SCHOOL OF PUBLIC HEALTH, COLLEGE OF HEALTH SCIENCES, UNIVERSITY OF GHANA

INTERVENTIONS IN PLACE TO ENHANCE TUBERCULOSIS CASE DETECTION IN HEALTH FACILITIES IN GREATER ACCRA REGION, GHANA.

BY

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THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH (MPH) DEGREE.

JULY, 2016

DECLARATION

I, Vincent Jessey Ganu, declare that this work "**INTERVENTIONS IN PLACE TO ENHANCE TUBERCULOSIS CASE DETECTION IN HEALTH FACILITIES IN GREATER ACCRA REGION, GHANA.**" is the result of my own original research undertaken under supervision and all other people's investigations have been appropriately acknowledged.

…… ……..

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…….. ……

Dr Ernest Kenu **Date**

Supervisor

DEDICATION

I dedicate this work to my family who have endured all the neglect during this period.

ACKNOWLEDGEMENT

I praise the Almighty God for giving me the necessary strength and wisdom required to complete this dissertation.

I would also like to express my profound appreciation to the following people for their immense and continuous support:

- Dr Ernest Kenu, for his indefatigable guidance and support. I am really grateful.
- All staff of School of Public Health for their diverse immense contribution
- Madam Abena Engmann for her support
- World Health Organization for their support in funding this project
- The Medical Directors and staff of all the health facilities visited.
- My family, for their encouragement and support.
- My colleagues and friends, for their priceless contributions.

ABSTRACT

Introduction

Despite the global response to the tuberculosis epidemic, a high burden of this disease still persists particularly affecting the poor and vulnerable population. Many cases are missed annually and passive case detection have not proven to improve on the number of tuberculosis cases detected. Implementation of facility and community based active case detection interventions have been documented to increase TB case detection rates. The aim of this study was to assess the interventions in place to enhance tuberculosis case detection in public health facilities in the Greater Accra region, Ghana

Methods

A cross-sectional study was conducted among TB coordinators of public health facilities in the Greater Accra region of Ghana. Questionnaires were administered to each TB coordinator to evaluate the TB case detection intervention measures being implemented and any hindering or facilitating factors to the implementation of the interventions.

Results

Only 1 out of 71 health facilities was implementing all the 6 intervention measures and 4 health facilities were not implementing any of the tuberculosis case intervention measures. Twenty-seven out of 71 health facilities were implementing at least 3 intervention measures. Most respondents (72.41%) stated periodic training on tuberculosis case detection interventions as an important facilitating factor and 75.38% of them also indicated that little or no support from the Ministry of Health or the National Tuberculosis control Programme was a major hindering factor.

Conclusions

Public health facilities in general are not implementing all the tuberculosis case detection interventions. However some facilities are implementing some of the tuberculosis case

detection interventions. There was lack of monitoring and evaluation of tuberculosis case detection implementation activities at the health facilities. Effective supervision, monitoring and evaluation and provision of required resources for intervention activities of the health facilities will ensure implementation of all case detection interventions.

Keywords

Tuberculosis, case detection, implementation, health facilities, Greater Accra, monitoring, evaluation

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ART	Antiretroviral therapy
CB-DOTS	Community-based DOTS
CHW	Community health worker
CIDA	Canadian International Development Agency
CNR	Case notification rate
DOTS	Directly observed treatment, short course
GHS	Ghana Health Service
HIV	Human immunodeficiency virus
MDR-TB	Multidrug-resistant TB
NTP	National Tuberculosis Control Programme
PLHIV	People living with HIV/AIDS
SOP	Standard operating procedures
TB	Tuberculosis
WHO	World Health Organization

DEFINITIONS OF TERMS

Passive TB case finding: Passive case finding comprises of diagnosing TB in symptomatic individuals presenting at hospitals for health services because they are not feeling well.

Active case-finding: A special kind of strategy where the health care system makes efforts to identify patients with TB among people who do not seek care due to TB symptoms. These special efforts go beyond passive TB case finding at hospitals. Active efforts including screening and testing are carried out in communities or populations that are underserved or at increased risk of TB increasing access to care.

Case detection rate: The proportion of notified cases of TB (including new and relapse) among the WHO estimated incident cases in a country, reported as an annual figure.

CHAPTER ONE

INTRODUCTION

1.1 Background

Tuberculosis (TB) has been referred to as the perfect manifestation of an imperfect civilization (Dormandy, 2000). Despite scientific and social advances, a high burden of tuberculosis persists worldwide, particularly affecting poor and susceptible populations (Dormandy, 2000).

TB is currently the leading cause of death globally with 4,400 victims every single day (WHO, 2015). TB is a preventable and curable disease caused by *Mycobacterium tuberculosis* and is transmitted through the air and primarily targets the lungs.

A total figure of 9.6 million incident cases of TB (5.4 million among men, 3.2 million among women and 1.0 million among children**)** were reported globally in 2014 with Asia and Sub-Saharan Africa recording the highest incidence of TB and deaths due to TB (WHO, 2015).

Sub-Saharan African was reported to have 28% of the world's tuberculosis cases but taking population into consideration, it had the most severe tuberculosis burden (WHO, 2015).

Despite the fact that TB has been curable for almost 70 years and most infected individuals are treated every year, the yearly rate of decline of TB incidence globally has averaged only 1.5% since year 2000 (WHO, 2015). Tuberculosis control has gone through many phases and is currently based on three strategies: case finding and treatment of active disease; treatment of latent TB infection; and vaccination with bacille Calmette-Guérin (BCG). The last two strategies have little impact on the incidence of TB, as treatment of latent TB is done in a few countries and BCG vaccine has minimal effect in the prevention of tuberculosis in the adults. Hence, case finding and treatment of active TB disease are currently the key approaches to interrupting transmission of TB and reducing incidence (WHO, 2010).

Active and enhanced case finding (ACF and ECF) requires extra efforts by the various health authorities or system to improve on TB case detection in a population. The main difference between ACF and ECF is the level of direct collaboration with the intended population. ACF is often more exhaustive, involving face-to-face contact with the intended population and immediate onsite assessment. ECF creates awareness about TB symptoms in the intended population through publicity and education, and encourages people to present themselves to health facilities for routine medical services. These strategies identify and thus offer treatment to people confirmed to have TB who have not accessed medical services on their own initiative. This early detection and thus treatment of patients with TB as a result of ACF and ECF, helps to decrease the quantity of TB infections and prevent secondary cases. ACF and ECF are important pillars of great interest for TB control because the minimal successes chalked by the current control strategies to decrease TB incidence, especially in regions with a severe burden of human immunodeficiency virus (HIV).

TB is a disease whose pathogenesis is characterized by a period of asymptomatic subclinical infection that might last for weeks to decades. As a result, a large reservoir of infected human beings exists, among whom new cases might arise at any time. These infections then spread to contacts (individuals in contact with the infectious case). Newly infected contacts might then progress to active tuberculosis disease, a process that could take weeks to more than a year, or enter the large pool of asymptomatically infected individuals and be at risk of future tuberculosis.

Tuberculosis case-finding and treatment of disease prevents the spread of tuberculosis by reducing the number of secondary infections resulting from each new case, but this strategy alone cannot lead to elimination of the disease (Dowdy & Chaisson, 2009).

Prompt case finding is an important pillar of global tuberculosis (TB) control (Raviglione, 2007) but low case detection has been reported in the African region (WHO, 2010). This low TB case detection rate is one of the noted problems facing TB control in Ghana. The Ghana National TB control program (NTP) and the Ghana Health Service has taken steps to address these challenges such as development of standard operating procedures for enhancing TB case detection in health facilities. The NTP collaborated with WHO in a 3 year WHO-CIDA initiative put in interventions in health facilities in Accra metropolitan area from 2009 to 2012. The interventions included screening of household contacts of TB patients and systematic screening of HIV and diabetic patients. These interventions were expected to be scaled up to other health facilities in Greater Accra Region and beyond. Despite these interventions, the case detection rate in Greater Accra has not seen any significant improvement. It is not known whether these evidence based interventions are still in place in these health facilities and the extent to which they are being implemented.

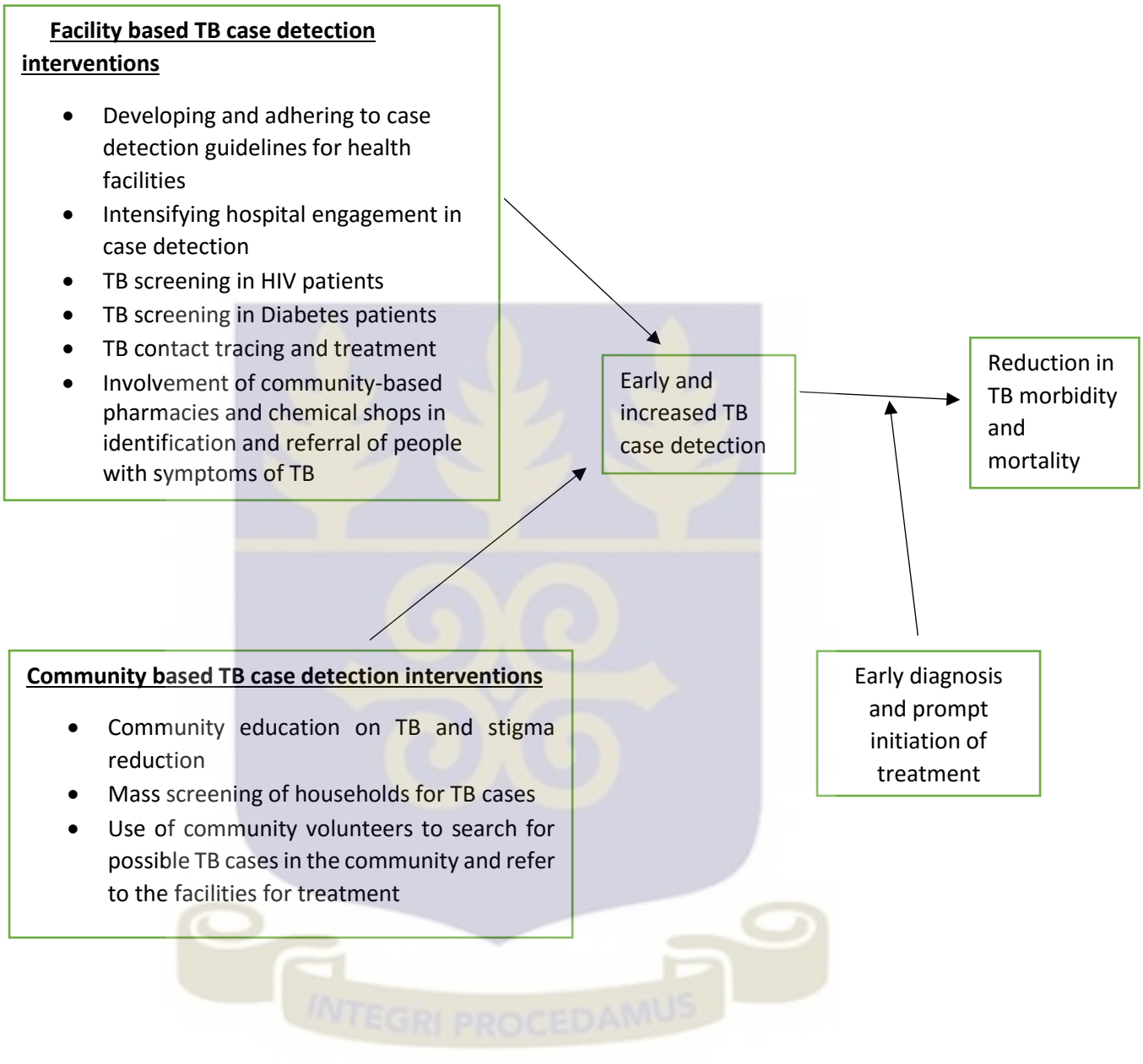
1.2 Problem Statement

The World Health Organization (WHO) estimates that 3 million people with tuberculosis are "missed" each year by health systems. This leads to the persistence of tuberculosis infection through airborne transmission in our communities (WHO, 2014). The estimated national prevalence of TB in Ghana is 282 (111-530) per 100 000 population of TB cases in 2014(WHO, 2015). An estimated 14668 new cases of TB were reported in Ghana in 2014 and Ghana's case detection was 33% which was below the African regional average rate of 47% and the WHO target of 70% (WHO, 2015). Since 2009, many steps have been taken by the national TB programme and the Ghana Health service to address these challenges identified. Some of the steps include the development of standard operating procedures in March, 2010 to ensure optimisation and standardisation of TB case detection activities in both public health facilities as well as communities. Another step was a 3 year collaboration between the Ghana national TB programme and the WHO-CIDA (Canadian International Development Agency) Initiative, where Ghana was part of five selected high TB incidence countries to put in place interventions in health facilities in Accra metropolitan district from 2009 to 2012. These interventions were intensified hospital engagement; systematic screening to identify TB cases among persons living with HIV; active screening among household contacts of known TB patients; involvement of community pharmacy and chemical shops owners in identification and referral of people with symptoms of TB and systematic screening of people with diabetes. These interventions were expected to increase the TB case detection in these health facilities. Subsequently, these interventions were to be scaled up to other health facilities in Greater Accra and beyond.

After the implementation of these interventions, the case detection rate in Greater Accra saw a marginal increase initially from 2517 detected TB cases in 2008 to 2651 detected cases in 2009. After 2009, the case detection has declined gradually and the current number of TB cases detected in 2014 was 2071. Reasons for these decline in case detection rates in the health facilities are unknown.

Although interventions to improve TB case detection were supposed to have been put in place in these health facilities, it is not known whether these evidence based interventions are still in place in these health facilities and the extent to which they are being implemented.

1.3 Conceptual Framework:



1.4 Justification

The National TB control programme have taken several steps including the WHO-CIDA initiative to increase case detection rates especially in Greater Accra Region with the aim of addressing the low case detection in the country. Though there has been some marginal increase in TB case detection in some health facilities in Greater Accra, our case detection rate has generally not improved significantly.

This study will help provide information on the number of facilities still having these TB case detection interventions or factors in place and the extent to which they are been implemented. This information can serve as a checklist for the TB control programme to target monitoring and supervision activities towards health facilities not implementing TB case detection interventions. Information from this study on the facilitating and hindering factors to the implementation of these TB case detection intervention measures would be important to the TB programme and the Ghana health service in the scale up of these measures to other regions in the country.

1.5 Study Objectives

General Objective:

To assess the interventions in place to enhance tuberculosis case detection in public health facilities in the Greater Accra region, Ghana

Specific Objectives:

1. To determine TB case detection interventions that are being implemented in public health facilities in Greater Accra.
2. To determine the proportions of public health facilities implementing all TB case detection interventions.
3. To determine the facilitating and hindering factors in implementing these TB case detection interventions in the public health facilities.

CHAPTER TWO

LITERATURE REVIEW

2.1 Tuberculosis burden

Globally, tuberculosis (TB) has been a considerable health problem and is currently ranked alongside human immunodeficiency virus (HIV) as a leading cause of death with 4,400 victims every single day (WHO, 2015) . With an estimated 9.6 million incident cases of tuberculosis and 1.5 million deaths in 2014, Asia and Sub-Saharan Africa recorded the highest incidence of TB and deaths due to TB (WHO, 2015). The global total is a substantial upward revision of estimates compared with estimates published in 2014.

Sub-Saharan Africa was reported to have 28% of the world's cases and has 281 incident cases per 100 000 population on average (WHO, 2015). Globally in 2014, there were an estimated 1.2 million new HIV positive TB cases (12% of all TB cases). Almost three-quarters of these cases were in the African Region (WHO, 2015).

Estimates of the rate of decline in tuberculosis incidence since year 2000 range from less than 1% per year to around 1·5% per year with variations by country and region (Murray et al., 2014).

TB still remains a huge problem as multidrug-resistant (MDR) TB remains a severe threat (Wright et al., 2009) and HIV continues to increase the epidemic, particularly in Africa (WHO, 2009).

Among PLHIV, TB is the most common life-threatening opportunistic infection, even in those receiving antiretroviral therapy, and the leading cause of death. There have been intense increase in TB case rates since 1990 in parts of the world where HIV and TB epidemics overlap. Almost one third of PLHIV in the world are co-infected with

Mycobacterium tuberculosis and are mostly in sub-Saharan Africa (Report of a Joint World Health Organization, 2008).

Ethiopia has detected and treated some 1·5 million cases of tuberculosis over the past 20 years. It has reduced TB mortality and prevalence by more than half since 1990 (worldwide, mortality fell by 45% and prevalence by 41% during the same period) (WHO, 2015).

Ethiopia's resolute commitment to control efforts has prompted experts to advocate that Ethiopia could serve as a model country (WHO, 2015).

National tuberculosis programmes across the globe are settling into the post-2015 agenda. The End TB Strategy, which will continue to run until 2030, predicts universal health coverage and social protection, alongside aspiring goals for reducing mortality by 90% and new cases by 80% (Uplekar et al., 2015). Ghana had an estimated TB prevalence of 282 (111-530) per 100 000 population in 2014 and a TB incidence rate of 165 (80-281) per 100,000 population (WHO, 2015). In most parts of Africa, treatment success rates are still below targets due to high death and default rates (Lönnroth et al., 2010). The TB mortality rate in Ghana remains high at about 7.5 per 100 000 (WHO, 2015).

Early case finding is a significant pillar of global tuberculosis (TB) control (Raviglione, 2007). Low case detection has been reported in the African region (WHO, 2010).

In 2012, it was estimated that a third of all TB cases worldwide were missed by national tuberculosis programmes (NTPs) (WHO, 2013a). Studies suggest that most non-identified or non-notified cases were from South-East Asia and Africa (Lönnroth, Jaramillo, Williams, Dye, 2010).

Arresting TB transmission within our communities is the primary goal of most TB control programs. Achieving this daunting aim takes substantial time, because most

individuals in endemic areas are already infected, creating a reservoir that constantly contributes to the pool of infectious cases. An effective and successful TB control program requires early diagnosis and immediate start of treatment for TB patients. Delay in diagnosis is important with regard to TB transmission within the community and the rate of spread of the TB epidemic (Bjune, 2005). Delayed diagnosis may result in more complications thus more extensive disease and lead to a higher mortality (Ward, Marciniuk, Pahwa, & Hoeppner, 2004). This diagnostic delay also leads to an increased period of infectivity in the community (Lawn, Afful, & Acheampong, 1998). The severity of the disease, access to health services, individual's perception of the disease, and the expertise of the health personnel are among various factors identified as influencing delay in diagnosis (Lienhardt et al., 2001).

It was found in Ethiopia that early presentation to health facilities for health services causes delay rather than suspicion of TB because TB symptoms are so common in most societies (Yimer, Bjune, & Alene, 2005).

2.2 Global Progress

Quite a number of tuberculosis medications emerged in the 1950s after streptomycin was discovered in 1944. This discovery was an important one as this led to the development of the combination therapy approach for treating tuberculosis. The risk factors for the TB infection largely still remained the same. The world population boom from 3 billion to 6 billion from 1960 to 1999 contributed significantly to the tuberculosis burden in the world (Lam, 2011). This led to accelerating urbanization, people struggling with overcrowding in living quarters, low wages, and poor working conditions, and also inadequate nutrition. These factors produced a conducive atmosphere for the growth and spread of TB.

The launch of the DOTS approach to TB control in 1994 by the WHO laid much emphasis on standardized case management of TB. Thus the prior approach of treating TB with different medicines for long periods was replaced by the DOTS approach. Later in 1999, the following were added to DOTS; culture-based diagnosis, drug susceptibility tests, and treatment with second-line drugs. This modification was called the DOTS-Plus approach and was implemented with the goal to tackle the evolving burden of multidrug-resistant (MDR) tuberculosis (Dheda et al., 2014; Tanimura, Jaramillo, Weil, Raviglione, & Lönnroth, 2014). The Stop TB Partnership was established in 2000 as a global movement to hasten social and political acts to stop the spread of TB.

The Stop TB Strategy was launched in 2006 due to the continuous challenges encountered in TB control. This strategy laid emphasis on DOTS expansion, tuberculosis in HIV patients, MDR tuberculosis, laboratory strengthening, and the development of new methods (WHO, 2013b).

In 2008, WHO endorsed the Three I's strategy (Report of a Joint World Health Organization, 2008) which were intensified case-finding, isoniazid prophylaxis therapy, and infection control to address the crisis of tuberculosis deaths among people with HIV. Intensified case-finding and isoniazid prophylaxis therapy save both lives and resources, given the number of tuberculosis cases prevented (Gupta et al., 2014). A "fourth I", which denoted integrated care at the health facility level for individuals co-infected with HIV and tuberculosis, has also been demonstrated to improve treatment outcomes for both tuberculosis and HIV (Durovni et al., 2013; Hermans et al., 2012). Despite confirmation of these old strategies, people infected with HIV

continue to perish from tuberculosis at a disturbing rate because not much is being done to ensure optimal prevention, detection, and treatment.

With regards to TB treatment worldwide, treatment with multiple antimicrobials, administered either individually or as fixed dose combinations (FDC) through the directly observed treatment strategy (DOTS) has been very key to controlling the disease.

Treatment options have evolved over the years from monotherapy to FDC (Monedero & Caminero, 2011; Pan, Chernew, & Fendrick, 2008). Monotherapy has been associated with high pill burden for patients, selective drug intake by patients, non-adherence, increased risk of drug resistance, inappropriate dosing and prescription of drugs (WHO, 1999). All these were said to have adverse effects on treatment outcome thus the rationale for the introduction of FDC (Hopewell, Pai, Maher, Uplekar, & Raviglione, 2006).

DOTS has mainly emphasized on the supply side of the TB control interventions. This approach required that the health systems should be functioning effectively which is also a challenge in most countries. Yet TB cases are still on the increase with incidence decline stagnating around 1.5% (Murray et al., 2014). These approaches to fighting TB addresses only part of the issue which is intensive case management but there is a need to increase the case detection rate of the disease before the need for the above approaches. The combination of intensive TB case detection and using the DOTS and STOP TB strategies is critical and well overdue to win the battle against tuberculosis.

2.3 TB Case detection

Tuberculosis prevalence surveys (WHO, 2013c) have revealed that more than half of those with bacteriologically confirmed tuberculosis do not report the symptoms that often prompt disease investigation (i.e. cough lasting 2–3 weeks). WHO (2013a) reported that more than 3 million tuberculosis cases worldwide were undiagnosed or were not notified and continue to transmit the disease in their families and communities..

In low income and middle-income countries with high burden of TB, most TB programmes have adopted policies that rely on passive case-finding, that is, waiting for the sick to seek care if they are able (Keshavjee, Dowdy, & Swaminathan, 2015). Also high risk populations who present to the hospitals for other ailments are not actively screened for tuberculosis and same for household contacts of patients with TB leading to low TB case detection. Most known contacts receive no post-exposure therapy, a standard intervention in most high-income settings. Delays in diagnosis through passive case detection have been associated with both patient and provider-related factors (Sreeramareddy, Panduru, Menten, & Van den Ende, 2009; Storla, Yimer, & Bjune, 2008). However, this approach does not seem to produce much results as the annual rate of decline of TB incidence globally has averaged only 1.5% since year 2000(WHO, 2015).

Over-reliance on standardized TB therapy and sputum smear microscopy which is a low-sensitivity visual diagnostic test that cannot determine drug resistance, has side-lined individuals whose illnesses are characterised by a lower TB bacillary load, such as children and individuals with HIV and diabetes, and also those with extra pulmonary or drug-resistant tuberculosis (Keshavjee & Farmer, 2012). Alternative choices are

however becoming available, with potential to offer considerable improvements in test characteristics (Pai & Schito, 2015).

The introduction of the Xpert MTB/RIF test, with greater sensitivity than sputum smear microscopy, leading to 45% surge in case detection in patients infected with HIV, is a significant advance in TB diagnosis (Lawn et al., 2012). The implementation of Xpert proved the benefits of better case detection with new diagnostics, and highlighted the challenges in introducing new technologies in weak health systems with poor service coverage and access (Creswell et al., 2014).

Early detection and treatment of both active disease and dormant latent infection, along with efforts to control transmission in health-care and congregate settings, have been lately recommended for some groups in limited settings, but have yet to be widely scaled up (McMillan, 2015).

The goals laid out in both the Stop TB Partnership's Global Plan to Stop TB 2016–2020 (Stop TB Partnership, 2015) and WHO's End TB Strategy (Uplekar et al., 2015) will require a comprehensive approach in identifying and treating all cases of TB, whether latent or active.

Increase in complications, mortality and worsening disease have been found to be the end result of delayed diagnosis of tuberculosis (Ward et al., 2004). It also leads to an increased period of infectivity in the community (Lawn et al., 1998). The severity of the disease, access to health services, individual's view of the disease, and the expertise of the health personnel are among various factors identified as influencing delay in diagnosis (Lienhardt et al., 2001).

Due to limitations of the current approach of passive case finding, there was a need to redefine this approach and active case finding was suggested as a new strategy to accelerate the control of tuberculosis (Golub et al., 2005; Lönnroth et al., 2010). Active

case-finding (ACF) is a special kind of strategy where the health care system makes efforts to detect TB patients among people who do not seek care due to TB symptoms (Golub et al., 2005). Various intensified tuberculosis case-finding activities are being promoted globally in order to carry out this new approach of active case finding sometimes involving mass radiological screening (Golub et al., 2005). Benefits of ACF over routine passive case-finding has been realised and as such been documented in many studies looking at both approaches. ACF has also been documented to detect a considerable number of undiagnosed TB patients much earlier than passive case-finding (den Boon et al., 2008; Eang et al., 2012).

Subsequently, active case finding also helps to reduce TB transmission by shortening the duration of infectiousness as the patients are identified early (Golub et al., 2005). ACF aims to reduce barriers for early TB case detection, including delay in presentation to a health facility, late identification of a person as a presumptive TB case, and timely diagnosis and subsequent treatment.

While showing significant promise as a tool to improve and accelerate TB diagnosis, subsequent treatment and cure must also be guaranteed at the various treatment points or centres as the active case detection activities are carried out so that ACF will be effective and have an impact on TB transmission in the community (Corbett et al., 2010).

Although there is growing interest in using this ACF approach for early case detection in developing countries (Golub et al., 2005), it is not well understood how best to apply and integrate ACF in the existing health care systems in different epidemiologic, socio-economic, and cultural contexts (Golub et al., 2005; Lönnroth et al., 2013)

2.4 TB Case detection in Ghana

It has been reported by the WHO that Ghana detects only 33% of its TB cases (WHO, 2015). Our case detection rate is well below the African regional average rate of 47% and the WHO target of 70%. This low TB case detection rate is one of the key problems facing TB control in Ghana.

The National TB programme and Ghana Health Service identified reasons for this low TB detection rate and broadly categorised them into 3:

- Factors related to health system failing to identify TB suspects and patients reporting to the health care facilities
- Factors related to access to the health care facilities and
- Factors related to knowledge, attitude and practice of the community.

Since 2009, many steps have been taken by the national TB programme and the Ghana Health service to address these challenges identified. Some of the steps include the development of standard operating procedures in March, 2010 to ensure optimisation and standardisation of TB case detection activities in both public and private health facilities as well as communities. Another step was the collaboration between the Ghana national TB programme and the WHO-CIDA (Canadian International Development Agency) Initiative, where Ghana was part of five selected high TB incidence countries in implementing specific approaches that contributed to not only increasing TB case detection in locations where they were applied, but also across the entire country. Accra was the focus for the WHO-CIDA initiative.

TB is both curable and preventable and therefore the need to increase case detection and initiate prompt treatment to save lives.

The Ghana Health Service and the National TB control programme have taken several steps including the implementation of the WHO-CIDA TB case detection interventions

initiative to increase case detection rates especially in Greater Accra Region. However no research has been conducted to assess if these TB case detection intervention measures are really being implemented in the various public health facilities in the country in order to increase TB case detections.

2.4.1 Tuberculosis case detection Interventions description

Aside the Ministry of health coming up with some interventions, a comprehensive integrated package of interventions were implemented in health facilities in the Accra Metropolis by the NTP in collaboration with WHO-CIDA to increase TB Case detection. Kumasi Metropolis was used to serve as a comparator. Both Metropolis shared similar profile in populations, human resource for health capacity, health infrastructure and, economic activities. TB Control in both metropolises were similar as well. The following targeted interventions were implemented in a package manner to address the gap of low TB case detection:

Improving contact tracing and investigations in households of index pulmonary TB cases

Household contact tracing and investigations are considered an important approach to augment TB case detection. These help to increase TB case-detection rates and to attempt to interrupt the transmission of TB disease (Morrison, Pai, Hopewell, 2008; Thind, Charalambous, Tongman, Churchyard, & Grant, 2012). Contact tracing remains an effective approach which plays a vital role in reducing the number of new cases, provided it is implemented in combination with other case detection strategies (Kasaie, Andrews, Kelton, & Dowdy, 2014). Household contact tracing especially TB active-

case finding among first degree relatives of TB patients in low-income settings have been found to be feasible and yielded results (Cheng et al., 2015).

Engagement of contact tracing activities enables health professionals to detect cases of TB without unnecessary delay and facilitates prompt initiation of treatment so that the subsequent chain of transmission can be interrupted (Jurcev-Savicević, 2011). There are evidence to reflect the benefits of implementing contact tracing in enhancing diagnosis of both pulmonary and non-pulmonary TB and early detection of drug-resistant form of TB (Begun, Newall, Marks, & Wood, 2013; Jurcev-Savicević, 2011).

Involving community pharmacy shops and chemical sellers to improve TB case detection

Pharmacies and small neighbourhood shops that sell medicines informally are often thought of as hindrances to TB control. This is because they often dispense some form of treatment to possible TB patients and sometimes provide mono-therapies, or insufficient dosages that contribute to the rise of multi-drug resistance (van den Boogaard et al., 2010). However, some successes have been achieved in some other countries where referrals from pharmacies had enhanced TB control efforts (Vu et al., 2012). Moreover pharmacists often have unique access to certain susceptible groups of people, such as diabetics (Gnanasan et al., 2011).

In our part of the world, pharmacy shops and chemical sellers play a crucial role as they are usually the first point of call for most people in our community. Most people avoid health facilities when sick due to several factors such as accessibility and high cost of care among others. They however go to these community pharmacy shops and chemical sellers for first aid. So periodic training and inclusion of these people in the fight against TB through referral of potential TB patients to health facilities will help in TB case detection improvement.

Organizing TB case detection

All health facilities are expected to have a TB team which sees to the development of TB case detection guidelines or standard operating procedures (SOPs). Having these guidelines helps to standardise the activities involved in improving TB case detection in these facilities. The team may eventually serve as an internal monitoring team to see to the implementation of the TB case detection interventions

Improving hospital-based TB case detection

Treatment and cure must be guaranteed at the various treatment points or centres as the active case detection activities are carried out so that ACF will be effective to have an effect on TB spread in the community (Corbett et al., 2010). Thus activities such as periodic training of health workers to build their capacities in TB case detection interventions, equipping the laboratories with the necessary diagnostic equipment all help to improve hospital-based TB case detection. Resources or the necessary logistics must be provided to improve TB case detection in our health facilities. Most TB cases in Ghana are identified in hospital settings through passive case finding of persons reporting with cough, respiratory and constitutional symptoms. Several patients are missed since there is no systematic approach to hospital based TB case detection. Standard Operating Procedures (SOPs) have been developed to standardise, optimise and make TB case detection permanent in the NTP.

Improving TB case detection among persons living with HIV (PLHIV)

The proportion of TB and HIV co-infection is highest in African countries. Despite the numerous achievements of DOTS in controlling TB, some evidence proposes that active case finding may be an essential factor of TB control in high prevalence areas, especially in the setting of HIV (Schulte et al., 2002). TB-HIV coinfection can modify the classic presentation of TB symptoms. Thus, coinfected persons may be less likely to suspect TB and be less likely to present to the health facility themselves (Jam et al., 2010). Thus there is a need to put in measures to enhance TB case detection among these vulnerable group through periodic screening for tuberculosis.

Improving TB case detection among persons living with diabetes mellitus

The increasing prevalence of diabetes mellitus (DM) globally and its effect on TB burden has been found to be greater than HIV infection in many studies (Ruslami, Aarnoutse, Alisjahbana, van der Ven, & van Crevel, 2010). TB control could further be enhanced by priming patients with identified determinants of TB, including those with DM (Lönnroth et al., 2010).

This involves both TB prevention through activities to reduce the prevalence of risk factors and targeted diagnostic and treatment interventions in vulnerable groups, such as people with DM. Systematic screening for active TB in people with DM accelerates case detection, leading to earlier treatment and prevention of transmission.

CHAPTER THREE

METHODOLOGY

3.1 Study design

The study was a facility based descriptive cross-sectional study. A quantitative approach through the administration of structured questionnaires was employed in carrying out the study.

3.2 Study site

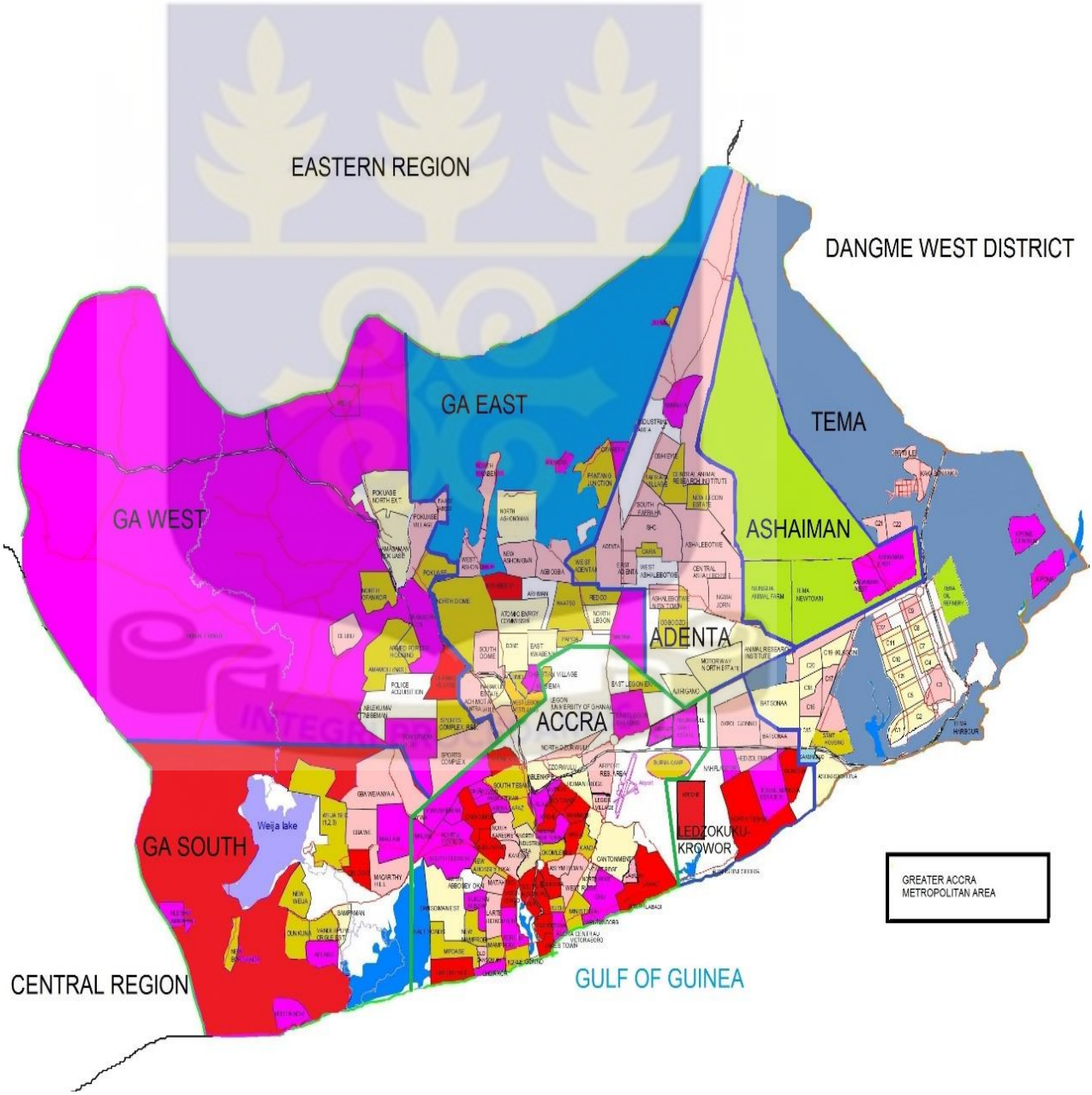
The study was carried out in public health facilities in the Greater Accra Region of Ghana. It is the smallest of the 10 regions of Ghana with respect to area, occupying a total land surface of 3,245 square kilometres or 1.4% of the total land area of Ghana. It is the second most populated region with a population of 4,010,054 in 2010in Ghana, after the Ashanti Region, accounting for 15.4% Ghana's total population.

The most represented ethnic groups in the region are the Akans (39.8%), the Ga-Dangmes (29.7%) and the Ewes (18%). The dominant religions in the region are Christians (83.0%), Moslems (10.2%) and traditional religion (1.4%). In terms of health facilities, there are both private and public health facilities in the region. For the public health facilities, the region has 1 teaching hospital, 72 hospitals, 270 clinics, 11 polyclinics, 125 community-based health planning and services (CHPS), 21 Health centres and 81 midwifery/maternity homes. The midwifery/maternity homes, health centres and CHPS are usually located within communities and usually offer minor treatment and education services to the people. The clinics, polyclinics and hospitals have been equipped with more resources in order to provide services for people referred to their end as well as those who walk in. These facilities are located within each district in the region and each facility is usually headed by a medical

superintendent who reports to the district directors who also then report to the Ghana Health Service.

They provide medical, surgical, paediatric, obstetrical and gynaecological services to the people in the districts. These facilities also refer patients requiring complex and intensive health services to the tertiary facility in the region when necessary.

Figure 1: Map of Greater Accra region indicating the various districts where the public health facilities were located.



3.3 Variables

My dependent variable was health facilities with TB case detection intervention measures in place and implementing them.

My independent variables were:

Variable	Definition
Organizing TB detection intervention	Health facilities having a TB team in place, having a TB case detection plan and standard operating protocols for TB case detection
Hospital engagement in TB case detection	Health facilities who had the following: TB registers in all consulting rooms, posters on TB symptoms and control displayed in all out-patient departments and fluorescent microscopes with light emitting diode (LED) in their laboratories
TB screening among PLHIV	Facilities having TB screening tools for PLHIV and carrying out TB screening in PLHIV
TB screening among patients with diabetes mellitus (DM)	Facilities having TB screening tools for patients with DM and carrying out TB screening in patients with DM
TB household contact tracing	Facilities having SOPs and guidelines for TB contact tracing investigations, registers for household contact tracing, TB contacts screening questionnaire and reporting forms for household contact tracing
Involvement of pharmacies and chemicals shops in identification and proper referral of suspected TB to health facilities	Facilities involving identified community pharmacy and chemical shops in TB case detection and organizing periodic training for them as well as providing them with sputum request forms

3.4 Sampling

3.4.1 Study Population:

Eighty public health facilities consisting of hospitals, polyclinics and health centers in the public sector in the Greater Accra region were visited during the study.

3.4.2 Sample size and sampling method

A list of all health facilities (public and private) and their corresponding districts/ municipals in the Greater Accra region was obtained from the Greater Accra regional health directorate. All public health facilities in the list obtained that were designated as hospitals and polyclinics in the districts/ municipals were identified and selected for the study. All Community-based Health Planning and Services (CHPS) facilities and health centers were excluded from the study as the intended scale up of interventions were supposed to be implemented in hospitals and polyclinics. But in districts where hospitals and polyclinics were not available, the health centers that served those districts were selected for the study. In all, 80 public health facilities consisting of hospitals, polyclinics and health centers in the various districts/municipal in the Greater Accra region were identified to be visited during the study.

The TB focal persons for the facilities were involved in the study. The TB focal person for each health facility was selected and s/he gave responses to structured questions in a questionnaire based on interventions, known hindering and facilitating factors to implementation of these interventions after each had given consent.

The TB focal persons were those who coordinated all of the activities of TB at the health facility and also acted as a liaison between the health facility and the national TB programme or the health ministry. In the absence of the TB focal person for the health facility, his/her deputy was selected to give response to the structured questionnaire.

3.5 Data collection, handling and analysis

3.5.1 Ethical considerations and approval

Ethical approval was obtained from the Ghana Health Service Ethical Review Committee.

Permission was also obtained from Greater Accra Regional Health Directorate, the National TB programme, district directors and public hospitals and health centre superintendents before proceeding to conduct the study.

Informed Consent

Written informed consent was sought from all TB focal persons prior to administration of questionnaires. The informed consent all provided a summary of the study for participants in the study.

Risks and benefits/compensation

There were no known risks associated with participating in the study and there were no compensations as well. However, this research sought to provide information that would help improve TB case detection rates in the health facility and initiate prompt treatment of these patients thus bringing benefit to the general public.

Confidentiality

Information about participants and their participation in this research were protected to the best of our ability. Participant confidentiality was assured by delinking responses from names and facilities. Study IDs were used throughout the study.

Additional Cost:

There were no additional cost for the participant.

Data confidentiality:

All manual and electronic data were stored in a secure locked cabinet and accessible to only the investigator. Data held on computers and flash drives were encrypted with a password which was known only on a need to know basis.

Voluntary Participation and Right to Leave the Research

Participation in this research was voluntary and each participant had the right to withdraw without any penalty at any point from participating in the research. Each participant also had the right not to answer questions they were not comfortable with.

3.5.2 Data collection

Structured questionnaires were administered to collect data from TB focal persons in each health facility. The questions were based on TB case detection interventions.

3.5.2.1 TB case detection interventions

The interventions that the questions were based on in the structured questionnaire were:

- organizing a TB team in each facility
- intensifying hospital TB case detection
- household TB contact tracing and investigations
- screening for TB in PLHIV
- screening for TB in patients with diabetes mellitus
- involvement of community pharmacy shops and chemical sellers

Questions on the presence or absence of hindering and facilitating factors to the implementation of these interventions were included in the structured questionnaire.

3.5.3 Pre- testing and review of instruments/tools

Pre-testing of the questionnaire was done at the Dansoman polyclinic. Based on the responses obtained during administration of the questionnaire during the pre-testing, the questionnaire was reviewed and appropriate changes effected accordingly.

3.6 Data Handling and Analysis:

Data obtained from the study were entered in excel on a daily basis and stored on a password secured flash drive. Confidentiality was ensured by not using the names of TB focal persons and completed questionnaires were kept under lock and key. Only the principal investigator had access to the data.

The data was cleaned using Stata version 13. All incomplete and inaccurate data were identified and replaced or modified. With some incomplete data, we went back to the data source and filled in the missing data variables.

The data were analysed in Stata version 13. Data obtained on the location of public health facilities in the various districts and also the number of facilities visited per district were analysed and information were presented in tables.

Data collected on TB case detection interventions being implemented by the various public health facilities were analysed and proportions were used to determine the number of facilities implementing the following: organizing TB detection intervention, the level of intensified hospital engagement by the national TB programme, active screening by health facilities to identify TB cases among persons living with HIV and among household contacts of known TB patients, involvement of pharmacies in identification and referral of people with symptoms of TB and systematic screening of people with diabetes.

The health facilities were then stratified into categories of those implementing all the TB case intervention measures and those not implementing any of the TB case detection measures and presented in figures. They were further sub analysed or categorized into proportions of health facilities each implementing only 1, 2, 3, 4, or 5 interventions.

Data obtained on facilitating or hindering factors to the implementation of the TB case detection interventions were also analysed and descriptive statistics including cross-

tabulations were used to identify possible factors influencing the implementation of TB case detection interventions.

Data on monitoring activities to ensure effective implementation of TB case detection interventions were analysed and were presented in frequencies.

3.7 Data Storage

All manual and electronic data were stored in a secure locked cabinet and accessible to only the investigator. Data held on computers and flash drives were encrypted with a password which was made available only on a need to know basis.

CHAPTER FOUR

4.1 RESULTS

A response rate of 88.8% (71/80) was obtained from health facilities when study was conducted. Nine health facilities were not included in the study due to the unavailability of TB coordinators in these facilities because of a strike action by community health workers during the study period.

Out of the 71 facilities visited, 88.7% (63/71) of them were Directly Observed Therapy (DOTS) centers. Eighty percent (57/71) of our respondents were females. Respondents were between 25 and 65 years of age with a mean age of 33.6 ± 9.1 years. Almost 51% (36/71) of our respondents were nurses, 17% (12/71) were disease control officers, 13% (9/71) were community health officers with the others having diverse backgrounds in the health sector (Table 1). Almost 54% (38/71) of the respondents were married, 40.9% (29/71) of them were single.

Table 1: Occupation of the respondents

Occupation	Number of respondents (%)	
Biomedical scientist	1	(1.4)
Community health officer	9	(12.8)
Disease control officer	12	(16.9)
Field technician	2	(2.8)
Health care assistant	1	(1.4)
Health information officer	1	(1.4)
Lab technician	2	(2.8)
Nurse	36	(50.7)
Nutrition officer	2	(2.8)
Pharmacist	3	(4.2)
Public health nurse	2	(2.8)
Total	71	(100.00)

4.1.1 Distribution of Public Health Facilities in Greater Accra Region

Public health facilities visited were from 16 different districts or municipalities (Table 2). Accra Metropolitan area had the highest number (10) of health facilities visited with Ga Central, La-Dadekotopon and Ledzorkuku-Krowor each having the least number (2) of facilities visited. Seven facilities were visited in the Ga West district with 6 facilities each visited in the Ashaiman and Ningo-Prampram districts of the Greater Accra region (Table 2).

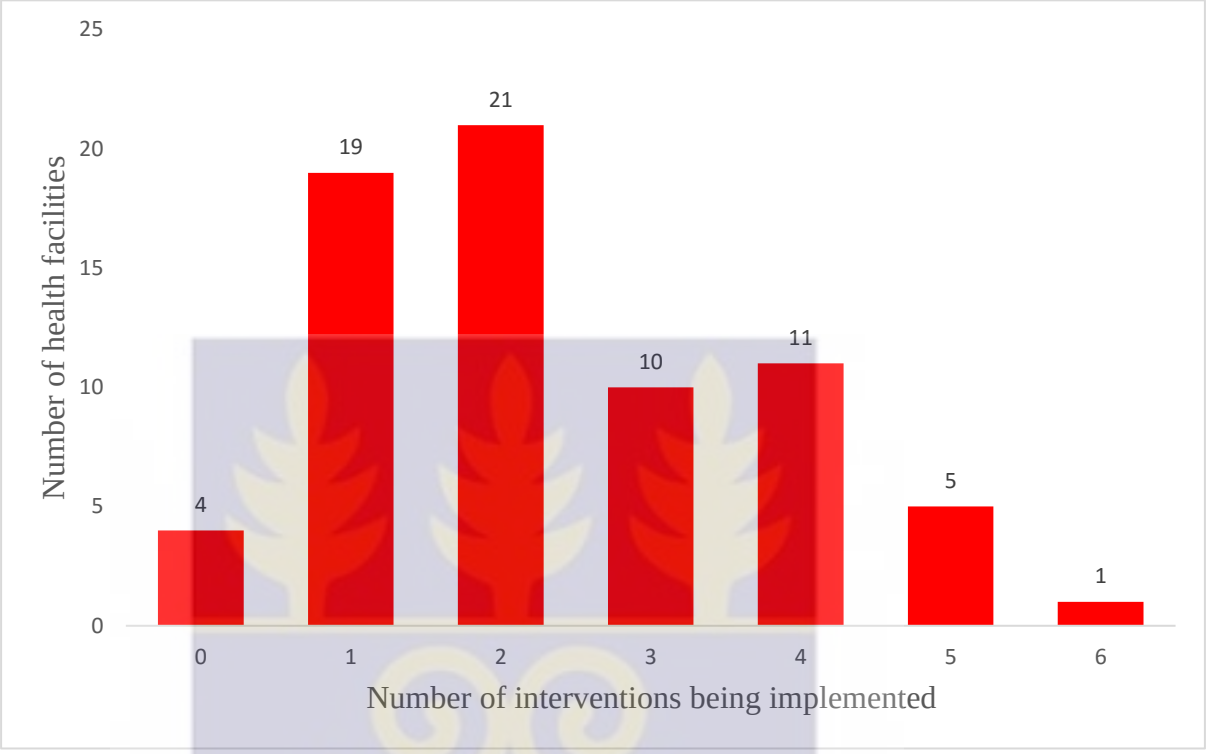
Table 2: Distribution of the facilities visited in the Greater Accra Region

District/Municipal	Number of facilities visited (%)	
Accra Metropolitan	10	(14.2)
Ada East	4	(5.6)
Ada West	3	(4.2)
Adentan	5	(7.0)
Ashaiman	6	(8.5)
Ga Central	2	(2.8)
Ga East	5	(7.0)
Ga South	5	(7.0)
Ga West	7	(10.0)
Kpone-Katamanso	4	(5.6)
La-Dadekotopon	2	(2.8)
La-Nkwantanang-Madina	4	(5.6)
Ledzorkuku-Krowor	2	(2.8)
Ningo-Prampram	6	(8.5)
Shai-Osudoku	3	(4.2)
Tema	3	(4.2)
Total	71	100.00

4.2 Implementation of TB case detection interventions

Only 1 out of 71 health facilities was implementing all the TB case detection interventions. Four health facilities were not implementing any tuberculosis case detection intervention. Nineteen health facilities were implementing only one TB case detection intervention with 21 health facilities implementing 2 TB case detection interventions (Figure 2).

Figure 2: Number of health facilities implementing tuberculosis case detection interventions in the Greater Accra region.



In implementation of each tuberculosis case detection intervention, 84.5% (60/71) of the health facilities were undertaking organizing tuberculosis case detection whiles 43.7% (31/71) were doing tuberculosis contact tracing. Thirty nine percent (28/71) of health facilities were screening for tuberculosis in HIV/AIDS patients and 27% of them were involving pharmacies and chemical shops in the communities to improve tuberculosis case detection (Table 3).

Table 3: Tuberculosis case detection intervention and the number of health facilities implementing them.

Intervention	Number of facilities (%)
Organizing tuberculosis case detection	60 (84.5)
Intensifying hospital tuberculosis case detection	14 (19.7)
Tuberculosis contact tracing	31 (43.7)
Involvement of pharmacies and chemical shops in communities to improve tuberculosis case detection	19 (26.8)
Screening for tuberculosis in HIV/AIDS patients	28 (39.4)
Screening for tuberculosis in diabetes mellitus patients	14 (19.7)

4.3 Facilitating and hindering factors

A chi-squared test of independence was performed to examine the relationship between facilitating and hindering factors reported by respondents and implementation of TB case detection interventions. Absence of the following factors were reported by respondents as hindering factors for the 4 health facilities not implementing any of the tuberculosis case detection interventions:

- Periodic training on tuberculosis case detection interventions (x^2 = 9.7645 p = 0.135)
- Availability of logistics for implementing tuberculosis case detection interventions (x^2 = 13.7202 p = 0.033)
- Enough staff/volunteers to carry out tuberculosis case detection interventions (x^2 = 8.0267 p = 0.236)
- Support from the Ministry of Health or the National tuberculosis control programme (x^2 = 7.3745 p = 0.288)

For health facilities implementing at least 1 intervention, periodic training on TB case detection interventions was a significant facilitating factor in implementing TB case detection interventions ($x^2 = 6.5096$ $p = 0.011$).

Health facilities implementing at least 4 TB case detection interventions had a significant association with having enough staff/volunteers to carry out TB case detection interventions ($x^2 = 3.9417$ $p = 0.047$).

Fifty three percent (40/71) of health facilities had developed standard operating procedures and guidelines in place (Table 4). None of the health facilities were receiving funding from the Ministry of Health and the National TB control programme for implementation of all 6 TB case interventions (Table 4).

Table 4: Resources available for implementation of tuberculosis case detection interventions in health facilities.

Resources	Number of facilities (%)
Development of SOPs and Guidelines	40 (56.3)
Periodic training	8 (11.3)
Provision of logistics	5 (7.0)
Funding	0 (0)

4.4 Monitoring of implementation activities

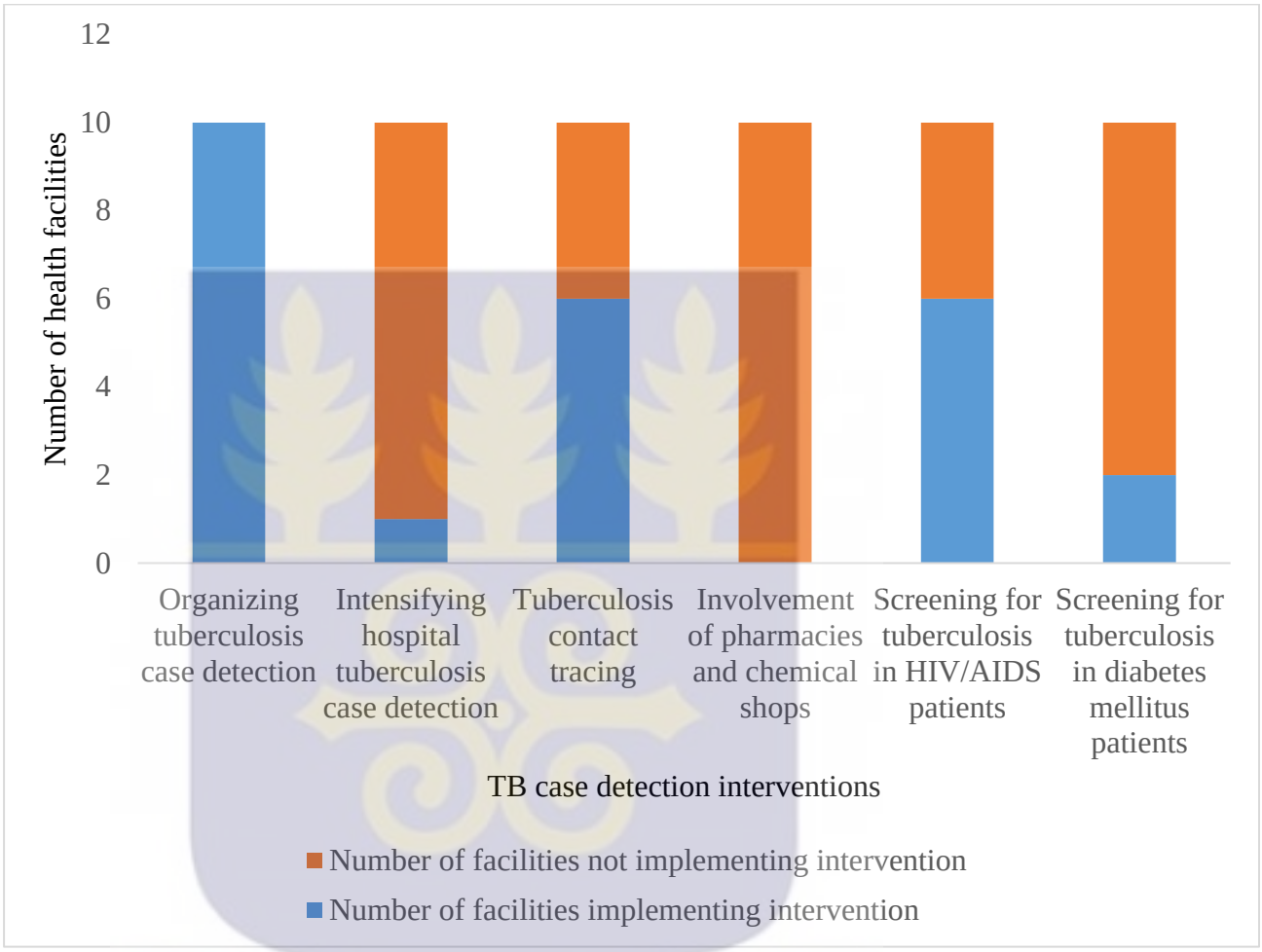
Further analysis revealed that 94% (67/71) of the health facilities had formed a tuberculosis team to oversee tuberculosis control activities including the implementation of case detection interventions. However only 13% (9/71) of these facilities carry out periodic review meetings for TB case detection intervention activities and only 28% (20/71) had evidence of availability of the last 2-3 TB meeting reports (Table 5).

Table 5: Monitoring measures in place at health facilities to enhance implementation of interventions

Monitoring measures	Number of facilities (%)
Presence of a tuberculosis team	67 (94.4)
Carrying out periodic review meetings for TB case detection interventions activities	9 (12.7)
Evidence of availability of the last 2-3 TB meeting reports	2 (28.2)

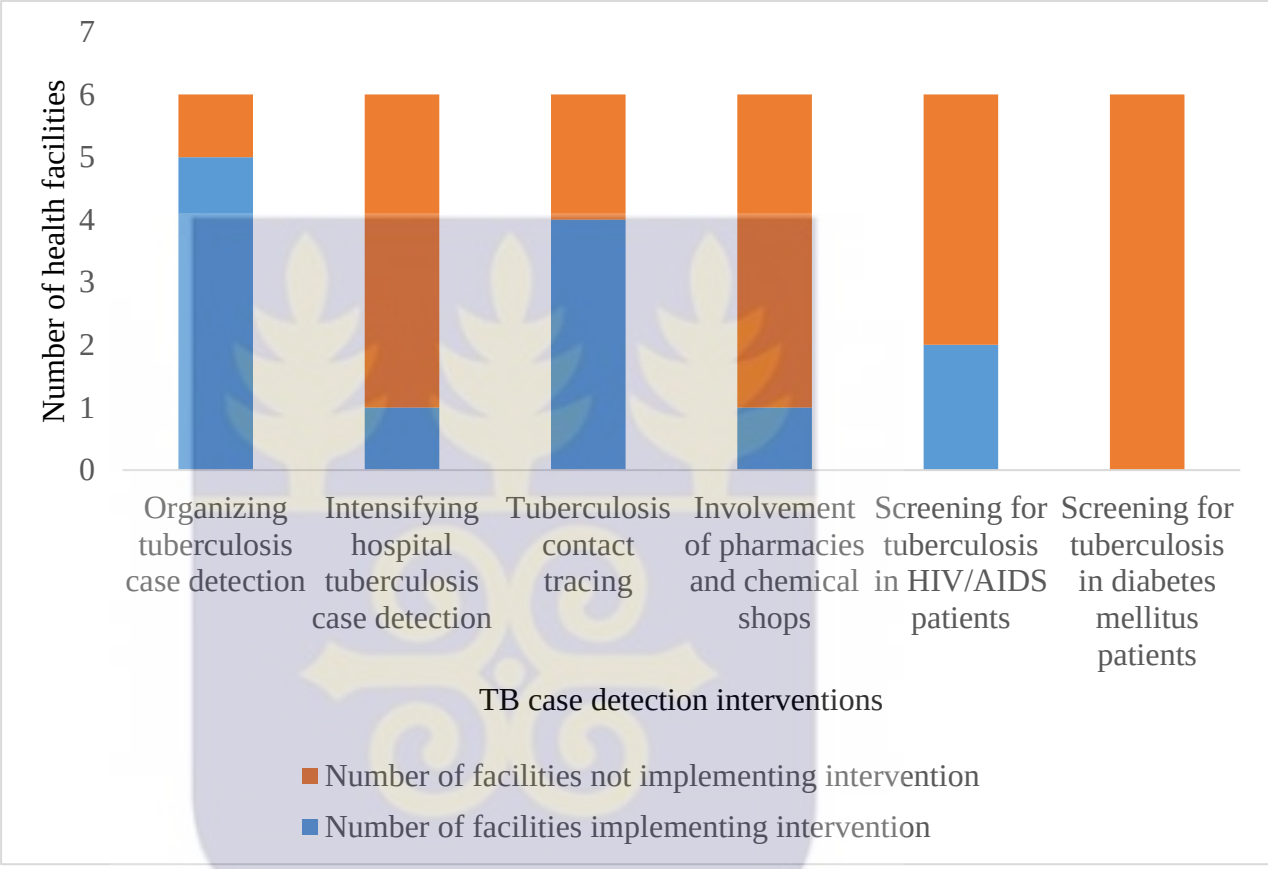
In the Accra Metropolitan district of the Greater Accra region, all the 10 facilities visited were implementing the intervention "organizing TB case detection" but none of the facilities were implementing the intervention "Involvement of community pharmacies and chemical shops" (Figure 3)

Figure 3: Number of health facilities implementing each TB case detection intervention in the Accra Metropolitan area in the Greater Accra region.



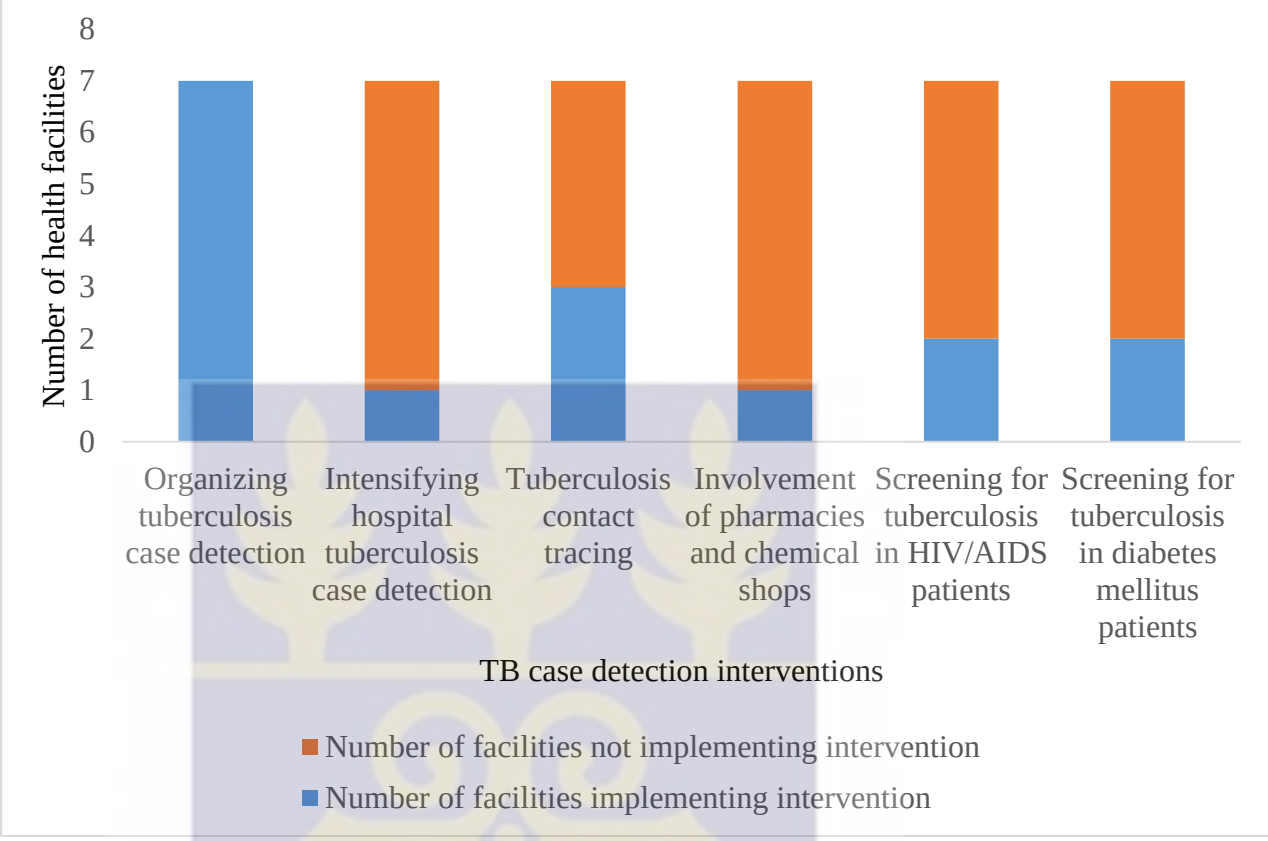
In the Ashaiman district, 5 out of 6 facilities were organizing TB case detection but no health facility screening for tuberculosis in patients with diabetes mellitus (Figure 4).

Figure 4: Number of health facilities implementing each TB case detection intervention in the Ashaiman district in the Greater Accra region.



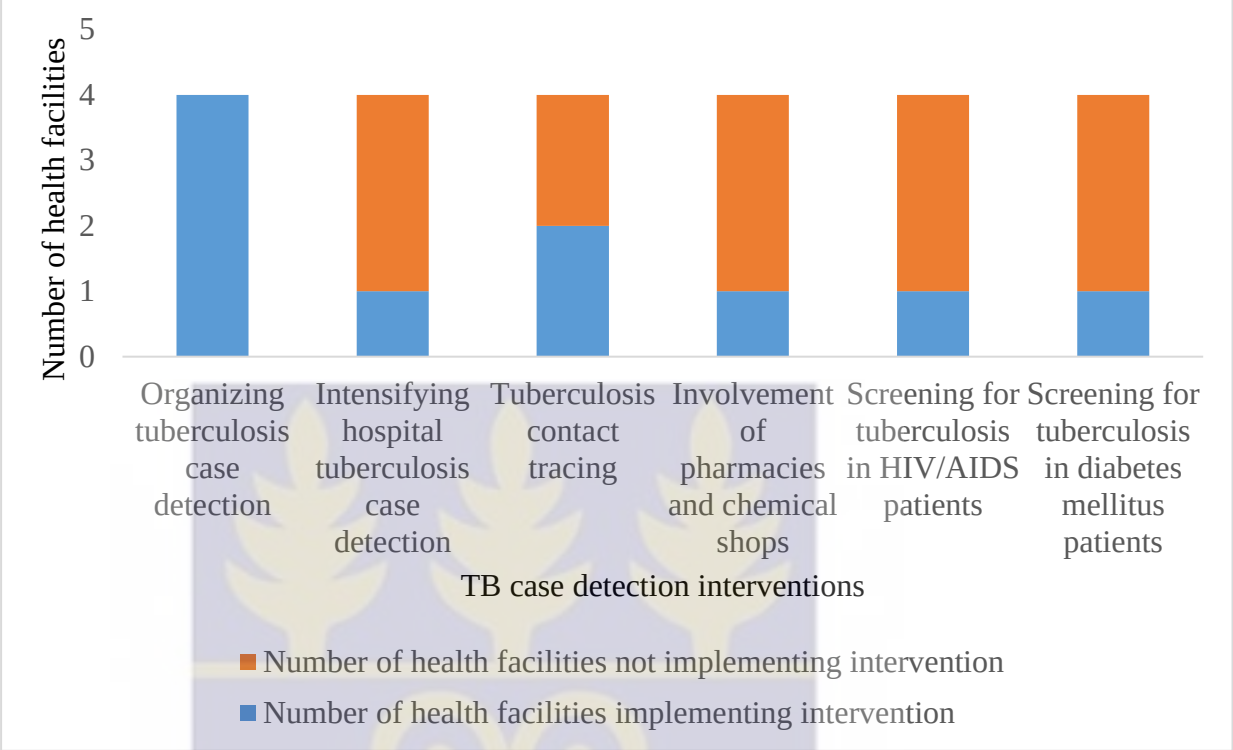
In the Ga West district, all 7 health facilities were implementing the intervention "organizing TB case detection" and 3 out of 7 health facilities were implementing the intervention "tuberculosis contact tracing" (Figure 5).

Figure 5: Number of health facilities implementing each TB case detection intervention in the Ga West district in the Greater Accra region.



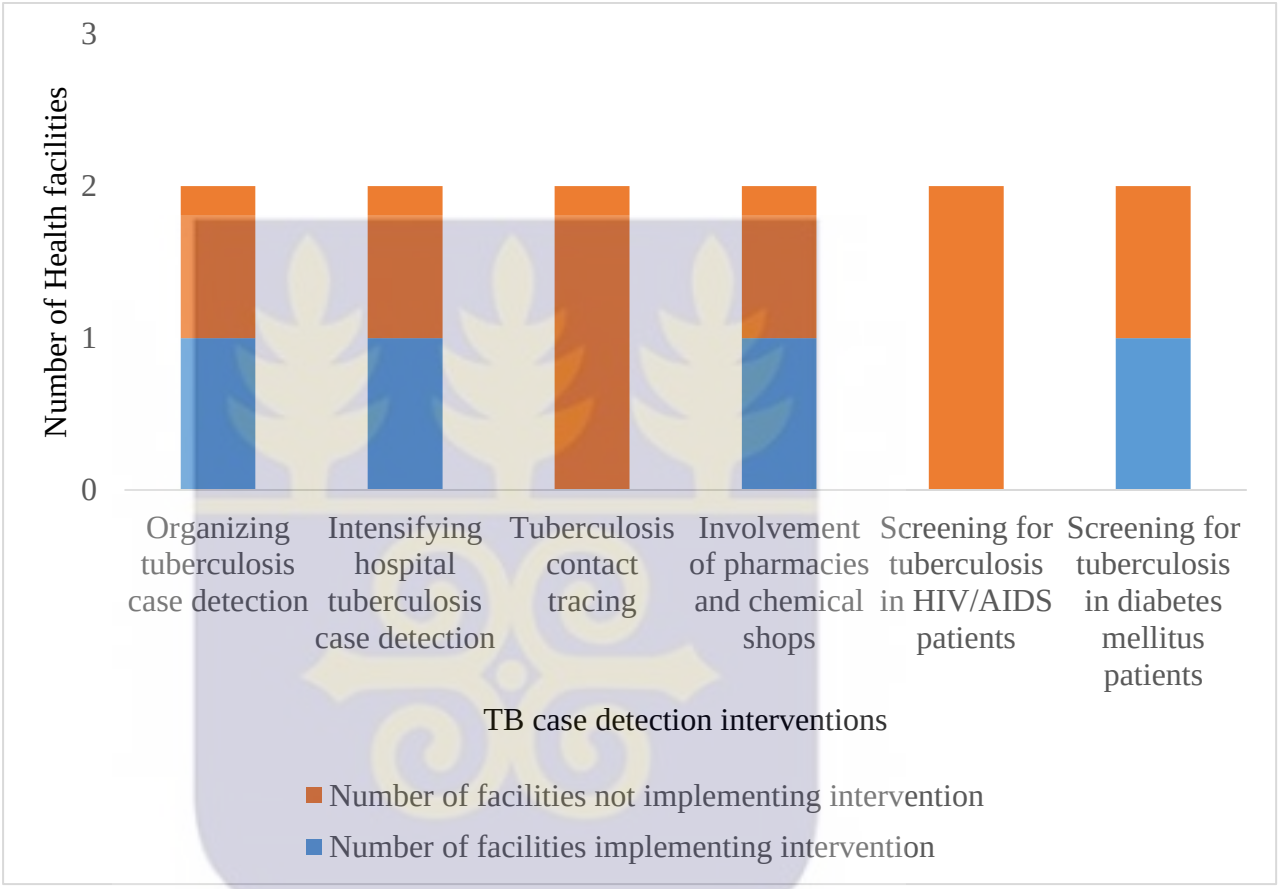
In the Ada East district, all health facilities were implementing the intervention "organizing TB case detection" and 2 out of 4 health facilities were implementing the intervention "tuberculosis contact tracing" (Figure 6).

Figure 6: Number of health facilities implementing each TB case detection intervention in the Ada East district of the Greater Accra region.



In the Ledzorkuku-Krowor district, no health facility was implementing "tuberculosis contact tracing "and "screening for TB in PLHIV" (Figure 7).

Figure 7: Number of health facilities implementing each TB case detection intervention in the Ledzorkuku-Krowor district in the Greater Accra region.



Data collected on the number of TB cases notified or reported in the last 2 years but could not be analysed as the data were not verifiable.

CHAPTER FIVE

5.0 DISCUSSION

The introduction and implementation of tuberculosis case detection strategies usually considers the local context and is based on a thorough assessment of the country's epidemiological state, possible benefits, risks, costs and available resources (Lönnroth et al., 2013). Thus tuberculosis case detection interventions tend to differ from one country to the other but the goal of increasing tuberculosis case detection remains the same.

Active case detection interventions or strategies for tuberculosis has been reported to be more efficient than those of passive case detection in the control of tuberculosis. This study produced important insights about the implementation of TB case detection interventions as well as influential factors that could facilitate or compromise optimal implementation of these interventions.

In this study assessing the tuberculosis active case detection interventions being implemented in public health facilities in the Greater Accra region, it was found that only 1.4% of health facilities were implementing all six interventions and 5.6% of health facilities were not implementing any intervention. Though our facilities are not implementing all TB case detection interventions, these interventions carried out through community based approach have been shown to improve TB case detection when carried out in the community in Tanzania (Colvin et al., 2014).This means our health facilities are still relying primarily on passive case finding approach to detect cases of tuberculosis. However studies in other countries have proven the feasibility of implementing these interventions and improving tuberculosis case detection rates (Elden et al., 2011).

With regards to implementation steps to be embarked upon, 53.3% of the health facilities had developed standard operating procedures (SOPS) and guidelines for tuberculosis case detection. This is a huge challenge as developing and having SOPs and guidelines for TB must be found in all health facilities to standardize TB activities in the facilities. Once facilities do not have these SOPs and guidelines, monitoring and evaluation of these TB activities become a challenge as well.

Less than 12% of health facilities had benefited from periodic training from Ministry of Health (MOH) and National Tuberculosis Control Programme (NTP), 7.0% had been provided with the necessary logistics such as diagnostic equipment to work with. Similar results were obtained in some study in another region in Ghana where lack of diagnostic equipment and centres for tuberculosis were reported (Amenuvegbe et al., 2016). These reasons are contributory factors to the low TB case detection in the country.

A striking finding was that only 1 out of 71 health facilities were implementing all the six tuberculosis case detection interventions being evaluated. This is a big challenge for NTP as it seeks to intensify its efforts for an increase in active TB case detection. This facility found in the urban areas of Greater Accra must have had all the needed support or logistics to implement all the interventions or the hospital could have come up with innovative ways to be effective in implementing the interventions. However early investigations must be directed to the 4 health facilities not implementing any intervention at all to determine all the reasons why and take the necessary actions so that these interventions are in place in these facilities.

The study found out that less than a quarter of health facilities were carrying out the intervention “intensifying hospital tuberculosis case detection”. Other studies on this TB case intervention have reported that improvements in the quality of TB diagnostic

services could significantly increase TB case detection and treatment rates in health facilities in low-income, high TB-burden countries (Davis et al., 2011).This may be due to the unavailability of functional equipment for laboratory diagnosis of tuberculosis as our study showed that half of our health facilities did not have the fluorescent microscopes with light emitting diode to aid diagnosis of tuberculosis. That could be a contributory factor for health facilities not implementing the intensifying hospital tuberculosis case detection intervention.

Although involvement of community pharmacies and chemical shops has been identified as a key intervention to early detection of tuberculosis, our study found that about 73% of our health facilities were not implementing this intervention. This implies missed opportunity for early identification of patients with tuberculosis as a lot of people access their services. Studies in other developing countries have made known modest successes in increasing timely referrals to TB care by pharmacists (Lambert et al., 2005; Vu et al., 2012). Pharmacists and chemical sellers are known to often have access to certain vulnerable population, such as diabetics and therefore could be of great help as well in screening such vulnerable population (Gnanasan et al., 2011). Thus the MOH and NTP would have to take the necessary steps in order to ascertain the willingness of pharmacists and chemical sellers to screen possible patients and refer to facilities for TB treatment. Further get the community pharmacists and chemical sellers involved in tuberculosis control.

Our study further revealed that less than half of health facilities screened for tuberculosis in patients with HIV/AIDS and only one-fifth of health facilities screened for tuberculosis in patients with diabetes mellitus. These two groups are vulnerable populations and it is alarming that less than 50% of our health facilities do not screen for tuberculosis in them. Patients with diabetes mellitus have a higher risk of diabetes

complications (Baker, Lin, Chang, & Murray, 2012) and also tend to require longer tuberculosis treatment, thus are more likely to develop multi-drug resistant tuberculosis (Chang et al., 2011).

Study results also revealed that less than half of health facilities visited were implementing tuberculosis contact tracing intervention. Similar findings were reported in another study in the Nkwanta South district of Ghana (Amenuvegbe et al., 2016). This may be as a result of some implementation gaps such as non-availability of logistics or enforcement of written down policies on household contact tracing. Similar concerns of contact investigations not often carried out despite national policy in many low-resource, high tuberculosis burden countries have been reported (Chang, Leung, 2009; Fox, Barry, Britton, & Marks, 2013). But contact tracing interventions have been endorsed internationally as an encouraging approach for identifying persons at high risk for developing tuberculosis (TB) as some studies have shown that active case finding among household contacts yields substantially more TB cases than passive case detection (Khaparde et al., 2015; Zachariah et al., 2003). The study by Khaparde et al., 2015, actually reported that household contact tracing contributed a further 63% TB cases compared to passive case detection intervention alone.

With regards to factors influencing implementation of TB case detection interventions, periodic training on TB case detection interventions was a significant facilitating factor in ensuring implementation of TB case detection interventions. But only 13% were benefitting from these periodic trainings. Similar findings of lack of periodic training of staff of health facilities were reported in the study in another region of Ghana (Amenuvegbe et al., 2016). However, for health facilities not implementing any TB case detection intervention, non-availability of logistics was a significant factor for their inability to implement tuberculosis case detection interventions. Having enough staff/

volunteers was key to the success of implementing TB case detection intervention in health facilities implementing at least 4 interventions. These factors that facilitate implementation of these TB case detection interventions should be extended to all other facilities by the ministry of health and the NTP.

So far, it is obvious that there are shortcomings with regards to the carrying out of the implementation of the tuberculosis case detection interventions by most health facilities in Greater Accra region.

The study further revealed that although 94.4% of health facilities had a TB team in place, only 13% of the health facilities actually had been having some periodic review meetings for TB case detection interventions activities. This is quite problematic as monitoring and evaluation of the implementation of an intervention is key to the sustainability or survival of that intervention. The health system, including the NTP, has gaps in accomplishing management and monitoring functions. This finding suggests that district and facility managers should be called upon to take the necessary corrective actions in order to address these shortcomings.

5.1 Limitations

Although this study yielded valuable information on the tuberculosis case detection interventions being implemented in public health facilities, there were some limitations. First, the study design was a quantitative method and so there were not much explanations to the results we have obtained now. A qualitative study design in addition would have provided us with some detailed reasons that would throw more light on the results that we have now.

Attempt was made to obtain information on the number of TB cases notified by each health facility in the past 2 years. The data obtained from the facilities could not be verified and therefore a trend analysis could not be done. Thus we could not do a

comparison between the number of TB case detection interventions being implemented by health facilities and trend analysis of TB cases notified.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Our study showed that only 1.4% of health facilities in the Greater Accra region were implementing all 6 TB case detection interventions. Four out of 71 health facilities in the Greater Accra region were not implementing any TB case detection intervention. The factors reported by respondents to be facilitating or hindering (if factors were absent) in the implementation of TB case detection interventions were:

- Periodic training on tuberculosis case detection interventions
- Availability of logistics for implementing tuberculosis case detection interventions
- Enough staff/volunteers to carry out tuberculosis case detection interventions
- Support from the Ministry of Health or the National tuberculosis control programme

The health facilities not implementing any of the TB case detection interventions had a significant association with availability of logistics for implementing tuberculosis case detection interventions as a hindering factor ($x^2 = 13.7202$ $p = 0.033$).

RECOMMENDATIONS

I recommend that a follow up qualitative study be carried out to ascertain the reasons behind the results we have now. This will help to identify the implementation gaps and hence take the necessary actions to address the problems.

I also recommend that district and health facility managers be met so as to ascertain why these interventions are not being carried out and what the possible solutions might be.

The staff of these health facilities should receive comprehensive training on the case detection intervention implementation activities. Health facilities should also be equipped with the necessary resources to work with so as to ensure these interventions are carried out.

Contact investigation information should be incorporated into routine national surveillance activities which would further improve intervention performance at the health facilities.

Engaging community pharmacists and chemical sellers is very key to the control of tuberculosis and should be intensified as this intervention can significantly decrease transmission and incidence of the disease.

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APPENDICES

CONSENT FORM

Factors in place to enhance tuberculosis case detection in health facilities in Greater Accra Region, Ghana: A cross sectional study.

Principal Investigator: Vincent Jessey Ganu

Address: School of Public Health, College of Health Sciences, University of Ghana.

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General Information about Research

Tuberculosis is currently ranked alongside human immunodeficiency virus (HIV) as a leading cause of death globally. The Ghana national TB control programme through the WHO-CIDA initiative began to put in measures in health facilities in 2009, with the aim of addressing the low case detection in the country. Accra was the focus for the project activities with the aim of scaling up to other parts of the country.

Despite these interventions or initiatives, Ghana's case detection rate reported to be 33% in 2014 was well below the African regional average rate of 47% and the WHO target of 70%. We do not know whether those measures put in place to help intensify TB case detection are really in place and functioning.

This study seeks to evaluate the existence of these case detection measures or strategies in place in our primary health facilities. We expect to get enough information on the implementation gaps, if any, present in our facilities hindering the execution of this TB case detection intensification measures or strategies. This information obtained can be

compared to the standard operating procedures for TB case detection developed by the Ghana TB control programme and the Ghana Health service. This will help form the basis for interventions to improve on the implementation of case detection measures in our health facilities.

Your involvement in this research will entail you answering questions TB screening approaches in your facility TB case detection measures in place in the facility. Answering these questions will take approximately 20 minutes.

Possible Risks and Discomforts

There is no risk in participating in this research

Possible Benefits

This research will provide information that will help improve TB case detection rates in your facility and initiate prompt treatment of these patients thus bringing benefit to the general public.

Confidentiality

We will protect information about you and your taking part in this research to the best of our ability. You and the health facility will not be named in any of our reports. However, the members of our research team may sometimes look at your research records.

Compensation

There is no compensation in taking part in this research.

Additional Cost

There will be no additional cost for the participant

Voluntary Participation and Right to Leave the Research

Your participation in this research is voluntary and you have the right to withdraw without any penalty at any point of participating in the research. You also have the right not to answer questions that you feel you are not comfortable for you.

Termination of Participation by the Researcher

You may leave the research at any time. If you choose not to take part, you can change your mind at any time and withdraw. The researcher may also terminate the research if the respondent is not co-operating.

Contacts for Additional Information

Please call Dr Ernest Kenu- 0244 592122 and Dr Phyllis Dako-Gyeke-- in case you have any problem with participation in the research or want some verification about this research.

Your Right as a Participant

This research has been reviewed and approved by the Ghana Health Service Ethical Review Committee. If you have any questions about your right as a research participant, you can contact the GHS research office between the hours of 8am-5pm through Dr Hannah Frimpong (233 021 681109) or email address Hannah.Frimpong@hru-ghs.org

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title "Factors in place to enhance tuberculosis case detection in health facilities in Greater Accra Region, Ghana: A cross sectional study" has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

_____ _____

Date Initials and signature or mark of participant

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

_____ _____

Date Name and Signature of Person Who Obtained Consent

QUESTIONNAIRE FOR ASSESSMENT OF INTERVENTIONS IN PLACE TO ENHANCE TUBERCULOSIS CASE DETECTION IN PUBLIC HEALTH FACILITIES IN GREATER ACCRA REGION, GHANA.

We kindly request that you answer the following questions as truthfully as possible and all the answers that you provide are anonymous.

District/Municipal/Metropolitan area:

Facility ID:

DOTS center: Yes / No

A) DEMOGRAPHY (TB Coordinator)

1. Age……
2. Sex: a) Male b) Female
3. Occupation
4. Marital status:

a) Single b) Married c) Divorced d) Widowed e) Separated f) Cohabiting

No	Questions and filters	Coding Categories	Skip to ≠
	Organizing TB case detection		
1	Does your health facility have a TB case detection plan that you know of? **(Kindly request to see them if available)**	Yes……..…1 No…….……..….2	
2	Do you have a health facility TB team?	Yes……1 No……...2	→ 8

3	Who are the members of the team? (Multiple responses)	Medical Superintendent/Hospital director……..1 TB coordinator (ITC) – Secretary….2 DOTS corner nurse……...3 Lab Technologist-in-charge……. 4 Pharmacist…….5 Public health nurse……6 Health promotion officer……..7 Others (Please specify) …….8	
4	What are the functions performed by your TB team? (Multiple responses)	Sensitization of health personnel and community health workers on interventions for TB case detection…1 Promotion and standardization of TB case detection activities in the health facility and surrounding communities……2 Assessment of TB case detection activities in the health facility and surrounding community……3 Developing plan for improving TB case detection in the health facility…4 Supervision of implementation of TB case detection improvement plan……5 Provision of on-the-job training to health workers and community health workers on guidelines or protocols for TB case detection……6 Work closely with public health nurse and community health workers to address TB case detection issues in their catchment area……7	

5	How many times does the TB team meet in a year?	4-6 times……1 4-6 times ……..……2 6-9 times…….……...3 >9 times…….……....4	
6	When was the last time the TB team met?	1st quarter of this year……1 2nd quarter of last year ……2 3rd quarter of last year……3 4th quarter of last year……4	
7	Does the health facility have the last 2-3 TB team meeting reports available for viewing? **(Kindly request to see them if available)**	Yes……1 No……..2 Don't know……3	
8	Does the health facility have standard operating protocols (SOPs) for TB case detection in all designated or important departments? **(Kindly request to see them if available)**	Yes……1 No……..2 Don't know……3	
	Intensifying Hospital TB case detection		
9	Does the facility's out-patient department (OPD) have TB registers in all consulting rooms?	Yes……1 No……..2 Don't know……3	
10	Are posters on TB symptoms and infection control displayed in all areas of OPDs, including waiting areas?	Yes……1 No……..2 Don't know……3	

	(Kindly request to see them if available)		
11	Does your health facility or National Tuberculosis Programme (NTP) provide periodic orientation on the use of the SOPs for TB case detection with particular emphasis on OPD staff, laboratory and DOTS corner staff?	Yes……1 No……..2 Don't know……3	
12	Does your health facility have Fluorescent microscopes with Light Emitting Diode (LED) to aid TB diagnosis?	Yes……1 No……..2 Don't know……3	
13	Does your health facility receive funding for operational cost for stationery and logistics from the national TB control programme (NTP) for intensifying hospital based TB case detection?	Yes……1 No……..2 Don't know……3	
14	Does your health facility have quarterly review meetings for hospital based case detection activities?	Yes……1 No……..2 Don't know……3	
15	Are all suspected TB patients identified at various OPDs referred promptly for diagnosis?	Yes……1 No……...2 Don't know……3	
	TB contact tracing		
16	Does your health facility have and use guidelines and SOPs for TB contact tracing investigations?	Yes ……1 No……..2 Don't know……3	

	(Kindly request to see them if available)		
17	Does your health facility have and use TB contacts screening questionnaire and reporting forms for household contacts tracing **(Kindly request to see them if available)**	Yes ……1 No……..2 Don't know……3	
18	Does your health facility have registers for household contact tracing	Yes ……1 No……..2 Don't know……3	
19	Does your health facility organize/ benefit from periodic training and orientation of its health staff about TB contact tracing and investigation activities.	Yes ……1 No……..2 Don't know……3	
20	Does your health facility receive funding for operational cost for TB contact tracing activities from the national TB control programme (NTP)	Yes ……1 No……..2 Don't know……3	
21	Does your health facility have quarterly review meetings for contact tracing activities?	Yes ……1 No……..2 Don't know……3	→ Skip to 24

22	Does your health facility have the reports of the last 2 review meetings for contact tracing activities for viewing? **(Kindly request to see them if available)**	Yes ……1 No……..2 Don't know……3	
	Involving Pharmacy Shops and Chemical Sellers to improve TB case detection		
23	Does your health facility involve any pharmacy shops or chemical shops in the screening and detection of TB cases in the community?	Yes ……1 No……..2 Don't know……..……3	→ Skip to 28
24	Does the health facility organize periodic training for the pharmacists/pharmacy assistants/attendants in the identified pharmacies and chemical shops in TB case detection?	Yes ……1 No……..2 Don't know……..……3	
25	Do the identified pharmacies and chemical shops have sputum request forms as well as tools for screening and referring TB suspects?	Yes ……1 No……..2	
26	Has your health facility sensitized your diagnostic centres on referrals from identified pharmacies and chemical shops?	Yes ……1 No……..2	
27	Does your health facility receive funding for operational cost for involvement of pharmacies and chemical shops from the national TB control programme (NTP)	Yes ……1 No……..2	

28	Does the facility screen for TB in HIV/AIDS patients?	Yes ……1 No……..2	→ Skip to 34
29	How many times does your facility screen for TB in HIV/AIDS patients in a year?	Once a year……..1 Twice a year…….2 Thrice a year…….3 Four times a year…….4 More than four times a year……...5	
30	Has there been any or yearly orientation of the health staff about conducting systematic TB screening among PLHIV?	Yes ……1 No……..2	
31	Does your health facility have and use TB Screening tools for PLHIV? **(Kindly request to see them if available)**	Yes ……1 No……..2	
32	Does your health facility receive funding from the national TB control programme (NTP) for operational cost for volunteers?	Yes ……1 No……..2	
33	Does your health facility have quarterly review meetings for TB screening among PLHIV activities?	Yes ……1 No……..2	
34	Does the facility screen for TB in patients with diabetes?	Yes ……1 No……..2	→ Skip to 39

35	How many times does your facility screen for TB in patients with diabetes in a year?	Once a year……..1 Twice a year…….2 Thrice a year…….3 Four times a year…….4 More than four times a year……...5	
36	Does your health facility have and use TB Screening tools for patients with diabetes? **(Kindly request to see them if available)**	Yes ……1 No……..2	
37	Does your health facility receive funding from the national TB control programme (NTP) for operational cost for volunteers?	Yes ……1 No……..2	
38	Does your health facility have quarterly review meetings for TB screening among diabetic patients' activities?	Yes ……1 No……..2	
39	Does your health facility organize/ benefit from periodic training and orientation on data capture, storage, management and use?	Yes ……1 No……..2	
40	How many new TB cases have been notified by your health facility in the last 2 years?	…….	

41	Are there any facilitating factors that help you to implement these TB case detection interventions?	Yes ……1 No……..2	→ Skip to 43
42	What are some of these facilitating factors?	1. Periodic training on case detection interventions 2. Availability of logistics for implementing case detection interventions 3. Enough staff/volunteers to carry out case detection interventions 4. Support from the Ministry of Health or the National TB control programme (NTP)	
43	Are there any hindering factors that prevent you from implementing these TB case detection interventions?	Yes ……1 No……..2	
44	What are some of these hindering factors?	1. Lack of periodic training on case detection interventions 2. Lack of logistics for implementing case detection interventions 3. Little or no staff/volunteers to carry out case detection interventions 4. Little or no support from the Ministry of Health or the National TB control programme (NTP)	