FACTORS CONTRIBUTING TO LOW TUBERCULOSIS CASE DETECTION IN BAWKU WEST DISTRICT IN THE UPPER EAST REGION OF GHANA.

BY

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(INDEX NUMBER: 10369480)

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

DECEMBER, 2018
DECLARATION

I, Ngrugma Jagri Isaac, the author of this dissertation do hereby declare that with exception of references, the literature and work of other researches which I have duly cited, the work in this dissertation is the result of my original work.

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................................................. Date........................................

Dr. Priscillia Nortey

(Supervisor)
DEDICATION

I dedicate this work to the Almighty God, for given me the strength, wisdom and protection for the successful completion of this work. Secondly, I also dedicate it to my family for having endured the neglect during this period.
ACKNOWLEDGEMENT

My sincere gratitude goes to my supervisor Dr. Priscilla Nortey who tirelessly edited my work and gave me guidance for the successful completion of this dissertation. I also acknowledge the Dean of the School of Public Health and all Faculty members for their support and encouragement throughout the course of study.

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# TABLE OF CONTENTS

DECLARATION.............................................................................................................. ii

DEDICATION.................................................................................................................. iii

ACKNOWLEDGEMENT ................................................................................................. iv

TABLE OF CONTENTS ................................................................................................. v

LIST OF TABLES .......................................................................................................... ix

LIST OF FIGURES ........................................................................................................ x

LIST OF ABBREVIATIONS ............................................................................................ xi

DEFINITION OF TERMS ............................................................................................... xii

ABSTRACT .................................................................................................................... xiii

CHAPTER ONE ............................................................................................................ 1

INTRODUCTION: ......................................................................................................... 1

1.1 Background .............................................................................................................. 1

1.2 Problem Statement ................................................................................................... 2

1.3 Justification ............................................................................................................. 3

1.4 Research Questions ................................................................................................ 4

1.5 General objective .................................................................................................... 4

1.6 Specific objectives ................................................................................................... 4

1.7 Conceptual Framework ......................................................................................... 5

CHAPTER TWO ............................................................................................................ 7

LITERATURE REVIEW ............................................................................................... 7

2.1 Epidemiology of tuberculosis .................................................................................. 7

2.2 Tuberculosis case detection ..................................................................................... 8

2.3 Community-level Factors influencing TB case Detection ..................................... 8

2.3.1 Access to TB services ....................................................................................... 8
2.4 Stigma ...........................................................................................................9
2.5 Improving Diagnostic Service and Infrastructure ......................................10
2.6 Working with the communities .................................................................10
2.7 Sociocultural roles and status in the family .............................................11
2.8 Health Literacy .........................................................................................12
2.9 Staff Attitude and Provider - Client interaction .......................................13
2.10 Health facility’s preparedness ...............................................................14
2.11 Providers’ level of suspicion ...................................................................15

CHAPTER THREE ..............................................................................................18

METHODS .........................................................................................................18

3.0 Study Design ..............................................................................................18
3.1 Background of the Study Area .................................................................18
3.2 Criteria for health staff selection ..............................................................22
  3.2.1 Inclusion criteria ..................................................................................22
  3.3.2 Exclusion criteria ................................................................................22
3.4 Criteria for community-based surveillance volunteers .........................23
  3.4.1 Inclusion criteria ................................................................................23
  3.4.2 Exclusion criteria ................................................................................23
3.5 Criteria for selection of community members ........................................23
  3.5.1 Inclusion criteria ................................................................................23
  3.5.2 Exclusion criteria for community members .......................................23
3.6 Criteria for selection of medical records ...............................................23
  3.6.1 Inclusion criteria ................................................................................23
  3.6.2 Exclusion criteria for medical records ..............................................23
3.7 Sample size calculation for community members ....................................24
3.8 Sampling Technique for community members ........................................... 24
3.9 Sampling Technique for Health staff ....................................................... 25
3.10 Sample size calculation for community-based surveillance volunteers .......... 25
3.11 Records review ....................................................................................... 26
3.12 Pre-test ................................................................................................. 27
3.13 Data Collection Tool ............................................................................ 27
3.14 Data collection technique ..................................................................... 27
3.15 Data Processing .................................................................................... 27
3.16 Data Analysis ....................................................................................... 28
3.17 Quality control .................................................................................... 29
3.18 Ethical Consideration .......................................................................... 30

CHAPTER FOUR ......................................................................................... 33

4.0 RESULTS .............................................................................................. 33
4.1 Socio-demographic characteristics of study participants ......................... 33
4.2 Surveillance activities of community-based surveillance volunteers .......... 37
4.3 Surveillance activities of clinical and laboratory personnel ....................... 37
4.4 Factors influencing Community Based Surveillance Volunteers’ referral of suspected TB clients ................................................................. 42
4.3 Factors associated with community members’ intention to first seek health care 46

CHAPTER FIVE .......................................................................................... 48

5.0 DISCUSSION ......................................................................................... 48

CHAPTER SIX ........................................................................................... 51

6.0 CONCLUSION ....................................................................................... 51
6.1 RECOMMENDATION ........................................................................... 51
6.2 LIMITATION ........................................................................................ 52
REFERENCES ........................................................................................................................................53

APPENDIX A i: Questionnaire for Community Health Volunteers ......................................................55

APPENDIX A ii: Questionnaire for health Staff ..................................................................................57

APPENDIX A iii: Questionnaire for Laboratory Staff .........................................................................59

APPENDIX A iv: Questionnaire for Community members .................................................................61
LIST OF TABLES

Table 1: POPULATION DISTRIBUTION FOR 2017 ................................................................. 19
Table 2: Operational definitions of variables measured among study participants in Bawku West District 2017 .......................................................... 20
Table 3: Study Population category .................................................................................. 22
Table 4: Proportionate allocation of sample size of community members ....................... 25
Table 5: Proportionate number of community-based surveillance volunteers in the Bawku West District ........................................................................... 26
Table 6: Socio-demographic characteristics of community based surveillance volunteers and community members in the Bawku West District, 2017 .......................................................... 34
Table 7: Knowledge and source of information of community based surveillance volunteers and community members about tuberculosis in the Bawku West District, 2017 ......................... 35
Table 8: Binary analysis of factors associated with suspected TB clients’ referral .......... 43
Table 9: Binary analysis of factors associated with community members intention to seek health care ........................................................................................................... 45
LIST OF FIGURES

Figure 1: Conceptual Framework shows Community-based Surveillance Volunteers and
Community members on Referral and Intention to seek treatment. ...........................................5

Figure 2: Proportion of suspected TB cases tested in Bawku West district, 2017 ..................39

Figure 3: Proportion of suspected TB clients with positive sputum in Bawku West district, 2017
..........................................................................................................................................................40

Figure 4: Community based surveillance volunteers’ assessment of health workers attitude 2017
..........................................................................................................................................................40

Figure 5: Community members’ assessment of health workers attitude towards TB clients, 2017
..........................................................................................................................................................41
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACF</td>
<td>Active Case Finding</td>
</tr>
<tr>
<td>AFB</td>
<td>Acid-Fast Bacilli</td>
</tr>
<tr>
<td>BWDHA</td>
<td>Bawku West District Health Administration</td>
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<td>CBSV</td>
<td>Community Based Surveillance Volunteer</td>
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<td>CDC</td>
<td>Centre for Disease Control</td>
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<td>CDR</td>
<td>Case Detection Rate</td>
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<td>CHPS</td>
<td>Community based Health Planning Services</td>
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<td>DHA</td>
<td>District Health Administration</td>
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<tr>
<td>DOTS</td>
<td>Direct Observe Treatment Short course</td>
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<tr>
<td>HIV</td>
<td>Human Immune Virus</td>
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<tr>
<td>KVIPs</td>
<td>Kumasi Ventilated Improved Pits</td>
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<td>NTCP</td>
<td>National Tuberculosis Control Programme</td>
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<td>OPD</td>
<td>Outpatient Department</td>
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<td>PCF</td>
<td>Passive Case Finding</td>
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<tr>
<td>RTI</td>
<td>Respiratory Tract Infection</td>
</tr>
<tr>
<td>SDG</td>
<td>Sustainable Development Goals</td>
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<tr>
<td>TB</td>
<td>Tuberculosis</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WVI</td>
<td>World Vision International</td>
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DEFINITION OF TERMS

Extra pulmonary TB: This is where the TB tubercle bacillus affect other organs other than the lungs.

Infectious Diseases: They are diseases capable of causing infection in a host.

Pulmonary TB: This is where the TB tubercle bacillus affects only the lungs.

Smear Positive TB: A patient whose sputum specimen is tested positive for tubercle bacilli.

Sputum: Is a thick-brownish/milk-like substance produce from the lungs of human beings that may contain TB bacilli that causes TB.

TB/HIV Co-infection: A person who is infected with both HIV and TB.

Treatment supporter: Any person nominated by a TB patient to supervise and monitor his daily administration of medication.

Tuberculosis: A chronic communicable disease cause by Mycobacterium Tuberculosis, Mycobacterium Bovine, Mycobacterium Cannetti and Mycobacterium Africanum.s
ABSTRACT

Introduction
Tuberculosis remains a major public health concern affecting one-third of the world’s population despite numerous interventions put in place to curb its occurrence by the national TB control programme. Early case detection and prompt treatment cures the patient’s breaks the transmission chain and improves the effort of control. The aim of this study was to determine the factors contributing to low TB case detection in Bawku west District in the Upper East Region.

Method: A cross-sectional study design involving quantitative method was conducted on 166 community members, 13 health workers involving in TB activities in the hospital and sub-districts, five laboratory staff, 159 community-based health surveillance volunteers as well as 2,581 records was reviewed from January to December 2017. A structured questionnaire was used to collect data from the participants.

Result: Only 377 out of 2,581 suspected TB clients who were referred for sputum smear microscopy availed themselves for the test. Out of which 10.6% (40/377) tested positive for sputum smear microscopy for TB. Knowledge of community based surveillance volunteers about tuberculosis caused by germs was universal (94.2%, 149/158) and about 80% (125/158) of the surveillance volunteers knew that tuberculosis is transmitted by droplets released through coughing and sneezing. Lack of refresher training of community-based surveillance volunteers and poor support for them were predictors of referral of suspected TB clients to health facility. Poor management of data by health staff also affected low TB case detection. Close to 60% (59.2%, 97/164) indicated an intention to seek care first in the health facility when they have symptoms of tuberculosis. Finally, poor contact tracing of suspected cases also influence case detection negatively.
**Conclusion:** Lack of training of community-based surveillance volunteers on TB case detection and poor Support for them hinders the referral of suspected TB case to health facility.

Community members intention to seek care in health facility and poor data management were some of the factors contributing to low TB case detection in Bawku West District in the Upper East Region of Ghana.
CHAPTER ONE

INTRODUCTION:

1.1 Background

Tuberculosis (TB) remains the major cause of morbidity and mortality and an important global public health problem affecting one-third of the world’s population despite the implementation of preventive and control measures over the past years. An estimated 9 million new cases of TB are reported globally and 2 million die annually (Sekandi et al., 2015). World Health Organization (WHO) indicates that African Region has the highest rate of TB cases and deaths per capita and contribute about 24% of the world’s cases. HIV co-infection has intensified the TB epidemic.

Sub-Saharan Africa contributes about 80% of the world’s TB/ HIV co-infection (Osei, Akweongo, & Binka, 2015). Although Ghana is not among the 22 high burden TB countries in the world, however, the disease is reported to be an important public health challenge. Ghana is ranked the 38th high burden TB country among 145 countries in the world and 19th in Africa and as a result, TB is considered as an important public health problem in the country (Osei, Akweongo, & Binka, 2015).

A diagnosis of TB is made by the clinical presentation of a cough for two weeks or more, night sweat, hemoptysis, weight loss, laboratory examination of sputum smear microscopy and chest x-ray. Sputum smear microscopy remains the commonest diagnostic tool for diagnosing a patient suspected of having TB. Diagnosis of pulmonary TB is confirmed by the presence of Acid-Fast Bacilli (AFB) in at least one of the two sputum samples during microscopic examination. Negative smear pulmonary TB is confirmed by chest x-ray and clinical judgment as a result of
the clinical presentation. Those with symptom suspected of having extra-pulmonary TB are also referred for x-ray and diagnosis is made by an experienced physician.

The cornerstone of TB control programmed is early case detection and prompt initiation of treatment. Therefore, any delay in case detection and consequently treatment of TB patients not only increases infectivity in the community but may lead to complications and death. Tuberculosis case detection rate in Ghana stands as 33% in 2015 (data.worldbank.org/indicator/SH.TBS.DTEC.ZS). In Bawku West District case detection rate in 2016 was 38% which is far below the WHO recommended 70% case detection rate. WHO; 1991 (WHA44/1991/REC1)

There is the need to conduct this study in Bawku West district of Ghana to ascertain factors that contribute to low TB case detection.

1.2 Problem Statement

Tuberculosis continues to pose a serious public health threat despite decades of sustained control efforts worldwide. About 9 million new cases of TB occur while 2 million people die annually (Sekandi et al., 2015). The Sustainable Development Goals (SDG) for 2030 were adopted by the United Nations in 2015 and one of the targets is to end the global TB epidemic and to provide an assessment of progress in TB diagnosis, treatment and prevention. The World Health Organization’s goal for Tuberculosis control is to detect 70% of new smear-positive TB cases and cure 85% of these cases WHO; 1991 (WHA44/1991/REC1).

Case detection is a cornerstone of the TB control strategy recommended by WHO, yet standard passive case finding approach has not achieved universal success in detecting all cases. Globally, it is estimated that nearly 30% of new TB cases remain undetected (Sekandi et al., 2015).
The factors that influences low TB case detection can broadly be categorized as having access to TB services, poverty, stigma, staff attitude, provider level of suspicion among others but this study seeks to explore referral of suspected TB clients to health facility by the community-based surveillance volunteers and community members intention to seek treatment when they have signs and symptoms of TB in the health facility.

In Bawku West District, several efforts have been made towards improving TB case detection such as building capacity of the health workers and provision of enabler’s package for TB patients and their treatment supporters at a cost to the state. In spite of these, TB case detection in Bawku West District was 69% in 2014, 68% in 2015 and 38% in 2016 respectively (BWDHA 2016, Annual Performance Review).

Due to this low case detection trend, coupled with passive case finding employed in the district, leads to many cases not diagnosed or receive treatment. These poses risk to the community as one TB case has the potential of infecting 10 to 15 cases annually if not detected and treated (Borgdorff, 2004).

This presents a substantial socioeconomic burden on the populace who are predominantly farmer and petty traders such as; loss of productivity, high dependency rate, school dropout, and stigmatization. This has necessitated the research to identify factors contributing to low TB case detection in the Bawku West District in the Upper East Region of Ghana.

1.3 Justification

The study will examine the context-specific causes of the persistently low and now falling trend in TB case detection in the Bawku West District. Recommendations from the study findings
would inform the NTP to devise ways of effectively controlling TB in the district and possibly in the region since the socio-economic terrain are the same.

1.4 Research Questions

1. What is the proportion of suspected TB cases in the district?
2. What is community-based surveillance volunteers and community member’s knowledge on TB?
3. What factors are associated with community-based surveillance volunteers’ referral of suspected TB case to the facility?
4. What factors are associated with the community members’ intention to seek treatment in health facility with symptom of TB?

1.5 General objective

To determine the factors that contribute to low TB case detection in the Bawku West District.

1.6 Specific objectives

1. To measure the proportion of suspected TB cases in the district
2. To assess knowledge of community-based surveillance volunteers and community members on TB
3. To determine factors associated with community-based surveillance volunteers’ referral of suspected TB case to the facility.
4. To determine factors associated with community members’ intention to seek treatment in health facility with symptoms of TB.
Figure 1: Conceptual Framework shows Community-based Surveillance Volunteers and Community members on Referral and Intention to seek treatment.

The conceptual framework illustrate the referral of suspected TB clients by community-based surveillance volunteers and the intention to seek treatment at the health facility by community members. Educational status of community-based surveillance volunteers will inform him or her to refer a suspected TB case to the health facility. The higher the educational level of the volunteer, the more likelihood that he or she will refer the client to the health facility for TB screening and management.

Secondly, the age of the community-based surveillance volunteer may also determine whether the suspected TB client are referred to the health facility or not. If the health surveillance
volunteer is grown and have more experience in the TB case detection activity, then he or she is in the better position to refer client to the health facility than the less experience ones. Furthermore, religion may also be a factor for determining whether TB cases are referred to the health facility. In the traditional settings where they may perceived persistent cough as an affliction of sin and are not likely to seek care in a health facility.

Similarly, the educational status of the community members will also have a bearing on the referral of clients to seek care at the health facility. The higher the educational status of the community member, the more likely he or she understands and appreciate signs and symptoms of TB and may possibly have an intention to seek health care at the health facility. Refresher training of community-based surveillance volunteer on TB case detection will create awareness and conscious effort will be made to refer to the health facility where screening can be done to detect TB cases.

Likewise, when the district or sub-district support community-based surveillance volunteers with an enabling package such as allowance or fuel for transportation, it will serve as a motivation for TB case searching which most of them will identified and subsequently referral to the health facility. Knowledge of community-based surveillance volunteers on the causes, mode of transmission, cost of treatment and where to seek information on TB case detection can affect their judgement on the referral of suspected TB cases to the health facility. The more knowledgeable the surveillance volunteers is on the causes, mode of transmission and the cost of treatment have the greater chance of referring the case to the health facility for TB screening. Community members knowledge on the causes, mode of transmission and the cost of treatment will also inform them where to seek health care if they have signs and symptoms of TB.
CHAPTER TWO
LITERATURE REVIEW

2.1 Epidemiology of tuberculosis

Tuberculosis (TB), a bacterial but environmentally and socio-economically driven disease is of growing public health concern especially in the most populous countries in Asia and Africa. TB has been exacerbated by the menace of HIV and AIDS which is sweeping across some countries especially in the African continent. The disease is largely airborne and accounts for millions of morbidities and mortalities annually across the globe. According to the World Health Organization, (2016), four – fifth of TB disease affects the lungs and is referred to as pulmonary TB (PTB) while the 20% is extra Pulmonary TB which can affect any part of the body including the skin, lymph nodes, bones among others. The pulmonary TB is further divided into two forms which are sputum smear-positive TB and sputum smear negative (X-ray suggestive of TB) TB.

In 2015, an estimated 10.4 million new cases of the disease occurred worldwide (World Health Organization, 2016). More than one-half of these cases, 5.9 million (56%), were among men while 3.4 million were among women. Children constituted 10%, equivalent to 1 million new infections.

Geographically, according to the WHO (2016), only six countries including China, India, Indonesia, Nigeria, Pakistan and South Africa accounted for 60% of the new infections in 2015.

In 2015, tuberculosis remained one of the top causes of mortalities in the world. More than one million (1.4 million) estimated deaths occurred as a result of TB disease and a further 400,000 TB-HIV and AIDS-related deaths (WHO. Global Tuberculosis Report, 2015).
2.2 Tuberculosis case detection

Tuberculosis case detection is an essential element in the control of the disease (Raviglione, 2015). To prevent further spread of the disease, early detection is key. According to (Ghana Health Service (GHS, 2012) incidence of the disease in the population is estimated at 281 per 100,000 of the population annually. An infected person who is not on treatment can infect between 10 to 15 additional persons in a year ((Borgdorff, 2004). The TB case detection rate is a proportion of the cases notified (both new and relapsed) in the population among the WHO estimated the incidence of the disease (Raviglione, 2015; World Health Organisation, 2016). The rate takes into account the annual risk of infection of at least 15 more persons in the absence of control measures and usually calculated annually. The factors that influence TB case detection can broadly be categorized into community-level and health facility related factors.

2.3 Community-level Factors influencing TB case Detection

2.3.1 Access to TB services

Access to tuberculosis diagnostic and other services can either be geographic, financial or both. The United Nations recommends that health services should be at most 5km radius to the service users. Yet, unfortunately, a substantial proportion of clients especially in developing countries are expected to commute over 20kms before they access health care service (Sulemana & Din 2014). Studies have found that distance is an impediment to access to basic health services including TB care. Poverty derives the financial access and has been identified as negatively influencing health. Even in developed countries such as China, TB has been found to be more prevalent in populated and overpopulated neighborhoods where living conditions are poor. Though the cost of TB screening and treatment in most countries is relatively free, the indirect cost prevents some clients from accessing care. The cost of travelling for services (Mclaren,
Ardington, & Leibbrandt, 2013) and in the case of breadwinners, the opportunity cost of staying off work (Kemp, Mann, Simwaka, Salaniponi, & Bertel, 2007) to seek treatment is enough to deny some people from seeking treatment early.

In a study to determine the association between poverty and TB case notification rate in Cambodia, Wong, Yadav, Nishikiorib, & Eangc (2013) observed that, increase in poverty rates resulted in a decrease in the sputum – smear-positive TB cases when other factors such as the distance to health facility and vaccination history are fixed. This means that even though a positive association exists between poverty and tuberculosis (Oxlade & Murray, 2012), a distance which is sometimes tied to cost can negatively affect the rate of case detection.

In accepting for TB test, patients’ socioeconomic status plays a critical role in the diagnosis. Studies show that people with low socioeconomic status are more likely to accept TB screening than those with high socioeconomic status. Poverty has been cited as a reason for many patients to seek delay health care or seek it from inappropriate sources.

This is linked with health system cost of services. Patients using public health facility tended to seek care after the disease had progressed. As the poor most likely to use public health facilities while those with high socioeconomic status resort to private facilities.

### 2.4 Stigma

Characteristically, TB has been associated with HIV and AIDS. As a result, the stigma associated with HIV and AIDS has been transposed onto TB patients (Yang et al., 2014). TB patients, therefore, would avoid seeking care especially in the public facilities where they believe confidentiality is lacking. At worse, these patients and their families may hide the condition to the extent that an entire family can be wiped off by the disease. In a study by Ahorlu & Bonsu
(2013), they found that people referred to TB patients as living corpses and some have vowed never to have anything to do with them including sharing utensils or having sex with them. Ironically, though private practitioners charge for TB care services, stigma sometimes drives people to seek care with them (private practitioners) instead (McArthur, Bali, & Khan, 2016).

2.5 Improving Diagnostic Service and Infrastructure

The laboratories must serve as a quality control to ensure the reliability of result, is an important indicator. Reagents and equipment need proper management so that they are operational at all times. The laboratory needs to be equipped so that they don’t run short of reagents. The diagnostic facilities must be increased to contain an increasing number of patients. In the absence of affordable and sensitive diagnostic test that does not require sputum, a reliable diagnosis can be made through careful history taking and clinical examination if health workers are trained to this extent. The WHO updated and consolidated guidance for programmatic management of latent TB infection (2018) recommends expanding TB testing and treatment beyond all PLWHIV and children under 5 years of age to HIV negative children above 5 years, adolescents and adults who are contacts of TB patients, as well as contacts of patient with MDR-TB as additional high risk groups Sekadde et al., (2018). For effective TB control, we need to have laboratories at every health centre so that diagnosis of TB can be made easily.

2.6 Working with the communities.

These result in delay of diagnosis and continuous infection of the community. Community engagement is critical to improve the sustainability of TB interventions, helping save lives from this infectious killer. The implementation and scaling up community-based TB activities remains weak, despite the clear need, the documented cost-effectiveness of community-based TB activities and the tremendous efforts that have been expended in recent years. Lack of
collaboration between NTPs and NGOs and other civil society organizations and the absence of joint strategic planning, monitoring and evaluation are more the norm than the exception WHO (2015).

More people live below the poverty line in developing countries. These poor people are unable to afford adequate nutrition, there is overcrowding and inadequate housing systems that prevents good ventilation in the homes. They are also unable to afford health service cost and therefore report to hospital late. Even though anti tuberculosis drugs are given free to the patients in most countries, patients still need some economic support to enable them obtain these free drugs. In Ghana Van der Werf, 1991 found that travel cost to the treatment center was a hindrance to case detection and treatment completion. This is because patients provide the money for transport.

Working closely with community members and health volunteers on TB case will help in detecting TB cases. The government should help educate community health volunteers and empower them to educate people about TB and possibly refer them to health facilities if the need arises. The traditional healers should also be involved since most of the patients seek care from them.

2.7 Sociocultural roles and status in the family

Gender and social status play a major role in health-seeking behavior and access to health services. Women are largely seen as socially and economically dependent on their male partners. The males determine when and where women should seek care in some settings especially patriarchal societies in Africa (Mawugbe 2008:14). In a multi-country study to examine the role of gender and TB, the authors (World Health Organisation, 2004) found that in Bangladesh women were more likely to suffer delayed diagnosis of TB because they are marginalized and traditional concepts feature so much in explaining TB. In India, because traditional practices
among women are mostly normative, they were more likely to visit traditional healers and temples before visiting the orthodox health facilities and this significantly increased delay for diagnosis McArthur et al., (2016).

Women are also seen as being overly concerned with their physical appearance so any physical symptoms are a border to them more than their male counterparts. Similarly, health workers tend to be more sensitive to physical symptoms than emotional ones because the former is overt. In the same cross-country study, the authors found that in Malawi, more prominent physical symptoms reduced delay while prominent emotional symptoms increased the delay in TB diagnosis (WHO, 2004).

Similarly, McArthur et al., (2016) in a study to characterize the socio-cultural barriers to TB diagnosis among women in India noted that women often faced socio-cultural barriers and stigma which may compel them to even hide their symptoms and consequently delay or fail to seek treatment in the public health facilities. These women, the authors noted often sought the services of traditional healers and practitioners, most of whom are unqualified and may fail to properly diagnose TB, thereby, delaying diagnosis.

2.8 Health Literacy

Health literacy enables people to understand basic information regarding health conditions that afflict them. It also empowers them to develop a health-conscious behavior and be able to seek appropriate care when they suspect they have a health problem. General education tends to positively influence the health literacy of people. In India, where about 10% of the population are vulnerable to TB, Muniyandi et al., (2015) found that almost half of the vulnerable population had poor health literacy on TB. This means these people may as well not avail
themselves for TB services including diagnosis and this can affect the case detection rate (Muniyandi et al., 2015).

TB – related literacy and general education also influence case detection. When patients have no knowledge about TB, it may influence their health-seeking behavior. Studies (Ahorlu & Bonsu, 2013; Amenuvegbe, Anto, & Binka, 2016; McArthur et al., 2016; Yang et al., 2014) have found that people have often misconstrued tuberculosis for some other disease. People have attributed TB to be an affliction by witches (Ahorlu & Bonsu, 2013) and therefore resorted to seeking the services of traditional healers. Since the private (including traditional healers) – Public collaboration is not well harnessed, a lot of cases would go unreported while serving as a pool of continuous infection.

2.9 Staff Attitude and Provider - Client interaction

Staff attitude ranges from stigma through non – adherence to privacy of the clients to poor instructions to suspected TB patients. The quality of sputum can influence the test results and the quality can be dependent on the instructions which were given to patients prior to sputum production and submission for testing. In a pragmatic randomized trial in Pakistan, Khan, Dar, Sismanidis, Shah, & Godfrey-faussett, (2004) found that women who were sufficiently given instructions on sputum production and submission were more likely than their non-instructed counterparts to test smear – positive. Despite the risk of infection of contacts of a confirmed TB patient, health staff sometimes fail to embark on contact tracing and screening for TB. Amenuvegbe, Anto, & Binka, (2016), found that though contacts of TB patients had high knowledge on TB, a very small proportion of them was traced and consequently had sputum smear microscopy done.
Some health care workers do not see TB control as a collective responsibility. As a result, they have erroneously tagged some health staff especially disease control officers and laboratory personnel as being responsible for all activities related to TB. Addo et al., (2010) in a training for laboratory personnel to improve TB diagnosis observed that prior to the training, only laboratory managers were often invited for such trainings and they (managers) hardly disseminated the training to the subordinates. This made the subordinates feel TB was not their business, hence remained apathetic towards its activities.

Negative staff attitude such as unfriendly and harsh treatment of TB patients was found to drive patients from the public health facilities to the traditional healers (Ahorlu & Bonsu, 2013).

2.10 Health facility’s preparedness

The health system preparedness is described in terms of capacity to suspect, screen and diagnose TB effectively. The unavailability of laboratory facilities, trained staff, and laboratory reagents can negatively impact on TB case detection. The golden rule for TB diagnosis is Ziehl Neelson light microscopy (WHO, 2010) and can be performed at lower levels of the health system including Health Centres and District Hospitals. In the study by Amenuvegbe et al., (2016) in Nkwanta South district where TB case detection was identified to be low, they found that of the 10 facilities in the district only two had laboratory facilities and less than half of the health staff received training in TB related activities. Training enhances the staff ability and vigilance in detecting and recommending a test for TB. In a study by (Gizaw, Alemu, & Kibret, 2015) in Ethiopia, the authors noted that a TB – related training for health staff was associated with increased knowledge and this can influence the staff ability to suspect TB for screening. They further found that a colossal number of health care providers had inadequate knowledge about tuberculosis. This situation can be a basket through which potential TB patients may be leaking.
Addo et al., (2010) also observed an improvement in Sputum – Smear Microscopy in facilities where staff received training on laboratory diagnosis of TB.

In a randomized controlled trial in South Africa, Fairall et al., (2005) observed the importance of supportive supervision, continuous capacity building and education on TB case detection. In the institutions where the authors provided intervention in the form of educational outreach to nurses, TB case detection improved.

### 2.11 Providers’ level of suspicion

In order to effectively suspect TB which may lead to its diagnosis, healthcare providers both in public and private facilities need to be vigilant and have a high sense of suspicion. A study in Kenya (Al-maniri et al., 2008) found that the level of suspicion among health workers was low when respondents were presented with case studies of tuberculosis. Similarly, Amenuvegbe et al., (2016) in Nkwanta South district also observed in a review of patient’s records that most patients who presented with a cough for two weeks or more never had sputum smear microscopy done for them because providers failed to suspect TB.

There is a low index of suspicion among health professionals when dealing with patients of socioeconomic status or patient in the private sector. One is likely to be diagnosed as TB in the public health facility than in the private sector.

Lack of vigilance by healthcare providers may miss TB cases. In the study in the Sissala East District in the Upper West region, Ahorlu & Bonsu, (2013) observed that though the majority of TB patients initially visited government health facilities, they complained that they were not screened for TB on a number of initial visits until the case became worse.
In conclusion, it is stipulated that clients should not move beyond 5kms radius before accessing health care services but most communities in Bawku West, commute over 20kms distance before accessing healthcare service which may result in a decrease in the sputum – smear-positive TB cases. The cost of travelling can negatively affect the rate of case detection.

Poor health literacy on TB may hinder client’s availing themselves for TB services including diagnosis and this can affect the case detection rate. Since the private (including traditional healers) – Public collaboration is not well harnessed, a lot of cases would go unreported while serving as a pool of continuous infection. Despite the risk of infection of contacts of a confirmed TB patient, health staff sometimes fail to embark on contact tracing and screening for TB cases.

As personnel’s being responsible for all activities related to TB, training for laboratory personnel to improve TB diagnosis observed that training was only restricted to laboratory managers who hardly disseminated the training to the subordinates. This made the subordinates feel TB was not their business, hence remained apathetic towards its activities. Negative staff attitude such as unfriendly and harsh treatment of TB patients was found to drive patients from the public health facilities to the traditional healers. Training enhances the staff ability and vigilance in detecting and recommending a test for TB. Similarly, Amenuvegbe et al., (2016) also observed in a review of patient’s records that most patients who presented with a cough for two weeks or more never had sputum smear microscopy done for them because providers failed to suspect TB.

There is a low index of suspicion among health professionals when dealing with patients of socioeconomic status or patient in the private sector. One is likely to be diagnosed as TB in the public health facility than in the private sector. Lack of vigilance by healthcare providers may miss TB cases.
TB case detection in Bawku West District was 69% in 2014, 68% in 2015 and drop to 38% in 2016 respectively (BWDHA 2016, Annual Performance Review). The consequence of this low detection, will present a substantial socio-economic burden on the populace who are predominantly farmer and petty traders which leads to loss of productivity, high dependency rate, school dropout, stigmatization, late diagnosis, and increase in drug-resistant TB (DR-TB) and TB mortalities in the district. Therefore, identification of the factors contributing to low TB case detection will help in directing future interventions.
CHAPTER THREE

METHODS

3.0 Study Design

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

3.1 Background of the Study Area

The study was conducted in the Bawku West district in the Upper East region with an estimated population of 109,391 people. The District shares boundaries with Burkina Faso in the North, Binduri District to the East, Tanlensi Namdam District to the West and East Mamprusi District to the South. About 75% of the District lies between 183m to 244m above sea level. Parts of the northern fringes of the District are between 244m to 305m with few isolated hills exceeding 305m above sea level. The District is demarcated into eight (8) Sub-Districts with One hundred and thirty-three (133) major communities.

Agriculture is the major economic activity in terms of employment and income generation. About 80 percent of the working population is engaged in this sector, the major food crops produced in the District being maize, rice, sorghum, millet, groundnut and Soya Beans. The only industrial crops available in the District is Shea nut. The major small-scale industrial activities in the District are; sheabutter extraction,

Land Size

The District covers an area of approximately 1,070 square kilometers, which constitutes about 12% of the total land area of the Upper East Region. It is the fourth biggest district in the Upper East Region in terms of land area.
Culture
The District is made of major tribes like Kusasis, Mamprusis, Bimobas, Busangas. However, Kusasis form about 85% of the population. Traditional Religion, Christianity, and Islam are major religions practiced in the District. Festival for the people is Samanpiiri

The District has 21 Health facilities made up of 1 District Hospital, 4 Health Centres, 3 Private health facilities, 7 clinics and 12 CHPS compounds where tuberculosis control activities are ongoing. The population of the district and the health facilities are shown in table:1 below

Table 1: POPULATION DISTRIBUTION FOR 2017

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Sub-districts</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Number of Communities</td>
<td>133</td>
<td>133</td>
</tr>
<tr>
<td>Target Populations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Projected Population</td>
<td>101,011</td>
<td>109,391</td>
</tr>
<tr>
<td>Health Infrastructure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Health centres</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Clinics (Government)</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Clinics (Private)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>CHPS</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 2: Operational definitions of variables measured among study participants in Bawku West District 2017

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definition</th>
<th>Scale of Measurement</th>
<th>Source of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent</strong></td>
<td>Referral of suspected TB clients and intention to seek treatment in health facility.</td>
<td>Binary</td>
<td>Interview</td>
</tr>
<tr>
<td><strong>Independent</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Age of respondent at last birthday</td>
<td>Continuous in years</td>
<td>Interview</td>
</tr>
<tr>
<td>Sex</td>
<td>Sex of respondent</td>
<td>Binary</td>
<td>Interview</td>
</tr>
<tr>
<td>Educational Status</td>
<td>Highest formal education obtained</td>
<td>Ordinal</td>
<td>Interview</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary school</td>
<td>Primary school</td>
<td></td>
</tr>
<tr>
<td></td>
<td>JHS</td>
<td>JHS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SHS</td>
<td>SHS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>Tertiary</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td>Respondent marital status</td>
<td>Nominal</td>
<td>Interview</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>Single</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>Married</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Divorce</td>
<td>Divorce</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Co-habitation</td>
<td>Co-habitation</td>
<td></td>
</tr>
<tr>
<td>Place of residence</td>
<td>Respondent place of resident</td>
<td>Binary</td>
<td>Interview</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>Rural</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>Urban</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>The respondent's Religion</td>
<td>Nominal</td>
<td>Interview</td>
</tr>
<tr>
<td></td>
<td>Christianity</td>
<td>Christianity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Traditional religion</td>
<td>Traditional religion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>Muslim</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>Occupation of respondent</td>
<td>Nominal</td>
<td>Interview</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>Unemployed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unskiller Labour</td>
<td>Unskiller Labour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skilled Labour</td>
<td>Skilled Labour</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Operational Definition</td>
<td>Scale of Measurement</td>
<td>Source of Data</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------</td>
<td>----------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Health seeking behaviours</td>
<td>Community members health seeking behaviours</td>
<td>Nominal Health Facility Prayer Camp Traditional header</td>
<td>Interview</td>
</tr>
<tr>
<td>Logistics</td>
<td>Logistics for TB case detection</td>
<td>Ordinal Adequate Inadequate Not available</td>
<td>Interview</td>
</tr>
<tr>
<td>Protocol</td>
<td>Respondent knowledge on TB</td>
<td>Ordinal Adequate Inadequate</td>
<td>Interview</td>
</tr>
<tr>
<td>Records review on Suspected TB cases</td>
<td>OPD Record</td>
<td>Ordinal Sufficient Insufficient None</td>
<td>Interview</td>
</tr>
<tr>
<td>Referral</td>
<td>Respondents referral to health facility</td>
<td>Ordinal Refers Do not refer</td>
<td>Checklist</td>
</tr>
<tr>
<td>Contact tracing</td>
<td>Respondents tracing</td>
<td>Ordinal Adequate Inadequate None</td>
<td>Interview</td>
</tr>
</tbody>
</table>

Different categories of data sources and the people studied (Table 3). They included the medical records, patients seen at the Out-Patient Department (OPD) from January 2017 to December 2017 with history of cough. Others were the community health surveillance volunteers in the district, community members, clinicians and public health staff who are engaged in detection and diagnosis of TB and laboratory staff in Bawku West District.
Table 3: Study Population category.

<table>
<thead>
<tr>
<th>Population</th>
<th>How sample were determine</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out-patience records from Jan-Dec 2017</td>
<td>Actual number from the cough register from Jan-Dec 2017</td>
<td>2,581</td>
</tr>
<tr>
<td>Community members</td>
<td>Proportionate</td>
<td>166</td>
</tr>
<tr>
<td>Community-based surveillance volunteers</td>
<td>Proportionate</td>
<td>159</td>
</tr>
<tr>
<td>Doctors</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Physician Assistants</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Nurses</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Laboratory Technicians</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>TB Coordinators</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

3.2 Criteria for health staff selection

3.2.1 Inclusion criteria

1. Staff interviewed were clinicians, data managers, institutional TB coordinator’s,
   District TB coordinator and laboratory staff.

2. They should have worked for a minimum of one-year in the district.

3.3.2 Exclusion criteria

1. Any staff who has not worked at the same post for a minimum of one-year within the
   current job was excluded in the study.
3.4 Criteria for community-based surveillance volunteers

3.4.1 Inclusion criteria

2. Any community-based surveillance volunteer who have been engaged actively in surveillance activities for a period of two-years in the District were included in the study.

3.4.2 Exclusion criteria

3. Any community-based surveillance volunteer who has not worked in the District for a minimum of two-years was excluded from the study.

3.5 Criteria for selection of community members

3.5.1 Inclusion criteria

4. Community members who were 18 years and above, resides in the Bawku West District and who were willing to participate in the study were included in the study.

3.5.2 Exclusion criteria for community members

5. Community members who were less than 18 years of age, in Bawku West District were excluded from the study.

3.6 Criteria for selection of medical records

3.6.1 Inclusion criteria

6. Any Out-patient department records of suspected TB clients with history of cough for two weeks or more from January to December 2017 were included in the study.

3.6.2 Exclusion criteria for medical records

7. Out-patient department records of suspected TB clients with history of cough for less than two weeks from January to December 2017 were excluded in the study.
3.7 Sample size calculation for community members.

The sample size was determined by using the Cochrane formula (Cochrane, 1977).

\[ n = \frac{(Z_{\alpha/2})^2 \times p(1-p)}{e^2} \]

Where: \( n \) = sample size to be determined, \( Z_{\alpha/2} \) = Reliability coefficient (z-score) of 1.96 at 95% confidence interval (CI), \( p \) = estimated community knowledge level on TB 89.7% or 0.89 (Amenuvegbe et. al; 2016), \( e \) = margin of error of 5% = 0.05

\[ n = \frac{(1.96)^2 \times 0.89(1-0.89)}{(0.05)^2} = 151 \]

Adjusting for a 10% non-response rate giving a sample size of 166

Therefore, calculated sample size was used for the study of 166 community members.

3.8 Sampling Technique for community members.

As indicated above, 166 community members were included in the study. A simple random sampling method was used to select one community from each sub-district. The names of the communities were written on papers in each sub-district and one community randomly selected from each sub-district until the required number was reached.

The sample size of 166 was proportionate to communities according to their population. The specific number of sample size for each communities was used based on their population to determine the number to be interviewed as shown in table 3.

The community members who were to take part in the study were selected proportionately by sub-district as shown in table 4 below.
Table 4: Proportionate allocation of sample size of community members

<table>
<thead>
<tr>
<th>Sub-district</th>
<th>Population</th>
<th>proportion</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zebilla- south</td>
<td>26,585</td>
<td>24%</td>
<td>40</td>
</tr>
<tr>
<td>Zebilla- North</td>
<td>11,780</td>
<td>11%</td>
<td>18</td>
</tr>
<tr>
<td>Binaba</td>
<td>19,803</td>
<td>18.1%</td>
<td>30</td>
</tr>
<tr>
<td>Sapelliga/Googo</td>
<td>14,237</td>
<td>13%</td>
<td>22</td>
</tr>
<tr>
<td>Tanga/Timode</td>
<td>12,572</td>
<td>11.5%</td>
<td>19</td>
</tr>
<tr>
<td>Tilli/Widnaba</td>
<td>5,901</td>
<td>5.4%</td>
<td>9</td>
</tr>
<tr>
<td>Zongoire</td>
<td>7,928</td>
<td>7%</td>
<td>12</td>
</tr>
<tr>
<td>Boya/Gbantongo</td>
<td>10,585</td>
<td>10%</td>
<td>17</td>
</tr>
<tr>
<td><strong>District Total</strong></td>
<td><strong>109,391</strong></td>
<td><strong>100%</strong></td>
<td><strong>166</strong></td>
</tr>
</tbody>
</table>

3.9 Sampling Technique for Health staff:

Purposive sampling method was used to select clinicians on duty including data managers, institutional TB coordinator’s and district TB coordinator and laboratory staff in the various facilities because they were directly involved in TB case management.

3.10 Sample size calculation for community-based surveillance volunteers.

The district registered 266 community health surveillance volunteers who are helping with surveillance activities in the district. Using Yamane (1967:886) formula for sample size calculation, 95% confidence level and \( p = 0.05 \)

\[
n = \frac{N}{1+N(e)^2}
\]

\[
n = \frac{266}{1+266(0.05)^2} = 159
\]

Where; \( n = 159 \) CBSVs
n = sample size

N = population size; 266

e = level of precision; 0.05

Proportionate sampling method was used to allocate communities to each sub-district.

Table 5: Proportionate number of community-based surveillance volunteers in the Bawku West District.

<table>
<thead>
<tr>
<th>Sub-district</th>
<th>Number of volunteers</th>
<th>The number to be selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zebilla- south</td>
<td>28</td>
<td>17</td>
</tr>
<tr>
<td>Zebilla- North</td>
<td>36</td>
<td>21</td>
</tr>
<tr>
<td>Binaba</td>
<td>40</td>
<td>24</td>
</tr>
<tr>
<td>Sapelliga/Googo</td>
<td>34</td>
<td>20</td>
</tr>
<tr>
<td>Tanga/Timode</td>
<td>44</td>
<td>26</td>
</tr>
<tr>
<td>Tilli/Widnaba</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td>Zongoire</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td>Boya/Gbantongo</td>
<td>28</td>
<td>17</td>
</tr>
<tr>
<td>District Total</td>
<td>266</td>
<td>159</td>
</tr>
</tbody>
</table>

3.11 Records review

The cough register at the OPD was reviewed from January to December 2017 for patient with history of cough for 2 weeks or more. In all 2,581 patients were found to have history of cough for 2 weeks or more. All these patients were referred to laboratory for sputum smear microscopy.
3.12 Pre-test

Pre-test was conducted in the Binduri District which is one of the sister Districts of Bawku West where the study was conducted. The rationale was to test for validity and reliability of the instrument. These questionnaire were reviewed to address the objectives of the study.

3.13 Data Collection Tool

Structured questionnaire designed for collection of information on TB from community health surveillance volunteers, health staff, laboratory staff, community members and the review of records were used.

3.14 Data collection technique.

Designed questionnaire made of both open and closed-ended questions were appropriately administered to all the respondents (health staff, community-based surveillance volunteers and community members) by interview and self completed questionnaires. The health staff were followed up at their health facilities to seek for informed consent before the administration of the questionnaire. Letters were written to the CBSVs through the district disease control officer to seek for their consent before the questionnaire administration.

3.15 Data Processing

The collected data was double entered, cleaned, validated and coded using Microsoft Excel version 2016. This data was imported into STATA version 15 for analysis.
3.16 Data Analysis

Data entry, coding, and cleaning were done using Microsoft Excel (Microsoft Incorporated) software and then imported into Stata version 15 (STATA, College Station, TX, USA) for analysis.

Appropriate descriptive and inferential statistics in Stata 15 were employed for the analysis. Univariate analysis was done to obtain frequencies and proportions of demographic characteristics of respondents. The proportions of community based surveillance volunteers who self-reported that they referred suspected TB clients to health facilities for diagnosis as well as the proportion of community members with intention to report to a health facility when they have symptoms of TB. Knowledge of community based surveillance volunteers and community members about causes of TB, signs and symptoms, mode of transmission and treatment modalities was reported in proportions. Proportions of suspected TB clients who received sputum smear microscopy testing as well as the proportion of positive sputum smear cases among those tested were computed. Also, proportions of health staff interveiewed as well as their surveillance activities with regard to TB were computed. Proportions and frequencies were presented in appropriate tables and charts.

Chi-Squared test (or Fisher’s exact as appropriate) was used to determine the association between community-based surveillance volunteers referral of suspected TB clients to the health facilities and socio-demographic characteristics, knowledge about TB, training in TB case detection and district or sub-didtrict support for case detection. Similar, Chi-squared (or Fisher’s exact) was used to test the assosciation between community members’ intenetion to go to a health facility when they have symptoms of TB and the socio-demograhpic characteristics, knowledge about TB, health workers’ attitude and source of information about TB.
Variables which showed association in the chi-squared analysis were assessed for the direction of association using simple logistic regression models. The variables which were statistically significant in the bivariate analysis were used in the multiple logistic regression. Specifically, simple logistic regression was performed with each of the independent variables which have a reasonably strong plausible association with referral of suspected clients to health facility and intention to seek care in a health facility when they have symptoms of TB. This was followed by a multiple backward logistic regression model where all significant covariables that were significant in the bivariate analysis were kept in the model and analyzed for their influence on the outcomes when considered together.

In the multiple logistic models, a likelihood ratio with a p-value of < 0.05 at 95% Confidence Interval (CI) obtained from any differences was considered a statistically significant determinant or predictor of either community based surveillance referral of suspected TB clients to health facilities or community members intention to seek care in health facilities when they have symptoms of TB.

3.17 Quality control

The study was conducted in accordance with the procedures specified in the proposal approved by the Ghana Health Service Ethical Review Committee which requires all ethical issues including privacy, confidentiality of study participants should be protected.

The training of field assistants and supervisors included areas such as objectives, importance of the study and data collection procedure. An average of 25 minutes was spent interviewing each participant.
3.18 Ethical Consideration

The purpose of this research was to find out what factors are contributing to low TB case detection in Bawku West district in upper East region. Research procedure, participant requirement and an approximate number of participants were involved in the study.

The health workers including clinicians, Laboratory staff, district TB coordinator, the community-based surveillance volunteers, community members and the review of records with signs and symptoms of TB.

Ethical approval was obtained from the Ghana Health Service Ethics Review Committee (GHS-ERC-074/12/17). Informed consent was obtained from respondents and confidentiality assured before the study. They were fully informed about the purpose, procedures, risks, and benefits of participating in the study. The participants who could not read, an explanation of the consent form was made known to them.

Participants who agreed to take part in the study were required to thumbprint or sign the consent form as an indication of their readiness to participate in the study. All the information obtained from this study will be kept confidential and used for the purposes of which it is intended. The information was securely stored without the names of the participants in a file which were accessible only to the research team. Each name was assigned an ID code and were securely kept. The results of the study will be disseminated in such a manner that no information will be directly related to the identity of a particular participant.

Benefit(s) / Risk(s):

There was no direct risk to the participants because, no sample was obtained from them, however, the goal of this study was to determine the factors that negate early case detection of
TB so that when diagnosis are made, initiation of prompt treatment will help prevents the risk of transmitting TB infection to others.

**Confidentiality:**
All the participants’ records from this study was treated as confidential medical records. The records were stored on the computer and secured with the password but accessible to only the principal investigator and the main supervisor.

Information collected on study forms and database was given code numbers. No name was recorded in the research forms or in the electronic database. No name or identifier will be used in any publication or reports from this study. However, as part of our responsibility to conduct this research properly, I may allow officials from the ethics review committee to have access to participants’ records.

**Voluntariness:**
Taking part in this study was out of the participant’s own prerogative. The participant was not under any obligation to do so. The research was entirely voluntary. However, if the participant chooses not to participate, this will not affect him in any form.

**Withdrawal from the research:**
Participants were made to choose to withdraw from the research at any time without having to explain the reasons for the decision. They were also asked not to answer any question they found uncomfortable or private.

**The consequence of Withdrawal**
There was no consequence, loss of benefit or care to the participant if they had chosen to withdraw from the study. However, some of the information that may have been obtained from
them without identifiers (name), before the participant chose to withdraw, may be modified or used in analysis reports and publications unless the participant objects to it. We wish to make good effort to comply with participants’ expectations as much as practicable.

**Costs/Compensation**

For participants’ time and inconvenience, malt drink was provided as snack, while participants’ waited to take part in the study. More importantly, signing the consent form does not reduce or take away any of the participants lawful rights.

**Conflict of interest declaration**

I have no affiliation with any organization solely involved in TB control program or in the promotion or marketing of TB prevention and control interventions or products.
CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics of community based surveillance volunteer

A total of 158 community-based surveillance volunteers were interviewed (Table 6). The median age of the respondents was 34 years old (Interquartile Range (IQR): 29 – 41) and most (70.3%, 111/158) of them were aged from 29 to 41 years old. The majority (61.4%, 97/158) of the respondents were males and almost all of them (98.7%, 156/158) resided in the rural areas of the District (Table 6). Almost 80% (126/158) of the surveillance volunteers were married 40.5% (64/158) of them had a secondary school education (Table 6). The majority (69%, 94/158) of them were Christians.

A total of 164 community members were interviewed with the median age of 35 years (IQR: 29 – 44). Seventy-four percent (121/164) of the respondents were males with 70% (114 /164) currently married. The majority (96%, 158/164) of the community members interviewed were resident in the rural areas of the district (Table 6). Seventy percent (114/168) of the respondents engaged in unskilled labour as their main source of income. About one-third (49/164) of the community members interviewed never had formal education and 58% (95/164) were Christians.

Thirteen health staff were interviewed of which 12 were males. The staff interviewed included one TB coordinator, five nurses, two doctors and five Physician Assistants. The mean age of health staff was 34 years (standard deviation ±7.5). Eight of the health staff interviewed (8/13) resided in urban area and seven were married (7/13). Of the 13 health staff interviewed, 12 were reportedly Christians.
Five laboratory staff were interviewed for the study all of whom were males. They included one laboratory technologist, one laboratory scientist and three laboratory assistants. Four (4/5) of them resided in urban area. Three (3/5) of the respondents were married and four (4/5) were Christians.

Table 6: Socio-demographic characteristics of community based surveillance volunteers and community members in the Bawku West District, 2017

<table>
<thead>
<tr>
<th>Variable</th>
<th>Community based surveillance volunteers (n= 158)</th>
<th>Community members (n=164)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq(n)</td>
<td>Prop (%)</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20 years</td>
<td>5</td>
<td>3.16</td>
</tr>
<tr>
<td>20 – 40 years</td>
<td>111</td>
<td>70.25</td>
</tr>
<tr>
<td>≥ 41 years</td>
<td>42</td>
<td>26.58</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>97</td>
<td>61.39</td>
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<tr>
<td>Female</td>
<td>61</td>
<td>38.61</td>
</tr>
<tr>
<td><strong>Residence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>2</td>
<td>1.27</td>
</tr>
<tr>
<td>Rural</td>
<td>156</td>
<td>98.73</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
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<td>16.46</td>
</tr>
<tr>
<td>Married</td>
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<tr>
<td>Divorced/separated</td>
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<tr>
<td><strong>Occupation</strong></td>
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<td></td>
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<tr>
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<td>3.80</td>
</tr>
<tr>
<td>Unemployed</td>
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<td>38.61</td>
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<tr>
<td>Unskilled labour</td>
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<td>31.01</td>
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<tr>
<td>Skilled labour</td>
<td>41</td>
<td>25.95</td>
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<tr>
<td>Others</td>
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<td>0.63</td>
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</table>
### Educational Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Community based surveillance volunteers (n= 158)</th>
<th>Community members (n=164)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No formal education</td>
<td>8 5.06 2.53 – 9.87</td>
<td>49 29.88 23.31 – 37.40</td>
</tr>
<tr>
<td>Primary</td>
<td>38 24.05 17.96 – 31.41</td>
<td>38 23.17 17.29 – 30.32</td>
</tr>
<tr>
<td>Junior High School</td>
<td>40 25.32 19.09 – 32.76</td>
<td>28 17.07 12.01 – 23.70</td>
</tr>
<tr>
<td>Senior High School</td>
<td>64 40.51 33.06 – 48.42</td>
<td>27 16.46 11.49 – 23.02</td>
</tr>
<tr>
<td>Tertiary</td>
<td>8 5.06 2.53 – 9.87</td>
<td>22 13.41 8.96 – 19.61</td>
</tr>
</tbody>
</table>

### Religion

<table>
<thead>
<tr>
<th>Variable</th>
<th>Community based surveillance volunteers (n= 158)</th>
<th>Community members (n=164)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christianity</td>
<td>94 59.49 51.58 – 66.94</td>
<td>95 57.93 50.16 – 65.32</td>
</tr>
<tr>
<td>Muslim</td>
<td>60 37.97 30.67 – 45.86</td>
<td>47 28.66 22.20 – 36.12</td>
</tr>
<tr>
<td>Traditionalist</td>
<td>4 2.53 0.94 – 6.62</td>
<td>22 13.41 8.96 – 19.61</td>
</tr>
</tbody>
</table>

Table 7: Knowledge and source of information of community based surveillance volunteers and community members about tuberculosis in the Bawku West District, 2017

<table>
<thead>
<tr>
<th>Variable</th>
<th>Community based surveillance volunteers</th>
<th>Community members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freq (n)</td>
<td>Prop (%) 95% CI</td>
<td>Freq (n)</td>
</tr>
<tr>
<td>Germs</td>
<td>149 94.23 89.21 – 96.99</td>
<td>141 85.98 79.70 – 90.54</td>
</tr>
<tr>
<td>Witchcraft</td>
<td>1 0.64 0.08 – 4.50</td>
<td>0 0    9.46 – 20.30</td>
</tr>
<tr>
<td>Taboos</td>
<td>6 3.85 1.72 – 8.36</td>
<td>23 14.02 0</td>
</tr>
<tr>
<td>Others</td>
<td>2 1.28 0.32 – 5.05</td>
<td>0 0    0</td>
</tr>
<tr>
<td>Droplets</td>
<td>125 79.49 72.34 – 85.16</td>
<td>138 84.15 77.66 – 89.02</td>
</tr>
<tr>
<td>Smoking</td>
<td>33 20.51 14.84 – 27.66</td>
<td>26 15.85 10.98 – 22.34</td>
</tr>
<tr>
<td>Orthodox medicines</td>
<td>1 0.63 0.08 – 4.44</td>
<td>7 4.27 2.03 – 8.74</td>
</tr>
<tr>
<td>Herbs</td>
<td>7 4.43 2.11 – 9.07</td>
<td>5 3.05 1.26 – 7.18</td>
</tr>
<tr>
<td>No idea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware</td>
<td>147 93.04 87.80 – 96.13</td>
<td>142 86.59 8.96 – 19.61</td>
</tr>
<tr>
<td>Unaware</td>
<td>11 6.96 3.87 – 12.21</td>
<td>22 13.41 80.39 – 91.04</td>
</tr>
</tbody>
</table>
Knowledge of community based surveillance volunteers about tuberculosis caused by a germ was almost universal (94.2%, 149/158). However, 3.9% (6/158) of the respondents believe tuberculosis is caused by breaking of taboos. About 80% (125/158) of the surveillance volunteers knew that tuberculosis is transmitted by droplets released through coughing or sneezing. All (100%, 158/158) of the surveillance volunteers knew signs and symptoms of tuberculosis and 95% (150/158) knew that the disease can be cured through the use of orthodox medicines (table 7). However, 4.4% (7/158) indicated they have no idea about how tuberculosis can be cured. Of all the respondents, 93% (147/158) knew that treatment for tuberculosis is free. The majority (82.91%, 131/158) of the surveillance volunteers reported that their main source of information about tuberculosis is from the health workers.

The majority (86%, 141/164) of the community members knew that TB is caused by germs and 84% (138/164) also knew that TB is transmitted through droplets released through coughing or sneezing from an infected person. Ninety-three percent (152/164) of community members knew that TB can be effectively cured using orthodox medicines and 86.6% (142/164) are aware that TB treatment is free of cost (Table 7). The majority (82.91%, 131/158) of the community members indicated health workers as their main source of information on TB.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Community based surveillance volunteers</th>
<th>Community members</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq (n)</td>
<td>Prop (%)</td>
</tr>
<tr>
<td>Source of information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health workers</td>
<td>131</td>
<td>82.91</td>
</tr>
<tr>
<td>Radio</td>
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<td>10.13</td>
</tr>
<tr>
<td>Television</td>
<td>6</td>
<td>3.80</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>3.16</td>
</tr>
</tbody>
</table>

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The majority (86%, 141/164) of the community members knew that TB is caused by germs and 84% (138/164) also knew that TB is transmitted through droplets released through coughing or sneezing from an infected person. Ninety-three percent (152/164) of community members knew that TB can be effectively cured using orthodox medicines and 86.6% (142/164) are aware that TB treatment is free of cost (Table 7). The majority (82.91%, 131/158) of the community members indicated health workers as their main source of information on TB.
4.2 Surveillance activities of community-based surveillance volunteers

A little over one half (51.9%, 82/158) of community-based surveillance volunteers reported that they have been trained on TB case detection. Seventy-four (118/158) percent of them reported that they do not receive any support from either the district or sub-district to enable them detect TB cases. The majority of them (54.5%, 86/158) reported that they get feedback from the sub-district after they have referred a suspected TB patient to the health facility.

The majority (63.29%, 100/158) of the surveillance volunteers interviewed indicated that they have posters and other materials about TB displayed in their communities. Eighty-one percent of the respondents also reported that they do ask clients about cough (or history of cough) for 2 weeks or more during their routine surveillance activities. Over one half (54.43%, 86/158) of the respondents indicated that they do not refer suspected TB clients to the health facility for diagnosis.

4.3 Surveillance activities of clinical and laboratory personnel

Eight of the respondents (8/13) reported that they have been sensitized on standard operation procedures for TB case detection. Eleven (11/13) respondents indicated their facilities TB team promote case detection activities in both private and public facilities.

Eight (8/13) respondents indicated that they review TB case detection activities in their facilities every four months while five (5/13) indicated they do not review TB case detection activities in their facility at all. Nine (9/13) staff said their facilities have written TB case detection plans to improve case detection and 10 (10/13) respondents indicated that, they have designated a staff responsible for the daily monitoring of TB case detection activities.
Similarly, nine (9/10) respondents indicated that the institutional TB coordinator collates data on TB case detection monthly and reports to the facility management. One respondent (1/13) indicated that he or she does contact tracing on a monthly basis, three (3/13) said they do it quarterly and another three (3/13) said they do contact tracing anytime a smear positive case is detected. However, six (6/13) respondents said they do not do contact tracing at all. Eight respondents said there are displayed posters on TB symptoms and diagnostic algorithm at their facilities.

Ten respondents (10/13) reported that they do actively ask all patients about a cough regardless of their presenting complaints so as to increase TB case detection. However, six (6/13) respondents indicated that they have a register to record suspected TB cases. Nine (9/13) respondents reported that they usually screen diabetes and HIV and AIDS clients for TB. Seven (7/13) respondents also indicated that they involve private practitioners in TB case detection activities.

All the five laboratory staff interviewed indicated they have displayed standard operating procedures for TB smear microscopy in the laboratory. All but one (4/5) indicated that they never run out of reagents for sputum microscopy. With regard to staff adequacy, three (3/5) indicated that they have enough staff to work on sputum microscopy request. Further, three (3/5) respondents indicated that sputum results are made available to clinicians within 24 hours of request while two (2/5) indicated that the results are available within 12 hours.

With regard to follow-up on clients who are smear-positive for at least one sputum but do not return for subsequent tests, all the respondents indicated that they give the results to the institutional TB coordinator for the necessary follow-up. Two (2/5) respondents noted that the last time TB quality control was conducted in their laboratory was three months ago, additional
two (2/5) indicated it was conducted six months ago while one (1/5) does not remember. In terms of refresher training on sputum microscopy, one respondent (1/5) indicated he received the last refresher training a year ago, another respondent (1/5) indicated he received refresher training two years ago while three (3/5) indicated they do not remember the last time they received refresher training on sputum microscopy.

On a daily basis, there is a designated nurse at the Out-Patients’ Department (OPD) of the Bawku West district hospital to screen clients for TB. Eligible clients after screening are referred to the laboratory for sputum-smear microscopy. In 2017, a total of 2,581 clients were eligible and referred for testing at the district laboratory. Overall, only 10 percent (244/2,581) of the suspected (eligible) clients were tested. The highest proportion of suspected TB clients who were tested (22.2%, 20/90) was recorded in September (Figure 2). A review of the laboratory records showed that 377 suspected TB clients were tested in 2017 with 10.6% (40/377) testing sputum-smear positive. The highest proportion of sputum-smear positive cases was recorded in April 2017 (25.6%, 10/39) [Figure 3].

![Figure 2: Proportion of suspected TB cases tested in Bawku West district, 2017](image-url)
Figure 3: Proportion of suspected TB clients with positive sputum in Bawku West district, 2017

Figure 4: Community based surveillance volunteers’ assessment of health workers attitude 2017
Almost (98.1%, 155/158) all of the community based surveillance volunteers interviewed indicated that they consider the opening time of health facilities in the district favourable. Forty-seven percent (75/158) of the community based surveillance volunteers reported that the attitude of health workers towards tuberculosis clients in the district is excellent (figure 4). Similarly, 34% (54/158) of the respondents rated the health workers attitude towards TB clients as satisfactory.

Figure 5: Community members’ assessment of health workers attitude towards TB clients, 2017

Sixty-five percent (107/164) of community members interviewed rated health worker’s attitude towards TB clients as good (Figure 5). Almost a quarter (24%, 40/164) of the respondents rated health worker attitude as satisfactory while four percent (6/164) also rated health worker attitude as bad (Figure 5). However, 53.1% (87/164) of community members indicated that they will not eat with someone who is diagnosed with tuberculosis.
Ninety-eight percent (160/164) of the community members indicated cough for two weeks or more as one of the main symptoms of tuberculosis. Close to 60% (59.2%, 97/164) indicated an intention to seek care first in a health facility when they have symptoms of tuberculosis while 40.9% (67/164) indicated they will first seek treatment in a prayer camp or in a shrine when they have symptoms of tuberculosis.

4.4 Factors influencing Community Based Surveillance Volunteers’ referral of suspected TB clients

There was association between respondent’s sex and the referral of suspected TB client to the hospital (Fisher’s exact, p= 0.031). Females are twice more likely to refer a suspected TB client to the health facility compared to their male counterparts (cOR=1.96, 95% CI: 1.02 – 3.74).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Chi-squared/Fisher’s exact</th>
<th>p-value</th>
<th>cOR</th>
<th>95% CI</th>
<th>p-value</th>
<th>aOR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
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<td>0.604</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Marital status</td>
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<td>-</td>
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<td>-</td>
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<td>Educational status</td>
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<td>-</td>
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<td>-</td>
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<td>Religion</td>
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<tr>
<td>Knowledge of cause of TB</td>
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<td>0.561</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>Knowledge of TB transmission</td>
<td></td>
<td>χ² = 3.80</td>
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<td>Knowledge of TB signs and symptom</td>
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<td>-</td>
<td>-</td>
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<td>-</td>
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<td>*</td>
<td>0.839</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ask about 2 weeks cough or history of it</td>
<td>χ² = 15.51</td>
<td>&lt;0.001</td>
<td>7.37</td>
<td>2.43 – 22.32</td>
<td>&lt;0.001</td>
<td>2.24</td>
<td>0.61 – 8.136</td>
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<tr>
<td>Display TB posters in community</td>
<td>χ² = 45.84</td>
<td>&lt;0.001</td>
<td>16.82</td>
<td>6.57 – 43.11</td>
<td>&lt;0.001</td>
<td>6.96</td>
<td>2.34 – 20.66</td>
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<tr>
<td>Source of information about TB</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Trained on case detection</td>
<td>χ² = 43.51</td>
<td>&lt;0.001</td>
<td>10.70</td>
<td>5.05 – 22.66</td>
<td>&lt;0.001</td>
<td>3.20</td>
<td>1.28 – 8.01</td>
</tr>
<tr>
<td>Health worker attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bad</td>
<td>*</td>
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<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>0.79</td>
<td>0.39 – 1.60</td>
<td>0.047</td>
<td>1.29</td>
<td>0.26 – 2.53</td>
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</tr>
<tr>
<td>Variable</td>
<td>Chi-squared /Fisher’s exact</td>
<td>p-value</td>
<td>cOR</td>
<td>95% CI</td>
<td>p-value</td>
<td>aOR</td>
<td>95% CI</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------</td>
<td>---------</td>
<td>-----</td>
<td>--------</td>
<td>---------</td>
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<td>--------</td>
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<tr>
<td>Excellent</td>
<td></td>
<td>2.64</td>
<td>1.01–6.88</td>
<td>0.511</td>
<td>0.82</td>
<td>0.41–4.05</td>
<td></td>
</tr>
<tr>
<td>District support for TB case detection</td>
<td>$\chi^2 = 25.60$</td>
<td>&lt;0.001</td>
<td>7.8</td>
<td>3.29–18.50</td>
<td>&lt;0.001</td>
<td>3.51</td>
<td>1.26–9.85$	extcircled{©}$</td>
</tr>
</tbody>
</table>

*=Fisher’s exact  
cOR= crude odds ratio  
aOR= adjusted odds ratio

$\textcircled{©}$= statistically significant after adjustment

Respondents’ socio-demographic characteristics such as age, marital status, educational status, religion and referral of suspected TB clients to the health facility by surveillance volunteers is shown in (Table 8). Similarly, knowledge of cause of TB, mode of transmission and the fact that TB is curable did not differ significantly between the respondents who referred suspected TB clients to the health facility and those who did not ($p>0.05$). Respondents who reportedly asked about 2 weeks cough or history of 2 weeks cough during their surveillance activities were about seven times more likely to refer suspected TB cases to a health facility compared with those who did not ask (cOR 7.37, 95% CI: 2.43 – 22.32). Training of community-based surveillance volunteers on TB case detection ($\chi^2 = 43.51$, $p<0.001$) and district support for TB case detection ($\chi^2 = 25.60$, $p<0.001$) were both associated with referral of suspected TB clients to the health facility.

Community based surveillance volunteers who had training on TB case detection had about 11 times the odds of referring suspected TB clients to the health facility as compared to those who do not have the training. Similarly, respondents who reportedly receive district or sub-district support for TB case detection had 7.8 times the odds (cOR = 7.8, 95% CI: 3.29 – 18.50) of
referring suspected TB clients to the hospital compared with those who did not receive support (Table 8). After adjusting for other variables, training on TB case detection, asking about 2 weeks cough (or history of it) and district or sub-district support for TB case detection remained significant predictors of referral of suspected TB clients to the health facility (Table 8).

Table 9: Binary analysis of factors associated with community members intention to seek health care

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chi-squared/Fisher’s exact</th>
<th>p-value</th>
<th>cOR</th>
<th>95% CI</th>
<th>p-value</th>
<th>aOR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge on cause of TB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germs</td>
<td>( \chi^2 = 6.57 )</td>
<td>0.010</td>
<td>3.21</td>
<td>1.27 – 8.08</td>
<td>0.013</td>
<td>-</td>
<td>0.83 – 5.97</td>
</tr>
<tr>
<td>Taboos</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Knowledge of TB transmission</td>
<td>( \chi^2 = 3.63 )</td>
<td>0.057</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Knowledge that TB has a cure</td>
<td>*</td>
<td>0.019</td>
<td>7.87</td>
<td>0.90 – 68.98</td>
<td>0.063</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Means of TB cure</td>
<td>*</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
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<tr>
<td>Orthodox medicines</td>
<td></td>
<td>7.37</td>
<td>0.02 – 1.34</td>
<td>0.089</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Herbs</td>
<td></td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness of free TB treatment</td>
<td>( \chi^2 = 7.85 )</td>
<td>0.005</td>
<td>3.71</td>
<td>1.42 – 9.69</td>
<td>0.007</td>
<td>1.43</td>
<td>0.40 – 5.22</td>
</tr>
<tr>
<td>Aware</td>
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<td>1</td>
<td>1</td>
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<td>Source of information about TB</td>
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<td></td>
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</tr>
<tr>
<td>Health workers</td>
<td>*</td>
<td>0.005</td>
<td>1</td>
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<td>1</td>
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<tr>
<td>Radio</td>
<td></td>
<td>0.36</td>
<td>0.10 – 1.34</td>
<td>0.128</td>
<td>0.43</td>
<td>0.11 – 1.78</td>
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<tr>
<td>TV</td>
<td></td>
<td>0.23</td>
<td>0.08 – 0.64</td>
<td>0.005</td>
<td>0.36</td>
<td>0.11 – 1.30</td>
<td></td>
</tr>
<tr>
<td>Health worker attitude</td>
<td>*</td>
<td>0.118</td>
<td>-</td>
<td>-</td>
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</table>

*=Fisher’s exact      cOR= crude odds ratio      aOR= adjusted odds ratio
CI = Confidence Interval

45
4.3 Factors associated with community members’ intention to first seek health care

Respondents’ age ($\chi^2 = 0.02$, p= 0.876), residence (Fisher’s exact, p= 0.526), marital status (Fisher’s exact, p= 0.510), occupation ($\chi^2 =1.52$, p= 0.467) and level of education ($\chi^2 = 4.44$, p= 0.349) and religion ($\chi^2 = 0.23$, p= 0.894) were not significantly associated with community members’ intention to seek care in a health facility when they have symptoms of TB. Attitude of health workers (Fisher’s exact, p=0.118), knowledge of cause of TB ($\chi^2 = 6.57$, p= 0.010), compared with those who think TB is caused by breaking of taboos, respondents who knew that TB is caused by germs were three times likely to have intention of first reporting to a health facility for care when they have symptoms of TB (cOR = 3.21, 95% CI: 1.27 – 8.08, p =0.013). Knowledge of TB transmission ($\chi^2 =3.63$, p= 0.057), Knowledge of TB has a cure (Fisher’s exact, p= 0.019), Those who knew that TB is curable are eight times more likely to have intention of first seeking treating in a health facility if they have symptoms of TB compared to those who do not know that TB is curable (cOR= 7.87, 95% CI: 0.90 – 68.98). However, this was not statistically significant. Compared with those who reported that TB is curable using orthodox medicines, respondents who said TB is curable using herbs are 85% less likely to have the intention of first seeking treatment in the health facility when they have symptoms of TB (cOR= 0.15, 95% CI: 0.02 – 1.34). This was, however, not statistically significant. Aware that TB treatment is free ($\chi^2 =7.85$, p= 0.005). Community members who are aware that TB treatment is free were significantly four times as likely as those who were not aware that TB treatment is free to seek treatment first in a health facility when they have symptoms of TB (cOR = 3.71, 95% CI: 1.42 – 9.69). Source of information was significantly associated with intention to first seek treatment in a health facility with signs of tuberculosis (Fisher’s exact, p= 0.005). Respondents who reportedly heard information about tuberculosis from radio were 64% less likely to intend to first seek treatment in a health facility when they have symptoms of TB.
compared with those who said they heard the information from health workers (cOR = 0.36, 95% CI: 0.10 – 1.34) [Table 9]. Similarly, respondents who heard the information from television were less likely than those who heard it from health workers to have intention of first seeking health care from a health facility when they have symptoms of TB (cOR = 0.23, 95% CI: 0.08 – 0.64). After controlling for other variables, no factors significantly predicted intention to first seek treatment in health facility when they have symptoms of TB (Table 9).
CHAPTER FIVE

5.0 DISCUSSION

The study examined factors which are associated with community based surveillance volunteers ability to refer suspected TB clients to the health facilities for diagnosis to be made. The study also examined factors associated with the health seeking behaviour of community members when they experience symptoms of tuberculosis.

A substantial number of suspected TB clients (2,204 suspected cases) out of 2,581 cases who were requested to go to laboratory did not turn-up for the Acid Fast Bacilli microscopic examination. The finding is similar to a study by Amenuvegbe et al., (2016) who observed that those who presented with cough for two weeks or more never had sputum smear microscopy done for them because providers failed to suspect TB. This is also consistent with the global estimate that states that nearly 30% of new TB cases remain undetected (Sekandi et al., 2015). Therefore, suspected clients must be sent to the laboratory by clinicians and the result be obtained before initiating any treatment for them.

Community members who were aware that TB treatment is free were significantly four times as likely as those who were not aware that TB treatment was free to seek treatment first in a health facility when they have symptoms of TB.

Respondents who reportedly asked about 2 weeks cough or history of 2 weeks cough during their surveillance activities were more likely to refer suspected TB cases to a health facility compared with those who do not ask. This was because they have high index of suspicion than those who do not ask about cough.
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 as screening such vulnerable population for TB (Gnanasan et al., 2011). Training of community based surveillance volunteers on TB case detection and district support for them in TB case detection were both associated with referral of suspected TB clients to the health facility. Similarly, respondents who reportedly receive district or sub-district support for TB case detection were more likely to refer suspected TB clients to the hospital compared with those who did not receive support. 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). Regular refresher training of community-based surveillance volunteers and health staff on TB case detection can increase the number of cases to be detected. Failure to detect infected TB cases can increase the rate of transmission as one TB case can infect up to 15 people in a year if not identified and treated.

Serious constraint of inadequate laboratory staff and the capacity of the other health centres to conduct the test was a challenge and this was a major factor which adversely affect TB case detection efforts in the district. The same challenge has also been reported from similar resource limited countries which eventually leads to poor case notification and treatment outcome. However, it was established that sustainable disease prevention hinges on adequate allocation and equitable distribution of human work force. Effective utilization and management of health information is crucial for evidence based allocation of resources. This can be attained if medical and administrative data are recorded accurately and completely at health facilities and submitted to relevant bodies in timely manner.
Contrary, the findings indicate that, there were gaps in recording and reporting of health information. There were inconsistencies in the records from the cough register and the laboratory register with the number of suspected TB cases. A total of 244 suspected TB cases were recorded in the cough register but the actual number recorded in the laboratory register were 377 cases. This can result in low case detection. A similar findings indicated that, a total of 932 patients records reviewed only 24.68% (230/932) had sputum smear microscopy done with as many as 702 (75.4%) of the cases going back home without further investigation for mycobacterium tuberculosis infection in Nkwanta South District Hospital (Amenuvegbe et al., 2016)

Supporting the community-based surveillance volunteers in the form of enabling packages such as allowance will motivate them to intensify active case search for suspected TB cases which will eventually increase TB case detection but this was not what we found in this study.

The findings revealed that, community-based surveillance volunteer do not get any form of support such as allowance from the district or sub-district in an effort to increase TB case detection activities in the district. So lack of support for them was a factor identified that was affecting the low TB case detection in the Bawku west district.

In conclusion, inadequate personnel at the laboratory, poor quality control systems, lack of refresher training of staff and community-based surveillance volunteers on TB case detection and poor data management were some of the factors contributing to low TB case detection in the Bawku West district in the Upper East region of Ghana. Therefore, adequate and timely allocation of laboratory technicians, adequately equipped other health centres to perform sputum smear microscopic test, and timely provision of refreshment trainings on TB diagnosis would help in TB case detection.
CHAPTER SIX

6.0 CONCLUSION

In conclusion, community-based surveillance volunteers who reportedly asked about 2 weeks cough or history of 2 weeks cough during their surveillance activities were more likely to refer suspected TB cases to a health facility compared with those who did not ask. Additionally, display of TB posters in communities was a predictor to seek health care in the facility when presenting with signs and symptom of TB.

Training of community based surveillance volunteers on TB case detection and district support for TB case detection were both associated with referral of suspected TB clients to the health facility. After adjusting for other variables, training on TB case detection, asking about 2 weeks cough (or history of it) and district or sub-district support for TB case detection remained predictors of referral of suspected TB clients to the health facility. After controlling for other variables, no factors significantly predicted intention to first seek treatment in health facility when they have symptoms of TB. When these factors are addressed, it will increase TB case detection in the District.

6.1 RECOMMENDATION

1. The district director of health services should enhance the capacity of community-based surveillance volunteers by training them on TB case detection and institute an enabling package to motivate them detect more suspected TB cases and refer for care.

2. The health care providers should intensify health education on tuberculosis to community members and to dispel misconceptions about the disease.
3. The institutional TB coordinator should always validate data generated in the cough register and that of laboratory records for accurate reporting.

4. The district director for health should intensify the activities of contact tracing of positive sputum smear microscopy result to help detect more TB cases.

6.2 LIMITATION

Traditional healers in the district, chemical sellers and other groups of people whose work predispose them to TB were not included due to financial constraints and time limitation.
REFERENCES

study of some selected communities in the Pru district, 2(4), 122–132.
be finalized and submission done to the school administrator in November 2018.
APPENDIX A i: Questionnaire for Community Health Volunteers

My name is Ngrugma, Jagri Isaac. I am a student at the School of Public Health Legon pursuing Master Degree in public Health. I would like to ask you a few questions on factors contributing to low TB case detection. Please provide candid responses to the questions. The survey would take about 15 to 20 minutes. Your views are very important and whatever information you provide will be kept confidential.

Participation is voluntary and you will not be adversely affected if you decline to participate or decide later to stop participating in the study. Your full participation, however, will be very beneficial to you as an individual and the research work. Please tick all that applied.

Demographic information

1. Age of respondent ………………………………..

2. Place of resident (a) Town (b) Village

3. Marital status….. (a) Single (b) Married (c) Divorced / Separated (d) co-habitation

4. Occupation of respondent (a) Unemployed (b) Unskilled labourer (Trader, farmer) (c) Skilled labourer (Seamstress, Hairdresser) (d) others (specify) …………………

5. Educational level of respondent (a) Never been to school (b) Primary (c) JHS (d) SHS (e) Tertiary level

6. Religion (a) Christianity (b) Muslim (c) Traditional religion (d) Other specify……………………………………………………………………………………………………………

7. What causes Tuberculosis? (a) Bacteria (b) Virus (c) Parasite (d) Witchcraft

8. How is TB Transmitted? (a) Droplets spray by coughing or sneezing (b) Smoking (c) Housefly (d) Mosquito

9. What are the signs and symptoms of TB? (a) Night sweats (b) Weight loss (c) cough (d) Fever

10. Can TB be cure? (a) Yes (b) No

11. If yes, how is it cured? (a) Orthodox medicine (b) Herbs (c) Has no idea.

12. Do you ask about 2 weeks or more history of a cough in your routine surveillance activities? (a) Yes (b) No

13. Have you got displayed posters and other materials explaining the signs and symptoms of TB? (a) Yes (b) No

14. Do you know that TB treatment is free? (a) Yes (b) No
15. If yes, where is your source of information?
(a) Health worker  (b) Radio     (c) TV        (d) Others specify

16. Where do you seek treatment first anytime you fall sick? (a) Health Facility
(b) Prayer camp   (c) Traditional healer   (d) Drugstore

17. Have you considered the opening time of the health facility favorable?  (a) Yes     (b) No

18. If no, why? ........................................................................................................................................

19. How is the attitude of health workers towards TB client?
   (a) Good       (b) Bad       (c) Satisfactory  (d) Excellent

20. Were you informed the number of months TB patient have to take treatment?
   (a) Yes         (b) No

21. If yes, how many months? ...........................................................

22. How long does it take you to get to the health facility?
   (a) 15 minutes  (b) 30 minutes   (c) One hour    (d) One hour 30 minutes

23. Can you afford the cost of transportation to the facility any time you fall sick? (a) Yes   (b) No

24. Have they organized TB case detection training for you?
   (a) Yes           (b) No

25. Do you register suspected TB cases you referred to the hospital?
   (a) Yes                 (b) No

26. Does the district give you any support to enable you to detect more TB cases?
   (a) Yes                  (b) No

27. Do you get feedback from the district after you have referred a suspected TB case to the hospital? (a) Yes                 (b) No
APPENDIX A ii : Questionnaire for health Staff

My name is Ngrugma, Jagri Isaac. I am a student at the School of Public Health Legon pursuing Master Degree in public Health. I would like to ask you a few questions on factors contributing to low TB case detection. Please provide candid responses to the questions. The survey would take about 15 to 20 minutes. Your views are very important and whatever information you provide will be kept confidential. Participation is voluntary and you will not be adversely affected if you decline to participate or decide later to stop participating in the study. Your full participation, however, will be very beneficial to you as an individual and the research work. Please tick all that applied.

Demographic information

1. Age of respondent ...............................

2. Place of resident  (a) Town  (b) Village

3. Marital status….. (a) Single  (b) Married  (c) Divorced / Separated  (d) cohabitation

4. Occupation of respondent ...............................

5. Rank ..........................................................  

6. Religion   (a) Christianity  (b) Muslim  (c) Traditional religion

7. Does the health facility TB team sensitize health personnel and community health workers on standard operation procedure for TB case detection? 
   (a) Yes  (b) No

8. Does your health facility TB team promote TB case detection activities in both public, private, and communities?  (a) Yes  (b) No

9. How often do you assess TB case detection activities in the health facility? 
   (a) Monthly  (b) Quarterly  (c) No assessment at all

10. Do you have a written development plan for improving TB case detection in the facility? 
    (a) Yes  (b) No

11. Does the health facility designate any health staff responsible for daily monitoring of TB case detection activities?  (a) DOTs corner nurse  (b) OPD Nurse  (c) No staff is assigned

12. Does the institutional TB coordinator collate data on TB case detection monthly and report to management?  (a) Yes  (b) No

13. Do you ensure that data from suspected TB case is properly recorded in the health facility register?  (a) Records are properly registered  (b) Not recorded

14. How often do you conduct contact tracing?  (a) Monthly  (b) Quarterly  (c) No contact tracing

15. Do you have displayed posters on TB symptoms and diagnostic algorithm at the facility?
16. Do you actively ask all patients about a cough regardless of their presenting symptoms?
(a) Yes  (b) No

17. Do you screen people with diabetes and HIV/AIDS for TB?  (a) Yes  (b) No

18. Do you involve private practitioners in TB case detection activities in the district?
(a) Yes  (b) No
APPENDIX A iii: Questionnaire for Laboratory Staff

My name is Ngrugma, Jagri Isaac. I am a student at the School of Public Health Legon pursuing Master Degree in public Health. I would like to ask you a few questions on factors contributing to low TB case detection. Please provide candid responses to the questions. The survey would take about 15 to 20 minutes. Your views are very important and whatever information you provide will be kept confidential.

Participation is voluntary and you will not be adversely affected if you decline to participate or decide later to stop participating in the study. Your full participation, however, will be very beneficial to you as an individual and the research work. Please tick all that applied.

Demographic information
1. Age of respondent ......................................
2. Place of resident  (a) Town  (b) Village
3. Marital status.  (a) Single  (b) Married  (c) Divorced / Separated  (d) cohabitation
4. Occupation of respondent ....................................
5. Rank ..............................................................
6. Religion  (a) Christianity  (b) Muslim  (c) Traditional religion
7. Do you have a display standard operating procedure for TB smear microscopy in the laboratory?
(a) Yes  (b) No
8. How will you explain to a TB suspect patient to obtain a good sputum sample?
(a) Take in a lot of air deeply  (b) Retain the air in the lungs and exhale  (c) Repeat the procedure three times and then cough out the sputum.
9. When was the last time you run out of the reagent for sputum microscopy?
(a) One month ago  (b) Two months  (c) Three months
10. Do you have enough staff to work on the sputum microscopy request?
(a) Yes  (b) No
11. What time duration do you make sputum result available to the clinicians?
(a) Within four hours  (b) Twenty-four hours  (c) Forty eight hours
12. How do you follow-up those who have at least one smear-positive result and has not returned?
(a) We don’t follow them up  (b) We give the result to the institutional TB coordinator
13. What are the standards for suspected TB patient on sputum submission?
(a) One spot and one morning  (b) Only one spot
14. Do you record all the sputum smear microscopy done at the laboratory?
(a) Yes                         (b) No

15. When was the last time you had refresher training on sputum smear microscopy?
(a) Last month                  (b) One year               (c) Two years
APPENDIX A iv : Questionnaire for Community members

My name is Ngrugma, Jagri Isaac. I am a student at the School of Public Health Legon pursuing Master Degree in public Health. I would like to ask you a few questions on factors contributing to low TB case detection. Please provide candid responses to the questions. The survey would take about 15 to 20 minutes. Your views are very important and whatever information you provide will be kept confidential.

Participation is voluntary and you will not be adversely affected if you decline to participate or decide later to stop participating in the study. Your full participation, however, will be very beneficial to you as an individual and the research work. Please tick all that applied.

Demographic information

1. Age of respondent ………………………………

2. Place of resident (a) Town  (b) Village

3. Marital status….. (a) Single  (b) Married  (c) Divorced / Separated  (d) cohabitation

4. Occupation of the respondent  (a) Unemployed  (b) Unskilled labourer (Trader, Farmer, and Fishmonger)  (d) Skilled labourer specify………………

5. Educational level of respondent (a) Never been to school  (b) Primary  (c) JHS  (d) SHS  (d) Tertiary level

6. Religion (a) Christianity  (b) Muslim  (c) Traditional religion

7. How is the attitude of health workers towards TB client?  
(a) Good  (b) Bad  (c) Satisfactory  (d) Excellent

8. What causes Tuberculosis? (a) Bacteria  (b) Virus  (c) Parasite  (d) Witchcraft

9. How is TB Transmitted? (a) Droplets spray by coughing or sneezing  (b) Smoking  (c) Housefly  (d) Mosquito

10. What are the signs and symptoms of TB? (a) Night sweats  (b) Weight loss  (c) a cough  (d) Fever

11. Can TB be a cure?  (a) Yes  (b) No

12. If yes, how is it cured?  (a) Orthodox medicine  (b) Herbs  (c) Has no idea.

13. Do you know that TB treatment is free?  (a) Yes  (b) No

14. If yes, where is your source of information?  (a) Health worker  (b) Radio  (c) TV  (d) Others specify

15. Did the health workers visit you at home after your patient was diagnosed as having TB?  (a) Yes  (b) No
16. Where will you first seek care if you have symptoms of TB?  (a) Health facility (b) Prayer camp (c) Traditional healer

17. Would you eat with somebody who had been treated with TB?
   (a) Yes     (b) No