny of my work – She saw everything!

Professor Richard Adanu, for the exposition on Public health as a career option.

Dr. Phyllis Dako-Gyeke, Dr. Emmanuel Assampong and Dr. Franklin Glozah for contributing to my training in implementation research.

Mr. Richard Akuffo (PhD Candidate) for that comprehensive brainstorming session!

Mr. Tony Godi (Department of Biostatistics) for initial exposure to time series analysis.

Mr. Raymond Gokah of the National TB Program; Mr. George Kumagah of the STOP TB Alliance; Ms Jabina Anaman of Aurum Institute; Mr Bernard Tawiah of Accra Metro Health Directorate; Mr. Amoateng of Kumasi Metro Health Directorate; Mr. Nicholas Duho of the Community Outreach Alliance; for the extensive support during the field work.

All TB coordinators and focal persons in public and private institutions who participated in the interviews.

All students of the HPPM class of 2018/2019 and TDR cohort 4 at the School of Public health, for the many communal learning experiences.

Mrs Engmann and Mrs Appah at the Office of Research, Innovation and Development (ORID), for the support over the course of the program.

My research assistants (now associates), Felicia, Perfect and Benedicta; for the hard work, and for tolerating my pedantry on their data management.

Finally, but not least, to WHO/TDR for sponsoring this master's program and funding this research.

ABSTRACT

Introduction: Tuberculosis exacts heavy morbidity and economic tolls globally – more than ten million incident cases and $9.2 billion of tuberculosis (TB) expenditure accrued in 2017 alone. The World Health Organization introduced the Public-Private Mix (PPM) initiative in the late 1990s as part of measures to achieve TB control targets by strategically engaging all health providers. Ghana, one of the thirty high-burden TB nations implemented PPM in 2003 in urban areas of the country. Whilst TB treatment success rate in Ghana is on a par with global targets, national TB case notification has been declining steadily. Also, the PPM initiative is yet to be scaled-up in Ghana. The evidence from several studies in different locales suggest that the performance of PPM is highly dependent on the context within implementing areas. It is unclear what contextual factors affect the PPM initiative in Ghana and what the trends in case notification in the implementing areas are.

General objective: To explore factors affecting Public-Private Mix strategy for TB care and control in urban areas in Ghana.

Methods: Twenty-three in-depth interviews, using a semi-structured interview guide, were carried out with TB coordinators involved in PPM-TB within the Accra and Kumasi Metropolitan areas of Ghana. Quantitative data on TB cases notified in Accra Metro (2007 to 2018) and Kumasi Metro (2012 to 2018) were obtained with a data extraction form to describe trends in case notification. The autoregressive moving average (ARIMA) method was used to forecast TB case trend for 2019.

Results: The most prominent amongst health system factors affecting PPM implementation included funding constraints, poor monitoring and supervision, and high attrition rates of trained TB workers. The involvement of an implementing partner (Aurum Institute) since 2018, is facilitating PPM in the urban areas. Case notification has been declining, with Kumasi Metro notifying persistently lower rates than Accra Metro. Predictive modelling forecasted a potential change of 4.5% and -0.3% in the expected 2019 annual notification rate for Accra and Kumasi Metros respectively.

Conclusion: The PPM initiative has declined in productivity since it was initially rolled out, but holds potential for improvement and scale-up if strengthened.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ACF	Autocorrelation Function
AMA	Accra Metropolitan Assembly
ANOVA	Analysis of Variance
ARIMA	Autoregressive Integrated Moving Average
BMU	Basic Management Unit
BCG	Bacille Calmet Guerrin
CDC	Centre for Disease Control
CSO	Civil Society Organization
DOTS	Directly Observed Treatment Short-Course
GHS	Ghana Health Service
HIV	Human Immunodeficiency Virus
KATH	Komfo Anokye Teaching Hospital
KMA	Kumasi Metropolitan Assembly
MDG	Millennium Development Goals
MDR-TB	Multi – Drug Resistant Tuberculosis
MOH	Ministry of Health
NGO	Non – Governmental Organization
NSA	National Situational Assessment
NHIS	National Health Insurance Scheme
NTP	National Tuberculosis Program
PACF	Partial Autocorrelation Function
PPM	Public-Private Mix
RBF	Results – Based Financing
SDG	Sustainable Development Goals

STATA	Statistics and Data
TB	Tuberculosis
USAID	United States Agency for International Development
WHO	World Health Organization

CHAPTER 1: INTRODCUTION

Tuberculosis is a completely curable disease; yet millions of lives continue to be lost to the disease since the WHO declared it as a public health emergency in 1993. The problem of drug resistance, the HIV pandemic and the potentiating effect of poverty on the disease have all been instrumental in this alarming state of emergency. By current reports (WHO, 2018b), over ten million people worldwide succumbed to the disease in 2017 alone. A need to strengthen initiatives designed to curb the disease is therefore paramount.

Tuberculosis (TB) is a contagious infection caused by a bacterium called *Mycobacterium tuberculosis*. Though it may affect many parts of the body, it primarily causes infection in the lungs. Exposure to the organism may result *active* TB disease, but it usually causes infection without necessarily producing disease symptoms – this is called latent TB. An unexplained cough typically lasting more than three weeks is the commonest symptom. TB infection of the lungs is spread by inhaling infected droplets released by a coughing or sneezing patient – so proximity is a risk factor; this transmission factor comes into play in overcrowded conditions like prisons; in localities with high TB prevalence; amongst health workers and patients in health facilities. An equally important predisposing factor is the presence of a weakened immune system, as seen in HIV and diabetes (CDC, 2013). Poverty also demonstrates a potent synergistic vicious cycle with TB (Barter, Agboola, Murray, & Bärnighausen, 2012); thus expectedly, the disease is more common amongst populations in developing countries. As part of efforts to control the disease, many policies, strategies and interventions have been developed and revised over the years by global and local public health bodies to help stem the tide of mortality and morbidity caused by the disease worldwide. These polices include the global Stop TB Strategy which ended in 2015, and its successor the End TB Strategy. These policies deployed critical innovations like Directly Observed Treatment Short-course (DOTS) and the Public Private Mix (PPM) among others to help achieve TB control targets.

Historically, control of TB has been largely a 'public sector' endeavour, spearheaded by the National TB Programs (NTPs) of various countries, employing DOTS as the foremost control strategy. Based on trends in TB morbidity and mortality, the WHO in the late 1990s introduced the (PPM) intervention to accelerate TB control.

PPM was implemented in Ghana in 2003, pursuant to the drive for partnerships in TB control spearheaded by the WHO. It is characterized by active efforts to engage private health providers to augment the public sector in TB control. This means that private health care providers are engaged as partners and assigned certain tasks in TB control, according to their respective capacities, interests and willingness, with the NTPs acting in a supervisory role. This contrasted the status quo where NTPs were essentially the sole predominant actors in TB control efforts at the country level (WHO, 2017b). One of the underlying premises is the fact that many health care consumers prefer to utilize the services of private health providers (Stop TB Partnership, 2010), who in many cases offer more personalized care and enjoy high levels of trust from their patients. Patients referred from private facilities to government facilities may therefore default in reporting for treatment on account of lack of confidence (and convenience) in the public sector (Mistry, Lobo, Shah, Rangan, & Dholakia, 2017; R. et al., 2004; Zafar Ullah et al., 2012). In the case of Ghana, there may be a particular vulnerability resulting from this situation especially since TB drugs cannot ordinarily be accessed outside of the public sector. The strategic inclusion of private providers therefore is necessary and simultaneously highly opportune for achieving successful outcomes, because it creates an environment within which management of TB can be monitored and regulated for better quality of TB care in the private sector. However, without designing the intervention to adapt to the contextual complexity of the healthcare ecosystem, the risk of unsatisfactory outcomes persists. A fairly recent systematic review concurs on this point when it reported that PPM has proven to be an invaluable tool in some countries, whilst it has underperformed in others, due to the dynamics

introduced by contextual differences (Lei et al., 2015). This suggests that success of the initiative is not necessarily guaranteed – Ghana for instance, is yet to achieve the intended nationwide scale-up of PPM despite its initial roll-out in 2003 (Ministry of Health, 2009); and an external review of TB activities in Ghana called for revitalization of PPM (Ministry of Health, 2013), on account of the dormancy of the initiative. TB case notification in particular has fluctuated around a stagnant average of 60 cases since 2013 (MOH, 2015). Treatment coverage, expressed as the proportion of estimated incident cases that are notified is around only 32% (WHO, 2018b). Evidently, in spite of the soundness of the PPM concept in principle, certain factors possibly influenced by local context may be important determinants of program outcomes. Gaining insights into what these factors are and how they may alter the dynamics of this strategy is crucial in advancing the fight against tuberculosis in Ghana.

1.1 Problem Statement

Ghana's NTP (National TB Program) with global fund support, developed guidelines for and implemented PPM (Public-Private Mix) in 2003 with the following overarching aims: to augment existing interventions in increasing TB case notification, treatment success rates and also to reduce the financial burden of TB treatment on patients. Since 2013 however, case notification for TB (all forms) in Ghana has been stagnant at around 60 cases per 100,000 population, contrasted with working targets for 2018, 2019 and 2020 at 113 –, 119 – and 125 cases per 100,000 population respectively (MOH, 2015). Treatment success rates on the hand, whilst encouraging (84%), still fell short of local targets set for 2015 to 2018 (87 –, 88 –, 89 – and 90% respectively) (MOH, 2015).

With the strength of (potential) roles played by private players in the health sector, it remains important to understand and optimize the opportunities these private sector actors afford, in order to realize the program goals. But, since inception in 2003, there is little evidence to help understand implementation issues concerning how private providers are selected, trained and

assigned tasks; contracting mechanisms; and monitoring and supervision – these form the building blocks on which PPMs are implemented. It has been noted that implementation of PPM can be highly contextual resulting in varying degrees of success in different countries (Lei et al., 2015). Therefore, it is necessary to understand whether these processes are on-going according to the set guidelines in Ghana, from the perspective of both the private and the public sector actors, and what contextual dynamics may impinge on success. It is also unclear what contribution PPM is making to TB case notification and management in these areas. It is also note-worthy that the WHO (2017b) recommends that PPM plans developed by countries must have a roadmap for extending coverage of the initiative nationwide. Yet, scale-up of this intervention is pending. This research will be instrumental in bringing to the fore, some insights to inform optimization of the Public-Private Mix.

1.3 Justification

This research explored and documented insights into the PPM (Public-Private Mix) program since its inception in Ghana a decade and half ago. This study aimed at contributing to addressing issues crucial to the implementation of PPP such as how private providers are engaged and trained, supported and supervised to perform TB care roles, and whether these processes and roles are carried out in accordance with set guidelines developed by the WHO and the NTP. These offered insights into potential system strengths and weaknesses, in order to institute remedies and to inform future health provider engagements.

This study also sought to uncover which other synergies may exist among private providers that may not yet have been captured under the umbrella of the PPM to help further strengthen TB control activities in Ghana. The trend analysis objective of this research as regards PPM case notification trends, was designed to bring to the fore the current state of PPM in terms of contribution to TB case notification. These may also be instructive for any scale-up attempts.

1.4 Research Questions

1. What contextual factors affect implementation of the Public-Private Mix strategy for TB control in urban areas in Ghana?
2. What are the trends in TB case notification in urban areas in Ghana?

1.5 Study Objectives

General Objective

To explore factors affecting the Public-Private Mix strategy for TB control in urban areas in Ghana.

Specific Objectives

1. To explore contextual health system factors in Public-Private Mix implementation.
2. To identify facilitators and barriers to the use of the Public-Private Mix.
3. To analyze TB case notification trends in the implementing urban areas.

1.6 Conceptual Framework

The conceptual framework is constructed on the basis of recommendations as well as lessons emanating from local studies and experiences within implementing countries. Implementing Public-Private Mix schemes involves a process of selection and prioritization of providers. This requires the identification of suitable partners decided according to factors like capability and strategic location of the providers. Then tasks required for the program have to be predefined according to set parameters like the needs of the area, competencies and resources for the tasks. Another important step is the recruitment method or contracting mechanism which will have to be established and utilized according to the preferences of the parties involved. Issues of how selected providers are trained as well as subsequent monitoring and supervision are all processes that need consideration and definition as part of initial processes (Stop TB Partnership, 2010). These factors interplay to give definition to and determine performance of these roles and tasks.

Potential roles that emerge for providers to be engaged in PPM schemes are different depending on the provider's capability, competence and preferences. These are described as the "Task Mix". Some providers may be deployed to identify and refer cases, to offer supervised treatment, to perform diagnoses and others may be identified to coordinate program activities or to play advocacy roles e.g. in creating awareness at all levels from the top of the political hierarchy down to the community.

The local policy orientation and commitment towards TB, the availability of technical support including guidelines, availability of funds and specific financial incentives such as the enabler's package are to a large extent the determinants of program success or failure.

Some factors reported in literature to militate against PPM include a poorly organized private sector which may reduce efficiency, weak systems for coordinating referrals, a perceived lack of transparency among partners, weak quality assurance and the time constraints of providers

who also have other obligations towards their status quo engagements (Daniel, Adedeji Adejumo, Abdur-Razzaq, Ngozi Adejumo, & Salako, 2013; Lei et al., 2015; Nwe et al., 2017; WHO, 2015). These factors may act at many levels against the realization of PPM outcomes. The expected outcomes of PPM include a positive trend of utilization (increase in providers engaged), increased case notification, increased treatment success, and a reduction of financial burden on patients and their household. Ultimately, nationwide scale-up is a desired target.

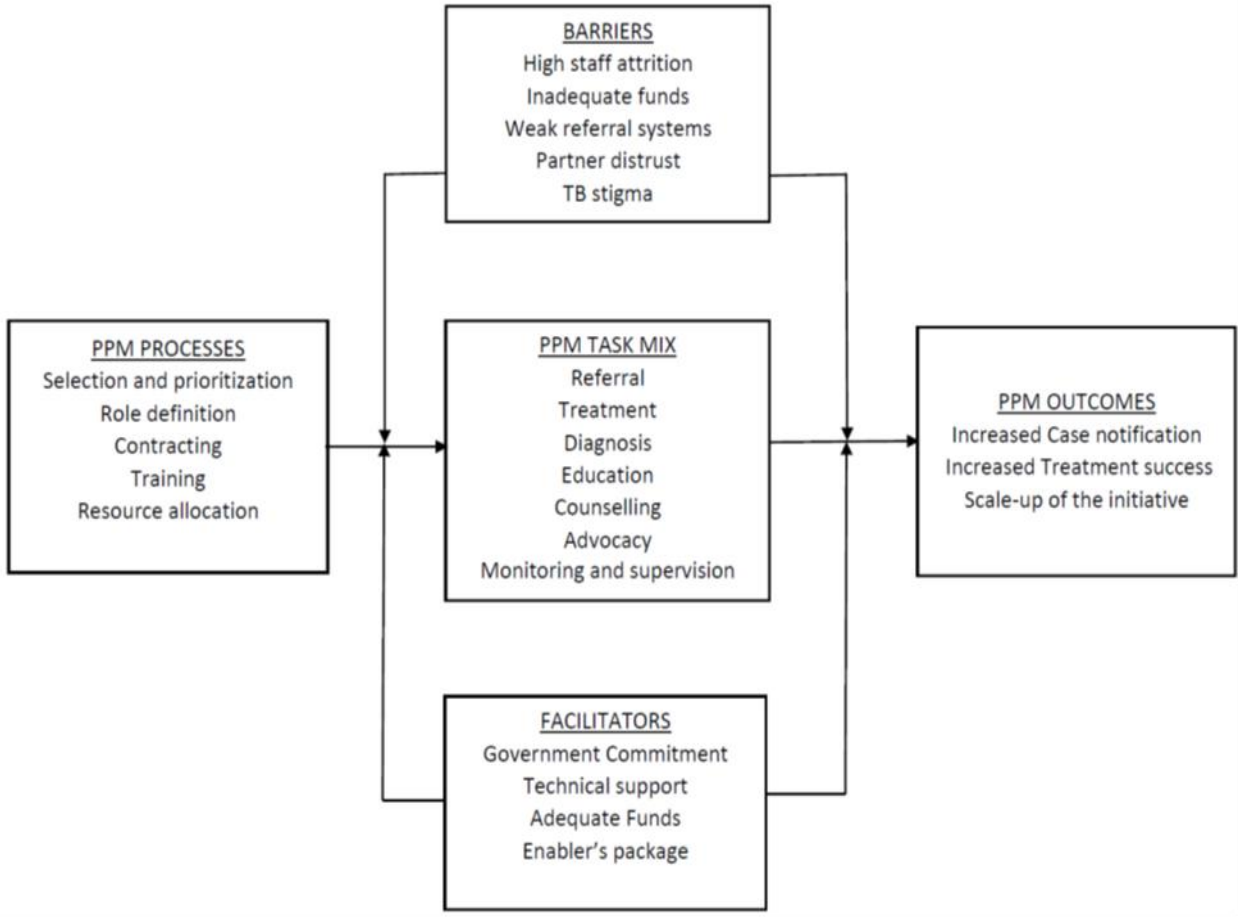

Figure 1.1: Conceptual Framework for the study

CHAPTER 2: LITERATURE REVIEW

2.1 What is Tuberculosis?

In the third world, tuberculosis is synonymous with poverty. The apparent synergy between this chronic human affliction and the destitution it visits on vulnerable populations can threaten economic development and human survival in poor regions. In spite of the propensity of TB to scourge developing countries, the disease is represented in every nation. Consequently, myriad interventions exist; global and regional in scale, and those with local adaptation, all implemented in order to combat the menace this infectious disease presents.

Mycobacterium tuberculosis is the principal infectious agent that causes TB. It is one of a group of bacteria referred to as the *M. tuberculosis* complex, most (though not all) of which have the potential to cause disease (CDC, 2013).The organisms are spread within tiny airborne droplets which are released when infected people cough or sneeze. The droplets may remain in aerial suspension for several hours (CDC, 2013). When inhaled, these droplets travel through the airway to the lungs where they may cause infection. The usual symptoms typically seen with TB disease include a cough lasting three weeks or more (in the case of pulmonary disease); sputum that may be blood-stained; shortness of breath; weight loss; low grade fever, and night sweats. Other specific symptoms depend on the site of infection which could be lymph nodes, the brain, intestines, kidneys, spine, bones or other parts of the body. Death can result without treatment.

Not every person develops TB disease on exposure to the bacteria. The majority develop latent TB; which is where a person has the bacteria within the body but has not developed disease. The immune system fights to keep the bacteria under control to maintain this latency status. Such people ordinarily cannot spread the bacteria to others. Over the course of their lifetimes however, people with latent TB if not treated, have a ten percent risk of the infection becoming active (CDC, 2013). This risk may be higher for people with compromised immune systems.

Aside weak immune systems, other factors such as population density in locales, duration and frequency of contact with infected persons and ventilation in households all play important roles in disease transmission (CDC, 2013).

2.2 The Burden of Tuberculosis

Over 95% of TB cases and deaths occur in less developed countries (Ghana NTP, 2012). The WHO (2018) estimated 10 million incident cases of the disease worldwide for the year 2017, during which year over 1.6 million deaths were recorded. Of these deaths, more than 15,000 including those with HIV co-infection occurred in Ghana (WHO, 2018a).

TB burden appears to conform to a strong socio-economic gradient within poor and vulnerable populations, evidenced in part by the higher incident and prevalent cases, and poorer disease outcomes among such populations. This sets up an un-ending vicious cycle of disease and poverty for the affected households because patients are unable to work for income due to illness; and also the fact that having to report daily to the health facility for DOTS treatment can be very economically disruptive (though in some cases, community health workers visit patients in their homes to administer treatment). Transportation and sustenance costs for patients can also be quite significant. Together, these factors can dramatically depress income-earning capacity. A systematic review on the TB-poverty duo showed that TB care costs to patients in sub-Saharan Africa could be widely divergent depending on the circumstances; and in some cases this cost can be as high as ten times the average annual income among low wage populations (Barter et al., 2012). In 2016, 64% of TB patients in Ghana were estimated to have suffered such "catastrophic" economic costs (WHO, 2018a). In a study on patient care costs across three continents, it was revealed that as much as 70% of TB patients in Ghana had to stop work at one time or other due to the illness, with approximately 50% staying out of work for more than 6 months; and for some patients with a history of hospitalization at one point, personal income losses averaged 67% (Mauch et al., 2013). This underscores the burdensome

nature of the disease amongst households that have suffered the TB affliction, as well as the high cost of remedial measures that must be taken by global health bodies and governments. According to the global TB report of 2017, $9.2 billion is required annually for execution of TB programs and activities, and a further $1.2 billion for research and development (WHO, 2017a). Between four-to-five years spanning 2016 to 2020, the WHO estimates expenditure on TB interventional activities to approximate $58 billion (WHO, 2018b). This staggering investment in TB whilst justified, is undoubtedly a huge opportunity cost for other public health interests globally. Regarding local micro-level statistics, and based on variations in regional poverty levels in Ghana, between $75 and $349.5 is required to detect and successfully treat one case of TB (MOH, 2015). These per capita costs significantly contribute to the overall expenditure on TB in the country; this currently stands at $29 million for 2018. Only about 29% of this amount was funded – with a mix of domestic and international support, leaving a deficit of 71% (WHO, 2018a). This current situation is a negative trend in TB financing in Ghana as compared to 2016 and 2017 for instance, which had budgets in excess of 80 and 60 million dollars respectively according data from a WHO (2018a) report. Thus, with the expectation of even better results from the lower financial input, a heightened efficiency is necessary in order to maintain the momentum against TB. PPM is one of the devices in the TB toolkit for driving towards better performance.

2.3 What is the Public-Private-Mix?

Public-Private Mix can be conceptualized as an integration of all relevant healthcare practitioners and facilities, working to achieve global TB targets through the use of standardized tools, such as (and mainly) the International Standards for TB care (WHO, 2017b). It comprises of a heterogeneous mix of collaborative efforts between private facilities and the NTP (public-private); between the NTP and other public institutions including prisons, military and teaching hospitals (public-public); collaboration among NGOs, civil society

organizations and private health providers (private-private) (WHO, 2017b). These strategic collaborative mechanisms exist to ensure that irrespective of which point a patient reports to within the health network, they are promptly identified for prompt referral or treatment. It also explicitly recognises and harnesses the role of non-clinical and non-mainstream actors in healthcare such as civil society organizations (CSOs). As at 2010, and with few exceptions, all countries with a heavy TB burden were at various stages of PPM implementation; and many were deploying PPM strategies with Global Fund support (Stop TB Partnership, 2010); with the Global Fund itself being a public-private partnership.

Ghana was one of the first African countries to integrate the concept into its TB control activities. Pilots were implemented in Accra and Kumasi under the auspices of the Global Fund (for malaria, TB and HIV) in their first round grant from 2003 to 2006, with subsequent expansion to four other urban areas with provision from the fifth round grant of the Global Fund that run from 2007 to 2011 (WHO, 2015).

2.4 Generic Framework of the Public-Private Mix

The schematic below (figure 2.1) shows how PPM is generally constituted. It comprises of the NTP in a stewardship role over other actors in the scheme, providing quality assurance and supervision and monitoring. Other levels include a Basic Management Unit (BMU) which is commonly a district health facility to directly supervise service delivery entities like hospitals, private clinics, pharmacies and NGOS. Engagement of private facilities into PPM is facilitated by using mechanisms such as a Letter of Agreement or Memorandum of Understanding (Stop TB Partnership, 2010).

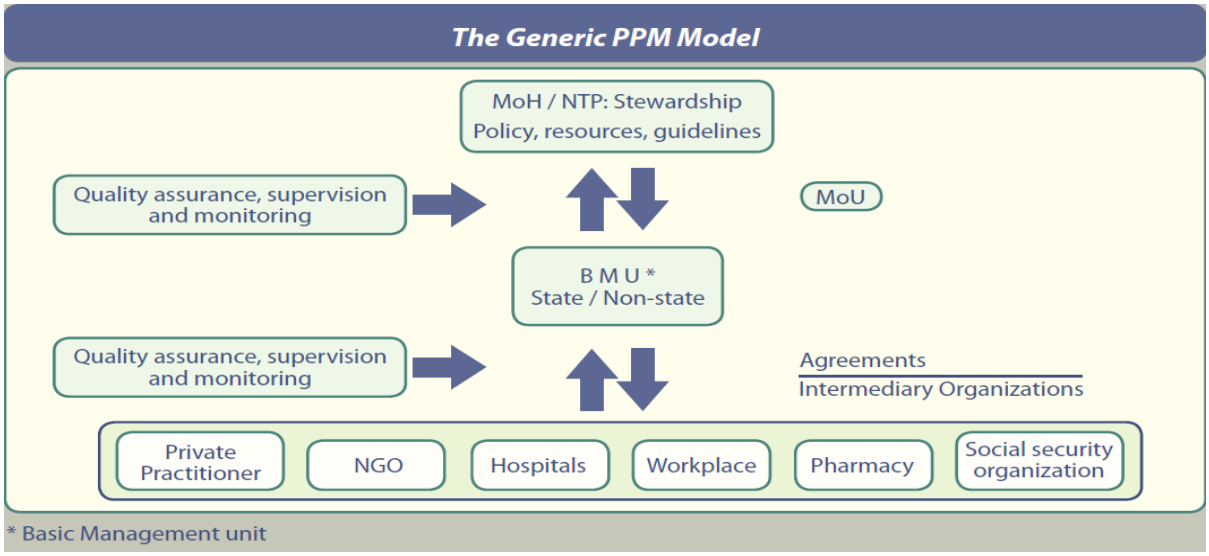

Figure 2.1: Generic PPM model. Source: Public Private Mix for TB care and Control-A Tool Kit.

2.5 Factors Affecting Public-Private Mix Implementation

This section reviews the relevant considerations that must be accounted for the initiation of Public-Private Mix. These border on funding for PPM including the enablers' package, how providers are prioritized and selected, monitoring and supervision, training, quality and scope of service delivery in PPM schemes as well as information.

2.5.1 Funding for TB Control

Control of TB is a humanitarian venture that deserves funding. Providing funding for TB is one way by which government commitment to TB control is exemplified (Amo-Adjei, 2014). For funding of PPM to be sustainable, it must be factored into domestic budgetary plans as one way to ensure continuity. Domestic and donor funding are among the principal mechanisms utilized to finance TB control (Global Fund, 2019). Ghana was among the highest funding beneficiaries of PPM grants for TB besides China and Indonesia (Stop TB Partnership, 2010). In recent times TB funding for Ghana has generally been on the decline with persistent budgetary deficits every year; of the 2018 TB budget of $29 million, a mere 29% was funded. Comparatively, 2016 and 2017 had budgets exceeding 80 and 60 million dollars respectively (WHO, 2018a). These undoubtedly have consequences on the performance of TB control

interventions. According to a study by Lal et al., (2011), financial investments in PPM have been cost-effective, with China, Nigeria, India and The Philippines as examples of countries experiencing PPM contribution to TB case detection above 25%, and with high success rates following treatment, after an estimated average spending of 10% of TB grants on PPM activities within various countries. Clearly fund performances differ across recipient countries. With increasing demand for efficiencies in fund utilization, results-based financing (RBF) approaches are increasingly becoming a favored model among donors who are driven by results (Kutzin, Yip, & Cashin, 2016).

2.5.2 The Enabler's Package for TB control

One of the most important incentives in TB is described as the enablers' package. Its design was the main attraction of PPM and was largely responsible for the appeal the initiative held to many private providers, due to the financial benefits it brought; and also for the immense social protection it afforded to TB patients who were mostly poor (Bonsu, 2018). It was the main instrument deployed for strengthening the program as a support mechanism to aid TB patients and TB care providers as far as TB care costs were concerned (WHO, 2015). Portions of the package were allocated to patients, their care providers (staff of facilities), and the treating facility. In Ghana, it facilitated patients' transportation and food supplements for patients, monetary incentives to TB case finders and treatment supporters; supported salaries of some TB staff as well as aided TB care providers in their tasks such as home verification (Amo-Adjei & Awusabo-Asare, 2013). Clearly, it provided many benefits to several actors within the TB arena. The administration of the package was however not without its own challenges; for instance, during a site visit to Ghana by the Global Fund, myriad problems were identified concerning delays with receiving the enablers package at the facilities; and a lack of specific guidelines on the disbursement of the facility (WHO, 2015), resulting in a situation where funds were not disbursed fairly, or even at all in some instances (Amo-Adjei, 2016).

These factors, in addition to a backdrop of dwindling funding in general, all effectively contributed to the suspension of the enablers' package from Ghana. Currently a form of the package exists only for supporting drug resistant TB and TB in pregnancy in Ghana.

2.5.3 Selection and Prioritization of Providers

This is the process by which private providers are identified as potential partners and steps initiated to engage them. The process can be flexible bearing in mind the divergent preferences and orientations of private providers. Khan, Salve, & Porter (2015) rightly observed that private providers are not a necessarily homogenous group – they vary widely according to operating models and interests. This is an important strategic consideration if any meaningful dividends are expected from their engagement. This means the approach to each provider may need to be individualized. The Stop TB Partnership (2010) recommends establishing an initial contact with providers in an area earmarked for implementation, in order to determine their willingness to get involved and then mapping the geographical locations of these providers. The process of selection and engagement may be facilitated by approaching them through professional associations to which these providers may belong or intermediaries such as NGOs (Stop TB Partnership, 2010). After identifying these providers, they should be prioritized according to willingness to participate (Stop TB Partnership, 2010), whilst also considering their current capacity in terms of human and other resources, as well as the size of their patient base.

NGOs' participation in TB care is opportune and appropriate because they in most cases work in the communities, with disadvantaged people, and generally have lower levels of bureaucracy. Their usual area of expertise is advocacy and activities concerning social mobilization, but they may also play roles in TB service delivery such referral, treatment supervision, awareness creation, influencing policy, mobilizing resources, etc. (Stop TB Partnership, 2010).

2.5.4 Contracting Mechanisms for engaging private providers

Contracting mechanisms are ways by which collaborations are formalized in PPM, setting the boundaries and obligations of the alliance. The memorandum of understanding remains the commonest means for this purpose. This is usually written and may be subject to legal enforcement. It includes a detailing of the PPM roles or functions expected to be performed by the consenting provider. Informal verbal agreements that are not covered by any documentation may also be given by private providers (Lei et al., 2015). Another type of contracting mechanism for formalizing collaborations is the letter of agreement (Stop TB Partnership, 2010). Literature suggests that when contracting mechanisms are involved, outcomes such as case detection, case management and treatment success are particularly enhanced (Lei et al., 2015).

2.5.5 Training of providers for TB care and control

Training for service providers that are engaged for PPM activities is core to the efficient functioning of the program. This is to ensure that appropriate methods are used in all tasks relating to TB control. The Stop TB Partnership (2010) recommends careful selection of trainers, preferably involving senior NTP officials. It also recommends that the training program is tailored to the different definitional tasks under PPM; compliant with the local circumstances in terms of training methods; equipped with appropriate training materials and tools; complemented by a suitable supervision strategy; and continuously informed by feedback from evaluations. Training is particularly noted as crucial for staff involved in data entry and reporting, since the integrity of data is a backbone of the monitoring and evaluation process (Stop TB Partnership, 2010). The Ghana PPM guidelines further recommends modifying the conduct of training activities to suit the conveniences of private providers so as to encourage their participation (GHS/MOH, 2003).

2.5.6 Monitoring and Supervision in Public-Private Mix

The monitoring and supervision process creates avenues for improving knowledge, skills and attitudes of workers. It also ensures compliance with set standards in order to achieve stated objectives, and provides the basis for justifying continued funding for PPM (Stop TB Partnership, 2010). Resource provision for monitoring and supervision and related activities is an essential component of PPM implementation; and this is the role of the National TB Program. Essential tools for this process include treatment cards and registers, checklists for supervisory visits and quarterly report. Indicators recommended for assessing adequacy of monitoring and supervisory activities in PPM include the number of visits, number of providers trained, and number of different categories of providers engaged actively (Lal, Sahu, et al., 2011).

2.5.7 The Task Mix – Roles defined for Providers in the Collaboration

The notion of task mix represents the diversity of roles that exist or are created within PPM schemes and how to allocate these tasks to various health providers and actors in accordance with their respective capabilities and competencies, as well as preferences. The WHO through the Stop TB Partnership (2010) advocates this as a foremost consideration in engaging providers. Some providers may be able to take on (almost) the entire range of tasks under PPM, whilst others may simply prefer to refer TB suspects to the government facility for instance. Allocating *medical tasks* to informal and non – qualified practitioners is not recommended (Stop TB Partnership, 2010). The tasks are broadly classified as clinical or public health tasks. By default, the NTP is responsible for the public health tasks whilst providers are mainly involved in clinical tasks. Whilst there is sufficient guidance on what roles should be assigned to each provider (WHO, 2017c), studies suggest that whether these recommendation are actually translated into action is unclear (Konduri, Delmotte, & Rutta, 2017). Figure 2.2 shows the scope of tasks that are proposed by the WHO as potential roles that can be performed by

providers involved in PPM. These are grouped as clinical tasks such as identification of cases, referral and treatment, which are performed by a range of qualified medical personnel including private and public sector actors. Public health tasks are usually undertaken by NTPs and other suitably equipped institutions. These functions include training, quality assurance, and monitoring and evaluation activities.

2.5.8 Advocacy in TB Control

The advocacy process can mobilize resources; change laws; influence policy and procedures, through the use of targeted action aimed at influential people or groups such as policy makers and the mass media.

Statistics from Pakistan provide one illustration of a heavy-burden TB location that has benefited from considerable sponsorship of advocacy activities, according to Turk et al. (2013). The authors carried out a cross-sectional study with 2400 respondents on the effectiveness of advocacy in creating awareness on TB, and they found that it correlated positively to awareness levels and accuracy of knowledge regarding TB (Turk et al., 2013). One qualitative study in India concluded that it has yielded significant dividends such as bridging the divide between communities and health systems as well as improved coordination of TB control activities (Kamineni, Turk, Wilson, Satyanarayana, & Chauhan, 2011).

	Tasks	National TB programme	Public or Private institution	Individual private provider	Private/ Public Laboratory	Non physician/ pharmacy
Clinical tasks	Identify TB symptomatics					
	Collect sputum samples					
	Refer TB suspects					
	Notify/ Record cases					
	Supervise treatment					
	Do smear microscopy					
	Diagnose TB					
	Prescribe treatment					
	Inform patients about TB					
Public health tasks	Identify and supervise treatment supporters					
	Follow up on defaulters					
	Training care providers					
	Supervision					
	Quality assurance for laboratories					
	Monitoring and evaluation					
	Drugs and supplies management					
	Provide stewardship: financing and regulation					

* Shaded cells correspond to tasks that can be taken up by respective provider type.

Figure 2.2: PPM Task Mix. Source: Public Private Mix for TB care and Control-A Tool Kit.

2.5.9 Scaling up Public-Private Mix

Scaling up is a method of disseminating innovation, to increase access to a larger population (WHO, 2016). The factors affecting scaling up may be informed or influenced by multiple issues. Milat, Bauman, & Redman (2015) contend nevertheless that these factors will conform to certain commonalities – for e.g. the potential geographical coverage of the intervention, it's effectiveness in producing results, or how it is received in the community, will determine success or failure.

The Public-Private Mix is yet to be scaled-up since implementation in Ghana in 2003. Scaling up TB interventions is high on the Ghana TB agenda, though funding constraints plague the sector (MOH, 2015). Funding however remains one of the most important determinants of scale up (WHO, 2015). Scaling up can help respond to the disparity between knowledge and practice, commonly referred to as the "know-do" gap. The WHO (2005) acknowledges the role of scale-up in dealing with this phenomenon by combating the deficit between knowledge generated by research and what gets translated into action.

Yamey (2012) opines that if evidence-based interventions are amplified, the burden of disease can be significantly reduced in developing countries. For this to be successful however, there must be an appreciation of the barriers and enablers to scale-up.

A narrative review concerned with models for scaling up, summed up the following as potential barriers to scale-up: failure to adapt to local contexts, human and other resource costs, program costs, resistance to change, poor planning and allocation of resources for training, monitoring and evaluation, poor political commitment (Milat et al., 2015). Lei et al., (2015) also concluded from their study that sufficient funding for essential activities, enabling policies and governance, effective collaborations, high standards of TB care, improved communication, better management of resources, increased awareness campaigns and patient education, are necessary pre-requisites for scaling up PPM.

2.6 Facilitators of the Public-Private Mix Initiative

Tools for PPM such as the National Situational Assessment (NSA) tool, Standard Treatment and Laboratory Registers are the most essential as far as PPM reporting and monitoring is concerned. Other tools developed to aid PPM TB include the International Standards of TB Care, the PPM Toolkit, and PPM guidelines developed for the country (Stop TB Partnership, 2010). These tools serve as indispensable guidelines and reference materials which facilitate PPM and TB control in general. Their availability and accessibility to providers is critical for positive outcomes.

The presence of technical support in the form of a resident technical advisor to the NTP (MOH, 2013) is a useful mechanism that encourages transfer of knowledge and expertise. Resident technical advisors usually possess a wealth of technical expertise gathered from several years' work in different settings. This is a valuable resource for all NTPs.

Several studies showed that incentives like the enablers' package and other non-monetary forms can be used successfully in promoting PPM and TB control in general (Amo-Adjei &

Awusabo-Asare, 2013; Ashraf et al., 2018; Ciobanu et al., 2014; Daftary et al., 2019). Providers may be motivated by free access to TB medications, opportunities for continuous education, provision of microscopes, training and education opportunities, and the prestige resulting from association with the program, as well as provision of certificates (Stop TB Partnership, 2010). Political commitment is an indispensable factor in TB control. Amo-adjei (2014) studied the issue of (Ghana's) political commitment to TB. He concluded that human, financial and infrastructural resourcing by government are paramount indicators of political commitment to resource provision. The author also highlighted the importance of legislative tools in TB control, and social interventions e.g. decent housing for the poor were also identified to be important considerations in the fight against TB in Ghana.

2.7 Barriers to the Public-Private Mix Initiative

Several barriers exist that may impede TB control efforts using PPM. One qualitative study performed in China (Zou et al., 2015), discussed the potential consequences of certain barriers to derail collaborations in TB control. Key among the factors included such issues as weak referral systems, partner mistrust, sub-optimal supervision and training, as well as the overriding issue of 'context'. These are proven detractors from progress if not adequately managed. Stigmatization in TB also leads to reduced care seeking behavior and hence poorer outcomes(Amenuvegbe, Anto, & Binka, 2016).

In some reports, the private sector has severally been accused of sub-standard practice in respect to management of TB (Samal & Dehury, 2017; Sulis & Pai, 2017). This may erode confidence in private sector, thus undermining the initiative.

A lack of government commitment as reflected in poor budgetary support for TB, weak clinical and other health regulatory systems, can also contribute to the risk of poor outcomes in TB control (Lei et al., 2015)

Poor communication and lack of trust in the collaboration is a major impediment to PPM partnerships according to some studies (Lei et al., 2015; Zou et al., 2015).

Reduced budgetary allocation for TB control activities within the health sector expenditure is a most important barrier. About 13% of TB funding in Ghana is domestically-sourced, with 16% derived from donors (WHO, 2018a), leaving a huge deficit of 71%. The consequences of this un-funded deficit is that many TB control activities including provision of adequate logistics, supervision, drug procurements, etc. may be adversely affected.

2.8 TB Case Notification and Trends

TB case notification refers to a process whereby diagnosed cases of TB are reported through the appropriate reporting channels e.g. local health authorities, then to the NTP and eventually to the WHO (Uplekar et al., 2016). As a "rate" it is computed as the number of new or relapse TB cases per 100,000 population. The notification rate for Ghana, in 2017, was 52 per 100,000 population, with the Greater Accra and Ashanti regions of the country recording 53.3% and 44.8% of the cases respectively. These figures are the lowest recorded in the last 12 years (Ghana Health Service, 2018). There is paucity of specific reasons in the published literature for this downward trend. Also, reports showed that significant variances in notification rates were noticed across the 10 regions of the Ghana (WHO, 2014). Whilst it is unclear what accounts for the downturn in case notifications, one local study in Ghana highlighted possible contributory factors like insufficient trained personnel, stigmatization, and inadequate facilities for diagnostic services (Amenuvegbe et al., 2016). Another study performed to assess the TB surveillance system of Ghana revealed a lack of consistency, accuracy or completeness in data reporting (WHO, 2014). Uplekar et al., (2016) also reported that data from the private health facilities in respect of TB is usually incomplete. The authors bemoaned low notification of TB cases as a grave impediment to TB control, even calling for enforcing of a "mandatory" notification policy in heavy TB burden nations (Uplekar et al., 2016). This is because

understanding the complete and accurate picture is necessary in order to design and fine-tune remedial national or global health responses. In spite of these weaknesses, PPM has been found to yield significant dividends to case notification. The evidence from countries that have placed a high priority on PPM such as Kenya, Thailand, Vietnam, India and Bangladesh points to an unequivocal increase in PPM contribution to case notification since 2012 (WHO, 2018b).

2.9 Conclusion of Literature Review

Tuberculosis leads to significant morbidity and mortality costs, particularly to developing countries. The Public-Private Mix (PPM) is in principle an effective mechanism for helping to achieve TB control targets such as the TB case notification rate – there exists substantial evidence on the utility and effectiveness of PPM experiences from other localities outside of Ghana. There is further documentary support for the assertion that it is crucial to tailor the specific implementation of the initiative to the context and realities of the implementing area. These contextual factors include issues concerning funding adequacy in general, financial incentives like the enablers' package, and methods for private provider recruitment, training and supervision, among others. In the case of Ghana, though there is substantial research on TB control in general, there is very little research on which and how contextual factors have interplayed to affect outcomes of the Public-Private Mix initiative specifically.

CHAPTER 3: METHODS

3.1 Study Design

This cross-sectional exploratory study was approached with an implementation research focus to understand factors affecting the Public-Private Mix Strategy initiated to control and treat TB in Ghana. It was also situated in the context of health systems research, and attempted to generate knowledge applicable to strengthening the health system using Tuberculosis as an entry point. In-depth interviews were carried out with coordinators and focal persons working in TB control with public and private health institutions; and civil society – and non-governmental organizations in two urban settings in Ghana, namely the Accra and Kumasi Metropolitan areas in the Greater Accra and Ashanti Regions respectively. Secondary numerical data were collected from the Accra and Kumasi Metropolitan Health Directorates of the Ghana Health Service. This numerical data consists of all categories of TB cases that are notified to the respective Metropolitan health directorates, as part of routine TB public health surveillance. The qualitative aspect was approached phenomenologically; to generate mainly ontological knowledge, but included elements of epistemological perspective to attempt general theorization.

Key informant interviews used were appropriate for the aim of understanding and plumbing people's experiences (Creswell, 2009) within the context of TB management in urban areas in Ghana. As noted by Alshenqeeti (2014) interviews are valuable in that they allow the construction of a holistic visualization of phenomena being described. This allowed extensive probing of respondents' knowledge and perceptions. A semi-structured interview guide was used to aid data collection; this tool was structured enough to ensure a systematic process whilst yet maintaining sufficient flexibility for the process to be adaptable as the interviews evolved. This proved advantageous for a study of such exploratory nature.

With the aid of spreadsheet software, descriptive techniques were used to provide the general pattern for TB case notification, as contributed by private and public health facilities from the first quarter 2007 to the last quarter of 2018 (Accra Metro) and 2012 to 2018 (Kumasi Metro). Time series analysis was then applied for predictive modelling of anticipated case notification for 2019.

3.2 Study Areas

The study sites were the Accra and Kumasi Metropolitan areas of the Greater-Accra and Ashanti regions of Ghana respectively. These are the two most populous Metropolitan areas in Ghana. These areas were selected because PPM was initially implemented there, and consequentially have the longest duration and arguably, depth of experience in PPM-TB.

Accra Metropolitan (Accra Metro)

Accra Metropolis shares boundaries to the North with Ga West Municipal , to the West with Ga South Municipal, La Dadekotopon Municipal to the East, and with its southernmost border as the Gulf of Guinea. The land surface area approximates 140 square kilometres (Ghana Statistical Service, 2014). Accra Metropolis has the highest population density in the Greater Accra region of Ghana with an estimated 2,036,889 inhabitants in 2017 (Ghana Health Service, 2018). The sex distribution consists of 51.9% females and 48.1% males. It is estimated that 96% of the inhabitants are Ghanaians. The population under 15 years is 42.6% with a relatively small elderly population (5.9%). Seven percent of the population that can partake in economic activity are not employed. The Metropolis is exclusively urban (Ghana Statistical Service, 2014). The high density of the populace, the fact that over 68% of dwelling units are compound houses, with 23% of households having at least 10 members occupying single rooms (Ghana Statistical Service, 2014). This situation of over-crowding poses a significant predisposition to TB transmission. Accra Metropolitan area is divided into five ‘sub-Metros’ for the purposes of health administration and service delivery. Each sub-Metro has one Government polyclinic,

several other smaller government clinics and private clinics. There is one teaching hospital and five Sub-Metro government hospitals. There are also five quasi-government facilities.

Data Collection Sites in Accra Metro

In-depth interviews were carried with TB co-ordinators in five Sub-Metro facilities namely, the Mamprobi Polyclinic, Kaneshie Polyclinic, Maamobi General Hospital, Adabraka Polyclinic and the Ussher Polyclinic. TB coordinators in two private clinics and one laboratory were also interviewed. Secondary Data on TB cases notified were collected from the Accra Metropolitan Health Directorate located in Adabraka, Accra.

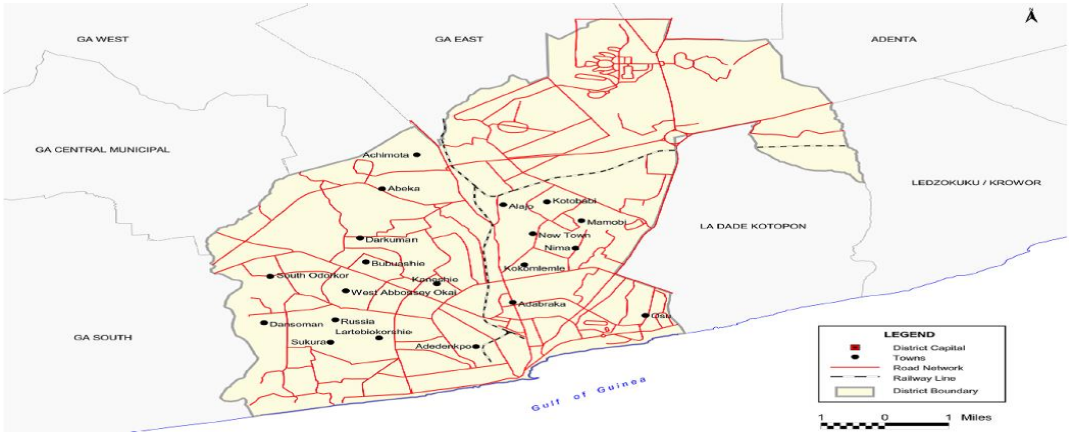

Figure 3.1: Map of Accra Metropolitan. From 2010 Population and Housing Census.

Kumasi Metropolitan area (Kumasi Metro)

It is also the most heavily populated of thirty districts in the Ashanti region of Ghana. Its geographic coordinates are Longitude 1.30ºW and 1.35ºE, and Latitude 6.35ºN and 6.40ºS, at 250m to 300m above sea level. The area is inhabited by an estimated 2,057,084 people in 2017 (Ghana Health Service, 2018). The Metropolis makes up 36.2% of the Ashanti region of Ghana by inhabitants. Males constitute about 47.8% of the population. An estimated 91.4% of the population that can engage in economic activity are employed, with the majority involved in service and trading activity. It is bordered to the north by Efigya Kwabre and Kwabre East districts, to the west by Atwima Kwanwoma and Atwima Nwabiagya districts. Asokore

Mampong and Ejisu-Juabeng municipality define the eastern boundary whilst Bosomtwe district delimits the southern border. It is 270 km from Accra and the land surface area is close to 215 kilometres square. The population density, averaging about 12 persons in each house, and the high levels of in-migration for commercial trading and other activity, may engender increased risk of TB transmission. As of 2010, the Kumasi Metropolitan had 136 health facilities with 115 of them being privately owned. The Komfo Anokye Teaching Hospital (KATH), which is the biggest health facility in the region is located in the Kumasi Metropolis (GSS, 2014).

Data Collection Sites in Kumasi Metro

Interviews were conducted in 4 public facilities namely the Suntreso Government Hospital, Maternal and Child Health Hospital, KMA (Kumasi Metropolitan Assembly) Clinic, Manhyia District Hospital. Interviews were also conducted with representatives of NGOs/CSOs in their office location. Secondary data on TB cases notified were collected from the office of the Kumasi Metropolitan Health Directorate.

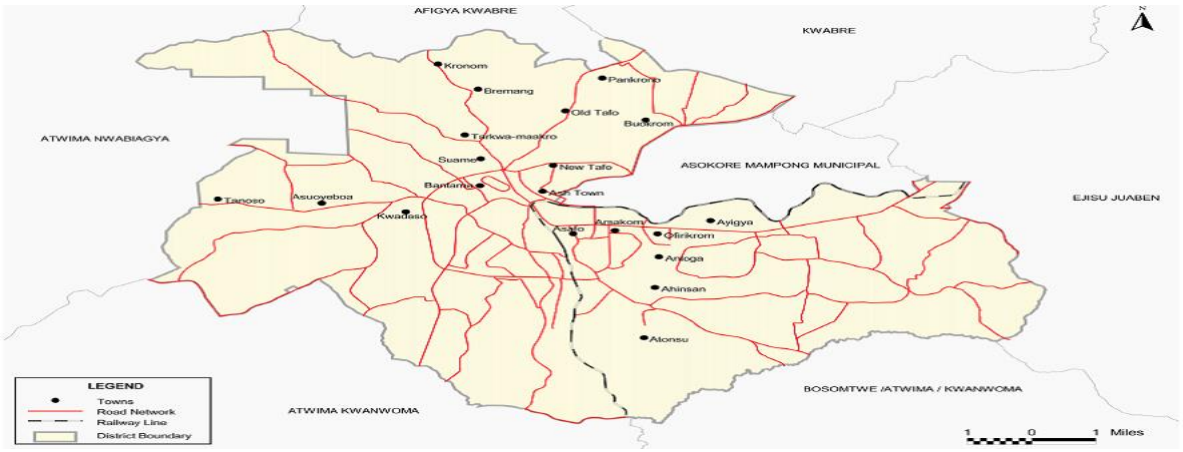

Figure 3.2: Map of Kumasi Metropolitan. From 2010 Population and Housing Census.

3.3 Study Population

Twenty five interviews were projected, out of which a total of twenty-three TB coordinators and focal persons had been interviewed by the saturation point. These 23 respondents consisted of health professionals such as nurses, disease control officers, laboratory technicians,

pharmacists working in public and private hospitals and clinics; as well as management professionals employed in Civil Society- and Non-Governmental Organizations within the Metropolis.

Source and description of the Secondary Data

Aggregate data consisting of 'all type' TB cases diagnosed and reported by sub-Metro public hospitals and private facilities to the respective Metropolitan health directorates were used. The data from Accra Metro were collected between the first and last quarters of 2007 and 2018 respectively; whilst the Kumasi Metro data spanned January 2012 to December, 2108.

The directorates are official units under the Ghana Health Service in charge of disease control activities within their designated catchment areas. The data were originally generated at public sub-Metro hospitals within the Metropolis, as well as their respective partnering private and quasi-government facilities. The supervising sub-Metro hospitals initially receives these data, compiles and then forward these reports to the Metropolitan Health Directorates. TB coordinators or focal persons in health facilities initially record daily diagnosed cases in a manual register which is then collated and recorded at the end of each month into the 'TB 07' register. This register is a Microsoft Excel-based template used in collecting and compiling data.

3.4 Inclusion Criteria

1. Participants currently involved in TB care and control activities or with a previous history of involvement; obtaining PPM implementation experience within one of the implementing urban areas.
2. Numerical TB data reported to the Accra and Kumasi Metropolitan health directorates were used.

3.5 Exclusion Criteria

1. Individuals expressing an unwillingness to participate.

2. Individuals with less than 1 year cumulative experience with TB.

3.6 Sampling Frame and Technique

The NTP defines private providers as doctors, physician assistants, nurses, midwives, chemical sellers, pharmacists and laboratory technicians who are in private practice.

An updated list of the providers including non-governmental and civil society groups partnering in PPM-TB activities, Metro- and sub-Metro district TB coordinators, was acquired from each Metropolitan health directorate and used as the sampling frame. From this list and assisted by National TB program officers, respondents likely to possess rich programmatic knowledge and experience in PPM, were purposively selected**.** Generally, individuals with the longest duration or highest hierarchical level of involvement were selected. This ranged from 1 to 20 years, and included levels from transport officer level to program managers and Chief Executive Officers. Thus, a maximum sampling variation of respondent category within each Metropolitan area was used, whilst observing for saturation. A total of twenty-three interviews were conducted. Creswell (2007) considers twenty to thirty interviews as sufficient for in-depth interviewing.

For the quantitative aspect of this research, numerical data present and accessible at the respective Metropolitan Health Directorates were reviewed aiming for the most complete data before and after 2013. This reference period marked the date of an external TB review in Ghana which called for PPM to be revitalized (Ministry of Health, 2013). These data are as collated with the TB 07 register by the Ghana Health Service.

3.7 Data Collection Methods

All interviews were performed by the Principal Investigator using semi-structured questionnaires. Potential participants were contacted by email or phone to extend an invitation for participation in the study. Follow-up calls were used to issue reminders and to finally determine interested and willing participants. On the agreed dates, interviews were performed

only after the informed consent form for the interview including digital audio-capture, had been duly read, understood, assented to and signed by the participant, in all cases.

A field note book was used to record any important observations some of which informed subsequent interviews and analysis. During interviews, recording equipment was checked for equipment functionality and clarity of voice at 10 minutes and 20 minutes. A final check was performed after the interview to confirm clear voice capture.

Quantitative data collection was by extraction of data pre-collected by the Metropolitan health directorates (Accra and Kumasi). Research assistants extracted data the excel-based standard reporting forms namely the TB 07 register. PPM data from 2007 to 2018 and 2012 to 2018 for Accra and Kumasi respectively were collected and recorded. Data collected by each research assistant was cross checked by another assistant and the principal investigator to ensure accuracy. Follow-up calls and visits to the data collection site were performed in order to cross-check missing or to verify potentially erroneous data wherever necessary.

3.7.1 Semi-Structured Interview Guides

The interview guides were exclusively in the English language, and voice recording was done with a digital audio recorder. Questions were structured to be as un-intimidating as possible overall, and avoided sensitive questions.

The first section of the interview guide collected information on participants' attributes such as age, sex, type of organization, occupation/job description, and duration of involvement in TB control.

Interview questions were open-ended, with probes – Patton (2003) suggested that this technique yields deeper responses about perceptions, feelings, experiences and opinions.

Interview questions bordered on provider enrolment issues in PPM like contracting mechanisms for engaging providers, provider preferences and capabilities for different tasks;

issues with provider training, and subsequent monitoring and supervision. Providers' views and experiences concerning barriers and facilitators to the PPM scheme were also sought.

3.7.2 Data Extraction Form

The form was spreadsheet format, based on Microsoft Excel and captured data such as categories of (public or private) providers engaged in PPM; and number of TB cases detected, disaggregated by sex, pulmonary or extra-pulmonary TB and grand total of all TB cases reported.

3.7.3 Instrument Validity

The semi-structured guide and the conduct of the interview were informed by guiding principles for PPM implementation. These principles are delineated in the PPM guidelines developed for Ghana; the WHO toolkit designed in 2010 for PPM (Stop TB Partnership, 2010), and the guide for national PPM action plan development (WHO, 2017b). These documents were designed for assisting with PPM implementation. They contain WHO recommendations on how to prioritize and engage private providers, definition of roles, supervision and monitoring as well as plans for scaling up PPM.

The interview guide was pre-tested with purposively selected participants to rectify ambiguities to avoid miscomprehension of questions, and appropriate follow-up questions were anticipated and refined in advance. Digital recording equipment were also tested during this period. The same group of research assistants conducted the pre-test and the actual data collection.

The Data extraction form was designed based on the 'TB 07' register used for compiling TB data. This register captures TB case notification data in format recommended in WHO documents guiding the use of TB data (WHO, 2014). It captures key variables like smear positive and negative cases disaggregated by sex, default status, TB of the lungs and extra-pulmonary TB, paediatric TB, and also disaggregation by age categories.

3.7.4 Pre-testing of Tools

The interview guide was pre-tested separately with 3 former TB coordinators within Accra, over 20 to 25 minutes each. This helped to identify and rectify ambiguous questions, as well as to anticipate and refine probing questions in advance. Digital equipment were also tested during this period. Respondents in pre-test were not invited to partake in the actual data collection.

Though the data extraction form was designed with full prior knowledge of the format of the source document, pretesting was done mainly to evaluate training given to research assistants. This was done with anonymised TB data of the same structure, obtained from the Accra Metropolitan health directorate.

3.8 Reflexivity and Perspectives in this Study

The researcher fully appreciated the potential for his role as an explicit instrument in the study to influence the conduct of the research process particularly the interviews; as well as subsequent analyses performed. The researcher also submits that his professional background as a medical officer and avid interest in implementation research, could potentially influence the focus of the interviews and meanings drawn from the responses, as well as what he considers as relevant findings for this study. Whilst the researcher certainly has appreciable understanding of the disease area, his limited knowledge and experience with the PPM initiative itself renders his view essentially that of an etic perspective, and he managed this position with a conscious attempt to carefully bracket his own biases and expectations, throughout the conduct of this study. In this vein the researcher attempted to present as much of the narrative as possible in the respondents' own voice to allow independent interrogation of the supporting 'evidence'. The research paradigm was relativistic overall, utilizing a phenomenological approach to garner mainly ontological lessons about people's everyday

understanding of happenings in the PPM; and some epistemological knowledge concerning PPM procedures.

3.9 Qualitative Analysis

Voice data were manually transcribed verbatim, and the notes were carefully read by the researcher (with simultaneous note-taking) twice for acquaintance with the material. Data were next uploaded into NVivo-12 software to aid the analysis. Thematic analysis as described by Creswell, (2009) as applicable to the purpose of this research, was used to analyse the data, following a systematic approach, yet adaptable to the structure of emergent issues. Braun & Clarke (2006), also explain thematic analysis as a process of recognition, organization and analysis of patterns or themes; and further argued that thematic analysis is a method in its own right, rather than a tool for data analysis.

The researcher developed a codebook as an intrinsic part of the coding process, allowing it to evolve largely during the first few transcripts. The codebook was then expanded and refined as coding and analysis progressed. Based on the study objectives and emergent issues, first cycle coding strategies such as descriptive coding, process coding and theme-ing were employed to sort data into relatively concrete and recognizable concepts and ideas and held under nodes. Further abstraction was used to sort these nodes and initial codes into higher order categories. Each category was further refined to enable convenient placement under one of the WHO conceptualized “building blocks” used in health systems research i.e. Service Delivery, Leadership and Governance; Health Information Systems; Finance; Health Workforce; and Essential Medicines access.

Figure 3.3 illustrates the coding and analytic strategy utilized to reduce the qualitative data to manageable information. The leadership and governance theme is used to illustrate this process.

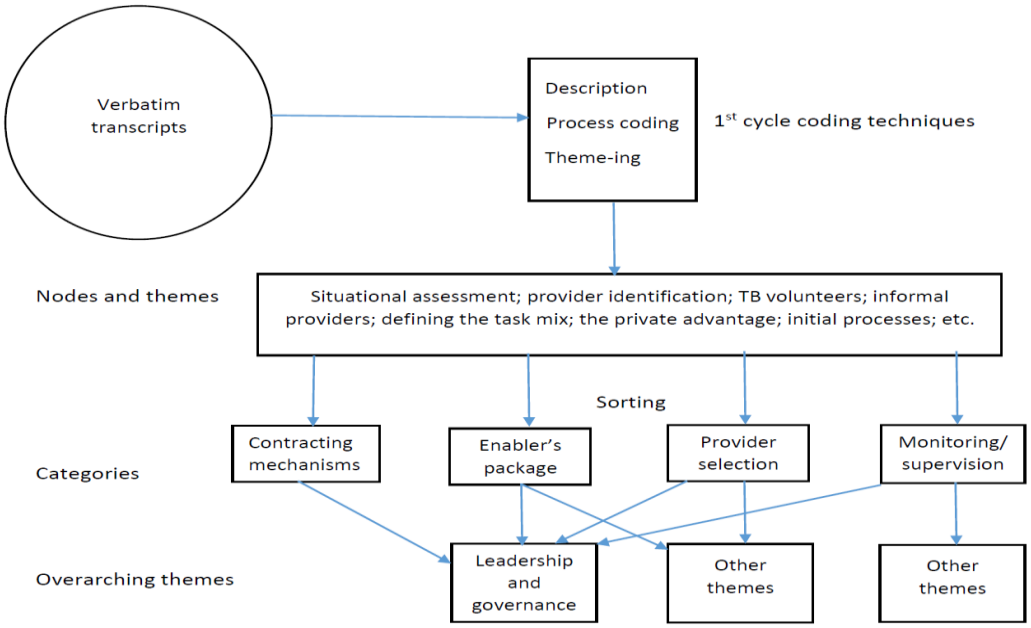

Figure 3.3: Schematic showing the coding strategy used during analysis

The WHO building blocks were used heuristically as over-arching themes for the purposes of this study. There is undeniable consensus that the blocks are useful for deconstructing the complexities that exist within health care delivery systems (WHO, 2010), as well as standardizing the language for effective knowledge transfer (Mounier-Jack et al., 2014). This analysis further adapts by extracting another theme from ideas subsumed within the six over-arching themes to answer the second specific objective of "Facilitators and Barriers to PPM". To help validate content integrity and to rationalize possible contradictions, cross-comparison and contrasts between responses on same questions were done, and also weighed against other relevant research findings. Findings relevant to the research objectives were then distilled and narrated, with the appropriate representative verbatim quotations being selected as illustrations of the 'evidence'. Since the analysis was based on an adaptive codebook, feedback was employed throughout the process to continuously inform the overall analytic process.

3.10 Secondary Data Analysis

The purpose of collecting secondary data was to analyse trends in TB cases notified as part of PPM. Accra Metro data spanning quarters 2,3 and 4 for 2009, and quarters 1 and 2 for 2010 were unavailable and thus analysis excludes figures for those periods. Raw figures on cases

notified were standardized by converting to number of cases per 100,000 population for each Metro. The population sizes used in the calculation were 2,036,889 and 2,057,084 for Accra and Kumasi Metropolitan areas respectively (Ghana Health Service, 2018).

A combination of data visualization and time series modelling techniques were deployed, using Microsoft Excel and Stata –15 statistical software, to explore the data. Data extracted from the TB 07 register were used to generate tables, line and bar charts using pivot table and pivot chart tools in Microsoft Excel. This helped to show the relative proportions of TB cases notified in private and public facilities each year, with disaggregation of cases by sex. Average private sector contribution to PPM was calculated for each year from 2007 to 2018 (for Accra data), and 2012 to 2018 (for Kumasi data).

The data were then formatted appropriately and imported into STATA – 15 statistical software to enable time series analysis. Time series analysis was performed using the Auto-Regressive Integrated Moving Average (ARIMA) modelling, otherwise known as the Box-Jenkins methodology. Line and auto-correlation plots were used to visually assess the presence of a trend within the data. Next, second order differencing (Accra Metro) and first order differencing (Kumasi Metro) were applied to achieve trend stationarity. The Augmented Dickey-Fuller test was used to confirm stationarity of the series after detrending. Auto-correlation and partial auto-correlation plots were then generated for the differenced (trend-stationary) data, which were used to identify the moving average (q) and auto-regressive (p) terms, and thus potential models for further exploration. Selection of models was based on Bayesian and Akaike information criteria, Log likelihood values, and model simplicity. The chosen model for each Metropolitan area was then used to forecast expected TB cases for the private and public facilities over the next four quarters in 2019 (Accra) and over the next twelve months of 2019 (Kumasi). Corresponding confidence intervals (95%) were constructed around the predicted values.

3.11 Quality Assurance

The three research assistants were trained by the Principal Investigator on transcription of qualitative data and numerical data collection. Training also included education on the research topic, objectives, data collection techniques, tools and equipment, ethical considerations, and also analytical methods employed in this research.

Instruments for data collection were designed with reference to WHO PPM guidelines. High quality recording equipment and transcription aids were secured, calibrated appropriately, used and well-maintained throughout the research. Research assistants were supervised at all stages of data collection and entry on and off the field by the principal investigator to ensure compliance with ethical provisions and adherence to protocol.

3.12 Ethical Considerations

1. Approval for this research was granted by the Ethics Review Committee of the Ghana Health Service; certificate number "GHS – ERC027/02/19".

2. The Accra and Kumasi regional and Metropolitan health directorates of the Ghana Health Service, as well as all the respective sub-Metro hospitals granted written permission prior to collection of all data.

3. Written and signed informed consent was obtained from all respondents. They were given adequate time to read the participants' information sheet and all issues were clarified.

4. The Principal Investigator declares no conflict of interest regarding this research.

CHAPTER 4: RESULTS

Responses offered by participants to interview questions posed were complemented by careful note-taking and observation on the field. These sources formed the experiential and evidential bedrock on which the ideas and concepts were generated to satisfy the research questions.

This chapter addresses the three research objectives by presenting the most relevant evidence in a transparent and concise manner using quotations, observations from field notes and tables and figures from the numerical data. To aid clarity, qualitative findings will be presented separately from quantitative findings. The qualitative findings chapter is structured to show more of the respondents' voice rather than the researcher's narrative, in order to allow a relatively independent interrogation of the 'evidence' presented.

4.1 Descriptive Quantitative Findings

The total cases notified in Accra Metro between 2007 and 2018 was 15,113, for all types of TB cases including smear-positive and -negative, extra-pulmonary and pulmonary, as well as paediatric TB cases.

Table 4.1: Accra Metro TB cases standardized per 100,000 population

Year	Facility Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarterly mean	Standard Deviation	Annual Total
2007		**24.45**	**21.21**	**26.02**	**26.90**	**24.65**	**2.51**	**98.58**
	Public	19.20	17.13	21.75	22.58	20.17	2.48	80.66
	Private	5.25	4.07	4.27	4.32	4.48	0.53	17.92
2008		**31.32**	**30.88**	**31.32**	**31.32**	**31.21**	**0.22**	**124.85**
	Public	26.02	24.84	27.35	26.22	26.11	1.03	104.42
	Private	5.30	6.04	3.98	5.11	5.11	0.85	20.42
2011		**29.26**	**27.44**	**26.95**	**21.70**	**26.34**	**3.25**	**105.36**
	Public	25.92	24.55	23.03	19.39	23.22	2.81	92.89
	Private	3.34	2.90	3.93	2.31	3.12	0.69	12.47
2012		**25.87**	**14.68**	**13.70**	**13.60**	**16.96**	**5.96**	**67.85**
	Public	22.58	11.64	10.85	11.19	14.07	5.69	56.26
	Private	3.29	3.04	2.85	2.41	2.90	0.37	11.59
2013		**12.86**	**12.37**	**13.70**	**12.62**	**12.89**	**0.58**	**51.55**
	Public	10.70	10.60	10.85	10.95	10.78	0.15	43.10
	Private	2.16	1.77	2.85	1.67	2.11	0.53	8.44
2014		**12.52**	**9.92**	**8.84**	**8.15**	**9.86**	**1.92**	**39.42**
	Public	10.90	7.86	7.02	6.78	8.14	1.90	32.55
	Private	1.62	2.06	1.82	1.37	1.72	0.29	6.87
2015		**11.93**	**10.70**	**10.60**	**12.81**	**11.51**	**1.06**	**46.05**
	Public	10.26	8.84	8.64	10.90	9.66	1.10	38.64
	Private	1.67	1.87	1.96	1.91	1.85	0.13	7.41
2016		**11.78**	**11.68**	**10.02**	**10.65**	**11.03**	**0.85**	**44.14**
	Public	10.41	9.23	8.74	9.62	9.50	0.71	38.00
	Private	1.37	2.45	1.28	1.03	1.53	0.63	6.14
2017		**9.92**	**9.28**	**10.21**	**9.13**	**9.63**	**0.51**	**38.54**
	Public	8.69	8.64	9.23	8.40	8.74	0.35	34.96
	Private	1.23	0.64	0.98	0.74	0.90	0.26	3.58
2018		**11.05**	**11.19**	**9.33**	**8.74**	**10.08**	**1.23**	**40.31**
	Public	9.77	9.77	8.25	7.71	8.87	1.06	35.50
	Private	1.28	1.42	1.08	1.03	1.20	0.18	4.81

*2009 and 2010 data unavailable

The highest case notification rate in Accra Metro was 125 cases per 100,000 population, observed in 2008; whilst 2017 recorded the lowest of 39 cases per 100,000 (Table 4.1).

Table 4.2: Kumasi Metro TB cases standardized per 100,000 population

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Monthly	SD*	Annual Total
2012	0.53	1.36	5.54	0.63	0.68	4.42	1.17	0.39	4.03	1.36	1.80	4.03	2.16	1.82	25.96
2013	3.21	3.55	3.06	3.84	3.16	3.06	3.69	3.01	2.14	3.45	2.72	2.53	3.12	0.49	37.43
2014	1.80	4.03	2.82	1.85	1.36	2.43	3.26	3.01	2.33	2.77	1.75	2.14	2.46	0.76	29.56
2015	2.38	2.82	2.92	2.33	2.67	2.43	2.04	2.53	2.82	3.11	2.09	0.00	2.35	0.81	28.15
2016	2.63	3.35	3.60	2.67	1.94	2.14	1.60	2.38	1.70	1.51	1.90	2.63	2.34	0.67	28.05
2017	1.94	2.92	2.53	3.01	2.72	2.24	1.75	2.14	1.70	2.04	2.63	1.51	2.26	0.50	27.13
2018	2.43	2.33	1.65	2.09	2.14	0.00	1.75	2.14	1.70	2.04	2.63	1.51	1.87	0.68	22.41

*Standard deviation

Kumasi Metro recorded the highest number of cases (38 cases/100,000) in 2013 and the lowest (23 cases/100,000) in 2018 (Table 4.2).

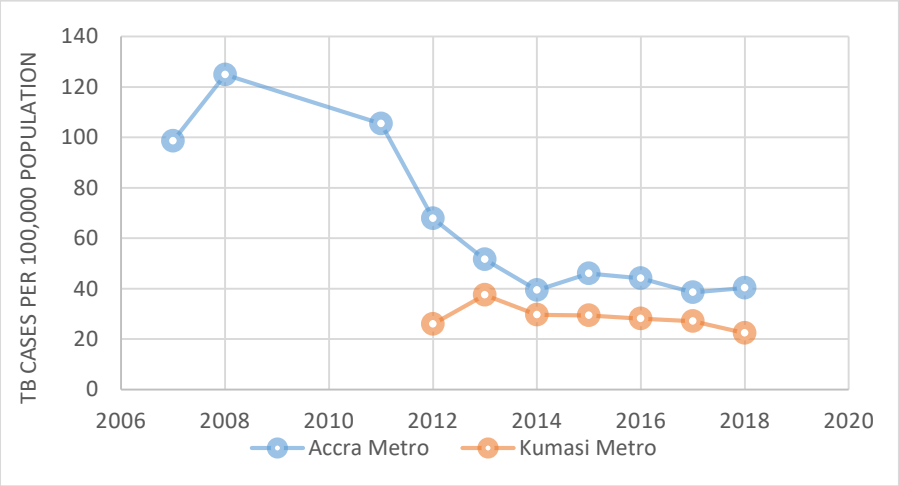

Figure 4.1: *TB case notification per 100,000 population for Accra and Kumasi Metropolitan areas*

As shown in Figure 4.1, Accra Metro had significantly higher cases of TB compared to Kumasi Metro (from 2012). Accra Metro also had the highest cases notified in 2008 (125 cases/100,000), and dropped steeply to 40 cases/100,000 by 2014 and then plateaued. Kumasi has had a gentler decline between 2013 and 2018, hovering around 30 cases per 100,000 on average.

A general pattern of declining case notification with time was noticed in both Metropolitan areas. TB case notification was markedly higher in Accra Metro than Kumasi Metro

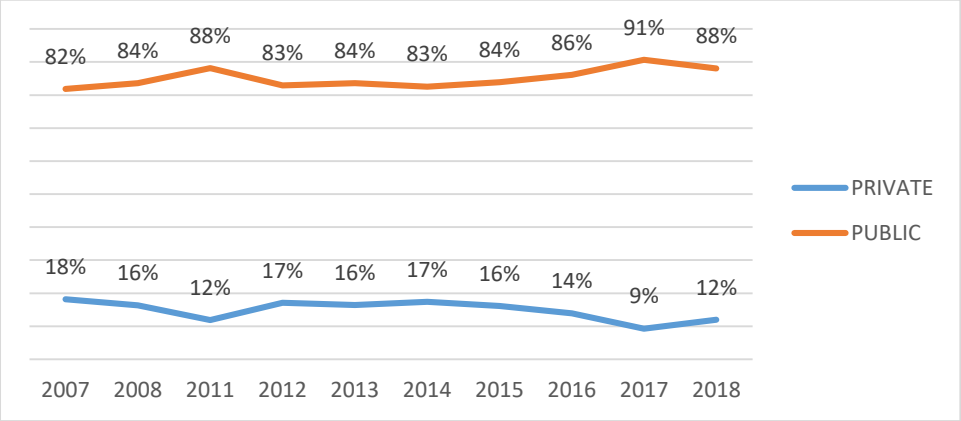

Figure 4.2: *Contribution of both sectors to case notification; Accra Metro.*

The highest yearly contribution made by private sector to case notification was in 2007 (22.2%). The lowest percentage was recorded in 2017 (9.3%) as shown in figure 4.2.

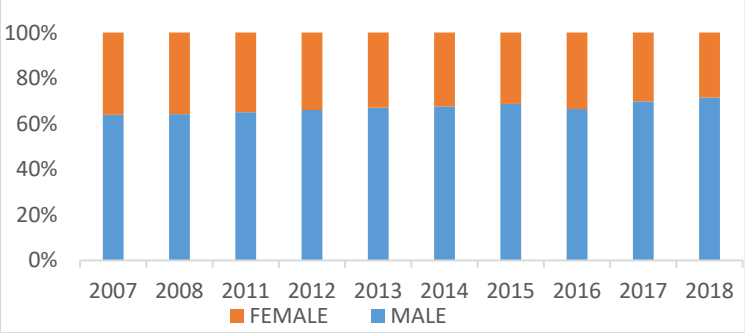

Figure 4.3: TB cases by Sex; Accra Metro

Table 4.3: *Cumulative sex ratio of TB cases (2007 to 2018); Accra Metro*

Type	%Female	Male : Female ratio
Public	0.347	**1.884**
Private	0.311	**2.215**
Both	0.341	**1.929**

Figure 4.3 and Table 4.3, show the male to female ratio within the private sector was noticed to be much higher in the private sector than the public sector, with the females making up only 31.1% compared to 35% within the public sector. The male to female gap was thus wider in private facilities relative to the public facilities within Accra Metro.

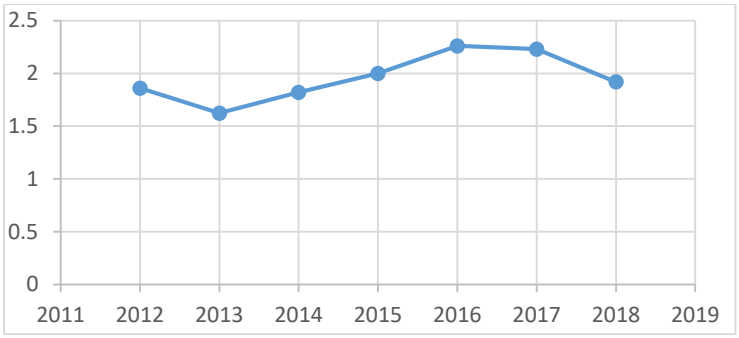

Figure 4.4: Trend of the ratio of male to female TB cases; Kumasi Metro.

The trend in male to female ratio is displayed by figure 4.4. The ratio of males to females fluctuated between 1.6 and 2.3 males per female. The male to female gap was narrowest in 2013 and widest in 2016.

4.2 Predictive Modelling of the TB Case Notification Trend for 2019

Time series analysis was used to forecast TB notification rates for 2019 in Accra and Kumasi Metropolitan areas. The following sections show the results of this analytic process.

4.2.1 Model identification for Accra Metro

The results of the model identification processes are shown in this section.

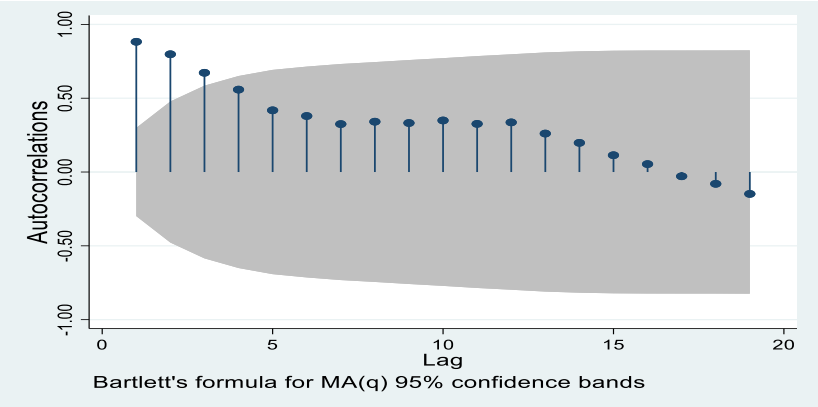

Figure 4.5: Autocorrelation plot of total TB cases; Accra Metro.

The slow decay in Figure 4.5 shows non-stationarity, indicating the presence of a trend. This means the series data required transformation to allow time series analysis. Figures 4.6 and 4.7 show the autocorrelation (ACF) and partial auotcorrelation (PACF) plots after applying two differencing steps to transform the data. A formal augmented Dickey-Fuller test confirmed trend-stationarity ($Z = -9.0$, $p<0.001$). The null hypothesis under the Dickey-Fuller test is that

the time data is non-stationary. A significant Dickey-Fuller test shows that the series was stationary for the arima modelling.

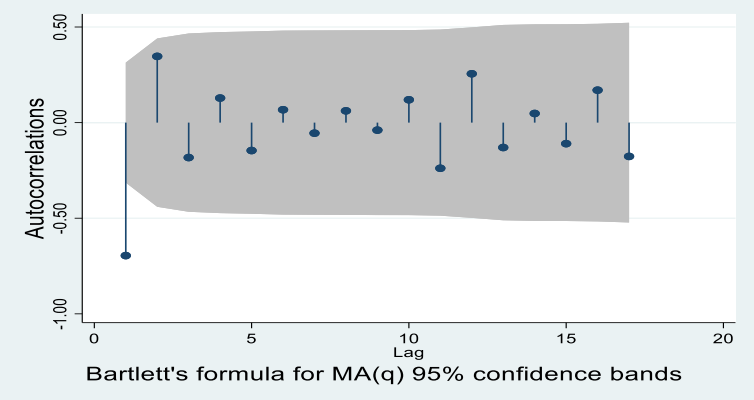

Figure 4.6: ACF plot after second order differencing

The plot show significant autocorrelation at lag 1, suggesting MA (1) process. This means that the moving average term 1 is applicable to the model (Figure 4.6).

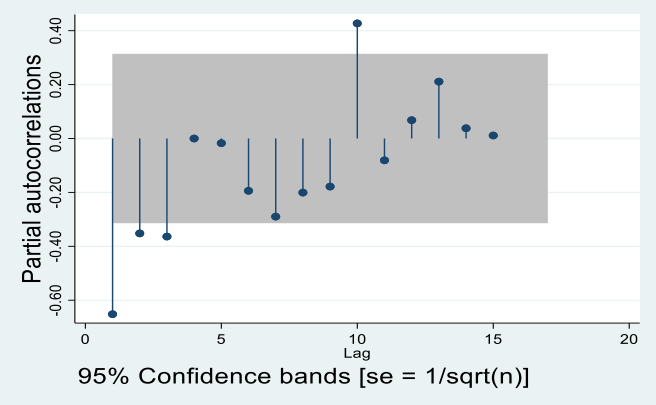

Figure 4.7: Partial autocorrelation plot for Accra Metro cases

Figure 4.7 shows significant autocorrelations at lags 1, 2, 3 and 10. This means autoregressive terms 1,2,3 and 10 were possible terms for the final model.

Table 4.4: Goodness of fit for considered models (Accra Metro)

Model	AIC	BIC	Log Likelihood
ARIMA (1,2,1)	**190.851**	**195.842**	**-92.426**
ARIMA (1,2,3)	196.216	206.197	-92.108

AIC= Akaike information critera; BIC = Bayesian information criteria

Table 4.4, shows the resulting potential arima models, ARIMA (1,2,1). Based on the information criteria as shown in the table, model (1,2,1) was selected as the final arima

regression model and used to forecast. The result of the regression parameters as shown below in table 4.5

Table 4.5: Parameter estimates from the final ARIMA regression model (1,2,1)

Arima model	Coefficient	SE	Z	P > |Z|	95% Confidence Interval
Constant	0.0423	0.0515	0.82	0.411	-0.05861 – 0.1432
AR (1)	-0.3784	0,1344	-2.82	0.005	-0.6418 – -0.1150
MA(1)	-0.9999	0.2075	-4.82	<0.001	-1.4067 – -0.5933

Observations = 39 quarters; Wald Chi-square = 89.05; p- value < 0.001

From table 4.5 both the autoregressive and moving average terms were significant. This means that the time series data was significantly auto-correlated with itself for predicting future values. The significant Wald chi-square for the overall model ($p<0.001$) shows that this model has significant predictive ability for future values of TB cases notified.

Prediction of 2019 case notification for Accra Metro

Predicted TB case notification for 2019 quarters 1 to 4 derived using ARIMA (1,2,1) are thus shown in table 4.6.

Table 4.6: Accra Metro Forecasted TB cases for 2019 (cases per 100,000 population)

Period	Forecast values	95% confidence interval
2019 Q1	10.0998	2.2046 – 17.9949
2019 Q2	10.4249	2.1733 – 18.6766
2019 Q3	10.6463	2.3448 – 18.9477
2019 Q4	10.9652	2.6566 – 19.2737
Total	42.1362	–

Q = Quarter

The forecast annual figure for 2019 (42.14 cases/100,000) compared to the 2018 annual total (40.31 cases/100,000) suggests a slight potential increase in TB cases notified in Accra Metro. This represents an estimated increase of 4.5% for expected annual case notification for 2019.

4.2.2 Model identification for Kumasi Metro

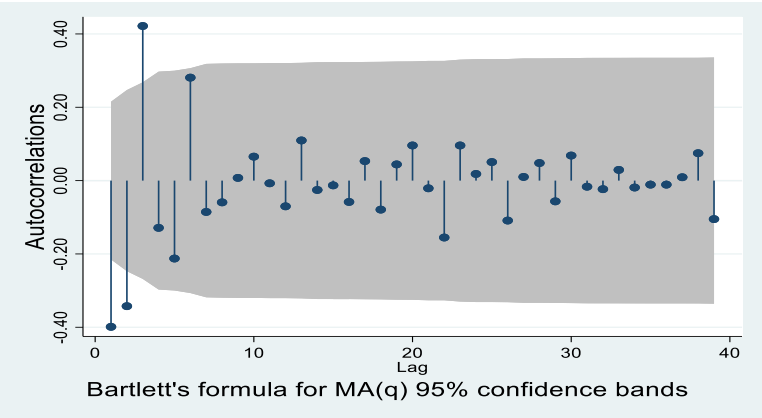

Figure 4.8: Auto-correlation plot for Kumasi Metro TB cases

The plot shows significant spikes at lags 1, 2 and 3. This means that moving average terms 1,2 and 3 were potential terms for the arima model (figure 4.8).

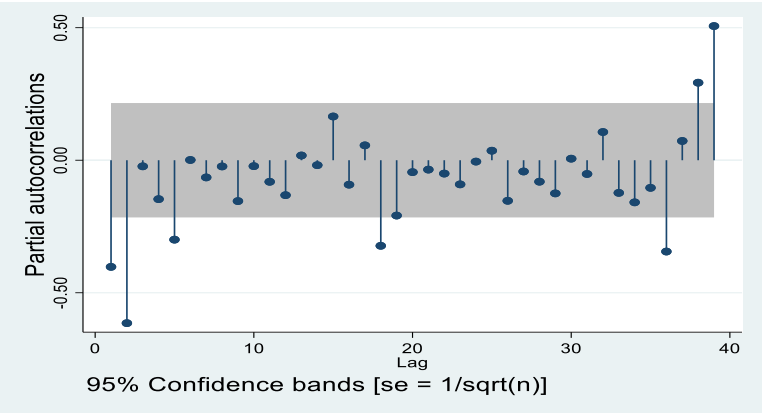

Figure 4.9: Partial Autocorrelation function for Kumasi Metro TB cases

Figure 4.9 shows significant spikes at lags 1,2,5 (and higher order non-seasonal lags). This means that auto-regressive terms 1,2 and 5 were potential terms for the model.

Table 4.7: Goodness-of-fit for considered models (Kumasi Metro)

ARMA MODELS	AIC	BIC	Log Likelihood
1. ARIMA, AR(1 2)	226.322	235.9974	-109.161
2. ARIMA (2,1,2)	**224.3061**	**238.8191**	**-106.153**
3. ARIMA, AR (1 2 5) MA(1 2)	217.5481	229.7022	-103.7741

Order of differencing (d) = 1

Table 4.7 shows the potential models considered. ARIMA (2,1,2) was selected because it had lower information criteria values than AR (1 2); and was less complex than AR(1 2 5) MA(1 2).

Table 4.8: Parameter estimates from the selected Arima regression model

ARIMA (2,1,2)	Coefficient	Std. Error	Z	P- Value	95% CI
Constant	-0.0048	0.0166	.0.29	0.77	-0.0374 – 0.0277
AR(1)	-0.6182	0.1424	-4.34	<0.001	-0.8972 – -0.3391
AR(2)	-0.4965	0.0847	-5.86	<0.001	-0.6625 – -0.3305
MA(1)	-0.7674	0.3203	-2.40	0.017	-1.3952 – -0.1396
MA(2)	-0.6378	0.2408	-2.65	0.008	-1.1098 – -0.1658
/Sigma	0.6761	0.0921	7.34	<0.001	0.4955 – 0.8566

Observations = 83; Wald Chi-square = 74.13; p – value < 0.001

Table 4.8 shows significant coefficients for the auto-regression terms (lags 1 and 2) and moving average terms (lags 1 and 2), showing that the terms could significantly predict subsequent values of cases notified. The overall p-value for the arima regression model was significant (p-value<0.001). This shows the final model has significant predictive ability.

This model was therefore used to forecast TB cases for the next 12 months of 2019 for Kumasi Metro.

Prediction of 2019 case notification for Kumasi Metro

As shown in Table 4.9, the forecasted annual total for 2019 (22.35 cases/100,000) is lower than that of 2018 (22.41 cases/100,000). This represents a change of -0.3%. Thus Kumasi Metro case notification is not expected to improve in the 2019.

Table 4.9: Forecasted TB cases per 100,000 population for 2019

Period	Forecast Values	LCL	UCL
Jan-19	1.6415	-0.6259	3.9089
Feb-19	2.1308	-0.2051	4.4666
Mar-19	1.8635	-0.7192	4.4461
Apr-19	1.7756	-0.8382	4.3894
May-19	1.9524	-0.6784	4.5832
Jun-19	1.8765	-0.7821	4.5352
Jul-19	1.8254	-0.8348	4.4856
Aug-19	1.8845	-0.7791	4.5481
Sep-19	1.8631	-0.8036	4.5298
Oct-19	1.8368	-0.8299	4.5035
Nov-19	1.8535	-0.8139	4.5208
Dec-19	1.8460	-0.8216	4.5137
Total	22.3496	-	-

UCL = Upper 95% confidence limit; LCL = Lower 95% confidence limit

4.3 Qualitative Findings

The findings from twenty-three in-depth interviews follow in the subsequent sections.

4.3.1 Characteristics of Interview Respondents

This section is based on interviews with 23 respondents. The varied professional backgrounds included nurses, laboratory technicians, management professionals, medicine counter assistant, disease control officers, and a transport officer. All the respondents played one coordinating role or other specifically for the PPM collaboration. Duration of involvement in TB control activities ranged from one to twenty years.

The twenty-three participants were distributed thus (Table 4.10):

Table 4.10: Background of Interviewees

Facility Type	**Location of Health Facility/Interview**		**Interviewee Characteristics**			**Total Person-years of PPM-TB Experience**
	Accra	**Kumasi**	**Sex**		**Age range in years**	
			M	**F**		
Public Facilities						
District Hospitals	5	4	3	6	32 -56	30
Private Facilities						
Hospital/clinic	2	0	2	0	55-59	31
Lab	1	0	1	0	58	15
Pharmacy	2	0	0	2	31 - 52	14
NGO	4	5	7	2	37 - 67	74
Grand Total	14	9	13	10	32 - 67	164

Categories under six overarching themes were identified as shown in table 4.11.

Table 4.11: Themes and categories used in data analysis

Over-arching themes	Categories
Leadership and Governance	Private provider recruitment; monitoring and supervision; contracting mechanisms; Government commitment; role definition for private providers;
Financing	Funding and spending for TB; enablers' package;
Workforce	Training and capacity building; Private staff and volunteer attrition; informal practitioners; trust relationships;
Service Delivery	Scope of roles and quality; workload of providers; impact of PPM; PPM scale up; feedback form patients; provider coping mechanisms
Medicine and Technology	TB medicines; TB technology and materials
Information	Information and communication

4.4 Leadership and Governance Processes and Considerations

This theme summarizes knowledge and opinions relating to mid to high level decision making within the PPM hierarchy. Findings are presented under the following categories: prioritization and selection of providers; monitoring and supervision; contracting mechanism; government's policy and commitment towards TB control; and role definition for providers.

4.4.1 Private Provider Recruitment into the PPM Scheme

Generally, it was desirous that as many private providers as possible get involved in PPM. There were however important considerations that went into deciding which private facilities to engage. All respondents shared the following sentiments about standards required of private facilities.

> *"If I want to select a private facility, what I would look out for is a facility that has competent staff. Because sometimes you'd go to a clinic, the patient's drugs, everything*

is there but you see the staff are not serious to help the person. But you go to other places and they are serious". (Nurse in Manhyia District, Kumasi).

A civil society organization known as Aurum Institute was noted to be collaborating with the NTP since the last quarter of 2018, for the purposes of recruiting providers for PPM. Generally, Aurum Institute appeared to demand stricter criteria than the NTP.

"So far as you're private facility it's fine but the Aurum one is the one that [has] criteria… but the normal one so far as you are health facility we [NTP] don't use any criteria… So far as you are practicing with the Kumasi Metro then you qualify" (TB coordinator in Kumasi).

"We have a criteria for selection as I said earlier, we look at your previous experience, we look at your any intervention in the public sector…because the idea is that if you are able to already run other public health interventions with the facility then bringing on board TB is easier. And then we look at your total OPD attendance in a month… And then we look at your reporting too…whether you are reporting on the DHIMS-2 platform". (Program manager of Aurum Institute, Accra).

Evidently, there were different policy thresholds for qualifying private providers to join the scheme.

4.4.2 Monitoring and Supervision of PPM Activities

Actors within the PPM strategy all concurred that monitoring and supervision was a necessary activity in program implementation. They however ascribed different meanings and attitudes to their monitoring and supervision experiences within the PPM. Some private sector providers complained about the surprise nature of monitoring visits by their supervisors from the NTP. Some coordinators explained why this was the case;

"Normally when you give the people prior information of a check, you won't see the real situation on ground but when you take them by surprise you're able to look at their

registers and the related things. That way if you do that you put them on their toes". (Metro TB co-ordinator, Kumasi).

"I agree with them [NTP] because some NGOs are not existing at all so they just want to surprise them" (Project Director, CSO in Accra).

But this modus gave a few providers negative impressions, reflecting potential mistrust among partners;

*"Sometimes they're not coming for monitoring, they're coming for witch hunting" (*Programs *director of a CSO in Kumasi*).

There were also inconsistencies in scheduling arrangements showcasing the presence of unclear, flexible or un-enforced timing routines for monitoring and supervision;

"Maybe two weeks or at the end of the month" (NGO Director, Kumasi).

"They go round I think about every three months" (Lab technician, Private hospital, Accra).

"Scheduling depends on [the] NTP, as and when they give funds for monitoring" (Public health Nurse, Accra Metro).

Hence, the prevailing sentiments among coordinators in both the private and public institutions were that supervision was irregular and usually constrained by funding inadequacy.

4.4.3 Contracting mechanisms used for formalizing the engagement of providers

There were varying experiences with formal agreements for the partnership and similarly varying understandings of what these agreements represented. Where a formal arrangement existed it tended to be a Memorandum of Understanding (MOU) in all cases.

"It's all MOUs; what we have is MOU, as a partnership document which spells out [the work requirements]… they provide the framework for enforcing the provisions therein. For example if an NGO access grants and goes out and fails to deliver on

schedule or fails to deliver at all, there are sanctions provided "(Executive Director of CSO in Accra).

Other respondents however had different experiences with such arrangements;

"They just invited the head of the facility and [other staff], there was no written agreement". (Private Lab technician, Accra).

"It was a paper contract but it wasn't something that was straight-jacket" (Disease control officer in public facility, Kumasi Metro".

Another respondent also hinted at sub-contracting arrangements that some NGOs may get involved in with other NGOs. Evidently, some amount of variation and discretionary deployment of policy existed in the arrangements made between the private sector and public sector actors involved with PPM schemes.

4.4.4 Government Policy and Commitment towards TB Control

Respondents were unanimous in their opinions concerning the lack of adequate commitment by the government to TB control. This reflected in both sectors. The following comment was particularly poignant:

"When you go to America, maybe two cases for the whole nation. But in Ghana, two hundred is not a problem, two thousand is not a problem…when you get to millions then we say that's a problem; let's address it" (Program Director of CSO in Kumasi)

Another coordinator in Kumasi felt government commitment should reflect in funding. He further complained of the funding situation thus far in 2019;

"This year there hasn't been any fund for TB activities. I don't know if government is providing or not" (TB coordinator, sub-Metro public hospital in Accra).

A chief executive of a private organization displayed obvious exasperation when he offered the following remark:

"Ghana is committed to the all the lofty words; when it comes down to the country specific situations there is much to be desired… you go everywhere Ghana is first to sign or ratify any treaty but when you come back home, we can agree that we're not seeing anything". (CSO executive, Accra).

Other respondents cited other reasons as evidence of government nonchalance including failing to regulate sale of herbal treatment for TB, the perpetuation of wrong information regarding diseases conditions like TB. Given the similarity of opinion and strength of sentiment expressed from different quarters on this matter of government commitment. It was clear that stakeholders have increasingly higher expectations of the government.

4.5 Financing TB Care and Control

This theme comprises categories showcasing respondents' experiences with funding for TB; and the Enablers' package which was implemented as a mechanism to support the mostly poor TB patients financially; and partly to motivate providers involved in their care.

4.5.1 Funding and spending for TB control activities

TB control is funded by a mix of international and domestic sources. TB control was found to be plagued by chronic funding deficits; with the consequent ramifications experienced in all aspects of TB control such as training, motivation, monitoring and supervision activities, provision of logistics and feeding of poor patients. Respondents shared their frustrations with fund provision;

"The main constraining thing is funds funds funds" (TB coordinator with a CSO in Accra).

"This time because of financial issues, monitoring and a lot of things are done by our own funds… at times there's a delay from management to release funds for whatever is supposed to be done… As at now this is May, we haven't received any money for

monitoring and supervision" (Public health nurse supervising one of the five sub-Metro areas in Accra).

"The funding is too small [and] it's a flat rate, everybody it's a flat rate". (according to a CEO of an NGO in Ashiedu-Keteke Sub-Metro, who complained that funding levels were not commensurate with the work requirements per organization).

Sometimes funding constraints also limited the ability of the NTP coordinators to conduct on-site (customized) training for health care providers on-site in their respective facilities, and to perform other routine functions;

"On-site [is better] but that one is costly than organizing all of them at a particular place" (Metro coordinator within Kumasi Metro).

Sometimes we have to fund [patients'] transportation out of pocket… because most of the TB patients are poor, so eventually some of the coordinators have to dip their hands in their own pocket to support the TB patient (Public sector coordinator, Accra).

Many coordinators in both the private and public sectors expressed sentiments that gave a sense that TB funding has been largely focused on external funding without installing mechanisms to ensure self-sustenance. All respondents who commented on sustainable financing agreed that sustainability measures need to be devised by the NTP, given the current exigencies:

"There should be structures in place so when the funds is not coming you can continue with the work… partnership. It is an essential aspect that needed to be done" (Project coordinator, private organization in Kumasi).

"Like the way we have the Ghana Heart Foundation. They have a way of generating [funds]" (Nurse in sub-Metro hospital, Accra).

Other organizations cope with financial constraints by harnessing inter-linkages with other disease control programs; or exploring other non-traditional sources to create some 'fiscal space' for TB;

"Like I told you it's linked to HIV and some of the children we support were having TB, so now when we get a project we're advised to include TB education. So that's a good policy. Even if it's HIV or Malaria they ask us to include TB education". (Project Coordinator, NGO in Kumasi Metro).

"We got some funds from religious groups like the Methodist [church]; STAR Ghana; we also got some funding from PROMPT, a USAID initiative. (Director, CSO in Kumasi).

4.5.2 The Enabler's Package for Supporting TB Patients and Motivating providers

Prior to its suspension, the enabler's package was the core component around which the PPM initiative derived its sustainability; it provided incentives for private facilities, some financial support for TB clients as well as motivation for staff who work with these patients. Some respondents recalled that era almost with a mixture of fondness and regret:

"The majority [of the funds from the enablers' package] goes to the patients, and then we have a small portion for organizers of meetings and outreach and contact visits. But the majority goes to the patients. It was really helping". (Metro TB Coordinator in Accra).

"[The] package has been cut and only available to MDR-TB patients, so that is how it is now". (Executive Secretary of a CSO in Accra).

The administration of the package whilst it was still active was not without problems however. These included delays and modifications of guidelines for disbursement to beneficiaries;

"When it comes to the facilities, at times there's a delay from management to release funds for whatever is supposed to be done" (Metro TB Coordinator in Kumasi).

"Information that the enablers package [was] not getting to the clients. Some are getting while some are not getting so that information led to withdrawal [of the package] from the system". (NGO Director, Accra).

"There [was] a document that specify how it should be but the compliance [was] not total… the formula for disbursement is there but each facility and its mode of disbursement so it's not uniform". (NGO coordinator in Accra).

Respondents believed that the afore-mentioned issues contributed to the failure and subsequent withdrawal of the enablers' package, and were unanimous that a substitute was needed.

4.6 Service delivery for TB control

This section describes respondents comments on issues bordering on the types of services provided by institutions collaborating in the Public-Private Mix (PPM); the additional workload imposed on healthcare providers; impact of PPM on TB control; scale-up of PPM; feedback from TB patients and coping mechanisms adopted by providers to aid their work.

4.6.1 Scope and Quality of TB care and control activities

Providers and facilities in the public sector are involved in the entire range of recommended PPM tasks such as referral, diagnosis, treatment, advocacy etc. This is in synchrony with WHO recommendations. Private providers contribute according to their capacities and interests;

"Actually we do TB case screening and referral for treatment; at the same time too we do counselling and testing for people living with HIV/AIDS". (CEO, NGO in Kumasi)

"[We] mobilize the power of persons… who have survived TB infection to be able to become advocates". (Executive secretary of CSO in Accra).

"Our place is chosen as a diagnostic and treatment centre, so it's a diagnostic centre and same as treatment centre so we are able to diagnose and treat at the same time". (Lab Technician, private hospital in Accra).

Responses from participants showed that the full repertoire of tasks for effective PPM implementation exists within the health setup of the implementing areas. However, the performance of these tasks is wrought with challenges;

"If the client doesn't turn up for treatment or his or her medications I can go there but it's difficult to do because we don't have funds, so we practically don't do it. That is the fact". (NTP sub-Metro coordinator in Kumasi)

"Yeah, currently you visit some of the private facilities and they are not screening at the OPD then they will complain of job load". (Public Health Nurse and sub-Metro coordinator in Accra).

One Accra coordinator in commenting on some of her typical routines, shared an interesting insight,

"I talk to them, I do screening, I go to churches and I talk to them in churches and most of the time I do go to the mosque, yeah because I realized that after the fasting there's more [TB] patients".

This observation hinted at a possibility of seasonal fluctuations in TB case detection.

4.6.2 Workload of providers involved in TB care

Due to the multi-tasking nature of TB service provision, some providers complained of being saddled with arduous or too many tasks to perform simultaneously;

"I have about twelve private facilities providing DOTS, but [I] can't visit all… only three". (Public health nurse supervising private facilities in Accra).

"*Because we combine Malaria, HIV and TB. So it's not easy*". *(Project coordinator, NGO in Kumasi).*

"I don't know if you have done TB work collaboration; it looks easy on the outside but it's not that easy; the reporting format and everything". (TB coordinator, public polyclinic in Accra).

4.6.3 Impact of Public-Private Mix on TB control

Nearly all respondents concurred that PPM has yielded positive benefits, but the prevailing sentiment was that there was more room for improvement.

"[PPM] has impacted positively because in 2011 over 100 NGOS were engaged in TB control. [Their] contribution was around 11% of the national target [though] this has [now] dropped to about 3%". (Executive of a CSO based in Accra).

"I took up in November 2017. There [has been] increment in our case detection I think by 6.8% or something… yes that is from the private". (Nurse, Accra).

"Like I told you, there's a village along Bekwai where there's a herbalist. So far he's referred two TB cases to us (Project director, CSO in Kumasi).

"Private clinics are very close to their residence and it ensures [compliance]". (Disease control Officer and TB coordinator, Kumasi).

"As far as TB, it has been successful but not too successful if I have to rate I will say average, it's not excellent its average". (CEO of Accra-based NGO).

Stakeholders were unanimous in the utility of PPM, and all of them suggested it has been a useful intervention. However, they agreed results could have been much better.

4.6.4 Scale-Up of the Public-Private Mix Initiative

There was consensus on views about the need to scale up the initiative in order to improve access. The rationales for the need to scale-up was included that;

"Not every community has government facilities". (CEO; NGO in Accra)

"In Kumasi we have a few public facilities, the rest are private. So really they have a lot of impact. So if we can involve them [the private sector], it will have a greater impact". (Disease control officer, TB coordinator).

Another who saw the need for expansion for purposes even beyond TB agenda, recalled that

"Yes it should be expanded nationwide because in certain areas the health facility is very poor. Sometime I saw a pregnant woman being carried on a chair to cross a river to go and deliver". (CEO of NGO with religious affiliation, Accra).

One public sector coordinator was however cautious about calls for scaling up, noting that

"If there is motivation, something to attract the private facilities then it is possible, but if it is as it is now then it's a no". (Director, Kumasi-based CSO).

In view of trends in TB case notification, participants believed such recommendations as these were in sync with the aim of reaching TB control targets locally and globally.

4.6.5 Feedback from TB clients

Respondents were asked about concerns TB patients may have shared with their care providers regarding their challenges in accessing care for TB disease. These included stigmatization; lack of meals to take the drugs with; lack of adequate information on TB care services. Their comments suggested that the synergy between TB disease and poverty is made manifest in many facets of TB care. The challenges bordered on food, stigmatization, transportation to access care, costs of lab investigations for other comorbidities, etc;

"They [patients] complain the drugs are too strong and they need to eat well and don't have money… they cry about not having food to eat" (Nurse, Polyclinic).

"The challenge is on stigmatization" reported a CEO of a NGO in Kumasi).

"They will ask you auntie we don't have money to go to the lab" said one TB nurse.

TB patients may also be exploited by some facilities, further compounding their pre-existing vulnerabilities.

"The sputum smear is supposed to be free but at times some of the private facilities, they charge for it… but when you approach them they will tell you they are not charging, but the clients will tell you they paid". (Public Coordinator, Accra).

4.6.6 Coping mechanisms adopted by providers to deal with some challenges

This section describes some contextual hurdles patients and their care providers have to negotiate in order to maintain work continuity. Many TB care providers have to draw on their personal resources to support the program, this finding was typically among public sector

coordinators. The private providers mainly spoke about having to compress many tasks into the time and logistic space that would have sufficed for only single tasks;

> *"when you go to do the home verification , you do the contact tracing instantly , screen them and then if there is any presumed case, then you pick it up and you follow up". (Public Health Nurse in Accra).*

> *"Yes, a lot of our personal funds, because now there are no funds so you can't sit down because you want the project to go on… at times some of the staff start to use their own pocket money because you look at the condition of the patient". (Public sector disease control officer, Kumasi).*

> *"You can collect the sputum in the morning then you do the microscopy in the afternoon when the work load is down so that it doesn't conflict with whatever you are doing" (Lab technician, private hospital in Accra).*

A TB care provider in a private pharmacy also did this to deal with funding inadequacy and lack of supporting staff in her facility;

> *"My son use the motor bike [to help deliver] drugs … to the patients. Sometimes I let him go and carry the sputum" (TB coordinator, private facility).*

Providers in both private and public institutions in both Metros reported making all these necessary adjustments in order to continue providing services.

4.7 Characteristics of the Workforce involved in providing TB care and control services

This theme encapsulates respondents' knowledge and views concerning issues with providing training for TB care providers; the perennial problem of TB staff attrition; involvement of informal practitioners in TB control; and trust relationships among partners in TB control.

4.7.1 Training and capacity building for the Public-Private Mix

The overall responsibility for training rests with the National TB Program (NTP). These include refresher trainings organized to re-orient providers as well as to issue updates on

protocols and procedures. NTP supervisors reported training their staff and private collaborators and private collaborators on a wide range of activities required for the successful execution of their duties

> *"We train new facilities that we introduce on board for the TB management and also if there's any update concerning tuberculosis, we do that too. And then when there's new staff in the system we have to train them too." (Sub-Metro coordinator, Accra).*
>
> *"We train them on anything concerning Tuberculosis and then data management, management of the TB cases itself. And also, how to monitor the patient and a lot of things". (Metro coordinator, Kumasi).*
>
> *"Initially we were trained how to handle cases, how to Identify and handle cases, how to manage cases and how to counsel patients on how they conduct themselves in other not to transfer the disease to others". (Private clinic coordinator).*
>
> *"First the technicians were trained in the sputum microscopy then the nurses and the other staffs were also in how to fill the TB forms so that they will be able to dispense the drugs; how to pick category [of TB cases]". (Private Lab technician).*

Both public and private sector providers however expressed some concerns about the training workshops;

> *"At times to organize them becomes difficult. Time is one of the factors; to be able to get them together… Especially if it's not on-site training, you would not get a lot of people… and at times too, those who matter, especially on the ground that will handle the cases, are not allowed to come to the workshops" (NTP Metro coordinator, Kumasi).*

Though believed the mass trainings were sometimes not very effective though it was a cheaper method than individualized (on-site training);

"on-site [training] is costly than organizing all of them at a particular place" (NTP coordinator, Accra).

The private practitioners on the other hand had their own misgivings about the conduct of the workshops, mainly with respect to timing, location and allowances;

"They will say come we will close at one [o'clock] and you go they will close at 4 [o'clock]" (Laboratory technician in a private hospital in Accra).

"Yeah, because most of those [trainings] are done in Accra, that's the problem, you get there [training venue], but you'll all be asked to go find your own accommodation". (NGO coordinator in Kumasi).

"We are a whole country, if you're going to center everything in Accra, what happens to the middle zone, what happens in the northern zone?" (CSO Director, Kumasi).

Training also appeared to be narrowed to TB focal persons only, without a plan for knowledge transfer to other staff.

"They go for the training and then they come and then close their minds. So the others feel since I have not been trained or I'm not the focal person, then it's not my work to do it… so when that [trained] person is not around, the work comes to a standstill". (Public coordinator in Accra Metro).

All coordinators providers also expressed the wish that trainings would be more frequent, with one Accra-based coordinator noting that *"sometimes like two years before you have this [refresher training]".*

4.7.2 Private facility staff and community TB volunteers' attrition from the workforce

A common problem bemoaned by the public sector coordinators was the fact that there was a high turnover of staff in private facilities; as well as loss of community volunteers. TB coordinators said TB volunteers were community people who provide support to patients during treatment and also contribute to community case detection.

"We train people, the next time you go there, maybe they're fired or they are no more there" as confirmed by a Metro coordinator in Kumasi.

"At times you get there and you meet a new face, there is high staff attrition in the private sector" (Program manager, CSO in Accra).

"Currently we don't have community volunteers with government sector. Who is motivating them? Nobody". (Sub-Metro coordinator in Accra).

Some participants opined that aside money, formal recognition and trainings could be used as motivation for TB volunteers; and discouraged an over-reliance on financial incentives;

"We've avoided monetary [incentives] so far because if we do monetary and the funds cease, what do we do? (Program Manager of a CSO in Accra).

4.7.3 Involvement of informal practitioners in TB control

Informal practitioners such as herbalists and spiritual healers were frequently mentioned by public coordinators as potential partners for the purposes of TB cases detection, and calling for further engagement with more informal providers;

"They are one group we can never ignore" (CEO of NGO in Accra).

"Here we have even trained a lot of them… not on management, but for detection".

Some coordinators acquiesced to this thinking, albeit in a more cautious manner,

"I think it's in order; It's okay but that should also be complimented with professional and technical support". (CSO director in Kumasi).

In field notes taken from 'out-of-interview' discussions with an Executive from Aurum Institute, it was made clear that this recognition of the utility of informal practitioners also reflects the realities of Ghanaian society – that patients may seek alternative healing at one point or other in their care- seeking expeditions due to varied and sometimes erroneous understanding of TB causality. Some participants confirmed this;

"[Patients] conclude that it's spiritual; we give them drugs, they'll go but you won't see them again. The next time you hear about them is that they have gone for spiritual assistance or prayer camps". (NTP Coordinator in Kumasi).

"They all end up in a traditional healers place and then they turn up when the whole issue is complicated, you see and most of them come back. We get about 60% of them losing their lives which shouldn't be so". (NTP Sub-Metro coordinator in Accra).

Participants however acknowledged that the technique for approaching these informal providers needs considerable tact, as some of them may perceive such advances as a government attempt to infiltrate their (unlicensed) business practice;

"One challenge we having with them [is that] the moment we try to engage them, most of them they don't have license, the drug peddlers and the traditional herbalists, so they are scared that we want to put them [in trouble] so they pull back, "we need them… because they are more easy to access than public health facilities". (CEO of an NGO based in Accra).

4.7.4 Trust relationships among partners in the Public-Private Mix

Generally there was a cordial relationship between public and private sector staff as far as their day-to-day collaborations in providing TB services to patients were involved. There was however some level of mistrust when it came to financial issues;

"If I say trust I will give them [NTP] forty-five percent". (Private partner in PPM).

"Yes, a lot [of mistrust] with regards to the funds, when you tell them there is no fund they don't believe it". (Public sector coordinator, Accra).

"The sputum smear is supposed to be free but at times some of the private facilities … charge [the clients]". (Public sector coordinator, Accra)

In other more worrying comments, there was a suggestion of potential fraudulent activity:

"The mistrust is that actually there are people who just form organizations on the basis of a call. When there is a call for TB [grants], [they] quickly go to Registrar-General, register an organization and can cook [up] so many things… Some of them don't even know what it means. But they get a consultant, write a proposal, get the funding and it's just portfolio NGO moving about". (Project Director, NGO based in Kumasi).

4.8 Medicines and Technology used in TB care and control

This theme summarizes respondents' experiences with TB medicines and other essential tools used in TB care and control.

4.8.1 Medicines used for Treatment of TB Disease

TB drugs are not stocked primarily by private facilities. They only have access to drugs for patients currently under treatment, and they have to make requisitions for the supply for each patient. Their coordinators facilitate this process as expeditiously as possible as they all commented on the importance of uninterrupted treatment.

"Yeah it's very easy [to get the drugs], if you bring your letter within the next thirty minutes, you will get it, provided we have some at the pharmacy" (Public health nurse, Accra).

"As for the drugs no problem… as soon as I get [a patient] I just go Maamobi [polyclinic] if only they have it in stock". (Private coordinator, Accra).

In spite of the reassurance, there were hints from other quarters that sometimes the main supply of drugs runs out; as well as other less favourable drug storage conditions

"I think there was some time that there were shortage of drugs so imagine you've gotten to the middle [of treatment] and there are no drugs and you are not supposed to miss doses; the patient [may] blame you for not recovering well".(Nurse in public polyclinic).

"At times too you go [on monitoring] and storage of medication is not as the standard way… you get there and the medication is mixed up with other stationaries … it's not well stored". (TB coordinator, Accra).

These negative findings concerning TB drugs were however not reported by other coordinators interviewed. The general impression respondents gave was that availability and handling TB drugs were accorded the utmost importance.

4.8.2 Availability of Materials and Technology for TB Care and Control Activities

TB coordinators noted some materials and tools that were indispensable in their line of work. The public sector coordinators ensured that their private counterparts had the requisite tools to work with. They however, reported having difficulties whenever their supply of some critical tools got exhausted; as well as issues with outdated guidelines and protocols.

"TB, without the [TB] register you can't do it". (TB coordinator, Accra).

"Apart from the screening tools , we provide them with the client folders , TB registers… we give them the needed logistics (TB coordinator, Kumasi).

"Accra Metro they supply as with the reagents for the TB screening" (Private coordinator).

None of the private sector respondents confirmed having a copy of the TB coordinators' manual from the NTP. The public sector coordinators had access to them but however mentioned the manuals were outdated;

"I think it should be revised because this [version] is 2012", one TB coordinator in Accra said.

A few respondents commented on occasional shortage of defective materials;

"As we speak now there is shortage of treatment support card… and these are all that I could get hold of on Thursday when I went to the regional NTP office; ten, just ten"

lamented one sub-Metro coordinator, who has been involved in TB control over the last three years.

"Sometimes when you go, the [microscopy] slide they give you, you have to come and use your own slide because theirs is mouldy; you can't use it" (Lab technician, Accra).

Some private facilities had also benefitted from new equipment distributed to them by Aurum Institute;

"We gave four of them [private facilities] Gene Xpert machines; two in Kumasi, two in Accra" (A manager from Aurum Institute, Accra).

The NTP was also noted to have distributed some Gene Xpert machines within public facilities. Respondents noted that these TB diagnostic machines were improving waiting times and diagnostic accuracy.

4.9 Information and Communication

One of the biggest challenges identified with regards to information was the lack of, or incomplete TB data entry by private providers. Nearly all public sector coordinators mentioned this issue;

"Yeah the most important thing is that they have to attach conditions to the reporting system because we're finding it difficult. A lot of them [private facilities] are not reporting". (Kumasi Metro coordinator).

Field notes taken during this research included the observation in all facilities that TB information is collected in manual TB registers in private facilities and at the sub-Metro level. Some respondents shared their frustration with having to perform manual data entry;

"[We] are supposed to be giving reports [to NTP] in everything but this is the case whereby you don't even have computers to work on". (Coordinator, Accra).

Several comments from respondents showed that there was a lot of information asymmetry regarding TB causation, treatment and availability of free treatment; with TB patients usually on the ignorant end of the divide. Whilst awareness creation efforts were reported to be sub-par by most respondents, a few respondents however believed that the awareness level on TB among the general public is rather high;

> *"[There is] high awareness; because now every village I go to, when someone is coughing too much they ask whether it's TB". (CEO of Accra-based NGO).*

Sometimes patients complicated their own treatment by providing false contact details and providing aliases instead of real names in an attempt to maintain anonymity;

One coordinator in Kumasi remarked that *"some [patients] even change their names… people are hiding their identity when it comes to TB*".

Coordinators complained that such instances made contact tracing very difficult.

4.10 Facilitators and Barriers to the Public-Private Mix

This section is summarized by the table below (Table 4.12). It represents the major facilitators and barriers extracted from the six main themes identified to answer the second objective of this study.

Table 4.12: Facilitators and Barriers to PPM identified

Overarching Themes	Key Barriers identified	Key Facilitators identified
Leadership and governance	Low prioritization of TB by government; sub-optimal monitoring and supervision;	Inclusiveness of all providers
Financing	Reduced TB funding	Financial incentives e.g. enablers' package
Workforce	High staff attrition in private sector; mistrust among partners;	Participation of community TB volunteers. NGOs/Aurum Institute
Service Delivery	TB stigma	Relatively better customer service in private facilities
Medicines and technology	Patients' default with medication; use of herbal medicine	Introduction of Gene Xpert machines for TB diagnosis
Information	Lack of/incomplete data entry; ignorance on TB disease and access to care	Availability of manuals for coordinators and OPD screening tools

The major facilitators and barriers teased out from respondents comments brought to the fore the issues summarized in Table 4.12. These factors represent the opinions expressed that were most common among all interviews that respondents discussed as essential. They were thus conceived as being representative of the major challenges as well as opportunities across the spectrum of TB care providers interviewed.

The inclusion of all partners in both private and private sectors in TB control, as well as incentives like the enablers' package and the supporting roles of TB volunteers were seen as facilitating the Public-Private Mix (Table 4.12). On the other hand, the barriers identified included funding inadequacy, high attrition of TB workers especially in the private sector, as well as mistrust among partners (Table 4.12).

CHAPTER 5: DISCUSSION

The three specific objectives in undertaking this research were to explore the health system factors affecting the Public-Private Mix (PPM) initiative; to identify facilitators and barriers to PPM; and to analyse trends in TB case notification using PPM.

5.1 Health System Factors Affecting PPM Implementation

This study revealed many health system factors affecting PPM implementation. The main issues are discussed in the subsequent sections.

5.1.1 Leadership and Governance in Public-Private Mix for TB Care and Control

From this study, private providers had multiple pathways for entry into the PPM schemes; examples include new facilities being invited by the government TB program, having previous work experience, or even private providers themselves taking the initiative to request for participation. This flexibility indicates an open system which contrasts positively against an exclusive system that may exclude others from participation. Ambe et al., (2005) provided the rationale for striving for maximum inclusion in TB collaborations, arguing that larger impacts are expected with the involvement of all health providers. That notwithstanding, every invitation or expression of interest in PPM is followed up with a facility (quality) assessment by TB coordinators from the public sector, to determine suitability for enrolment. This is because the World Health Organization (WHO) recommends prioritization of providers according to certain criteria which ensure equity and quality in the provision of TB care service to communities (Stop TB Partnership, 2010). In areas without many private facilities however, it may be more strategic to build capacities of the few rather than exclusion, simply because the alternatives are limited. In the current wave of private provider engagement by Aurum Institute in Ghana, a strict insistence of the inclusion criteria of OPD attendance of 500 may exclude some strategically located facilities. Monitoring and supervision is mandated by the WHO in order to ensure compliance with standards (Stop TB Partnership, 2010). Some

providers considered the conduct of monitoring and supervision as "witch-hunts" because some of the exercises tended to be unannounced by the supervising coordinators from the government sector. The public sector officials rationalize this with the observation that it is one way to ensure that they (private providers) are kept "on their toes" ; further contending that these 'surprise' visits are minimal in any case. Respondents from both sides of the divide acknowledged the pros and cons of this methodology however. Public sector coordinators were of the view that they needed more resources to be able to adequately perform the supervisory duties. This would enhance compliance with standards and lead to better results. This is important because evidence from Ethiopia showed that TB patients had a higher likelihood of default if their care providers were not receiving adequate supervision by TB experts in their districts (Mesfin et al., 2009).

5.1.2 How the Collaboration between Partners in Public-Private Mix is Formalized

The method that was used to formalize the collaboration between the public and private sector actors was a memorandum of understanding (MOU). No other type of contractual agreement was mentioned. In other countries a letter of agreement may also be used, typically in the case where the provider was an individual rather than an institution (Phalkey, Butsch, Belesova, Kroll, & Kraas, 2017). In some facilities visited however, there was no recall of any contractual documentation. Whilst this suggests a degree of inconsistency in procedures, it may also be merely in keeping with the philosophy of allowing some flexibility, to suit private providers' wishes. Some providers interviewed in this study perceived these documents as binding, with potential legal liabilities, and reasoned therefore that this may make other providers hesitate to get involved. For yet other respondents, the documentation signified that they were being 'taken seriously' in the collaboration. Lei et al (2015), showed that PPM outcomes were better where contracting mechanisms (with obligations) are involved. Where resources and fund allocation is involved, having formal arrangements is best practice for streamlining activities

and enforcing adherence to standards, for optimal outcomes. Studies done by Lonnroth and colleagues suggest that using well-defined contracts can lead to effective practitioner involvement in partnerships (Lönnroth, Uplekar, & Blanc, 2006).

5.1.3 The Commitment of Government to TB Control

The commitment of government to the TB cause could be described as inadequate, inferring from the opinions of all respondents. It was described that government will not prioritize TB until there are "millions" of cases. Evidence of this is seen in the lack of funding, reactionary nature of resource allocation, the overall inconsistency in some procedures as confirmed by participants, and the failure of government to devise alternative strategies to sustain core components like the enablers' package after it was withdrawn. These have contributed to the negative trends in TB outcomes over the years, in synchrony with falling funding levels for TB control. Government is obliged to fund TB because it is socially responsible; when TB funding is strategic it has been shown that it can be cost-effective (Lal, Uplekar, et al., 2011). On the positive side, the policy of restricting free marketing of TB drugs in Ghana can be argued as one potent show of commitment, because it contributes significantly to reducing drug resistance

5.1.4 Financing for TB care and control in the Public-Private Mix Initiative

The nagging theme underlying most activities required for TB control bordered on of fund availability and the allocation thereof. This view was shared by all respondents regardless of professional orientation, public or private affiliation, or duration of involvement in TB control. TB funding both on the global and domestic stages has been declining steadily (Frick, 2017; Global Fund, 2019; WHO, 2018a). This is a potent causal factor for decline in outcomes such as case notification and treatment. Opportunities that exist within 'less traditional' sources of fund-raising such as private for-profit tertiary institutions and medical facilities, religious organizations could all be harnessed to ease the financial burden on the public sector; Slevin &

Wells (2014) hinted that exploring and combining all these potential funding sources for TB control purposes yields successful results. Lal et el (2011) also showcased how cost effective TB programs can be in a paper that showed an increase in case detection by more than 25% in China, Nigeria, India and The Philippines when funding for TB increased by 10%. Certainly, this requires the application of best practices in efficiency. One strategy advocated by Aurum Institute, interviewed as part of this study, concerned the 'co-financing' of TB with the National health Insurance Scheme (NHIS). This holds some promise because it offloads the burden of financing care for TB patients, as shown in a study in China (Xiang et al., 2016).

Higher integration and synergies among the several vertical disease control programs should be explored and optimized. Historically, the evidence is that isolating disease programs from the horizontal health structure leads to duplicative roles and expenses (Raviglione & Pio, 2002). These optimization measures can help to stabilize funding for TB and importantly, avoid the scenario of TB care providers having to meet their work obligations with their own funds, thus occasionally funding some TB care costs from their pockets.

It is pertinent to consider that only 22% of TB care costs are actual medical care costs, with the remainder subsumed in transport, food-related spending, and partially compensation patients for income losses, and motivation for health care providers (Matji, 2016). These non-medical costs were what the enablers' package stood for. Over 64% of TB patients suffered catastrophic economic costs from accessing TB care in a 2016 survey (Bonsu, 2018) Therefore, it can be argued that the suspension of the enablers' package is a potent illustration of a squandered opportunity for accelerated TB control. This resulted from some irregularities with the administration of the funds, including chronic delays and unclear guidelines in fund disbursement (WHO, 2015). These were direct reasons ascribed to the exit of many private providers from the PPM initiative, because it was the only modicum of financial compensation they derived from participating in TB control. Accordingly, all respondents called for the

government has to devise alternative financing mechanisms to power this component of TB control. A study in Ghana showed that the enablers' package led to improved TB outcomes whilst it was active (Amo-Adjei & Awusabo-Asare, 2013). A systematic review that also assessed the impacts of adherence interventions including enablers' package revealed that treatment completion and success rates were enhanced by such incentives (Alipanah et al., 2018).

5.1.5 Quality of Service Delivery in Public-Private Mix

Responses obtained about the range of tasks showcased the entire range of tasks necessary for a comprehensive program implementation. This implies a level of 'readiness' within the system. The comprehensive range is not necessary always available in all facilities however, as some are only able to handle certain tasks according to their capacities or preferences. This may mean extra inconvenience (including financial) for patients who are referred long distances either to access diagnostic services or TB medication. TB clients were also reported to have a preference for receiving treatment for TB in private facilities. There is a pervasive perception that the standard of care quality is higher in private facilities, accounting for why clients prefer to first report to private facilities (Phalkey et al., 2017) . A local study also found that customer satisfaction and service quality were better in private hospitals than public facilities in Ghana (Anabila, Kumi, & Anome, 2019). In contrast however, a study in China found perceived quality of care to be better in public clinics, across all measurement domains used including autonomy, confidentiality and communication. This may be a reflection of the differences in regulatory contexts of the health systems in different places.

Service delivery is further affected by the workload involved in TB control. An Ethiopian study that quantified the turnaround times of laboratories tests including gene Xpert tests, concluded that increased workload was one of the many factors limiting efficiency (Shiferaw & Yismaw, 2019). The time commitments required of 'TB practitioners' was reported to be considerable.

This is contributed to in part by the fact that most coordinators interviewed especially disease control officers, have to share their working time among a number of disease control programs; and also some coordinators have to supervise multiple catchment areas. It is useful to heed the admonishment of the World health Organization that health providers be assigned tasks according to their explicit capabilities and competencies (Stop TB Partnership, 2010).

5.1.6 Feedback from TB patients on their challenges

Stigmatization of TB patients is still rife, as evidenced by concerns expressed by patients Courtwright & Turner (2010) systematically reviewed the literature on TB stigma, concluding on the deleterious effects on TB control fortunes. This includes prevention or delay in care-seeking. This results in spread of infection and unnecessary deaths. 'Stigma management' must be fully integrated as an intrinsic part of TB control. Studies show that TB treatment is negatively affected by the socio-economic barriers including the lack of food (Sagbakken, Frich, & Bjune, 2008), negatively affecting compliance. Another study also found that provision of food as part of TB control packages enhances treatment compliance (Gebremariam et al., 2010). Scarcity of food presents one undeniable challenge to indigent TB patients. In this study, this was one of the key reasons described for defaulting of prescribed treatment regimens. It was clear from sentiments expressed during interviews that effective treatment plans for TB cannot ignore the issue of patient meals.

5.1.7 Scaling-up of Public-Private Mix for TB care and control

Currently PPM in reality is still limited to the implementing urban areas in Accra and Kumasi. Yamey (2012) provided conviction that amplifying evidence-based interventions reduces disease burden significantly. It was suggested by participants in this study that extending the initiative nationwide will increase access to local communities. 'Hard to reach areas' tend to be the working domain of NGOs operating in these areas for various causes. Encouraging and empowering them to add TB control to their efforts will be a cost effective way to cover these

areas. A study in Tanzania reported on a three-fold increase in TB case detection among HIV patients following extending collaboration to an NGO by the National TB program (Wandwalo, Kapalata, Tarimo, Corrigan, & Morkve, 2004). Scaling of concept-proven initiatives is useful because this will respond to the "know-do" disparity by transferring knowledge into effective action (WHO, 2005). In some countries including Nigeria and India, extending PPM coverage contributed up to 25% of TB cases detected (Lal, Uplekar, et al., 2011). It remains imperative however, to consider the varied socio-cultural and economic nuances, i.e. context within different communities, in any scale-up attempts (Lei et al., 2015; Yamey, 2012).

5.1.8 Human Resource, training and capacity building for Public-Private Mix

About 75% of the cost in curing a TB patients goes into the cost of hiring a TB care worker (Awofeso, Schelokova, & Dalhatu, 2008). This makes optimizing every TB care worker essential in order to derive maximum efficiency. From this study, coordinators noted that more training was needed for TB providers; secondly, training of private providers is more efficient if done 'on-site' at the locations of each provider. In such a case, the training is able to be customized to individual needs and contexts; one study found that educational outreaches to TB nurses at their workplaces significantly improved quality of care to patients (Fairall et al., 2005). It was not the purpose of the authors to compare this to offsite training however. It is unclear from the literature whether on-site training yields better results than mass trainings outside of providers' workstations. TB coordinators also noted that individualized training is more expensive compared to assembling many providers at one location for mass training. Some supervising coordinators adapt by utilizing their monitoring and supervisions visits as opportunities to provide on-site context-specific training. This measure is a useful alternative that reduces wastage by combining as many necessary activities as feasible into each supervision visit. This will also empower district coordinators to support facilities within their catchment areas better, in contrast will the problem of training workshops being restricted to

the capital city (Accra) only, as some respondents had pointed out in protest during the interviews.

The introduction of Gene Xpert machines into the private sector by Aurum Institute will improve diagnostic accuracy and consequentially TB case detection; and also increase the critical mass of personnel with competency in using the machines for the health sector.

The high attrition rate reported within the private sector cannot be resolved directly by the public sector. This is because the National TB program (NTP) has no control over who is employed or retained by a private facility. Most TB coordinators in the private sector only perform TB control functions as additional tasks, with some unfortunately approaching the work as not a part of their core functions. Their underlying reasons have more to do with their primary employment conditions rather than any inconvenience the TB program may be causing them. Thus, the NTP has no control over their retention. 'Moral persuasion' has been proposed as a possible alternative strategy especially in the setting of limited financial resources (Slevin & Wells, 2014), for motivating staff. There is limited empirical evidence however, on whether such techniques are effective in the Ghanaian setting.

TB volunteers help in complementing the work of TB personnel. Additionally, they are ideally positioned within the community to support treatment and to directly ensure compliance on account of their proximity to clients (WHO, 2018b). A cluster randomised intervention in Malawi found that engaging such categories of unpaid providers led to increased testing rates of TB and HIV (Bello et al., 2017). They are also more likely to receive cooperation during active house to house visits for TB screening as part of active case detection and thus accelerating cures; one study in Thailand found that TB patients who benefited from home visits by volunteers achieved treatment success rate of 95% (Ngamvithayapong-Yanai et al., 2013). What remains important however, is to provide them with the requisite training and supervision whilst they are deployed in their localities.

5.1.9 Involvement of Informal Practitioners in the Public-Private Mix

That Ghanaian TB clients will continue to solicit services of herbalists, the religious orthodoxy, and fetish entrepreneurs is inescapable. It is in light of this fact that many respondents in this study acknowledged the crucial mixed blessing they presented. Whilst some studies take note of the undesirable delays and consequences that herbalists, spiritualists and other pluralistic health systems may introduce into care seeking channels, (Mbuthia, Olungah, & Ondicho, 2018), others also report that such alternatives have yielded benefits (Bello et al., 2017). This study found that some herbalists and spiritual healers enrolled in a few areas, were contributing to PPM. Kaboru, Uplekar, & Lönnroth, (2011) showed the rationale and potential for inclusion of such informal practitioners. They however explicitly state the necessity for adequate stewardships from the NTPs in such arrangements. Patients are more likely to be disabused of the thinking that TB disease is acquired via curses if these informal partners can be educated and empowered to provide that education to clients and then refer them appropriately to health facilities for treatment. Several studies have demonstrated that given the right mix of training and other resources traditional healers were able to make significant contributions to TB case detection and control in general (Colvin et al., 2003; Harper et al., 2004; Sima, Belachew, Bjune, & Abebe, 2019).

5.1.10 Trust Relationships among Partners Affect the Collaboration

Theobald et al., (2018) emphasized and showed that it is important to build trusting alliances within the area of implementation research as a necessary pre-condition for successful outcomes. A systematic review concerning the effects of trust within healthcare systems showed that trusting relationships lead to better motivation and worker retention as well as quality of care (Okello & Gilson, 2015). In this study, some private facility managers believed they were receiving less financial support than they were due from the TB program; coordinators within the facilities complained their managers withheld the funds for other

purposes. The NTP coordinators on the other hand received feedback from TB patients that they were being charged by private providers for otherwise free lab tests. There were also reports of some patients being dis-honest about these claims. This was a cyclical blame game of alleged malfeasance that fostered mistrust at all levels. One study in Zambia concluded on how such poor trust relationships could be inimical to progress in partnerships (Matenga, Zulu, Corbin, & Mweemba, 2019). A contributory factor to the quagmires associated with the enabler's package itself had to do with the fact that it did not have a specific formula for the disbursement. Though respondents confirmed that there were 'general recommendations' as to the funding allocation, there remained sufficient laxity to allow excessive discretionary use of the funds, which was lacking in transparency. A Nigerian study found that such trust and transparency issues were key challenges for accountability in health financing systems (Uzochukwu et al., 2018). Some facility mangers did not see a need to pay the motivational allowances to their coordinators because these coordinators were already being paid as staff of the facilities. Such reasoning may have contributed to their conduct in handling disbursements associated with the enablers' package.

5.1.11 Availability of TB drugs and Gene Xpert Machines

Ghana's current policy concerning TB drugs discourages these drugs from being procured or stocked by private facilities. Its importation and distribution within the country is tightly controlled such that TB drugs are (normally) only accessible within the public health sector. Only those private facilities within the PPM collaboration may as when necessary (when a diagnosis of TB has been made) be allocated drugs specifically for patients receiving DOTS therapy. This mechanism has nullified the potential for unregulated sale and misuse of TB drugs. Also provision of TB drugs for free is also a major dis-incentive for private facilities to stock these drugs for sale. This is no doubt an appropriate strategy in the fight to prevent drug resistance. Also shortage of TB drugs may severely impact negatively on TB control. A study

in south Africa estimated a 2.1% ($p<0.01$) and 1.42% ($p<0.01$) reduction cure rate and treatment success rate per every 10% rise in TB stock-outs (Koomen, Burger, & van Doorslaer, 2019). In spite of the undesired potential consequences, some respondents reported occasional stock-outs. A study showed that significant cost escalations and poor treatment outcomes occurred when there were shortages of first line drugs for treating TB (Scott, Shah, Porco, & Flood, 2015).

Gene Xpert machines introduced into the private sector by Aurum Institute are expected to increase diagnostic efficiency and accuracy. The Xpert MTB/RIF test is recommended as priority testing method critically ill, those with HIV or at risk of drug resistance (TB Care I & USAID, 2014). This will promote quicker diagnosis and initiation of treatment for positive cases including those with rifampicin resistance. This is in sync with the Ghana Health Service vision of employing more efficient diagnostics to TB control (MOH, 2015). In the long term, this will also build capacity within the private sector for the use of current first line diagnostic technology for TB, which was previously the exclusive preserve of laboratories in the public sector, due to the prohibitively high cost of acquiring the machines, coupled by the 'un-profitability' of investing in TB diagnostics, from the private sector perspective.

In one private clinic the researcher visited within Accra, it was noted that requests for the Gene Xpert test had increased markedly including referrals from a nearby government district hospital. Whilst this is an encouraging trend for case detection, it heralds a potential for the few private facilities equipped with Gene Xpert (currently four) to get overwhelmed by abundant requests. This may become unsustainable in the long term and may force managers of these private facilities to act to preserve staff time for their primary interests.

5.1.12 Information and Communication in TB Care and Control

The marked information asymmetry noticed within the TB control is inimical to progress against the disease. Studies show that there is persistence of inaccurate knowledge,

unfavourable belief systems and perceptions among the patients and the general populace in Ghana with serious stigmatizing effects (Dodor & Kelly, 2009); and institutions involved in TB control must improve on awareness creation to keep populations updated on TB access and care (Zou et al., 2015). There was poor communication between providers along the public private divide; and then among providers and patients. This has the effect of producing a workforce that is not in sync with each other regarding procedures and protocols, also patients and the general public are less likely to seek timely and appropriate care if they do not have accurate information about TB symptomatology, as well as knowledge of available and free treatment for TB. Studies from other areas found that such information gaps could result in poor treatment adherence or loss of clients to follow-up (Mekonnen & Azagew, 2018; Tola, Tol, Shojaeizadeh, & Garmaroudi, 2015). Adequate and accurate information has been shown to be crucial in averting the persistence of misconceptions and myths regarding TB (Amo-Adjei & Kumi-Kyereme, 2013), and contributes to reduced stigma (Gebremariam, Bjune, & Frich, 2010), and hence higher initiation and completion of treatment. The continued use of outdated manuals means that some areas may not be providing service with the most update protocols potentially exposing the system to vulnerabilities including poor treatment outcomes.

5.2 Key Facilitators and Barriers to Public-Private Mix

The second specific objective of the study was to identify key facilitators and key barriers to the Public-Private Mix (PPM). These issues were extracted from the predominant challenges and opportunities highlighted by respondents in describing their experiences with the health system factors previously described.

5.2.1 Barriers to the Public-Private Mix for TB Care and Control

TB funding in Ghana has taken a downturn. This negative funding trend is a global phenomenon (Frick, 2017), that is threatening the gains made in TB control. The declining trend in case notification over the years could be said to mirror the current falling trends in

funding, with respondents in this study noting the significant contributions of PPM to case detection during times when (funding) conditions were auspicious. Frick and colleagues in another publication, showed how funding gaps in TB control could undermine delivery of effective and safe care by TB control programs (Frick, Henry, & Lessem, 2016). Respondents in this study believed strongly that low prioritization of TB control by government is a major barrier to TB control efforts in Ghana. This also reflects in low budgetary allocations for TB control as was reported by respondents. In a qualitative study in by Amo-Adjei, (2014), respondents elucidated on the importance of political influence in the fight against TB. Strong political commitment accompanied by adequate funding will help in achieving TB targets (Raviglione & Sulis, 2016). These are necessary for strengthening PPM efforts. When PPM was intensified (with significant resource injection) in India, up to 12% increase in case notification was recorded (Lal, Sahu, et al., 2011). These potential gains may be missed when these shortfalls are not addressed. One prominent occurrence leading to poor PPM outcomes was the suspension of the enablers' package as was found in this study. Other researchers found the impact of incentives similar to the enablers' package to improve TB control, and particularly reducing economic burdens on poor patients (Seung, Keshavjee, & Rich, 2015; Zhao, Wang, Tao, & Xu, 2013). Thus TB control in Ghana was dealt a huge blow with the suspension of the package. Other barriers identified from this study bordered on poor supervision, inadequate funds, the presence of stigma in TB care, and poor public awareness on TB. These findings were also variously mirrored in several studies (Wei et al., 2009; Zinatsa, Engelbrecht, van Rensburg, & Kigozi, 2018; Zou et al., 2015). Additionally in this study, attrition of trained staff from TB program, particularly those in the private sector was a major challenge to supervisors, because it hampered program continuity and quality. A study in Kerala, also India found similar findings with respect to staff attrition as well as other factors

like a lack of financial incentives, mistrust between partners and issues with stigmatization all being barriers to PPM utilization (Nair, Philip, Varma, & Rakesh, 2019).

5.2.2 Facilitators of the Public-Private Mix for TB Care and Control

Financial incentives in particular, and other forms of motivation like formal recognition, were found to be positive influencers of private sector participation and the performance of TB staff in general during the interviews. Some studies confirm the importance of financial motivational packages as way of attracting private providers into TB control partnerships (Querri et al., 2017; Slevin & Wells, 2014). Ashraf et al., (2018), also found the use of such a mechanism as a very effective device, noting that case notification in Pakistan went up by 71% following introduction of monetary incentive. Some researchers estimated a two-fold increase in notification rate after evaluating PPM schemes that included incentive components (Khan et al., 2012). Ciobanu et al., (2014) similarly documented some promotive effects of incentives on treatment success rates in Moldova. With curtailment of the enablers' package in Ghana, respondents noted that one of the hitherto biggest facilitators of Public-Private Mix participation had been lost.

TB Volunteers were also reported to be a very useful resource for supporting TB control within the urban areas during the interviews. One study in the Philippines also revealed that volunteers played a crucial role in improving TB care access and detection of cases; contributing about 3% to total diagnosed cases in some facilities (Querri et al., 2017). The impact of NGOs performing TB care services extending to remote areas was found to be highly opportune. Of particular note was an international non-governmental organization (NGO) in Ghana, Aurum Institute which was severally touted in this study as a major positive influence on the TB landscape in Ghana. Studies show that partnerships with NGOs can be high yielding – about 36% of TB case detection was contributed by four NGOs working within their catchment

populations in Myanmar (Soe et al., 2017). One NGO collaborated with the national program in Tanzania to yield a three-fold increase in case detection (Wandwalo et al., 2004).

The introduction of Gene Xpert devices into the health service sector is also expected to be a major game changer in TB care from the perspective on interviewees in this study. In 2009, about 37% of TB cases were reported to have been missed due to inaccuracies with traditional diagnostic methods like sputum microscopy (WHO, 2010). Studies show that Gene Xpert testing is associated with reduced waiting times for test results, higher diagnostic accuracy, as well as reduction of unnecessary empirical treatments; thus contributing immensely to efficiency in TB control programs (Davis et al., 2014; Haraka et al., 2018). Respondents interviewed had complained of the time constraints imposed by their having to perform sputum smear microscopy which had longer turnaround times; successful deployment of Gene Xpert machines in the implementing areas can therefore be expected to expedite diagnostic services and consequentially improve TB case detection, notification and prompt initiation of treatment.

5.3 TB Case Notification Trends in Accra and Kumasi Metro

Case notification in Ghana has been declining, reaching one of the lowest figures by 2016 (GHS, 2017). In 2013, an external review of TB in Ghana called for PPM revitalization (MOH, 2013), this call may partly be responsible for the initial rise in case notification that was seen in 2014 from the results of this study. This renewal of efforts included objectives to rigorously integrate TB care services in the general health system, make TB drugs easily accessible, to improve diagnostic standards across the country, though it is unclear what specific resource injections accompanied this advocacy effort. Since then however, the decline has been steady. This downward pattern is in synchrony with the trend of TB funding in Ghana between 2012 and 2016 (Global Fund, 2019). Respondents from this study shared similar views on the effects of funding on case finding. Fund allocation between 2014 and 2018 has consistently remained below budgeted amounts (Global Fund, 2019; WHO, 2018a). The enablers' package for motivating providers and supporting patients was also curtailed around 2014 according to respondents in this study. These downturns within the TB space may have contributed to the negative trends in case notification seen over this period. (WHO, 2014). A study from Haiti showed that case notification improved from 142 to 153 cases per 100,000 between 2010 and 2015 for all TB forms, when active case finding and better diagnostics were applied to TB control (Charles et al., 2017). Other studies however found that case notification is not always necessarily enhanced by increased resource inputs; a study in Lagos – Nigeria, noted declining notification between 2013 and 2015 despite TB services being expanded during that time (Adejumo et al., 2017). Other sources cite reasons as poor compliance with data reporting regulations, especially from the private sector as being contributory to low figures (Uplekar et al., 2016b). In this study, public TB coordinators who were interviewed severally complained about the sub-optimal data reporting practices of private providers.

Case notification in Accra Metro was found to be persistently higher than Kumasi Metro. Both areas in 2018 recorded lower than the 2017 national average of 52 cases/100,000. What accounts for the inequality in the two areas could not be resolved by this study. Historically, other reports have also found marked variations in case notification across different parts of Ghana (MOH, 2013; WHO, 2014). Another study also found significant variations in notification rates across some areas within Ethiopia (Hamusse, Demissie, & Lindtjørn, 2014). Some authors surmise that potential difference in disease prevalence, poor case detection, or effects of programmatic interventions could be explanatory factors (Aia et al., 2018; Hamusse et al., 2014). Generally, empirical evidence for variation across geographies is inconclusive.

Form this study, private sector contribution to case notification fluctuated between the highest rate of 18% and the lowest of 9.3% (2017) in Accra Metro. Whilst this figure was comparable Indonesia (9%) in 2016, private sector contribution to case notification in Bangladesh has performed favourably at a consistent 30%; whilst India and Pakistan record around 21% case notification by the private sector (WHO, 2018). These suggest there is more room for improvement in Ghana.

In 2008, a large number of cases were notified by the public facilities. This trend was however not noticed within the private sector. Perhaps an over concentration of interventions and resources within the public sector at the time may have contributed to this occurrence.

The proportion contributed by the private sector was also highest in 2007; this came a few years after initiating the PPM initiative in 2003. It is reasonable to conclude that the increased prioritization of private sector involvement at the time, may have contributed to this surge. With dwindling funding available for TB control, most private practitioners have been pulling out of involvement with TB control, as was revealed during interviews.

The Male to Female Disparity in Case Notification among the Private and Public Sector

Generally, there exists a higher predilection for men to contract TB than women. The cumulative sex ratio calculated for all years from this study was 1.93; this agreed with similar finding of 2:1 in another study (Rao, 2009). When disaggregated into public and private sectors however, there was a higher percentage of females captured in the public sector (34.7%) compared to that of facilities in the private sector (31.1%). The literature on the public-private sex disparity is lacking, and this finding is hardly conclusive. Still, many studies have discussed the role of gender in TB infection and the implications on controlling the disease (Bello-López et al., 2019; Dogar, Shah, Chughtai, & Qadeer, 2012; Horton, MacPherson, Houben, White, & Corbett, 2016), making understanding of the patterns therefore important. The disparity in the sex gap seen in the private and public sectors may reflect a difference in preference of the sexes for the types of facilities attended i.e. public and private. It is possible that male TB patients prefer private facilities or that female patients prefer public facilities. That both suppositions may be true is also entirely plausible; systemic and cultural biases not explored in this study may have significant influences on choices of health care (public or private) according to sex. Several studies have shown how gendered socio-economic nuances may affect health seeking preferences of patients (Chikovore et al., 2017; Dememew, 2016; Mumtaz, Salway, Waseem, & Umer, 2003). This finding may also be a reflection of the aggravated socio-economic disparity between men and women with TB. The crippling effect of poverty on women's access to health in general (Jacobson, 2018; Ngoma & Mayimbo, 2017) possibly ascribes them lower purchasing power, and therefore may be less likely to seek care in private facilities which generally are associated with higher costs of attendance. This may further be compounded by ignorance that free treatment for TB exists whether in private or public facilities; as was expressed by some respondents in this study.

5.4 Limitations

Numerical data from Kumasi Metropolitan Health Directorate were not disaggregated into public and private sectors, and thus comparisons private-sector-specific contribution could not be computed for Kumasi Metro. Also Kumasi Metro data spanned 2012 to 2018 compared to 2007 to 2018 for Accra Metro. Comparisons were therefore drawn among the two areas for only those periods where data were available for both.

Private sector respondents from Kumasi Metro included those with NGOs only as it was difficult securing those from clinics due to their relative scarcity compared to Accra, and unfavorable time schedules. This therefore led to the exclusion of private clinics in Kumasi from the respondent population. The study however observed sampling saturation across respondent categories and findings could be arguably be viewed as sufficiently representative. The researcher also acknowledges that the complexity of the health care systems cannot be fully understood without considering the opinions and insights held by actors in the policy space such as politicians, health regulatory agencies, health economists etc., and critically TB patients themselves; due to the design, time and the logistic constraints of the study. The effects of these are that key insights from other equally important TB sector actors may have been excluded from this study, with a potential to bias the observations made.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The Public-Private Mix (PPM) initiative has generally lost much of the enthusiasm with which it was initiated in 2003; case notification an outcome measure of PPM has also stalled across Accra and Kumasi Metropolitan areas. Trend analysis suggests that there is unlikely to be a marked increase in notification rate over the next year. This downturn is attributable to several contextual health system factors including (and mainly) inadequate funding, exacerbated by low level of commitment and action by local policy makers, among other issues.

Exogenous shock factors like the arrival of Aurum Institute on the Ghanaian scene, placing particular emphasis on private sector optimization, may be associated with renewed interest in PPM participation.

6.2 Recommendations

1. The National TB Program (NTP) in Ghana must develop long term strategic plans regarding financing that is sustainable, and with adequate accountability structures to monitor the application of allocated funds to private providers. This will help to stem the tide of inefficiencies in resource allocation and utilization for TB control.
2. The NTP must consider viable incentives to replace the enablers' package, or other alternative mechanisms for encouraging active private provider participation, minimizing TB staff attrition, as well as motivating TB volunteers.
3. Provision of food for TB patients should be viewed as a necessary adjunct to TB treatment in order to promote compliance with medication. The NTP should consider factoring this into TB control strategies.

4. Adequate trainings and refresher workshops should be provided to all TB focal persons in private and public sectors and updated TB coordinators' manuals should be made available to them by the NTP.
5. Effective communication among partners in the Public-Private Mix is necessary to foster understanding, mutual trust and respect; as well as accurate understanding of their obligations in the partnership. This should be promoted among all actors in TB control.
6. The inequalities in the case notification rates across the urban areas, as well as the differences in the observed male to female ratio in the private and public sectors should be explored by further studies to generate significant insights. Understanding these issues may reveal underlying demographic and gender-related influencers of health-seeking behavior. This may be relevant to understanding disparities in performance indicators within TB control. This should be taken up by the NTP in collaboration with other implementing partners, and academic institutions in Ghana.

REFERENCES

Adejumo, O. A., Daniel, O. J., Abdur-Razzaq, H. A., Shogbamimu, Y. O., Femi-Adebayo, T., Adepoju, V. A., … Sodipo, O. O. (2017). Trend of tuberculosis case notification and treatment outcome in Lagos State, Nigeria: a 5-year retrospective study. *Transactions of The Royal Society of Tropical Medicine and Hygiene*, *111*(7), 300–307. https://doi.org/10.1093/trstmh/trx060

Aia, P., Wangchuk, L., Morishita, F., Kisomb, J., Yasi, R., Kal, M., & Islam, T. (2018). Epidemiology of tuberculosis in Papua New Guinea: analysis of case notification and treatment-outcome data, 2008-2016. *Western Pacific Surveillance and Response Journal : WPSAR*, *9*(2), 9–19. https://doi.org/10.5365/wpsar.2018.9.1.006

Alipanah, N., Jarlsberg, L., Miller, C., Linh, N. N., Falzon, D., Jaramillo, E., & Nahid, P. (2018). Adherence interventions and outcomes of tuberculosis treatment: A systematic review and meta-analysis of trials and observational studies. *PLOS Medicine*, *15*(7), e1002595. https://doi.org/10.1371/journal.pmed.1002595

Alshenqeeti, H. (2014). Interviewing as a Data Collection Method: A Critical Review. *English Linguistics Research*, *3*(1), 39–45. https://doi.org/10.5430/elr.v3n1p39

Ambe, G., Lönnroth, K., Dholakia, Y., Copreaux, J., Zignol, M., Borremans, N., & Uplekar, M. (2005). Every provider counts: effect of a comprehensive public-private mix approach for TB control in a large Metropolitan area in India. *The International Journal of Tuberculosis and Lung Disease : The Official Journal of the International Union against Tuberculosis and Lung Disease*, *9*(5), 562–568. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/15875930

Amenuvegbe, G. K., Anto, F., & Binka, F. (2016). Low tuberculosis case detection: a community and health facility based study of contributory factors in the Nkwanta South district of Ghana. *BMC Research Notes*, *9*(1), 330. https://doi.org/10.1186/s13104-016-2136-x

Amo-Adjei, J. (2014). Political commitment to tuberculosis control in Ghana. *Global Public Health*, *9*(3), 299–311. https://doi.org/10.1080/17441692.2014.880500

Amo-Adjei, J. (2016). Conforming to partnership values: A qualitative case study of public-private mix for TB control in Ghana. *Global Health Action*, *9*(1), 1–7. https://doi.org/10.3402/gha.v9.28000

Amo-Adjei, J., & Awusabo-Asare, K. (2013). Reflections on tuberculosis diagnosis and treatment outcomes in Ghana. *Archives of Public Health*, *71*(1), 22. https://doi.org/10.1186/2049-3258-71-22

Amo-Adjei, J., & Kumi-Kyereme, A. (2013). Myths and misconceptions about tuberculosis transmission in Ghana. *BMC International Health and Human Rights*, *13*(1), 38. https://doi.org/10.1186/1472-698X-13-38

Anabila, P., Kumi, D. K., & Anome, J. (2019). Patients' perceptions of healthcare quality in Ghana. *International Journal of Health Care Quality Assurance*, *32*(1), 176–190. https://doi.org/10.1108/IJHCQA-10-2017-0200

Ashraf, R., Naureen, F., Noor, A., Ilyas, J., Fatima, R., Yaqoob, A., … Hussain, S. (2018). Does Cash Incentive Effect TB Case Notification by Public Private Mix-General

Practitioners Model in Pakistan? *Journal of Tuberculosis Research*, *06*(02), 166–174. https://doi.org/10.4236/jtr.2018.62016

Awofeso, N., Schelokova, I., & Dalhatu, A. (2008). Training of front-line health workers for tuberculosis control: lessons from Nigeria and Kyrgyzstan. *Human Resources for Health*, *6*, 20. https://doi.org/10.1186/1478-4491-6-20

Barter, D. M., Agboola, S. O., Murray, M. B., & Bärnighausen, T. (2012). Tuberculosis and poverty: The contribution of patient costs in sub-Saharan Africa - A systematic review. *BMC Public Health*, *12*(1). https://doi.org/10.1186/1471-2458-12-980

Bello-López, J. M., León-García, G., Rojas-Bernabé, A., Fernández-Sánchez, V., García-Hernández, O., Mancilla Rámirez, J., & Ibáñez-Cervantes, G. (2019). Morbidity Trends and Risk of Tuberculosis: Mexico 2007-2017. *Canadian Respiratory Journal*, *2019*, 8295261. https://doi.org/10.1155/2019/8295261

Bello, G., Faragher, B., Sanudi, L., Namakhoma, I., Banda, H., Malmborg, R., … Squire, S. B. (2017). The effect of engaging unpaid informal providers on case detection and treatment initiation rates for TB and HIV in rural Malawi (Triage Plus): A cluster randomised health system intervention trial. *PloS One*, *12*(9), e0183312. https://doi.org/10.1371/journal.pone.0183312

Bonsu, F. (2018). The 2016 patient cost survey in Ghana : results and implications, (May). Retrieved from www.who.int/tb/advisory_bodies/impact.../tf7_p21_Ghana_patient_cost_survey.pdf%0A%0A

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

CDC. (2013). CDC core Curriciculum complete. Retrieved from https://www.cdc.gov/tb/education/corecurr/pdf/corecurr_all.pdf

Charles, M., Richard, M., Joseph, P., Bury, M. R., Perrin, G., Louis, F. J., … Lowrance, D. W. (2017). Trends in Tuberculosis Case Notification and Treatment Success, Haiti, 2010-2015. *The American Journal of Tropical Medicine and Hygiene*, *97*(4_Suppl), 49–56. https://doi.org/10.4269/ajtmh.16-0863

Chikovore, J., Hart, G., Kumwenda, M., Chipungu, G., Desmond, N., & Corbett, E. L. (2017). TB and HIV stigma compounded by threatened masculinity: implications for TB health-care seeking in Malawi. *The International Journal of Tuberculosis and Lung Disease*, *21*(11), 26–33. https://doi.org/10.5588/ijtld.16.0925

Ciobanu, A., Domente, L., Soltan, V., Bivol, S., Severin, L., Plesca, V., … de Colombani, P. (2014). Do incentives improve tuberculosis treatment outcomes in the Republic of Moldova? *Public Health Action*, *4*(Suppl 2), S59-63. https://doi.org/10.5588/pha.14.0047

Colvin, M., Gumede, L., Grimwade, K., Maher, D., & Wilkinson, D. (2003). Contribution of traditional healers to a rural tuberculosis control programme in Hlabisa, South Africa. *The International Journal of Tuberculosis and Lung Disease : The Official Journal of the International Union against Tuberculosis and Lung Disease*, *7*(9 Suppl 1), S86-91. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12971659

Courtwright, A., & Turner, A. N. (2010). Tuberculosis and Stigmatization: Pathways and

Interventions. *Public Health Reports*, *125*(4_suppl), 34–42. https://doi.org/10.1177/00333549101250S407

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five traditions*. *Sage Publication*. https://doi.org/10.1111/1467-9299.00177

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative and Mixed Approaches (3rd Edition)*. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. https://doi.org/10.2307/1523157

Daftary, A., Satyanarayana, S., Jha, N., Singh, M., Mondal, S., Vadnais, C., & Pai, M. (2019). Can community pharmacists improve tuberculosis case finding? A mixed methods intervention study in India. *BMJ Global Health*, *4*(3), e001417. https://doi.org/10.1136/bmjgh-2019-001417

Daniel, O. J., Adedeji Adejumo, O., Abdur-Razzaq, H. A., Ngozi Adejumo, E., & Salako, A. A. (2013). Public-private mix for TB and TB-HIV care in Lagos, Nigeria. *International Journal of Tuberculosis and Lung Disease*, *17*(9), 1195–1198. https://doi.org/10.5588/ijtld.12.0759

Davis, J. L., Kawamura, L. M., Chaisson, L. H., Grinsdale, J., Benhammou, J., Ho, C., … Cattamanchi, A. (2014). Impact of GeneXpert MTB/RIF on patients and tuberculosis programs in a low-burden setting. a hypothetical trial. *American Journal of Respiratory and Critical Care Medicine*, *189*(12), 1551–1559. https://doi.org/10.1164/rccm.201311-1974OC

Dememew, Z. (2016). Trends in tuberculosis case notification and treatment outcomes after interventions in 10 zones of Ethiopia Trends in tuberculosis case notification and treatment outcomes after interventions in 10 zones of Ethiopia, (September). https://doi.org/10.5588/ijtld.16.0005

Dodor, E. A., & Kelly, S. (2009). 'We are afraid of them': Attitudes and behaviours of community members towards tuberculosis in Ghana and implications for TB control efforts. *Psychology, Health & Medicine*, *14*(2), 170–179. https://doi.org/10.1080/13548500802199753

Dogar, O. F., Shah, S. K., Chughtai, A. A., & Qadeer, E. (2012). Gender disparity in tuberculosis cases in eastern and western provinces of Pakistan. *BMC Infectious Diseases*, *12*(1), 244. https://doi.org/10.1186/1471-2334-12-244

Fairall, L. R., Zwarenstein, M., Bateman, E. D., Bachmann, M., Lombard, C., Majara, B. P., … Chapman, R. D. (2005). Effect of educational outreach to nurses on tuberculosis case detection and primary care of respiratory illness: pragmatic cluster randomised controlled trial. *BMJ (Clinical Research Ed.)*, *331*(7519), 750–754. https://doi.org/10.1136/bmj.331.7519.750

Frick, M. (2017). Funding for tuberculosis research—an urgent crisis of political will, human rights, and global solidarity. *International Journal of Infectious Diseases*, *56*, 21–24. https://doi.org/10.1016/J.IJID.2016.11.412

Frick, M., Henry, I., & Lessem, E. (2016). Falling Short of the Rights to Health and Scientific Progress: Inadequate TB Drug Research and Access. *Health and Human Rights*, *18*(1), 9–24. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/27780996

Gebremariam, M. K., Bjune, G. A., & Frich, J. C. (2010). Barriers and facilitators of

adherence to TB treatment in patients on concomitant TB and HIV treatment: a qualitative study. *BMC Public Health*, *10*(1), 651. https://doi.org/10.1186/1471-2458-10-651

Gebremariam, M. K., Bjune, G. A., & Frich, J. C. (2010). Barriers and facilitators of adherence to TB treatment in patients on concomitant TB and HIV treatment: a qualitative study. *BMC Public Health*, *10*(1), 651. https://doi.org/10.1186/1471-2458-10-651

Ghana Health Service. (2018). *The Health System in Ghana, facts and Figures*. Retrieved from ghanahealthservice.org/downloads/Facts+Figures_2018.pdf

Ghana NTP. (2012). Introduction To Who Stop Tb Strategy and Tb Control Programme, 1–173. Retrieved from http://www.tbghana.gov.gh/sites/default/files/NTP Training Manual 2012.pdf

Ghana Statistical Service. (2014). *2010 Population and Housing Census. District Analytical Report. Accra Metropolitan*. Retrieved from www.statsghana.gov.gh/gssmain/.../Census2010_Summary_report_of_final_results.pdf

GHS/MOH. (2003). *PPM DOTS PRIVATE SECTOR GUIDELINES GHANA*. Retrieved from Unpublished report. Accessed from NTP Head Office, Accra, Ghana. April, 2019

GHS. (2017). *THE HEALTH SECTOR IN GHANA FACTS AND FIGURES 2017*. Retrieved from https://www.ghanahealthservice.org/ghs-item-details.php?cid=5&scid=55&iid...

Global Fund. (2019). *Ghana Tuberculosis Results Profile*. Retrieved from https://www.theglobalfund.org/media/8402/oig_gf-oig-19-009_report_en.pdf?u...%0A%0A

GSS. (2014). *2010 Population and Housing Census. District Analytical Report. Kumasi Metropolitan*. Retrieved from www.statsghana.gov.gh/docfiles/2010_District_Report/Ashanti/KMA.pdf

Hamusse, S. D., Demissie, M., & Lindtjørn, B. (2014). Trends in TB case notification over fifteen years: the case notification of 25 Districts of Arsi Zone of Oromia Regional State, Central Ethiopia. *BMC Public Health*, *14*(1), 304. https://doi.org/10.1186/1471-2458-14-304

Haraka, F., Nathavitharana, R. R., Schumacher, S. G., Kakolwa, M., Denkinger, C. M., Gagneux, S., … Ross, A. (2018). Impact of diagnostic test Xpert MTB/RIF® on health outcomes for tuberculosis. *Cochrane Database of Systematic Reviews*, (2). https://doi.org/10.1002/14651858.CD012972

Harper, M. E., Hill, P. C., Bah, A. H., Manneh, K., McAdam, K. P. W. J., & Lienhardt, C. (2004). Traditional healers participate in tuberculosis control in The Gambia. *The International Journal of Tuberculosis and Lung Disease : The Official Journal of the International Union against Tuberculosis and Lung Disease*, *8*(10), 1266–1268. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/15527161

Horton, K. C., MacPherson, P., Houben, R. M. G. J., White, R. G., & Corbett, E. L. (2016). Sex Differences in Tuberculosis Burden and Notifications in Low- and Middle-Income Countries: A Systematic Review and Meta-analysis. *PLoS Medicine*, *13*(9), e1002119. https://doi.org/10.1371/journal.pmed.1002119

Jacobson, J. L. (2018). Women's Health: The Price of Poverty. In *The Health of Women* (pp.

3–32). Routledge. https://doi.org/10.4324/9780429496455-2

Kaboru, B. B., Uplekar, M., & Lönnroth, K. (2011). Engaging informal providers in TB control: what is the potential in the implementation of the WHO Stop TB Strategy? A discussion paper. *World Health & Population*, *12*(4), 5–13. https://doi.org/10.12927/whp.2011.22235

Kamineni, V. V., Turk, T., Wilson, N., Satyanarayana, S., & Chauhan, L. S. (2011). A rapid assessment and response approach to review and enhance advocacy, communication and social mobilisation for tuberculosis control in Odisha state, India. *BMC Public Health*, *11*, 463. https://doi.org/10.1186/1471-2458-11-463

Khan, A. J., Khowaja, S., Khan, F. S., Qazi, F., Lotia, I., Habib, A., … Keshavjee, S. (2012). Engaging the private sector to increase tuberculosis case detection: An impact evaluation study. *The Lancet Infectious Diseases*, *12*(8), 608–616. https://doi.org/10.1016/S1473-3099(12)70116-0

Khan, M. S., Salve, S., & Porter, J. D. H. (2015). Engaging for-profit providers in TB control: Lessons learnt from initiatives in South Asia. *Health Policy and Planning*, *30*(10), 1289–1295. https://doi.org/10.1093/heapol/czu137

Konduri, N., Delmotte, E., & Rutta, E. (2017). Engagement of the private pharmaceutical sector for TB control: Rhetoric or reality? *Journal of Pharmaceutical Policy and Practice*, *10*(1), 1–13. https://doi.org/10.1186/s40545-016-0093-3

Koomen, L. E. M., Burger, R., & van Doorslaer, E. K. A. (2019). Effects and determinants of tuberculosis drug stockouts in South Africa. *BMC Health Services Research*, *19*(1), 213. https://doi.org/10.1186/s12913-019-3972-x

Kutzin, J., Yip, W., & Cashin, C. (2016). Alternative Financing Strategies for Universal Health Coverage, 267–309. https://doi.org/10.1142/9789813140493_0005

Lal, S. S., Sahu, S., Wares, F., Lönnroth, K., Chauhan, L. S., & Uplekar, M. (2011). Intensified scale-up of public-private mix: A systems approach to tuberculosis care and control in India. *International Journal of Tuberculosis and Lung Disease*, *15*(1), 97–104.

Lal, S. S., Uplekar, M., Katz, I., Lonnroth, K., Komatsu, R., Yesudian Dias, H. M., & Atun, R. (2011). Global Fund financing of public-private mix approaches for delivery of tuberculosis care. *Tropical Medicine & International Health*, *16*(6), 685–692. https://doi.org/10.1111/j.1365-3156.2011.02749.x

Lei, X., Liu, Q., Escobar, E., Philogene, J., Zhu, H., Wang, Y., & Tang, S. (2015). Public-private mix for tuberculosis care and control: A systematic review. *International Journal of Infectious Diseases*, *34*, 20–32. https://doi.org/10.1016/j.ijid.2015.02.015

Lönnroth, K., Uplekar, M., & Blanc, L. (2006). Hard gains through soft contracts: productive engagement of private providers in tuberculosis control. *Bulletin of the World Health Organization*, *84*(11), 876–883. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/17143461

Matenga, T. F. L., Zulu, J. M., Corbin, J. H., & Mweemba, O. (2019). Contemporary issues in north-south health research partnerships: perspectives of health research stakeholders in Zambia. *Health Research Policy and Systems*, *17*(1), 7. https://doi.org/10.1186/s12961-018-0409-7

Matji, R. (2016). Providing comprehensive patient- centered care : A conceptual Framework For Quality TB Care. Retrieved from https://www.urc-chs.com/.../Related URC publication_Social Support F...

Mauch, V., Bonsu, F., Gyapong, M., Awini, E., Suarez, P., Marcelino, B., … Klinkenberg, E. (2013). Free tuberculosis diagnosis and treatment are not enough: patient cost evidence from three continents. *The International Journal of Tuberculosis and Lung Disease : The Official Journal of the International Union against Tuberculosis and Lung Disease*, *17*(3), 381–387. https://doi.org/10.5588/ijtld.12.0368

Mbuthia, G. W., Olungah, C. O., & Ondicho, T. G. (2018). Health-seeking pathway and factors leading to delays in tuberculosis diagnosis in West Pokot County, Kenya: A grounded theory study. *PloS One*, *13*(11), e0207995. https://doi.org/10.1371/journal.pone.0207995

Mekonnen, H. S., & Azagew, A. W. (2018). Non-adherence to anti-tuberculosis treatment, reasons and associated factors among TB patients attending at Gondar town health centers, Northwest Ethiopia. *BMC Research Notes*, *11*(1), 691. https://doi.org/10.1186/s13104-018-3789-4

Mesfin, M. M., Newell, J. N., Walley, J. D., Gessessew, A., Tesfaye, T., Lemma, F., & Madeley, R. J. (2009). Quality of tuberculosis care and its association with patient adherence to treatment in eight Ethiopian districts. *Health Policy and Planning*, *24*(6), 457–466. https://doi.org/10.1093/heapol/czp030

Milat, A. J., Bauman, A., & Redman, S. (2015). Narrative review of models and success factors for scaling up public health interventions. *Implementation Science*, *10*(1), 113. https://doi.org/10.1186/s13012-015-0301-6

Ministry of Health. (2009). The National Tuberculosis Health Sector Strategic Plan for Ghana 2009 - 2013, 1–110. Retrieved from www.tbonline.info/media/.../national_tb_health_sector_strategic_plan_2009-2013_2....

Mistry, N., Lobo, E., Shah, S., Rangan, S., & Dholakia, Y. (2017). Pulmonary tuberculosis in Patna, India: Durations, delays, and health care seeking behaviour among patients identified through household surveys. *Journal of Epidemiology and Global Health*, *7*(4), 241–248. https://doi.org/10.1016/j.jegh.2017.08.001

MOH. (2015). The National Tuberculosis Health Sector Strategic Plan for Ghana:2015-2020. *Ministry of Health*, 1–132. https://doi.org/10.1017/CBO9781107415324.004

MOH, G. (2013). *End-Term Comprehensive External Review of the Ghana National Tuberculosis Health Sector Strategic Plan 2009 – 2013*. Retrieved from apps.who.int/medicinedocs/documents/s21996en/s21996en.pdf

Mounier-Jack, S., Griffiths, U. K., Closser, S., Burchett, H., & Marchal, B. (2014). Measuring the health systems impact of disease control programmes: A critical reflection on the WHO building blocks framework. *BMC Public Health*, *14*(1), 1–8. https://doi.org/10.1186/1471-2458-14-278

Mumtaz, Z., Salway, S., Waseem, M., & Umer, N. (2003). Gender-based barriers to primary health care provision in Pakistan: The experience of female providers. *Health Policy and Planning*, *18*(3), 261–269. https://doi.org/10.1093/heapol/czg032

Nair, S., Philip, S., Varma, R. P., & Rakesh, P. S. (2019). Barriers for involvement of private

doctors in RNTCP - Qualitative study from Kerala, India. *Journal of Family Medicine and Primary Care*, *8*(1), 160–165. https://doi.org/10.4103/jfmpc.jfmpc_208_18

Ngamvithayapong-Yanai, J., Luangjina, S., Nedsuwan, S., Kantipong, P., Wongyai, J., & Ishikawa, N. (2013). Engaging women volunteers of high socioeconomic status in supporting socioeconomically disadvantaged tuberculosis patients in Chiang Rai, Thailand. *Western Pacific Surveillance and Response Journal : WPSAR*, *4*(1), 34–38. https://doi.org/10.5365/WPSAR.2012.3.4.013

Ngoma, C., & Mayimbo, S. (2017). The Negative Impact of Poverty on the Health of Women and Children. *Annals of Medical and Health Sciences Research*. Retrieved from https://www.amhsr.org/articles/the-negative-impact-of-poverty-on-the-health-ofwomen-and-children-4022.html

Nwe, T. T., Saw, S., Win, L., Mon, M. M., van Griensven, J., Zhou, S., … Aung, S. T. (2017). Engagement of public and private medical facilities in tuberculosis care in Myanmar: Contributions and trends over an eight-year period. *Infectious Diseases of Poverty*, *6*(1). https://doi.org/10.1186/s40249-017-0337-8

Okello, D. R. O., & Gilson, L. (2015). Exploring the influence of trust relationships on motivation in the health sector: A systematic review. *Human Resources for Health*, *13*(1). https://doi.org/10.1186/s12960-015-0007-5

Patton, M. Q. (2003). Qualitative evaluation checklist. *Evaluation Checklists Project*, (September), 1–13. Retrieved from http://www.wmich.edu/evalctr/archive_checklists/qec.pdf%5Cnhttp://dmeforpeace.org/sites/default/files/Patton_Qualitative Evaluation Checklist.pdf

Phalkey, R. K., Butsch, C., Belesova, K., Kroll, M., & Kraas, F. (2017). From habits of attrition to modes of inclusion: Enhancing the role of private practitioners in routine disease surveillance. *BMC Health Services Research*, *17*(1), 1–15. https://doi.org/10.1186/s12913-017-2476-9

Querri, A., Ohkado, A., Yoshimatsu, S., Coprada, L., Lopez, E., Medina, A., … Shimouchi, A. (2017). Enhancing tuberculosis patient detection and care through community volunteers in the urban poor, The Philippines. *Public Health Action*, *7*(4), 268–274. https://doi.org/10.5588/pha.17.0036

Rao, S. (2009). Tuberculosis and patient gender: An analysis and its implications in tuberculosis control. *Lung India : Official Organ of Indian Chest Society*, *26*(2), 46–47. https://doi.org/10.4103/0970-2113.48897

Raviglione, M. C., & Pio, A. (2002). Evolution of WHO policies for tuberculosis control, 1948-2001. *Lancet*, *359*(9308), 775–780. https://doi.org/10.1016/S0140-6736(02)07880-7

Raviglione, M., & Sulis, G. (2016). Tuberculosis 2015: Burden, Challenges and Strategy for Control and Elimination. *Infectious Disease Reports*, *8*(2), 6570. https://doi.org/10.4081/idr.2016.6570

Sagbakken, M., Frich, J. C., & Bjune, G. (2008). Barriers and enablers in the management of tuberculosis treatment in Addis Ababa, Ethiopia: a qualitative study. *BMC Public Health*, *8*(1), 11. https://doi.org/10.1186/1471-2458-8-11

Samal, J., & Dehury, R. (2017). Three important obligations of private practitioners can help

bring down the scourge of tuberculosis in India. *International Journal of Advanced Medical and Health Research*, *4*(1), 2. https://doi.org/10.4103/IJAMR.IJAMR_67_16

Scott, J. C., Shah, N., Porco, T., & Flood, J. (2015). Cost Resulting from Anti-Tuberculosis Drug Shortages in the United States: A Hypothetical Cohort Study. *PloS One*, *10*(8), e0134597. https://doi.org/10.1371/journal.pone.0134597

Seung, K. J., Keshavjee, S., & Rich, M. L. (2015). Multidrug-Resistant Tuberculosis and Extensively Drug-Resistant Tuberculosis. *Cold Spring Harbor Perspectives in Medicine*, *5*(9). https://doi.org/10.1101/CSHPERSPECT.A017863

Shiferaw, M. B., & Yismaw, G. (2019). Magnitude of delayed turnaround time of laboratory results in Amhara Public Health Institute, Bahir Dar, Ethiopia. *BMC Health Services Research*, *19*(1), 240. https://doi.org/10.1186/s12913-019-4077-2

Sima, B. T., Belachew, T., Bjune, G., & Abebe, F. (2019). Traditional healers' role in the detection of active tuberculosis cases in a pastoralist community in Ethiopia: a pilot interventional study. *BMC Public Health*, *19*(1), 721. https://doi.org/10.1186/s12889-019-7074-9

Slevin, K. W., & Wells, W. (2014). Public Private Mix (PPM) Models for the Sustainability of Successful TB Control Initiatives. A working meeting co-convened by USAID and the World Bank, in collaboration with the Stop TB Partnership's PPM subgroup, and organized with PATH. *United States Agency for International Development*, (May), 29. Retrieved from http://www.who.int/tb/careproviders/ppm_tb_dcmeeting_report.pdf

Soe, K. T., Saw, S., van Griensven, J., Zhou, S., Win, L., Chinnakali, P., … Aung, S. T. (2017). International non-governmental organizations' provision of community-based tuberculosis care for hard-to-reach populations in Myanmar, 2013–2014. *Infectious Diseases of Poverty*, *6*(1), 69. https://doi.org/10.1186/s40249-017-0285-3

Stop TB Partnership. (2010). Public Private Mix for TB care and Control-A tool kit. Retrieved from http://www.who.int/tb/careproviders/ppm/PPMToolkit.pdf

Sulis, G., & Pai, M. (2017). Missing tuberculosis patients in the private sector: business as usual will not deliver results. *Public Health Action*, *7*(2), 80–81. https://doi.org/10.5588/pha.17.0039

TB Care I & United States Agency for International Development. (2014). International Standards for Tuberculosis Care. *TB Care I & USAID*, 92. https://doi.org/10.1016/S1473-3099(06)70628-4

Theobald, S., Brandes, N., Gyapong, M., El-Saharty, S., Proctor, E., Diaz, T., … Peters, D. H. (2018). Implementation research: new imperatives and opportunities in global health. *Lancet (London, England)*, *392*(10160), 2214–2228. https://doi.org/10.1016/S0140-6736(18)32205-0

Tola, H. H., Tol, A., Shojaeizadeh, D., & Garmaroudi, G. (2015). Tuberculosis Treatment Non-Adherence and Lost to Follow Up among TB Patients with or without HIV in Developing Countries: A Systematic Review. *Iranian Journal of Public Health*, *44*(1), 1–11. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/26060770

Turk, T., Newton, F. J., Netwon, J. D., Naureen, F., & Bokhari, J. (2013). Evaluating the efficacy of tuberculosis Advocacy, Communication and Social Mobilization (ACSM) activities in Pakistan: a cross-sectional study. *BMC Public Health*, *13*, 887.

https://doi.org/10.1186/1471-2458-13-887

Uplekar, M., Atre, S., Wells, W. A., Weil, D., Lopez, R., Migliori, G. B., & Raviglione, M. (2016). Mandatory tuberculosis case notification in high tuberculosis-incidence countries: policy and practice. *The European Respiratory Journal*, *48*(6), 1571–1581. https://doi.org/10.1183/13993003.00956-2016

Uzochukwu, B., Onwujekwe, E., Mbachu, C., Okeke, C., Molyneux, S., & Gilson, L. (2018). Accountability mechanisms for implementing a health financing option: the case of the basic health care provision fund (BHCPF) in Nigeria. *International Journal for Equity in Health*, *17*(1), 100. https://doi.org/10.1186/s12939-018-0807-z

Wandwalo, E., Kapalata, N., Tarimo, E., Corrigan, C. B., & Morkve, O. (2004). Collaboration between the national tuberculosis programme and a non governmental organisation in TB/HIV care at a district level: experience from Tanzania. *African Health Sciences*, *4*(2), 109–114. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/15477189

Wei, X., Chen, J., Chen, P., Newell, J. N., Li, H., Sun, C., … Walley, J. D. (2009). Barriers to TB care for rural-to-urban migrant TB patients in Shanghai: a qualitative study. *Tropical Medicine & International Health*, *14*(7), 754–760. https://doi.org/10.1111/j.1365-3156.2009.02286.x

WHO. (2005). Bridging the "Know–Do" Gap Meeting on Knowledge Translation in Global Health. *Retrieved September*, *25*(October 2005), 2006. https://doi.org/10.1016/j.jesp.2005.12.008

WHO. (2010). *Global Tuberculosis Control 2010*. *https://apps.who.int/iris/handle/10665/44425*.

WHO. (2010). WHO, 2010, Monitoring the Building Blocks of Health Systems: A handbook of Indicators and their Measurement Strategies, Geneva. http://www.who.int/healthinfo/statistics/toolkit_hss/en/index.html.

WHO. (2014). Understanding and using tuberculosis data. *WHO Report*, 212. https://doi.org/ISBN 978 92 4 154878 6

WHO. (2015). Scaling up PPM: lessons from design and implementation of the Global Fund TB grants, 47. Retrieved from https://www.challengetb.org/publications/tools/ua/Scaling_Up_PPM.pdf

WHO. (2016). Scaling up projects and initiatives for better health: from concepts to practice. Retrieved from www.euro.who.int/__data/assets/.../Scaling-up-reports-projects-concepts-practice.pdf

WHO. (2017a). GLOBAL TUBERCULOSIS REPORT 2017., 2016–2017. https://doi.org/2017 report

WHO. (2017b). Guide to develop national action plan on PPM. Retrieved from http://cseindia.org/userfiles/inap_amr_20170420.pdf

WHO. (2017c). *Guidelines for treatment of drug-susceptible tuberculosis and patient care*. *WHO press* (Vol. 1). https://doi.org/10.1586/17476348.1.1.85

WHO. (2018a). *Ghana Tuberculosis Profile*. Retrieved from https://extranet.who.int/sree/Reports?op=Replet&name=/WHO_HQ_Reports/G2/PROD

/EXT/TBCountryProfile&ISO2=GH&outtype=html

WHO. (2018b). *WHO | Global tuberculosis report 2018*. *WHO*. World Health Organization. Retrieved from https://www.who.int/tb/publications/global_report/en/

World Health Organization (WHO). (2018). Engaging Private Health Care Providers in Tb Care and Prevention: a Landscape Analysis. Retrieved from https://www.who.int/tb/publications/2018/PPMLandscapeAnalysis.pdf?ua=1

Xiang, L., Pan, Y., Hou, S., Zhang, H., Sato, K. D., Li, Q., … Tang, S. (2016). The impact of the new cooperative medical scheme on financial burden of tuberculosis patients: evidence from six counties in China. *Infectious Diseases of Poverty*, *5*(1), 8. https://doi.org/10.1186/s40249-015-0094-5

Yamey, G. (2012). What are the barriers to scaling up health interventions in low and middle income countries? A qualitative study of academic leaders in implementation science. *Globalization and Health*, *8*(1), 1. https://doi.org/10.1186/1744-8603-8-11

Zafar Ullah, A. N., Huque, R., Husain, A., Akter, S., Islam, A., & Newell, J. N. (2012). Effectiveness of involving the private medical sector in the National TB Control Programme in Bangladesh: Evidence from mixed methods. *BMJ Open*, *2*(6), 1–8. https://doi.org/10.1136/bmjopen-2012-001534

Zhao, Q., Wang, L., Tao, T., & Xu, B. (2013). Impacts of the "transport subsidy initiative on poor TB patients" in Rural China: A Patient-Cohort Based Longitudinal Study in Rural China. *PLoS ONE*, *8*(11), e82503. https://doi.org/10.1371/journal.pone.0082503

Zinatsa, F., Engelbrecht, M., van Rensburg, A. J., & Kigozi, G. (2018). Voices from the frontline: barriers and strategies to improve tuberculosis infection control in primary health care facilities in South Africa. *BMC Health Services Research*, *18*(1), 269. https://doi.org/10.1186/s12913-018-3083-0

Zou, G., King, R., Walley, J., Yin, J., Sun, Q., & Wei, X. (2015). Barriers to hospital and tuberculosis programme collaboration in China: context matters. *Global Health Action*, *8*, 27067. https://doi.org/10.3402/gha.v8.27067

Appendix 1A: CONSENT FORM FOR TB PROGRAM OFFICERS

Research Title: Factors Affecting Public-Private Mix Strategy For TB Care and Control in Urban Areas in Ghana.

Statement By Participant

I acknowledge that I have read and understood the contents and meaning of the participants' information sheet provided in the English language. I am fully aware of any implications of my participation and my right to withdraw from the study at any time regardless of whether I have already signed this form. I hereby agree to be part of this study.

Participant's name or initials ..... Code.....

Participant's Signature..... Date.....

Consent for voice recording

I grant permission for this interview to be recorded (please circle response). YES NO

Investigator's Statement

I certify that I have provided sufficient time and information to the participant to make an informed choice to participate in this study or not. All clarifications have been provided.

Name of interviewer .....

Signature of interviewer .....

Date.....

This is to Certified that this Study's Inform Consent form has been Approved By GHS-ERC for the Period 20-02-2019 to 19/02/2020
Signed ..... Date 20/02/2019
Name ..... GHS- ERC Administrator

Appendix 1B: CONSENT FORM FOR HEALTH PROFESSIONALS

Research Title: Factors Affecting Public-Private Mix Strategy For TB Care and Control in Urban Areas in Ghana.

Statement By Participant

I acknowledge that I have read and understood the contents and meaning of the participants' information sheet provided in the English language. I am fully aware of any implications of my participation and my right to withdraw from the study at any time regardless of whether I have already signed this form. I hereby agree to be part of this study.

Participant's name or initials ..... Code.....

Participant's Signature..... Date.....

Consent for voice recording

I grant permission for this interview to be recorded (please circle response). YES NO

Investigator's Statement

I certify that I have provided sufficient time and information to the participant to make an informed choice to participate in this study or not. All clarifications have been provided.

Name of interviewer .....

Signature of interviewer .....

Date.....

This is to Certified that this Study's Informe Consent form has been Approved By GHS-ERC for the Period 20-03-2019 To 19/02/2020
Signed Hmmpong Date 20/02/2019
Name Hannah Mmpon
GHS- ERC Administrator

Appendix 1C: CONSENT FORM FOR REPRESENTATIVES OF NGOs/ORGANIZATIONS

Research Title: Factors Affecting Public-Private Mix Strategy For TB Care and Control in Urban Areas in Ghana.

Statement By Participant

I acknowledge that I have read and understood the contents and meaning of the participants' information sheet provided in the English language. I am fully aware of any implications of my participation and my right to withdraw from the study at any time regardless of whether I have already signed this form. I hereby agree to be part of this study.

Participant's name or initials ……………………………………………… Code………………...

Participant's Signature……………………… Date…………………………

Consent for voice recording

I grant permission for this interview to be recorded (please circle response). YES NO

Investigator's Statement

I certify that I have provided sufficient time and information to the participant to make an informed choice to participate in this study or not. All clarifications have been provided.

Name of interviewer ……………………………………………………

Signature of interviewer ………………………………………………

Date…………………………………

Appendix 2: ETHICAL APPROVAL

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Tel: +233-302-681109
Fax + 233-302-685424
Email: ghserc@gmail.com

MyRef. GHS/RDD/ERC/Admin/App 1956
Your Ref. No.

20th February, 2019

Melvin Katey Agbogbatey
University of Ghana
School of Public Health

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC027/02/19**
Project Title	Factors Affecting Public-Private Mix Strategy for TB Care and Control in Urban Areas in Ghana
Approval Date	20th February, 2019
Expiry Date	19th February, 2020
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study.
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.
- Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
PROFESSOR MOSES AIKINS
(GHS-ERC VICES CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra

Appendix 3: Semi-Structured Interview Guide

Study Title: Factors Affecting Public-Private Mix Strategy for TB Care and Control in Urban Areas in Ghana.

Academic Institution and address: School of Public Health, College of Health Sciences, University of Ghana, Legon, Accra.

Principal Investigator (student): Melvin Katey Agbogbatey.

Telephone and e-mail: 0246229263; mkagbogbatey@st.ug.edu.gh

Introduction

Thank you for agreeing to be part of this study. Please be reminded of your right to leave the study at any time without explanation or risk. I would however be grateful if you can complete the entire process. Our conversation will be on issues in the area of Public-Private Mix, also referred to as PPM. I will use the term PPM throughout this interview to mean Public-Private Mix. Please be assured of my professional conduct in this interview.

Section 1: Attributes of Participants

1. AGE:……. 2. SEX:…….

3. PLACE OF WORK:……

4. JOB TITLE/DESCRIPTION…….

5. DURATION OF WORK IN PPM:……

6. SUMMARY OF ROLES IN PPM:……

Section 2: Interview Questions

1. Can you please tell me about how private providers are selected for PPM?

Probe: Is an initial situational assessment for the area done as part of this? Is the recruitment/selection process continuous? Yes/no explain

2. What types of tasks are undertaken in PPM?

3. What is your opinion on the scope of tasks in PPM?

Probe: should there be more/other types of tasks perhaps yet to be considered?

4. What contracting method(s) are used to formally engage providers in PPM?

Probe: What have been your views on these methods? Are the contracts legally enforceable? What is your opinion on this?

5. Can you give me an idea what training for PPM involves?

Probe: What challenges do you encounter with the training process? What would you like to be done differently? How often are refresher trainings conducted?

6. What does monitoring and supervision mean as far as PPM-TB is concerned?

Probes: what challenges do you have with this process?

7. What challenges are encountered with supporting private providers to perform roles in TB care and control?

8. What is your comment on the practice of engaging informal partners, e.g. traditional healers, as is done with PPM in some countries?

9. What factors do you think may promote PPM initiative?

10. What factors that may hinder the PPM initiative?

11. What can you tell me about the enablers' package?

Probe: What is your opinion on how this package has contributed to TB control in Ghana? What is your opinion on financial incentives in general as regards TB control? What other types of incentive do you think may be acceptable to providers?

12. What is your general view on costs involved in PPM-TB activities?

13. What are your ideas on how costs of TB control activities could be reduced?

Probe: What alternative mechanisms should health policy makers should consider to raise more funds?

14. What kind of tools or materials does the NTP provide to support private providers in TB care? Probe: also ask about availability/accessibility of the Ghana PPM guidelines to providers, TB coordinators manual

15. In what way has political influence or policy promoted TB control?

Probe: what about hindering TB control; are you able to give some examples?

16. Have you experienced any issues with trust/mistrust with your partners in PPM? If yes explain further.

17. Can you recall or think of any other challenges or enablers to the PPM initiative you may have experienced?

18. On the whole how has the PPM initiative impacted on any aspect of TB control in this catchment area?

19. Do you think PPM will be expanded nationwide? Probe: What informs your opinion?

20. What changes would you like to see in PPM that may improve TB care and control?

21. What else on this subject do you think I should consider in writing my report?

Thank you very much for your time and interest.

Appendix 4: Data Extraction Form

Research Title: Factors Affecting Public-Private Mix Strategy for TB Care and Control in Urban Areas in Ghana.

Location (Metro area)……

Date: …….

Name and Signature of Data Collector:

……

ALL FORMS OF TUBERCULOSIS CASES NOTIFIED; YEAR: 20…….

SUB-METRO AREA	FACILITY TYPE (PUBLIC/PRIVATE)	PERIOD (MONTH/QUARTER)	MALE	FEMALE	TOTAL
TOTAL					

Appendix 5: Codebook (post – analysis; showing parent nodes only)

Parent Nodes	Description	Files	References
00.Memorables	Memorable quotes	18	35
01.Leadership and Governance Processes and Considerations	contains categories discussing provider prioritization and selection for PPM; definition of roles and resource allocation; contracting mechanisms; monitoring and supervision	23	153
02.Financing TB Care and Control	contains categories discussing the enabler's package; funding adequacy and usage including autonomy;	23	114
03.Service Delivery	contains categories discussing the PPM task mix; attitudes of workers; comparative advantage of private and public facilities; worker understanding of their roles; demand side feedback from patients	23	171
04.Workforce Characteristics and Processes	contains categories discussing staff and volunteer recruitment; motivation; training and certification; knowledge and skill transfer	23	265
05.Medicines and Technology	contains categories discussing availability of and access to TB drugs, screening and diagnostic tools; transportation	23	57
06.Information and Communication	contains categories discussing capture of TB data; contact tracing and home verification; reporting systems;	23	28