

**INFLUENCE OF COMMUNITY HEALTH VOLUNTEERS ON IMPLEMENTATION
OF COMMUNITY BASED TUBERCULOSIS CARE, IN BUNGOMA COUNTY, KENYA**

BY

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DECLARATION

I declare that this is my original work and has never been presented for the award of any degree in any other university.

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This research project has been submitted for registration with my approval as the university supervisor.

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DEDICATION

This research project is dedicated to my beloved wife Lillian Lodi for her support while I was writing this project. To all my dear children Dan, Rebecca, Naituni, Senaipei, Neniso and Brian for support and encouragement. For my beloved parents, Mr. Joseph Lodi and Mrs. Teresa Lodi, thanks dad and mom.

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LIST OF ABBREVIATIONS AND ACRONYMES

AIDS	Acquired immunodeficiency syndrome
CHW	Community health worker
CBO	Community-based organization
CB-DOTS	Community Based Directly observed treatment short course.
DHMTs	District Health Management Team
DOTS	Directly Observed Treatment Short Course
DTC	Diagnostic testing and counseling
DTLC	District tuberculosis / leprosy coordinator
HIV	Human immunodeficiency virus
ICF	Intensified case finding
IPC	Infection prevention and control
KAPTLD	Kenya Association for Private practitioners in TB and Lung Disease
LMIS	Logistic Management Information System
NGO	Non-governmental organization
NLTP	National Leprosy / Tuberculosis Program
PAL	Practical Approach to Lung he
PPM	Public-Private Mix
TB	Tuberculosis
WHO	World Health Organization

ABSTRACT

Tuberculosis has re-emerged as a major public health problem in the world. World Health Organization estimate that a third of the world's population is infected with tubercle bacillus with about nine million people progressing to active tuberculosis disease each year, two million of whom die of Tuberculosis disease. The main objective of this study is to establish the roles played by Community Health Volunteers in tuberculosis care, prevention and control in Bungoma County. It looks at their roles in the implementation of community based –Directly observed treatment short courses (Community based-Directly observed treatment short courses). Another area is defaulter identification and initiation of tracing and retrieving of patients, contact tracing and screening of all smear positive contacts and referral of suspect to health facility. The study also looked at Heath education given to the community through effective communication as part of advocacy, communication and social mobilization. The other area the researcher looked into is observation of patient take their medication (Directly observed therapy), referral and linkage of clients to facility and community, and documentation of tuberculosis information in the community tuberculosis tools. The study was undertaken in Bungoma County which has 240 community units with approximate 2400 community health volunteers. The study design included developing a questionnaire that administered after a population frame had been determined through cluster sampling method to get required sample size. The study was descriptive cross sectional. Data was collected using a structured questionnaire and was analyzed using computer data base SPSS, chi-square and presented using texts, pie charts, tables. The results helped to find out the roles played by Community Health Volunteers in implementation of community based directly observed treatment short courses indicating areas of success, failures, and challenges encountered. It provided a conclusion and recommendation that will be used to improve the services to the people of Bungoma.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

World Health Organization 2011 defines community health workers as the Community Own Resource Persons (CORPs). They are volunteers that provide services at the household level that include a community-based information system, dialogue based on information, health promotion, disease prevention, simple curative care using drugs supplied through a revolving fund generated from users, and a referral system established by local health committees. They are elected by their own communities, with guiding criteria from Ministry of health. Even though community own resource persons is nominated by the communities, the criteria for selection can be jointly agreed between the community and the health system. These could include ability to read and write, being a permanent resident of the community, and having demonstrated attitudes valued by the community. When asked about a single intervention that would do the most to improve the health of those living on less than \$1 a day, Paul Farmer, the founding director of Partners In Health (PIH) said, “Hire community health workers to serve them. In my experience in the rural reaches of Africa and Haiti, and among the urban poor too, the problem with so many funded health programs is that they never go the extra mile: resources (money, people, plans, services) get hung up in cities and town. If we train village health workers, and make sure they’re compensated, then the resources intended for the world’s poorest – from vaccines, to bed nets, to prenatal care, and to care for chronic diseases like AIDS and tuberculosis – would reach the intended beneficiaries. Training and paying village health workers also creates jobs among the very poorest”.

Raj and Mabelle Arole, founders of the Comprehensive Rural Health Project in Jamkhed, Maharashtra, India expressed similarly strong opinions concerning the necessity of community health workers (CHWs). They believe that not only community Health workers remove the problem of the last mile, but that they could also provide prevention, which is a significant, yet overlooked aspect of healthcare. The New York Times columnist Tina Rosenberg writes about the roles that “They decided that doctors were not the way to help rural villages. The vast majority of sickness in rural areas could be prevented with clean water, waste-disposal systems and more diverse farming. Villages need to end deadly superstitions about health. They need to

end discrimination against women and Untouchables, and to learn about hand-washing, nutrition, breast-feeding and simple home remedies. Doctors do none of these things.”_In this view, Community Health Volunteers are not merely a lesser substitute for doctors, but rather crucial adjuncts (Tina et al 2013).

CHVs can assume a wide variety of roles in healthcare. Just as surgical task shifting provides low cost yet effective surgical care in the absence of surgeons, community health workers help the poor overcome barriers to accessing effective healthcare in the absence of physicians and nurses (Raj et al 2013). Anybody can be trained as community health workers due to the versatility of this profession. For example, even patients themselves are often trained as community health educators in order to educate their peers regarding healthcare issues. In developing countries, Community Health Volunteers can contribute to increased access to the formal healthcare system or improved patient adherence to treatment regimens, among numerous other roles.

In the United States Of America Corporation for National and community services in 2014, the American continued to strengthen their communities through volunteering (Jose et al 2014). One in four adults (25.4%) volunteered through organization, demonstrating that volunteering remains an important activity for millions of Americana (Bevan 2014). Quarter of Volunteers work in health related organization that include tuberculosis care.

In sub-Saharan Africa, the model for primary care at the level closest to the community includes one or two community health workers per population of 1000-5000 people. These Community Health Volunteers are trained to provide basic medical and preventive care. According to Berman et al. (1987), community health workers (CHWs) are “local inhabitants given a limited amount of training to provide specific basic health and nutrition services to the members of their surrounding communities. They are expected to remain in their home village or neighborhood and usually work part-time as health workers. They may be volunteers or receive a salary. They are generally not, however, civil servants or professional employees of the Ministry of Health.” Berman et al. (1987), also note that, [in South Africa] in 2004, the term community health worker was introduced as an umbrella concept for all the community/lay workers in the health sector, and a national Community Health Workers Policy framework was adopted.” Community Health Workers were initially promoted in the 1978 Alma Ata Declaration on Primary Health

Care and were integrated into many countries' health systems. However, due to inappropriate top-down implementation, the Community Health Workers programs failed and ultimately diminished during the 1980s and 1990s. In the late 1990s and early 2000s, Community Health workers reemerged as a valuable health resource to face the epidemics of malaria, tuberculosis (TB), and HIV/AIDS, and are now being used for a wide variety of health conditions in both the developing and developed worlds.

In Kenya, according to Kenya Essential Package for Health (KEPH), communities are the foundation of affordable, equitable and effective health care, and are the core of the in the second National Health Sector Strategic Plan 2010 -2015 (NHSSP III). This strategy document sets out the approach to be taken to ensure that Kenyan communities have the capacity and motivation to take up their essential role in health care delivery. The overall goal of the community strategy is to enhance community access to health care in order to improve productivity and thus reduce poverty, hunger, TB and HIV/AIDS care, and child and maternal deaths, as well as improve education performance across all the stages of the life cycle. This is accomplished by establishing sustainable community level services aimed at promoting dignified livelihoods throughout the country through the decentralization of services and accountability. Community Health Volunteers provide level one service where it refers to the entire community-based component of the Kenya Essential Package for Health.

Tuberculosis has re-emerged as a major public health problem in the world (International journal for Tuberculosis and lung diseases 2010). WHO estimates that a third of the world's population is infected with the tubercle bacillus with about nine million people progressing to active disease each year, two million of whom die of Tb disease,(WHO publication 2010). Increased case notification of 190% in Tanzania and 290% in Malawi demonstrate the burden that Hiv infection is exerting on African Tuberculosis control programs (Global Tuberculosis program me 1996). The potential coping capacity may lie within affected communities but the capacity needs to be harnessed if tuberculosis is to be controlled (Wilkenson et al). An example, since 1991 all patients with tuberculosis in Hlabisha health district, South Africa have been eligible for community based directly observed therapy (DOT). Patients are supervised either by a health worker (HCW) in a village clinic, or in the community by community health Volunteers (CHV) .or a volunteer lay person (VLP). Tuberculosis incidences increased from 312 in 1991 to 1250

cases in 1996 (Gerraint et al). Limited government resources to screen and monitor disease progression of Tb in developing world countries hamper the eradication of the disease. In response the government in partnership with World Health Organization has introduced community based directly observed treatment, short-course (CB-DOTS) through the community units under community strategy program. Other factors have contributed to this large Tb disease burden include poverty and social deprivation that has to a mushrooming of peri-urban slums, congestion in prisons and limited access to general health care services (Division of Leprosy, Tuberculosis and Lung Diseases 2014). Kenya is 15th among the 22 high Tb burdened countries in the world (WHO publication 2014). DOTS started in 1993 in Machakos district, achieved 100% countrywide coverage in 1997 (National Tb programmed 2003). Estimated 40-60% of all patients have HIV infection in 2014; the country notified 88000 cases according to Division of Leprosy, Tuberculosis and Lung diseases (DLTLD). Additionally there have been increasing concerns about the emergence of drug resistant Tb, a threat that would pose major challenge in the fight against TB in the resource limited country. The role of the community in the control of tuberculosis is through National community strategy programme which has been rolled out throughout the country. It involve formation of community unit comprising of community own resource persons, Community Health Extension Workers (CHEW) and Community Health Volunteers (CHVS).

In Bungoma County in year 2014 tuberculosis notification was 1863 cases and a total of 5 multiple drug resistance Tuberculosis (MDR Tb) cases were notified (National TB program report). If tuberculosis control programs are to be successful in the face of a massively increased caseload, resource outside of the hospital will need be effectively harnessed(Bayer Wilkinson 1995).. All this calls for community participation. There are a total of 316 community unit under community strategy with a total of 3757 Community volunteers, 251 Community Health Extension Workers and 2340 Community Health Committees covering a population 1.68 million people (census 2009) in Bungoma County. This study will seek to assess community involvement in Tb control and care. The study will also try finding out the success, failures, challenges, and strength weaknesses. Opportunities and strength, of CBDOTS. The researcher will try to formulate recommendation based on the study, to extend Tb care to the community by improving access, identify suitable community treatment supporters in consultation with the community, recommend effective referral system, ensure effective method of community

recording and reporting, supply of anti-TB drugs, recommend appropriate standardized indicators to be reported by the CHVS, ensure adequate financing, and other recommendation the will improve efficiency.

1.2 Statement of the Problem

Little is known of the actual proportion of contribution of community Health Volunteers (CHV) in Kenya. In one of the study by Jane Ong'ango et al compared "The effects on Tuberculosis Adherence from utilizing community Health Workers: A Comparison of selected Rural and Urban settings in Kenya. The result of this study concluded that "utilization of CHV enhanced TB treatment adherence and the best effects were in the urban set up. In as much as TB is a chronic and highly infectious disease, it is both preventable and treatable. TB remains a public health challenge in Kenya and in the world as it kills one person every 20 seconds according to the publication of advocacy to control TB international (ACTION), 2008 and global health advocates 2010. Approximately 200 people die of TB infection daily in Kenya, a country ranked 15th out of 22 by the WHO, among the high burden countries. The problem is further compounded by the HIV infection as 44% of all TB cases are HIV positive (DLTLD report – 2015).

By 2014 December a total of 1500 cases had been diagnosed with Multiple drug resistance Tuberculosis (MDR) and 3 with Extra Drug Resistance (XDR) TB (DTLD report2014). In Bungoma new cases notified in 2014 were1863 notified with a case detection rate of 80% (WHO 2013). ..What this means there 20% of infectious cases in community fuelling the spread of Tb. This calls for concerted efforts by all stakeholders to put all their efforts and resources to fight the spread of tuberculosis in the community. Therefore the researcher endeavors to find the contribution of the community members in providing care to affected members of the society, prevention undertaken by them and any other control measures. To make things worse there is an increase in the number of multiple drug resistance Tb in Bungoma, (5 MDR cases) in 2014 alone according to NLTP reports 2014. In 2013 the number of Tb patient notified referred by CHW were 12 and number of defaulter traced by CHW at the same time were 10 which is very low.

At the same time in 2013, 762 Tb patients died of tuberculosis, which is 9.2% of all registered patients within two months of starting treatment (NLTP report2014). This means there is delay in seeking health care among the people in the community. This study will try to find out the role of CHV in Tb care in the community.

1.3 Purpose of the Study

This study intends to investigate the influence of community Health volunteers in the implementation of community based Tuberculosis care, in Kenya, Bungoma County.

1.4 Research Objectives

- i. To determine the extent to which awareness creation influence implementation of community based tuberculosis care in Bungoma County.
- ii. To establish how access to direct observation of treatment influence implementation of community based tuberculosis care in Bungoma County.
- iii. To determine the extent to which defaulter tracing and contact screening influence implementation of community based tuberculosis care in Bungoma County.
- iv. To determine the extent to which trainings influence implementation of community based tuberculosis care in Bungoma County.

1.5 Research Questions

- i. How does awareness creation influence implementation of community based tuberculosis care in Bungoma County?
- ii. How does direct observation of treatment influence implementation of community based tuberculosis care in Bungoma County?
- iii. What is the extent to which defaulter tracing and contact screening influence implementation of community based tuberculosis in Bungoma County?
- iv. . How does trainings influence implementation of Community based tuberculosis Bungoma County?

1.6 Significance of the Study

The research will help establish the role played by Community Health Volunteers (CHV) in Tb care, control and prevention. In this particular research, the study intends to establish the contribution of community Health Volunteers in carrying out awareness creation especially in terms of reducing stigma and myths associated with tuberculosis disease. The research will also look at the roles played by CHVs in the provision of

directly observed treatment, defaulter tracing and contact tracing, collection, documentation, reporting and use of data in decision making in the community. It will help the researcher come up with policies and guidelines on CBDOTS. It will also help in giving direction on achievement, success of the program and at the challenges objectively.

1.7 Basic assumption of the Study

It is assumed that during the study the community units will be still functional, there will be enough time to carry out the study, analyses and present to the board of examiners. It is assumed the weather will be favorable during collection of data; there will be enough capital and enough CHVS to sample from. Also assumed is that all CHV will possess basic education and speaks English. It is assumed there will be some data kept in the link facilities.

1.8 Limitation of the Study

The scope of questionnaire as the only research technique has limitations. For example the answers have to be accepted as final and there is no opportunity to probe beyond the given answer or clarity ambiguous answers. The participants will have to see all items before responding to any one of them, this means that the various answers cannot be regarded as independent. There may be little time to carry out the study. Lack of money may be a constraint and poor command of English language among Community Health Volunteers may be a challenge. Implementations of the study results may be challenging as some of the recommendations will require finances.

1.9 Delimitation of Study

The scope of the study will be limited geographically because it is accessible to Bungoma County of Kenya. The concern is on the influence of community Health Volunteers on implementation of community tuberculosis care. The content of this study will be limited to the influence of community health volunteers, Community health committee's members and Community health extension workers. Finally this study will be limited in time to six months from January 2016 to June 2016.

1.10 Definition of significant terms.

The following terms will be used in this study to mean:

- **Community health volunteers**

In this study, this will refer to community own resources persons identified by the community and trained and supported by Community Health Extension Workers (CHEW).

- **Community based directly observed therapy**

We refer to care given to Tuberculosis patient or suspect at level one service by either by treatment supporters who are usually temporary volunteers e.g Household members, community volunteers, Neighbors, Friends, workmate e.t.c. CHEWS and CHW, organized community health groups e.g. NGO/FBO/CBO.

- **Awareness creation**

In this study, this refer to information, education and messages communicated to members of the public with the aim to bring about behavior change.

- **Defaulter**

Has been operationalised to mean any Tuberculosis patient who misses scheduled appointment twice during the intensive phase or misses second month's scheduled appointment is considered a defaulter.

- **Defaulter tracing**

Will refer to the process of identifying, locating and retrieving patients who have stopped collecting/taking Tb medication against medical advice.

- **Contact screening.**

Has be operationalised to mean those person who are in constant contact with smear positive tuberculosis patient

- **Documentation**

Is the information collected and reported by CHV.

- **Training;**

Will refer to the knowledge and skills taught to the Community Health Volunteers, Community Health workers and Community Health Committees members.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter the researcher will define the problem, and cover the background information of the work of the community health volunteers in delivering tuberculosis care. The researcher will review similar studies in developed countries, African region, Kenya and Bungoma County if any. The areas to be covered include increasing community awareness, access to drugs and direct observation of treatment, defaulter tracing and contact tracing, and trainings: and the influence on implementation community tuberculosis care.. Finally a conceptual framework explained and summary written.

2.2. Increasing awareness creation as an influence in implementation of community tuberculosis care.

According to Barger M.A 2011 the common symptom of TB (cough and fever) are non specific, overlapping with those other common endemic diseases such respiratory infection. TB is also often perceived as chronic, incurable disease. Raising awareness of signs and symptoms of the disease and the availability and benefits of treatment has been successfully been done by members of the community through formal and informal arrangements. These include Village elders, School teachers, CHVs, religious leaders, trade unions, and women organizations. A strategy in which knowledge of leprosy was passed through school children to illiterate parents in India may also be applicable to tuberculosis (Stone et al 2005). Mr. Stone observed that success was most apparent where the mass media complemented the messages given by community members. These examples indicate that TB control programs could take advantages existing community resources to enhance community knowledge of TB.

First it is possible to build capacity at village level to manage community based activities effectively. Communities can be organized into functional units such as villages or sub locations that are linked to or part of legal structures of the country, for effective action of health. Health Committees and resource persons elected by these structures can be trained for effective action for health in the village level. These structures work best when linked to administrative structure as well as health facilities catchment areas, and when they are in control of tangible decision,

guided by clear guidelines defining their roles. Second the CHVs as volunteers can provide services at household level that include a community- based information system, dialogue based on information, health promotion, disease prevention, simple curative care using drugs supplied through a revolving funds generated from the users, and referral system established by local health committees.(Kidane and Murrow). In another study by Jayashree S, Gothankar published by international journal for preventive medicine on: Tuberculosis Awareness Program and Associated Changes in Knowledge Levels of School Students. This school-based interventional study was done on 135 secondary school students. They were randomly selected infield practice area of Urban Health Training Center (UHTC) of a private medical college in Pune city. Health awareness session on tuberculosis was conducted by using various visual and audiovisual aids by the medical college undergraduate students. A pre-test and post-Performa was filled before and after the session. Paired t-test was used to assess the effectiveness of awareness program. The results are shown in the Table below;

Number of school students who gave correct responses ($n=138$) Only 58% of students in pre-test and 89% students in post-test answered correctly about correct modes of transmission of tuberculosis. Tuberculosis being an airborne disease is transmitted effectively in overcrowded and poorly-ventilated households. In current study, in pre-test, only 64% students agreed to the statement that tuberculosis spreads rapidly in overcrowded and ill-ventilated houses while 93% students agreed to the above statement in post-test. In conclusion, although school students were well informed initially about tuberculosis, health education sessions by medical students using various visual and audiovisual aids helped significantly to improve knowledge of school students regarding tuberculosis. Both medical students and school students participated enthusiastically in this health awareness program. This activity helped medical students to acquire following skills related to communication; working in a team i.e. team work, preparation and presentation of various visual aids for health awareness program, co-ordination with district tuberculosis unit. They also gained knowledge of research methodology etc.

Table 2. 1: Tuberculosis awareness program and study done on 135 secondary school students..

Topic	Pre-test (%)	Post-test (%)
Causative agent of tuberculosis	66 (48.88)	118 (87.40)
Modes of transmission	78 (57.77)	120 (88.88)
Role of environmental factors in spread of tuberculosis	87 (64.44)	126 (93.33)
Common symptoms of tuberculosis	100 (74.07)	122 (90.37)
Diagnosis of tuberculosis	34 (25.18)	72 (53.33)
Whether complete cure possible	109 (80.74)	131 (97.03)
Availability of free treatment	99 (73.33)	122 (90.37)
Place of free treatment	84 (62.22)	109 (80.74)
Meaning of DOTS	27 (20)	83 (61.48)
Duration of treatment under DOTS	58 (42.96)	132 (97.77)
Ways of prevention of spread of tuberculosis	41 (30.37)	105 (77.77)
Vaccine for tuberculosis	84 (62.22)	132 (97.77)

SOURCCE: AUTHOR 2015

Thus, medical college students can be involved to some extent for conducting health-related behavioral change communication (BCC) activities in schools during their community medicine morning posting. Collaboration of private medical colleges, schools, and district tuberculosis units can be ideally achieved under Public Private Partnership (PPP) for health awareness programs. It is important to note that awareness campaign alone however well disseminated.

Will only have a positive impact if diagnosis is available, treatment is accessible and there are no other barriers preventing people from receiving treatment (Wali et al 2012)

There are many people with TB who do not go for treatment (D.Maher 2011). Community based care may help control program achieving high cure rates and making progress towards WHO target of 85% case detection. D. Maher in his studies found out that an ongoing process, unlike mass screening, community based surveillance has been found to be sustainable, the key being that CHV know their people. In programs achieving high cure rate, once suspected cases have been identified, CHV can continue their involvement in referring TB suspect for diagnosis, delivering sputum specimens to health facility and collecting results.

In Mali d. Maher found out that surveillance has been successfully combined with distribution of curative drugs, stool collection, and health education in guinea worm programs, costs were estimated to be \$100- 200 per village per year. Case detection is a vital element of TB control programs (WHO publication 2008). These examples illustrate the possibility of combining surveillance activities with other diseases control efforts and involving community workers in a multi-activity role. It is important to clearly define the roles of CHV in each setting. The effectiveness of community health services and community health volunteers has been shown in a number of studies and projects. In Demographic Republic of Congo (CHV), were found to be effective in administering timely and effective case detection and referral of presumptive tuberculosis cases (Kidane and Murrow, 2000). Since CHVs are also local community members, they are, in principle, always accessible to the villagers.

In another study in The Gambia by C. Lienhardt et al indicated the following: One of the main objectives of tuberculosis control is to reduce tuberculosis transmission in the community through early detection of smear-positive pulmonary tuberculosis (TB) cases and rapid administration of a full course of treatment.1. As active case-detection is difficult on a large scale and requires the investment of extensive human and financial resources for a relatively Poor yield of cases, most TB control programmes in developing countries use passive Case finding, relying on suspect TB cases to present to health services. 2. Delays in diagnosis and start of effective treatment increase morbidity and mortality from TB as well as the risk of transmission in the community. 3. Delays in diagnosis of TB have been reported in both industrialized and developing countries and vary considerably, from 6.2 weeks in Australia 5 to

12 weeks in Botswana⁶ and 16 weeks in Ghana (IUALTD 2001). A number of factors have been identified that appear to influence delay in diagnosis and start of treatment. These include the individual's perception of disease, the severity of the disease, access to health services, and the expertise of the health personnel.

Operational research directed at increasing our knowledge of the factors affecting delay to treatment has an important role to play in improving the quality and effectiveness of national TB programmes. In the paper, presented by C. Lienhardt et al, Medical research council laboratories, Faraja, Banjua, The Gambia, London School of Hygiene and Tropical medicine Residence program University of Toronto Canada data from a study investigating the factors affecting the time period between the onset of symptoms and the initiation of treatment in adult TB patients in The Gambia, a country with a well established, decentralized TB control programme and low human immunodeficiency virus (HIV) prevalence. The study was part of a series of collaborative projects between the Gambian Department of State for Health and the UK Medical Research Council (MRC), directed at improving TB control and treatment in The Gambia The were shown below:

Table 2.2: Distribution of various time delays among 152 smear positive pulmonary TB patients in The Gambia.

Delay	Mean(weeks)	Median(wks)	Inter quartile range
Patient delay	0.7	0.3	0.14 – 1.0
Health provider delay	10.6	8.3	4.2 - 13.4
Total delay to treatment	11.5	8.6	5 - 17

SOURCE: AUTHOR 2015

The total delay to treatment observed in this study was shorter than the delays reported in other studies in adults in sub-Saharan Africa (12 weeks in Botswana, 6 16 weeks in Ghana,⁷ 16–20 weeks in Kenya¹¹). This could be related to the method of estimating the time from onset of symptoms to initiation of treatment, but could also reveal a true difference in delay to diagnosis and treatment.

Finally a study had done by Mutinda et al about Health seeking behavior practices of Tb patient and access to health care among Tb patients in Machakos County, Kenya.

Table 2. 3: represents access to healthcare by Tb patients n=316

ACCESS	YES	NO	OTHERS
1. Received prescribed drugs	87.7 (n=277)	11.4 (36)	0.9 (0.3%)
2. Received free services in Public health facilities.	89.9 (n=284)	5.3 (n=17)	–
3. Assistance in taking drugs by Health workers in the community	–	71.6% (n=224)	28.4% (n=92)
4. Received Health education on Tb from health workers	52.8% (n=149)	47.2% (n=149)	–
5. Family members support in Tb treatment	74.8% (n=238)	24.8% (n=78)	0.4 (n=1)
6. Existence of Tb patient support group	11,4% (n=36)	86.7% (n=274)	1.9% (n=6)

SOURCE; AUTHOR 2015.

Delay to seek formal health care in designated health facilities is due to fear of stigma that is associated with TB. This resulted to delay in diagnosis, initiation of early treatment and advancement of the disease process. There is secrecy to disclosure of TB status and the TB patients were forced by poverty to disclose to a family member who could assist, keeping the rest in the dark. As a result the TB patients continue to spread the infection to contacts and the unsuspecting family members' majority who offer care to their kin with no knowledge of the illness. As a control measure, this study recommend the Ministry of Health to initiate behavioral change communication strategies to educate the communities on clinical presentation ,the need for early diagnosis, treatment adherence and curability of TB. Further to initiate mandatory surveillance and TB patient treatment supervision by health workers in communities to stop transmission of TB.

2.3 Access to direct observation of treatment influence implementation of community based tuberculosis care.

Barger (2013) in his researcher on community involvement says, all programs including successful TB control, require an uninterrupted drug supply. Many health programs name

irregular drug supply as the main reason why patients are unable to complete treatment. The distribution of curative medication has been found to be the most acceptable, effective and sustainable function of the CHVS provided the supplies are adequate (Wali et al 2012). It was seen to empower the community by providing access to treatment, to enhance the status of CHVS and to address the true needs of the community. Community attaches a higher value to those who give palliative and curative and lower value to CHVS who give preventive and promotive care. M. Hadlkey gave the following lessons from community TB. Programs are dependent on good drugs supplies at central stores down to sub counties and health centre level. Communication between drug distributors and stores is essential. Programs planned by communities are more likely to be sustainable than those planned by health care professional , the higher the success of the programme, provided that basic supervision is built into program implementation. Home visits for drugs delivery, while apparently very convenient, are not always welcome by the patient with stigmatized disease such as tuberculosis. Community members are able to evaluate the appropriate of house to versus central distribution and change their strategy accordingly as shown in the table below: It shows the number of studies on cost-effectiveness of TB control by topic and region, 1980 – 2004. Community members are able to evaluate the appropriate of house to house versus central distribution and change their strategy accordingly as shown in the table below indicate the number of studies on the cost-effectiveness of Tb control by topic and region, 1980-2004.

Table 2.4: Shows number of studies on cost effectiveness of tuberculosis control by topic and region 1980 – 2004.

INTERVENTION	EAST-ASIA AND PACIFIC	EUROPE AND CENTRAL ASIA	LATIN AMERICA AND THE CARIBBEAN	MIDDLE EAST AND NORTH AFRICA	SOUTH ASIA	SUB-SAHARAN AFRICA	WORLD TOTAL	NUMBER OF STUDIES CONSIDERED FOR TRANSMISSION
BCG vaccination	1	0	0	0	0	0	1	0
TLTI	0	0	0	0	0	3	3	3
Treatment of active disease: the DOTS strategy	4	2	0	1	0	2	9	4
Variations on DOTS:								
Management of drug-resistant disease	0	0	1	0			1	1
Treatment of HIV co-infection	0	0	0	0			1	1

SOURCE: AUTHOR 2015

Three times weekly to a health centre for observation. Walt Perara 2010, this can result to an economic burden to the family and considerable social cost to the patient. Organized community groups, peer groups, chosen members of the community and family members, all have the potential to act as supervisors to ensure completion of treatment and cure.

Decentralizing tuberculosis control measures beyond Health facilities by harnessing the contribution of the community could increase access to effective tuberculosis care (M. Hadley 2000). Barriers to successful tuberculosis control stem from biomedical, social, and political factors. Lessons to be learned will be relevant in the issues of limited awareness of tuberculosis, limited access to care stigma and motivation to continue with treatment. The roles of CHVS will be determined by the work they do in the community.

In a study in the United states of America by Patrick K.Moonan et al (2015), found that Universal DOT by community Volunteers for tuberculosis is associated with decrease in acquisition and transmission of resistant tuberculosis’

These data suggest resistance is less likely to develop and be transmitted when persons with tuberculosis are managed with universal DOT as compared to selective DOT. This provides additional support for recommending management of patients with universal DOT as the best strategy for preventing the development and transmission of drug-resistant tuberculosis.

In a study in Hlabisa in South Africa show that incidences of tuberculosis in Africa is increasing dramatically and fragile health systems are struggling to cope (Wilkinson et al 2010). Potential coping capacity may lie within affected communities but this capacity needs to be harnessed if tuberculosis is to be controlled (Wilkinson et al 2010). Since 1991 all patients with tuberculosis in Hlabisa health district, South Africa have been eligible for community-based directly observed therapy (DOT). Patients are supervised either by a health worker (HW) in a village clinic, or in the community by a community health worker (CHW) or a volunteer lay person (VLP). Tuberculosis incidence increased from 312 cases in 1991 to 1250 cases in 1996. By December 1995, 2622 (87%) of 3006 patients had received DOT, supervised mainly by VLP (56%) but also by HW (28%) and CHW (16%). The proportion supervised by HW fell from 46% in 1991 to 26% in 1995 ($P = 0.0001$). More patients supervised by VLP (85%) and CHW (88%) than by HW (79%, $P = 0.0008$) completed treatment. Case-holding by HW declined more between 1991 and 1995 (84% to 71%, $P = 0.02$) than did case-holding by both CHW (95% to 90%, $P = 0.7$) and VLP (88% to 84%, $P = 0.4$). Mortality was similar (4–6%) and stable over time, irrespective of the supervisor. High tuberculosis treatment completion rates are achievable and sustainable for several years in resource-poor settings despite a massively increased case load if community resources are harnessed. Patients may be more effectively supervised by voluntary lay people than by health workers under these circumstances, without being placed at increased risk. These findings by David Wilkinson in Hlabisa South Africa suggest that community supervisors may be an essential component of any DOT strategy.

Increased case notifications of 190% in Tanzania and 290% in Malawi demonstrate the burden that HIV infection is exerting on African tuberculosis control programs (Global Tuberculosis Programme 1996). As well as the HIV epidemic, population growth, widespread poverty, and ineffective control programs contribute to the growing epidemic of tuberculosis in Africa. South Africa is suffering an explosive HIV epidemic (McIntyre 1996; US Bureau of the Census 1996); for Tropical Medicine and International Health volume 2. Although tuberculosis need not be treated in hospital (Bayer & Wilkinson 1995), the few successful African control programs

typically rely on an initial 2-month hospital stay to ensure treatment adherence (Graf 1994). If tuberculosis control programs are to be successful in the face of a massively increased caseload, resources outside of the hospital will need to be effectively harnessed. This was shown in study in Hlabisa Kwazulu/natal, South Africa, where successful use of voluntary lay people and community health workers in the delivery of community-based DOT in Africa (Bayer et al 2010).

Table 2.5. Shows direct observation of treatment in kwazulu Natal S.A

NO. OF PATIENTS (%) PER YEAR	1991	1992	1993	1994	1995	
TOTAL						
Management Ward	50(22)	101(17)	65(9)	67(10)	101(12)	384(13)
DOT	175(78)	486(83)	628(91)	614(90)	719(88)	622(87)
Total	225(100)	587(100)	693(100)	681(100)	820(100)	3006(100)
Supervisors of DOT patients:						
HW	80(46)	154(21)	172(28)	142(23)	184(25)	732(28)
CHW	20(11)	56(12)	110(17)	126(21)	114(16)	426(16)
VLP	75(43)	276(57)	346(55)	346(56)	421(59)	1464(56)

SORCE: AUTHOR 2015

. Table 2.6. Management of 3006 patients with tuberculosis between 1991 and 1995.

Number of surviving patients (%) completing treatment/year.

Supervisor	1991	1992	1993	1994	1995	Totals
HW	63 (84)	128 (90)	129 (82)	99 (72)	125 (71)	544 (79).
CHW	19 (95)	45 (88)	97 (94)	95 (80)	93 (90)	349 (88)
VLP						63

. The issue of community involvement in public Health approaches and in the delivery of health to the people is not new. Already 36 years ago, the “ALMA-ATA” declaration on 6th to 12th September 1978, the importance of full and organized community participation and ultimate self-

reliance with individual, family and community assuming more representation for their own health. Despite this vision, not much has happened in the delivery of Tb care and control with regards to community engagements'. WHO came up with Stop Tb strategy, designed to support health policy makers and patient, groups and local partners including community involvement activities in national strategic plans to control Tb.(WHO publication 2008)

The political commitment and community involvement are powerfully sustained by using advocacy, communication and social mobilization. For the above to succeed the following recommendation by WHO is necessary?

Policy guidance, initial implementation and scale up; advocacy and communication Capacity building; addressing special challenges in controlling Tb; ensuring quality of services provided at the community level; budgeting and financing; establishing a plan for monitoring, evaluation and supervision; operational research

A study done by CDC/WHO found out in sub-Saharan Africa the role of CHW and community volunteer has improved care for Tb care in awareness raising, behavior change and community mobilization. It has also reduced stigma and discrimination, helped in screening and testing for Tb and Tb related morbidity (e.g Hiv counseling and testing).It has facilitated access to diagnostic services (e.g sputum or specimen collection and transport); initiation and provision of preventive measures. The referral of community members for diagnosis of Tb and related illness, treatment initiation, provision and observation for Tb and co-morbidity has been done by community members. Other services offered by CHV include treatment adherence support through peer groups, education and individual follow-up. The home based palliative care for Tb and related illness together with community led local advocacy activities have successfully implemented (Getahun et al).

Another study was done in Senegal on expansion of CB-DOTS, found that establishment of "CORE GROUP" helped to expand the program and here some the recommendations:

To follow recommended protocol for infection control in the community eg proper ventilation can help reduce concentration of bacilli in the room.

People living with HIV/AIDS are dangerously vulnerable to Tb infection and train staff and volunteers on Tuberculosis care (Francis Curry, 2007).

Community contributions to TB case notifications and treatment adherence support for patients (all forms) in 22 countries, 2012–2013.

Countries contribution to tb notifications, 2013 contribution to treatment adherence support, 2012 cohort proportion of total tb notifications (all forms) from community referrals in 2013, in basic management units (bmus) that reported data (%) geographic coverage of data reporting by basic management units (bmus) proportion of tb patients (all forms) who received treatment adherence support in the community in 2012, in basic management units (bmus) that reported data (%) geographic coverage of data reporting by basic management units (bmus).

Table 2.7: Geographical coverage of DOTs by countries

COUNTRIES	Proportion of total Tb notifications (All forms) from community referrals In 203, in Basic management units (BMUS) That reported data (%)	Geographical coverage. Proportion of data .Reporting by basic management units (BMUS)
Bangladesh	44% (71784/163106)	476/850 BMUs Not available
Botswana	49% (3439/6958)	All BMUs (28) 51% (3900/7576) All BMUs (28)
Burkina Faso	9% (484/5326)	64/86 BMUs 19% (935/5023) 30/86 BMUs
Côte d'Ivoire	11% (2123/19895)	61/82 BMUs 7% (1656/22822) 22/82 BMUs
DR Congo	30% (3527/11636)	104/515 BMUs Not available
Ethiopia	11% (5443/51296)	278/921 BMUs 16% (7097/45449) 54/921 BMUs
Ghana	2% (336/15606)	All BMUs (216) Not available
Guinea	12% (1307/11313)	All BMUs 25% (1667/6566) 20/55 BMUs
India	5% (22422/423824)	1200/3000 BMUs 57% (735822/1288141) 2732/3000 BMU
Indonesia	42% (33170/78960)	43/497 BMUs 1% (4244/328824) 43/497 BMUs
Kenya	4% (3263/89796)	All BMUs (225) 1% (885/98443) All BMUs (225)
Malawi	5% (438/9690)	84/167 BMUs Not available
Mozambique	11% (5656/53272)	All BMUs (641) 26% (5510/20951) Not available
Myanmar	1% (1613/142162)	All BMUs (347) Not available
Nigeria	Not available	34% (30484/90305) All BMUs (774)
Rwanda	19% (1154/5980)	All BMUs (199) 42% (2460/5888) All BMUs (199)
Senegal	9% (1162/13464)	All BMUs (76) 5% (671/12339) All BMUs (76)
Sierra Leone	25% (3038/12334)	All BMUs (170) 6% (486/8230) All BMUs (170)
South Africa	6% (495/7943) 2/52	BMUs Not available
Sri Lanka	Not available	10% (835/8752) All BMUs (26)
Swaziland	Not available	100% (7162/7162) All BMUs (82)
UR Tanzaniab	15% (3700/25463)	47/168 BMUs 35% (21579/62477) 47/168 BMU

Data reported in the 2014 round of global TB data collection could not be compared with data reported in 2013, since the unit of reporting in 2013 was the lowest administrative unit rather than the BMU. b The proportion of patients receiving treatment support in the community was calculated using the total cohort (all BMUs) of TB patients starting treatment in 2012 as the denominator. Data disaggregated by BMU were not reported. c The denominator includes new and relapse TB cases only. Countries, data were incomplete and difficult to interpret and for this reason are not comparable.

2.4 Defaulter tracing and contact screening influence on implementation of community tuberculosis care.

A recent analysis of global tuberculosis (TB) case notification data estimated that only 27% of new smear positive cases that arose in 2000 were detected by the current recommended strategy (DOTS) and only 19% were successfully treated (Mercedes et al). These results suggest that while good TB treatment success rates have been achieved under DOTS, low case detection rates remain an obstacle to the long-term success of TB control programs. Current World Health Organization policy emphasizes passive case finding in contrast with the identification of cases through screening by CHV. This strategy has been based on the expectation that passive detection of individuals ill enough to seek medical care is far more cost-effective than population-based screening by CHVs and compliance was higher in those who have identified themselves as symptomatic (Iliana F. Pachao 2010). Nonetheless, the failure of national TB programs to detect the vast majority of infectious cases suggests that active screening strategies should be reevaluated in an attempt to improve case detection and, thereby, increase access to TB treatment (Pachao 2010). Contact investigation for cases of active pulmonary TB is standard practice in developed countries (James Bayona 2011). Through this process, household and other close contacts of infectious case subjects are identified by community volunteers and tested for TB infection and disease. Several recent studies conducted in high burden areas have shown that active case finding among household contacts yields substantially more TB cases than passive case detection. Other groups have suggested that active case finding should be extended to high-risk communities at large, rather than only focus on households of case subjects (Muraya 2013). In a study, done in Northern Lima, Peru by Mercedes et al describes and evaluate a simple active case finding strategy in contacts of case subjects with active TB in a high incidence shantytown in Lima, Peru by CHVs. This is an area characterized by poor health indicators; in the year 2000, annual public health expenditure per capita in Peru was 238 U.S.

dollars (USD), average income was 130 USD, and infant mortality in Lima was 19 per 1,000 live births. Although the incidence of new TB cases was approximately 170 per 100,000 per year at the national level, rates are much higher in the densely populated shantytowns surrounding Lima; masked pockets of incidence can be as high as 340 per 100,000.¹³ He assessed active case finding in two different contact groups; the first group included individuals who were household contacts of case subjects with pulmonary TB, while the second group included residents of the case subjects' neighborhoods who may have had more causal contact with the patients. Since active case finding does not preclude self referral, they measured the prevalence of TB detected through combined active and passive case finding in comparison with passive case finding alone in both of these groups, and they also describe the risk factors associated with failure to self-refer. The result of TB prevalence detected through combined active and passive case finding among 1,094 household contacts referred by CHVs was 0.91% (914 per 100,000), much higher than with passive case finding alone (0.18%; 183 per 100,000; $p_0.02$). Among 2,258 neighbors, the combined strategy detected a TB prevalence of 0.22% (221 per 100,000) in contrast to 0.08% (80 per 100,000) detected through passive case finding alone ($p_0.25$). Risk factors for being diagnosed through active case finding in contrast with self-report included age ≥ 55 years (odds ratio [OR] 5.5; 95% confidence interval and female gender (OR 3.9; 95% CI 0.99, 22.3). James Bayona et al (2012) concluded that risk of active TB among symptomatic household contacts of active case subjects in that community was very high. Results suggested that contact screening by CHVs in such settings may be a powerful means of improving case detection rates for active TB disease.

Adherence to long-term therapies is a multidimensional phenomenon determined by the interplay of five sets of factors (dimensions) namely; social and economic factors, health care team and system-related factors, condition-related factors, therapy-related and patient-related factors. Improving treatment outcomes and designing effective interventions require understanding of the factors that prevent people from adhering and those that help in treatment completion. In Sub-Saharan Africa, several social and economic factors such as low income, lack of social support, low education, financial problems and inability to afford services have been linked to TB treatment adherence. Older age, the male sex, inadequate knowledge, ignorance on need for treatment compliance and stigma are among reported patient-related factors that influence default in the region (Muture et al). Reported health care system-related factors for default include poor service provider attitudes, negative attitude by tuberculosis patients towards the

treatment centre, running out of drugs, access to health services and living near to treatment centre. Side effects, drugs too strong, and feeling better are among therapy related factors that influence TB treatment default while HIV co-morbidity is among the condition-related factor reported. Studies on TB treatment default in Nairobi, and the country at large, have not been documented.

This study aimed to determine the duration TB patients stayed in treatment before default and the factors associated with default in Nairobi. Specifically, we evaluated the timing of treatment default among those who abandoned treatment; we examined the risk factors for treatment default; and, through interviews involving both structured and open-ended questions, we explored the health attitudes and beliefs associated with treatment default.

Table 2.8. Prevalence of tuberculosis (TB) in household contacts by smear status of index case subject

Smear status Of index case subject	Prevalence of TB in all contacts reporting cough		Prevalence of TB in contacts providing sputum sample	
	N	%	N	%
	Negative	1/3	3.2	1/19
1_	1/21	4.7	1/18	5.5
2_	1/31	3.2	1/19	5.3
3_	5/24	20.8	5/21	23.8
Total	8/107	7.5	8/77	10.4

SOURCE: AUTHOR 2015.

Active default tracing is an integral part of tuberculosis (TB) programmatic control (Ishikawa et al 2009). It can be differentiated into the tracing of defaulters (patients not seen at the clinic for > or =2 months) and 'late patients' (late for their scheduled appointments). Tracing is carried out to obtain reliable information about who has truly died, transferred out or stopped treatment, and, if possible, to persuade those who have stopped treatment to resume (Ohkado et al 2013). This is important because, unlike routine care for non-communicable diseases, TB has the potential for transmission to other members of the community, and therefore presents the issue of the rights of the individual over the rights of the community. For this reason, default or 'late patient' tracing,

has been incorporated into standard practice in most TB programmes and, in many industrialized countries, it is also a part of public health legislation (Ohkado et al 2013) in a paper published in operational training at research training Institute of Tuberculosis in Japan. In resource-poor countries with limited access to phones or e-mails, default tracing involves active home visits by CHVs. According to Kekkaku community members volunteers are used in Tuberculosis surveillance, data collection, data analysis and feedback. The role played by community members lead to improved tuberculosis outcome to 90% in Japan.

Osa-eloka et al 2010 carried a study in educational intervention with a control groups selected using multi-stage sampling techniques. A calculated sample size of 190 patients was used for each group. The instrument was a pre-tested semi-structured interviewer administered questionnaire. The results indicated awareness of contact tracing and defaulters at baseline and post intervention were respectively 18.2% and 85.2% ($X^2 = 158.4$, $DF = 1$, $p = 0.000$; $CI: 15.8-82.2$) for the study group; 18.4% and 26.0% ($X^2 = 3.31$, $DF = 1$, $p = 0.069$; $CI: -9.9-24.7$) for the control group. Knowledge that contact tracing involve bringing all household contacts of TB patients for screening was 79 (44.9%) and 33 (19.2%) for the study and control groups at baseline ($X^2 = 26.32$, $p = 0.000$; $CI: 7.2-44.1$), but 151 (85.8%) and 36(20.9%) for the same at post-intervention ($X^2 = 147.22$, $p = 0.000$; $CI: 49.3-80.1$). At baseline, only 5 (2.8%) of the study and 6(3.5%) of the control groups ($X^2 = 0.12$, $p = 0.730$; $CI: -14.2-12.8$) brought two or more contacts for screening. At post-intervention, the figure rose to 114 (64.8%) and 9 (5.2%) ($X^2 = 134.94$, $p = 0.000$; $CI: 44.3-74.9$) for the study and control groups respectively. Over 50% of the contacts brought for screening were less than 10 years; 31 (18.3%) at baseline to 138 (81.7%) post-intervention in the study group ($CI: 47.6-79.2$), and 26 (35.1%) to 38 (51.4%) for the control group ($X^2 = 12.472$, $p = 0.000$; $CI: 0.1 -32.5$) (Babatunde et al 20110). He concluded that Intensive planned health education intervention has been used to improve the contact tracing and defaulter tracing skills of the TB patients in a major TB centre in Enugu State, Nigeria

In another study in Kibera Kenya by Kery Thompson et al showed that retention of patients in long term care and adherence to treatment regimens are a constant challenge for HIV, prevention of mother to child transmission of HIV (PMTCT), and TB programmes in sub-Saharan Africa. This study described the implementation and outcomes of an active defaulter tracing system used to reduce loss to follow-up (LTFU) among HIV, PMTCT, TB, and HIV/TB co-infected patients

receiving treatment at three Médecins Sans Frontières clinics in the informal settlement of Kibera, Nairobi, Kenya. Patients are routinely contacted by a social worker via telephone, in-person visit by CHVs, or both very soon after they miss an appointment. Patient outcomes identified through 1066 tracing activities conducted between 1 April 2008 and 31 March 2009 included: 59.4% returned to the clinic, 9.0% unable to return to clinic, 6.3% died, 4.7% refused to return to clinic, 4.5% went to a different clinic, and 0.8% were hospitalized. Fifteen percent of patients identified for tracing could not be contacted. Lost to follow up (LTFU) among all HIV patients decreased from 21.2% in 2006 to 11.5% in 2009. An active defaulter tracing system is feasible in a resource poor setting, solicits feedback from patients, retains a mobile population of patients in care, and reduces LTFU among HIV, PMTCT, and TB patients.

2.5 The influence of training on implementation of community tuberculosis care

A community consists of individuals and families who live together in some form of social organization and unity (Giuliano Gargioni 2012). Communities exist in the context of a larger society that should help the personal development of each individual, recognizing that his or her dignity is the fundamental value, the society needs to respect and support. Every government has the responsibility to provide essential social services, including education and health services, to all its citizens in order to ensure that every person has a real opportunity for personal growth and development (Lana et al). However, scarce resources, poverty, malnutrition, insecurity, displacement and the global epidemics of HIV, malaria and tuberculosis pose formidable threats to the vast majority of people in the world (Chakaya et al). The experiences presented in this study show that enhancing the empowerment of people based on increased knowledge and direct involvement in decisions that influence their lives is an effective way of organizing health services Giuliano et al 2014). Global initiatives aimed at tackling development, poverty and disease express a renewed effort for global solidarity, but they can be more focused and effective if the people who are more severely affected by these conditions are involved in shaping the answers (WHO publication 2014).

.To tackle the threat of TB and of other health problems, educate communities how to take care of their health, understand and promote healthy behavior and take responsibility for providing care and support for sick people. Moreover, by being fully aware that TB is a serious transmissible but curable disease and that diagnostic and treatment services are freely available to all, people can effectively contribute to refer early to the health services every person who may have TB (Chakaya et al 2013). National health services confronted by the global threat of

the TB epidemic should not miss this opportunity. Community involvement in TB care and prevention also provides a chance to communities and civil society organizations, including patients' and activists' groups, to foster their empowerment in matters that strongly affect the common good of a society (Sean Armstrong 2013).. Health services and local communities working together can bring practical solutions that respond to the needs of people where they live. Health services can provide resources, facilities and professional expertise to complement people's efforts to take responsibility for their own health. Political commitment and community involvement are powerfully sustained by using advocacy, communication and social mobilization. Advocacy ensures political and financial commitment to place TB high on the development agenda and to involve the people affected and their communities (WHO 2014). Communication facilitates dialogue and information sharing; helping people to understand and to influence positively their health-related behavior and helping health services to better understand the personal and social aspects of health problems to provide more adequate answers (Paula et al 2010). Social mobilization refers to promoting the active the involvement of people with TB and communities in health initiatives.

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Local communities, people who are directly affected by TB and people who have had TB but have been cured should never be seen as mere passive beneficiaries of health services but as partners who can actively join the fight against the disease (Lana et al 2013). This approach must influence how interventions are designed, planned, implemented and evaluated jointly with people with TB and their communities from the very start Country experiences also show that effective involvement does not simply mean decentralizing services into the community or providing suboptimal services for poor people and should not be based on “professional” training and medicalization of laypeople. On the contrary, it means promoting people's responsibility for health through health-related education, identifying problems and establishing a dialogue on possible solutions and how to put them into effect, fostering community self-reliance and ownership of health initiative.

The following recommendations by WHO 2013 identify eight specific areas that should be considered to promote and implement the involvement of people with TB and communities in TB care and prevention and to strengthen their empowerment in health interventions: policy guidance, initial implementation and scale-up ;. advocacy and communication ; capacity-building

; addressing special challenges in controlling TB ; ensuring the quality of services provided at the community level ; budgeting and financing ; establishing a plan for monitoring, evaluation and supervision ; operational research (WHO publication 2013).

In a study published in European Respiratory Journal in 2015 titled “Towards tuberculosis elimination; an action framework for low incidence countries identified training as a major factor (Giovanni et al 2015). Central coordination under government stewardship, which can be enhanced through establishment of a national TB policy committee, should ensure the development of a national strategic plan for TB elimination embedded in national health and social sector plans, and accountability for its implementation. The central coordination should ensure that a cohesive and dedicated TB public health infrastructure is in place, which is vigilant in addressing all aspects of TB care and prevention, and ensure adequate surveillance and monitoring. The required size and capacity for a central coordination team, the need for specialized units for TB diagnosis and treatment, and the appropriate level of centralization or de-centralization of services depends on the size of the country as well as TB burden and distribution. The following functions must be fulfilled: formulation of standards and protocols and incorporation of these in the national legal and regulatory framework for health; well-functioning chains of care, with strong referral, notification and information mechanisms between primary care, hospitals and specialized services, both public and private : human resource planning, capacity strengthening, basic and continuous medical education that include the development of TB consultant networks, and targeted educational campaigns : a high-quality network of laboratory services, validated through proficiency testing and other quality control mechanisms : an uninterrupted, quality-controlled supply of drugs and diagnostics, based on forecasting; drug management capabilities, and a strategy for rational drug use (including fixed-dose combinations); and high-quality collection and analysis of data and capacity of all levels of the health system in surveillance and programmatic monitoring and evaluation (Kuut Lonnrota et al 2014)

Public health authorities should ensure that high-quality TB care and associated social protection are available for all patients regardless of ability to pay for services. There should be capacity to use the best TB tests available for all in need and to provide optimal and comprehensive treatment for all people with TB and related co morbidities (Ibrahim et al).

Political commitment is also required for essential regulatory approaches, including an infectious disease law that is effectively implemented and enforced. Specific regulations are required for vital registration, mandatory TB case notification, screening of selected risk groups, access to care for undocumented immigrants, cross-border collaboration, treatment outcome monitoring, registration, importation, and manufacturing, prescribing and dispensing of TB tests and medicines, and infection control in healthcare services and other settings

Active involvement of civil society organizations, affected vulnerable communities or patient organizations can help pursue independent efforts complementary to those of the government. The partnership effort also needs to extend into the routine practice of local health and social services, public health practitioners, researchers and the private sector. The involvement of prison health services, occupational health departments, immigration authorities and special health and social services for vulnerable groups needs to be considered. TB control in large cities may require special initiatives planned together with city health authorities(Gerrald et al 2015 London)..

In another study by C.D.C South Africa 2015 in Eastern Cape in South Africa, showed that training of Health care Workers, community Volunteers and general public lead improved tuberculosis care. Training helped the development of community based strategy to identify Tb cases and ensure early referral by CHV for screening and treatment. In addition training assisted provincial health department to integrate Tb treatment cases with HIV and other health services (International Union against Tb and lung diseases 2014). Training also provided skills to properly manage multi-drug and extensively drug resistant Tb and to support patient drug adherence (CDC Atlanta 2014).

The results of this study showed trained 20,308 Health care workers (CDC 2014) by USAID funds. Also National training on new package of training material on National Tuberculosis Control Programme (NTCP) guidelines, follow up with role out training on revised and new sections of guidelines including the gene xpert algorithms with 389 participants (CDC 2015). Other areas of success after training are increased Hiv testing of Tb patient from 74.5 % to 93 %(NTCP South Africa 2014)., increased uptake of Isoniazid preventive therapy from 30% to 65% and improved supportive supervision (Limenako et al 2015).

In Kenya a survey conducted by National Tuberculosis and Leprosy Program (NLTP) showed that 5230 Health care workers were trained by Global fund and USAID funds. The results lead to increased case finding from 70% to 80% (NLTP reports 2014). There was also increased cure rate from 84% to 89%, increased HIV testing among Tb patients from 80% to 93%, uptake of antiretroviral drugs from 60% to 90% (NLTP reports 2015) The total community volunteers trained were 4000 contributing significantly to above achievement and 750 schools reached with Tb information countrywide.

2.6 Theoretical framework

The Health Belief Model (HBM) is a psychological model that attempts to explain and predict health behaviors by focusing on the attitudes and beliefs of individuals. The HBM was developed in the 1950s as part of an effort by social psychologists in the United States Public Health Service to explain the lack of public participation in health screening and prevention programs (e.g., a free and conveniently located tuberculosis screening project).

Perceived Threat: Consists of two parts: perceived susceptibility and perceived severity of a health condition.

Perceived Susceptibility: One's subjective perception of the risk of contracting a health condition,

Perceived Severity: Feelings concerning the seriousness of contracting an illness or of leaving it untreated (including evaluations of both medical and clinical consequences and possible social consequences).

Perceived Benefits: The believed effectiveness of strategies designed to reduce the threat of illness.

Perceived Barriers: The potential negative consequences that may result from taking particular health actions, including physical, psychological, and financial demands.

Cues to Action: Events, either bodily (e.g., physical symptoms of a health condition) or environmental (e.g., media publicity) that motivate people to take action. Cues to actions are an aspect of the HBM that has not been systematically studied.

Other Variables: Diverse demographic, socio-psychological, and structural variables that affect an individual's perceptions and thus indirectly influence health-related behavior.

Self-Efficacy: The belief in being able to successfully execute the behavior required to produce the desired outcomes. One of the first things one can do is determine the respondent's preconceived notions about the role of health behavior change in illness prevention. The simplest technique a person can use is to assess the patient's perceived barriers and benefits to engaging in the behavior change. The health educator can engage in this process by discussing with the patient his/her perception of the pros and cons for engaging in the behavior. During a discussion of the barriers, the patient can begin addressing how to overcome some of the obstacles to the performance of the behavior, thereby increasing self-efficacy for its performance.

Cues to action also influence whether a person will be motivated for lifestyle change. Cues can include illness in other family members, information from the media, and concurrent symptoms experienced by the individual. Health educators can elicit from the target group or person the potential cues he/she is exposed to on a daily basis and then use these cues as reminders of the potential consequences of failing to change unhealthy behavior practices.

2.7 Implications for Health Behaviors

HBM research has been used to explore a variety of health behaviors in diverse populations. For instance, researchers have applied the HBM to studies that attempt to explain and predict individual participation in programs for influenza inoculations, high blood pressure screening, smoking cessation, seatbelt usage, exercise, nutrition, and breast self-examination. With the advent of HIV/ AIDS, the model also has been used to gain a better understanding of sexual risk behaviors.

Perceived barriers are the most influential variable for predicting and explaining health-related behaviors. Other significant HBM dimensions are perceived benefits and perceived susceptibility, with perceived severity identified as the least significant variable. More recently, though, researchers are suggesting that an individual's perceived ability to successfully carry out a "health" strategy, such as using a condom consistently, greatly influences his/her decision and ability to enact and sustain a changed behavior

2.8 Limitations

General limitations of the HBM include: a) most HBM-based research to date has incorporated only selected components of the HBM, thereby not testing the usefulness of the model as whole. b) as a psychological model it does not take into consideration other factors, such as environmental or economic factors, that may influence health behaviors; and c) the model does

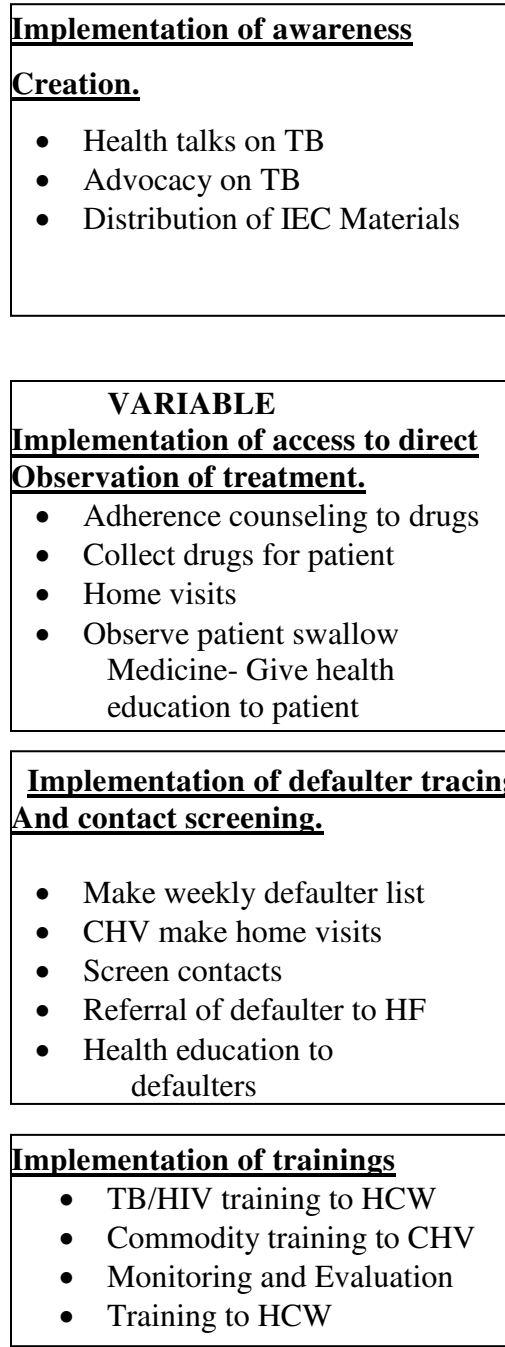
not incorporate the influence of social norms and peer influences on people's decisions regarding their health behaviors (a point to consider especially when working with adolescents on HIV/AIDS issues).

2.9 The conceptual framework

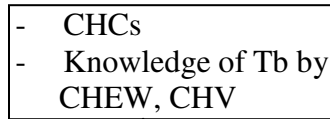
The conceptual framework for this study was researcher based framework depicted in figure 1.1 below. In the framework the researcher intends to determine how effective communication, identification of defaulters and contact tracing, observation of treatment directly by community health volunteers and documentation of information in community tools.

Figure 2.1: Conceptual framework for the study

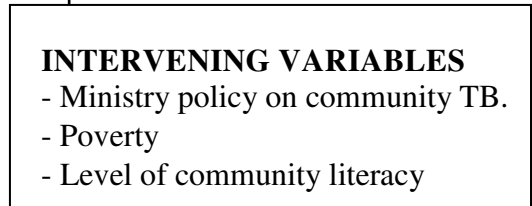
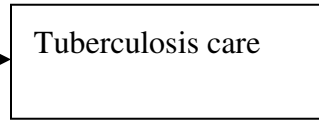
**INDEPENDENT
VARIABLES**



MODERATING VARIABLES



DEPENDENT



Source; Author 2015

2.10 Summary of Literature Review

In this chapter I introduced the research topic, defined it, discussed in details the objectives using dependent, independent, moderating variable and intervening variables. I also put theoretical framework and conceptual framework which were explained.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Methodology refers to the system of methods or procedure used in sampling and collecting data required for a particular research. It is also the application of the principles of data collection methods and procedures in any field of knowledge. In this chapter the researcher shall cover research design, target population and calculate the sample size and sampling procedure/technique. The research will also look at research instrument, piloting of the study tool, validity of the instrument, data collection procedures, data analysis technique and ethical consideration.

3.2 Research Design

The research adopted descriptive survey research design. The research was concerned with the role played by CHVs in implementation of community tuberculosis care in Bungoma County. It investigated implementation of awareness creation, access to direct observation of treatment, defaulter tracing and contact screening, and training of health care workers and community volunteers. Such issue are best investigated through survey research design (Kerlinger, 1986) and hence the choice.

3.3 Target population

The target population was all community Health Volunteers in all the 226 community Units in Bungoma County. Every community unit (C.U) has 10 active CHVS, this was based on records from the County director of health Bungoma county, ministry of health. Also to be included in the target population was all 452 community Health extension workers who are ministry of health employees and member of community health committees who are 2260. The total target population will be 4972.

3.4 Sample Size

To determine the sample size, the research used Krejcie and Morgan Table (1970) to calculate the sample size. There are various formulas for calculating the required sample size based upon, used by Krejcie and Morgan in their 1970 article 'Determining Sample size for research activities'.

According to Krejcie and Morgan table, given the research target population of 4972 then the sample size will be 382. Bungoma County as the study area, each unit comprise of 22 elements. This means $382/22 = 17$ community unit was sampled using sampling procedure below.

3.4.2 Sampling Procedure

Simple systemic sampling technique was used to select the samples from the population in the community units to participate in the survey. The procedure was as follows: It involved a random start from an orderly list, and then proceed with selection of the K^{th} element from then onwards. (K – is the sampling interval = Population size(N)/Sample size(n)).

$$K = 4972/382 = 13$$

3.5 Research Instrument

The main instrument for data collection was questionnaire for CHVs, CHEW and CHC members. Document analysis involved reviewing the contents of the documents with the aim of adducing some relevant secondary data (Oslo and Onen 2005). The questionnaire is the convenient tool especially where there are large numbers of subjects to be handled. It facilitates easy and quick derivation of information within a short time. The CHV questionnaire was used to gather data on communication, DOTS, health education, home visits, and stigma reduction.

3.5.1 Piloting of the Study Tool

The study tools were testing on a small population in one of the C.U(Namasanda C,U) before the study is carried out'

3.5.2 Validity of the Instrument

Validity is the accuracy and meaningfulness of inferences, which are based on research results. Validity is the degree to which results obtained from the analysis of the data actually represents the phenomenon under study. Validity therefore has to do with how accurately the data obtained in the study represents the variables of the study. If such data is true reflection of the variables, then inferences based on such data will be accurate and meaningful. The instrument was rated in terms of how effectively it samples significant aspects of the purpose of the study. The content validity of the instrument was determined in two ways. First the researcher discussed the items in the instrument with the supervisor, lecturers from the department and colleagues. These people indicated by tick or cross for every item in the questionnaire if it measured what it was supposed to measure or not. A coefficient of those that is measured is computed. A coefficient of 0.5 implied that the instrument was valid. Advice given by these people helped the researcher

determine the validity of research instruments. These suggestions were used to make necessary changes. Secondly, content validity of the instrument will be determined through piloting, where the responses of the subjects will be checked against the research objectives.

3.5.3 Reliability of the Instrument

Koul (1993) states that the type of reliability of a test refers to ability of that test to consistently yield the same results when repeated measurement are taken of the same individual under the same condition. Basically, reliability concerned with consistency in the production of the same results and refers to the requirement that, at least in principle another research on another occasion, should be able to replicate the original piece of researcher and achieve comparable evidence or results, with similar or same study population.

To establish the reliability of the questionnaire, pre-testing through piloting was done in Bungoma County. The reliability of the items was based on estimates of the variability among items. The community units that were used in piloting study were not used in the main study. The entire instrument was tested before data collection was carried out in the field. The reliability coefficient was determined using the retest method. A reliability coefficient of at least 0.5 was considered high enough for the instrument to be used for the study (Kerlinger, 1986).

Feedback obtained from the study assisted the researcher in revising the instrument of data collection to ensure that it covered the objectives of the study. The main reason for piloting the questionnaire was to ensure that the items would detect the kind of responses the researcher intends to get, that the item they are acceptable in terms of their content, and they adequately covers any aspect of the unit which the researcher particularly wishes to explore. In a case where it was discovered that the items in the questionnaire are difficult for the respondents, they were rectified accordingly.

3.6 Data Collection Procedure

Before collection of data, the researcher sought authority from University of Nairobi Research committee and also permission from County Director of Health Research committee of Bungoma County. Data was collected from community Health Volunteers from sampled community units. The instrument of data collection was documented, analyzed and interpreted. The data will be,

collected by the researcher so as to get firsthand experience in conducting a study. Consent was sought from respondents. Data collection involved obtaining actual data for analysis.

3.7 Data Analysis Technique

Data was analyzed descriptively. In consultation with experts, descriptive method was employed in analyzing qualitative data where frequencies and proportions were used in interpreting the respondent's perception of issues raised in the questionnaires so as to answer the research questions. Descriptive statistic such as frequency distribution, percentages, means, and standards deviations were calculated and data presented in form of tables, graphs, and charts. Data was then analyzed. Collected data was cleaned, coded, and SPSS version 16 was used for analysis. Data was analyzed descriptively.

3.8 Ethical consideration

The researcher sought permission from County Director of Health, Bungoma and study subject before the study commences. He ensured confidentiality of the information given and the safety of the same information.

3.9 Operational definition of variables

There are four variables that were considered in this study, namely, independent, intervening, moderating and dependent variables. The independent variable variables was communication factors, treatment observation factors, defaulter and contact tracing factors and documentation factors while dependent variable was care, prevention and control of tuberculosis. The intervening variables were ministry of health policy on community tuberculosis, poverty and level of community literacy. The moderating variable was CHVS/ CHEW knowledge of tuberculosis and level of education of CHVS.

The information is presented in Table 3.2 below.

Table2. 9: Operationalization of the variable for the study.

Objective	Variable	Indicator	Measure	Scale	Tool
The roles of CHVS on implementation of community based tuberculosis care, prevention and control.	Care, prevention and control	Records in link Health facilities. -Records in the CUs.	-To get the number of CHVs doing Tb work. -To get the number of Tb presumptive cases referred for care. -To get the number of Tb contacts screened and referred for care.	Nominal	

INDEPENDENT VARIABLES

Objectives.	Variables	Indicators	Measures	Scale	Tools.
To establish the roles of CHVS for effective communication in care, prevention and control of Tb	Care, prevention and control.	.Records at HFs - Records from CUs.	-To get number of home visits by CHVs. -To get the number of IEC materials distributed	Nominal	
2.To establish the roles played by CHVs in implementing directly observed therapy as a measure of Tb care, prevention and control.	Care, prevention and control	Records at HFs.	-To get the number of Tb patients observed by CHVs.	Nominal	

<p>. 3.To investigate the roles of CHVs in identifying Tb defaulters and contact, and initiating tracing and screening in the community</p>	<p>Care, prevention and control</p>	<p>-Records at HFs. -Records ta CUs.</p>	<p>-To get the numbers of defaulters referred. -To get the number of presumptive Tb suspect referred.</p>	<p>Nominal</p>	
<p>4.To investigate the roles of CHVs in documenting Tb information in relevant community Tb tools</p>	<p>Care, prevention and control</p>	<p>-Records at HFs. -Records ta CUs.</p>	<p>To get the number of reports sent to HFs.</p>		

SORCE: AUTHOR 2015.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter discusses questionnaire return rate, personal details, the chapter is organized according to the objective of the study. The analyzed data is presented using frequencies distribution tables preceded by interpretation and explanation of findings on the influence of the community health volunteers on the implementation of community based tuberculosis care, in Bungoma County in Kenya.

4.2 Response Rate

In the study, the questionnaires were administered to Community health volunteers, Community health committee's members who were combined and Community health extension workers who are employees of ministry Health, Bungoma County.

. Table 4.1 shows the number of questionnaires administered and the response rate.

Table 4.1 Response Rate

Department	Number Administered	Response Rate	% Response Rate
Community health Volunteers/CHC	350	261	73.2
Community health extension workers	32	19	73.2
Total	382	280	73.2

Table 4.1 shows that the questionnaire returns and interview responses were received from 280 of the entire sample of 382 of respondents (comprising 261 community health volunteers/community health committees' members and 19 community health extension workers). This was 73.2% participation rate. The questionnaire return rate was not 100% because of some drop outs among CHVs and competing tasks among the CHEWS during the time of interview. The researcher individualized the questionnaires to all respondents due to cost factor of hiring researcher assistants.

4.3 Socio-demographic Characteristic of the study Participants.

The study sought to establish demographic characteristic of the community health volunteers/ community health committee members based on age, gender, academic qualification and training in tuberculosis as shown below:

4.3.1 Gender of respondents

The study sought to establish the gender of the respondents. The results were summarized and presented in the table 4.2 below:

Table 4.2 Gender of respondents

Gender	Frequency	Percentage
Male	132	47
Female	148	53
Total	280	100

Sources: Primary data

Table 4.2 shows that majority (53%) were females against 47% of the respondents who were males among the 280 CHV/CHC and CHEWS sampled 17 community units.. This reveals that more females participated in the study than males. The female's domination among the community health volunteers over and above men's representation shows that woman than men are the ones concerned with the health of their families and the community they live in. It further shows community tuberculosis care is mostly done by women. From the reviewed literature there was no past research evidence that had linked gender of the participants with influence of community health volunteers on implementation of community tuberculosis care. The social norms in the area of study favor women in the taking care of the family including health care. This study has approved that social norm by showing that more women are willing to volunteer to give free service in health care, and in community tuberculosis care .While men were at 47% participation in the study, this could be due ratio of men to female which is 48% men to 52% female in the county. More research need to be done to verify this proportion based on census population of each sex.

4.3.2 Age of the Respondents

The study sought to determine the age of the respondents. The results were summarized and presented in the table 4.3 below:

Table 4.3 Distribution of respondent by age groups,

Age Category	Frequency	Percentage
<18	0	0
18 – 24	16	6
25 – 34	64	23
35 – 44	104	37
>44	96	34
Total	280	100

The findings showed that majority of the respondent were aged between 35 to 44 (37%), followed closely those aged above 44 years (34%), then 25 to 34 years (23%), 18 to 25 only (6%) and none under 18 years. This study shows young people are not involved in volunteers as only 6% respondent were of below 24 years though one could argue that the young people could be in school or college but this will be disapproved by the data on level of education of CHVS. Therefore in this study majority of the community health volunteers/ community health committees members are above 35 year of age. Another advantage of the community health volunteers who major in terms of age can work without supervision and understand any guidelines they are given. In keeping with the culture and socialization of the people of Bungoma, this age group bracket of above are respected in the in the and hence can good entry, better mobilization and good outcome of the community tuberculosis program.

4.3.3 Training on TB care

The study sought to determine if CHVS were trained on TB care. The findings were as shown in table 4.4 below:

Table 4.4 Training of the Respondents

Training	Frequency	Percentage
Yes	125	45
No	155	55
Total	280	100

Table 4.4 shows the CHVs who are trained at 45% while those who are not trained at 55%. Majority of the respondents were not trained. The results paint a gloomy picture 55% of all community health volunteers/ community health committees' members are not trained on tuberculosis care at all. What this means that, they cannot recognize symptoms and signs of tuberculosis among the member of their community, hence they cannot make a diagnosis or supervise the treatment (DOTS). This also implies that the 55% CHVs/CHC cannot give health education or tuberculosis talk during action days. On the other hand 125(45%) have some training on tuberculosis care and are well prepared give health talks, recognize symptoms and signs of TB and refer appropriately, supervise medication and create awareness to the population they live in.

4.5 Duration of training

The study sought to determine the duration each of the respondents had undergone the training the results were summarized and presented in the table 4.5 below:

Table 4.5 Training on TB

DAYS	Frequency	Percentage
1	71	59.2
3	51	40.8
Total	125	100

The number of respondent who were trained on tuberculosis care for one day (59'2%) means they had sensitization on TB or session during the formation of community where all topic on primary health care is mentioned in passing. While the 71 CHVs/ CHCs have an idea about tuberculosis care, they are not well equipment to handle all aspect of tuberculosis care. On the other hand 51 respondents (40.8%) underwent technical tuberculosis module training which is more comprehensive. The 40.8% of the community health volunteers are able to recognize symptoms and signs and make appropriate referrals, do DOTS, and are able to understand who is a defaulter, a contact and screening of the same. They are able to hold public Barasa or talk about tuberculosis care during monthly action days.

Table 4.6 value of training on Tb care

Item	Frequency	Percentage
Yes	263	94
No	17	6
Total	280	100

The majority of the respondents 263 (94%), asked if there was any value in having community TB training, they overwhelming agreed and said it added quality to their work. This shows the desire for CHVs/CHCs to adequate training in community Tuberculosis so that they can perform their work without hindrance. This calls for all stakeholders who include the National and County government, and partners to support community tuberculosis by providing resources for training.

4.3.4 Highest Level of Education of the Respondents

The study sought to determine the highest level of education of the respondents and the findings were as shown in table 4.6 below:

Table 4.7 Highest Level of Education of the Respondents

Education Level	Frequency	Percentage
Primary	41	15
Secondary	174	62
Tertiary	62	22
None	3	1
Total	280	100

Table 4.7 shows the education level of the respondents whereby 15% had primary level of education, 62% had secondary level of education, 22% had tertiary level of education, 1% had none .The majority of the respondents 62% possessed at least secondary level of education This reveals that majority of the respondents were form four leavers. The number of years in formal education for the CHVs/CHCs ranged from primary 8, secondary 12, and college 15’

Therefore the average number of years of schooling among community health volunteers/ community health committees was:

(primary=(41@ 8)+ (secondary= 174@12)+ (Tertiary= 62@15)+ (None= 3@ 0) = 328+2088+930+0/280 =11.95.years. Therefore on the average the results showed that community health volunteers had only 11.95 years in formal education. Majority had secondary school education. However there is no post research evidence that linked the participants mean number of years in formal education with good implementation of tuberculosis care in Bungoma county. Formal years in school is impotant to the ability of CHVs/CHCs in comprehending new knowledge in management and implementation of community based tuberculosis care.

Table 4.8 Who supports CV

Item	Frequency	Percentage
GOK	62	22
Partners	154	55
None	64	23
Total	280	100

Table 4.8 shows the results of the support community health volunteers received as shown: The Government of Kenya 62 (22%), Partner who included international donor agencies like USAID, WHO and faith based organization 154 (55%) and None 64 (23%). Therefore this means majority of the community health volunteers/ community health committees in the community

units are supported by Donors through the partner’s organizations. Some of the supports include formation of community units, material support, trainings and sometimes stipends.. GOK follows with only 22% support which is really low for sustainability of community strategy. Therefore the government needs to allocate more resources to community health. 64 (23%) of the participants did not have any support which impact negatively on their work and there is need for somebody to urgently support them.

4.4 Increasing awareness creation as an influence in implementation of community tuberculosis care

In this section community health volunteers were asked to respond to questions on awareness creation on tuberculosis care in the community as part of implementation of community strategy and how their work has impacted on service delivery at level 1 of health delivery system.

4.4.1. Tuberculosis talks during home visits

This section sought to find out if community health volunteers/ community health committees talk about tuberculosis during home visits to their clients and if so what message do they pass to the households. First they were asked if they talk about Tb during home visits.

Table 4.9 Tb talks during home visits

Item	Frequency	Percentage
sometimes	140	50.00%
always	100	35.71%
never	40	14.29%
Total	280	100.00%

From table 4.9 240 respondents (85.71%) talk about tuberculosis during their home visits, which of 35.71% will always have a session on Tb during home visits. 40 participants have never talked about Tb while visiting the homes. This finding is important as corresponds research done by other scholars as seen in literature review; Stone et al 2005, in his research found out that using community resources enhances community knowledge. In another findings the CHVs as volunteers can provide services at household level that include a community- based information system, dialogue based on information, health promotion, disease prevention, simple curative care using drugs supplied through a revolving funds generated from the users, and referral system established by local health committees.(Kidane and Murrow 2013). On the other hand there are 40 participants (14.5%) who have never talked about tuberculosis during their work. There is need therefore to empower this community health volunteers, so that they can create awareness in the community about TB.

4.4.2 What CHV/CHC talks to the public?

In this section, the participants were asked what they talk about in terms symptom, diagnosis and prevention.

Table 4.10: what do you talk about?

Item	Frequency	Percentage
Symptoms	132	47
Diagnosis	45	16
Prevention	94	34
None	39	14
Total	280	100

The result of what they talk about while visiting homes were symptoms =132 (47%), diagnosis =45 (16%), prevention =94 (34%), none = 39(14%). From this finding, the most talked about is the symptoms and signs (47%) followed by prevention (34%), then diagnosis 16% and none

14%. In total majority 97% of the respondents were involved in awareness creation during home visits, which is one the biggest contribution from community health volunteers/ community health committee members to tuberculosis control program. The research findings in this study are in agreement with the study done by Jayashree S, Gothankar published by international journal for preventive medicine on: Tuberculosis Awareness Program and Associated Changes in Knowledge Levels of School Students. This school-based interventional study was done on 135 secondary school students. They were randomly selected infield practice area of Urban Health Training Center (UHTC) of a private medical college in Pune city. Health awareness session on tuberculosis was conducted by using various visual and audiovisual aids by the medical college undergraduate students. A pre-test and post-Test was filled before and after the session. Paired t-test was used to assess the effectiveness. Number of school students who gave correct responses ($n=138$) Only 58% of students in pre-test and 89% students in post-test answered correctly about correct modes of transmission of tuberculosis. Tuberculosis being an airborne disease is transmitted effectively in overcrowded and poorly-ventilated households. In current study, in pre-test, only 64% students agreed to the statement that tuberculosis spreads rapidly in overcrowded and ill-ventilated houses while 93% students agreed to the above statement in post-test. In conclusion, although school students were well informed initially about tuberculosis, health education sessions by medical students using various visual and audiovisual aids helped significantly to improve knowledge of school students regarding tuberculosis. Both medical students and school students participated enthusiastically in this health awareness program. This activity helped medical students to acquire following skills related to communication; working in a team i.e. team work, preparation and presentation of various visual aids for health awareness program, co-ordination with district tuberculosis unit. They also gained knowledge of research methodology of awareness program methodology.

4.4.3 TB IEC material given to CHVs/ CHC

In this section, the respondents were asked whether, they were given information, education and communication materials (IEC) on tuberculosis while going on duty.

Table 4.11 Tb IEC materials are given

Item	Frequency	Percentage
Yes	105	38
No	175	62
Total	280	100

The table above shows the results on possession of IEC material on tuberculosis care. Those who said yes =105 (38%) and no =175 (62%).In essence this means that only 38% of the CHVs/CHCs were accessible to IEC material to help increase tuberculosis awareness in their respective villages. This also helped them to pass correct and consistent information to the population. On the other hand a large number of CHVs/CHCs were not supplied with IEC material on tuberculosis care (62%). The findings therefore mean that the CHVs/CHC members were passing information to the public which was not uniform and consistent and there is danger of passing wrong information. The importance of IEC material like posters can be read by many people for a long time therefore constantly raising awareness in the society. In this question on IEC, during literature review, the researcher did not find similar study at that time.

4.4.4 ACTION DAYS TALKS BY CHVs/CHCs

In this question the respondents were whether in their dialogue days ever talked about community tuberculosis care.

Table 12 Have you ever talked about TB in action days.

Item	Frequency	Percentage
Yes	189	68
No	91	32
Total	280	100

The results from above table shows yes= 189 (68%), spare sometime during their monthly dialogue days to pass tuberculosis care messages to the general public hence increasing tuberculosis awareness in the community. Those who said no= 91 (32%), represented a missed opportunity to tuberculosis awareness in the community. Those groups of community health volunteers/ community health committee's members should be targeted for training or sensitization on awareness creation. On the other hand the CHVs/CHCs who are involved in awareness creation 68% have helped to delay for patient who seeks treatment when they have signs and symptoms of Tb. This findings therefore are consistent with the observations made by Maher 2011 that, 'there are many people with TB who do not go for treatment (D.Maher 2011)'. Community based care may help control program achieving high cure rates and making progress towards WHO target of 85% case detection. D. Maher in his studies found out that an ongoing process, unlike mass screening, community based surveillance has been found to be sustainable, the key being that CHV know their people. In programs achieving high cure rate, once suspected cases have been identified, CHV can continue their involvement in referring TB suspect for diagnosis, delivering sputum specimens to health facility and collecting results.

4.4.5 The frequency of the talks by CHVs/ CHCs

In this question the respondent were asked the frequency they talk about tuberculosis during action days.

Table 13: How often do you talk about TB in action days?

Item	Frequency	Percentage
Quarterly	174	62
Monthly	106	38
Total	280	100

The table above indicates that 174 (62%) talked about tuberculosis quarterly in their action days in their communities. The 106 respondent (38%) said they talked about tuberculosis care monthly in their actions to the public. This also confirms the role of community health volunteers/ community health committees in increasing public awareness in the community on tuberculosis care. During literature review the found out that the study done by Mutinda et al about Health seeking practices of Tb patient and access to health care among Tb patients in Machakos County, Kenya Delay to seek formal health care in designated health facilities is due to fear of stigma that is associated with TB. This resulted to delay in diagnosis, initiation of early treatment and advancement of the disease process. There is secrecy to disclosure of TB status and the TB patients were forced by poverty to disclose to a family member who could assist, keeping the rest in the dark. As a result the TB patients continue to spread the infection to contacts and the unsuspecting family members' majority who offer care to their kin with no knowledge of the illness. As a control measure, this study recommend the Ministry of Health to initiate behavioral change communication strategies to educate the communities on clinical presentation ,the need for early diagnosis, treatment adherence and curability of TB. Further to initiate mandatory surveillance and TB patient treatment supervision by health workers in communities to stop transmission of TB.

Finally all this findings from this study correlates well with other findings by other researchers cited in this section pointing to the roles played by community health volunteers / community

health committees member in awareness creation in the community. Informed public will make correct decision and will reduce delays in seeking health care.

4.5 Access to direct observation of treatment influence implementation of community based tuberculosis care

In this section looked at roles of CHVs/CHCs in observing the tuberculosis patient swallow as part of drug adherence, hence improving treatment outcomes. The researcher also looked at ways in which DOTS is implemented and CHVs/CHCs helps in collection of drugs from facility for the patient.

Table 14: Respondents Opinion on the Extent to which DOTS are vital in treatment of TB

1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree

Item	1	2	3	4	5	Mean
	(%)	(%)	(%)	(%)	(%)	
1. DOTS is done	44	37	15	0	4	1.83
2. DOTS is done in phases	52	44	4	0	0	1.52
3. DOTS is observe patient swallow medicine.	44	33	19	4	0	1.83
4. CHV/CHC collects medicine for patient from the facility.	56	33	7	0	4	1.63
5. To what extend do you agree that DOTS is important to patients.	33	44	19	0	4	1.98

From this table, 1= 44% of the respondents strongly agreed that DOTS is done in the community, 37% agreed, 15% were neutral, 0% disagreed and 5% strongly disagreed. From these findings a total of 76% of CHV/CHCs have done DOTS and this has improved patient outcomes. The research findings in this section shows CHVs implementing community based tuberculosis care (CB-DOTS) in the most effective ways. 2=52% of the respondent strongly agreed that DOTS is

done in phases, that is the intensive phase hat last two months and continuation phase of four months, 44% strongly agreed and 4% were neutral. 3= 44% of the respondents strongly agreed the definition of DOTS as observing the patient swallow their medicine, 33 agreed, 19 were neutral and 4 disagreed. In total 77% of all participants understood the meaning of DOTS and a small percentage of 23 did not know the meaning of DOTS. 4= 56% of the respondents strongly agreed to have collected drugs from the patients during the course of their work.33% agreed, 7% were neutral and 4% strongly disagreed. In all 89% of the CHCs/CHCs agreed to have collected medicine for their patient increasing adherence and reducing defaulter rate. 5= 33% strongly agreed that Dots is important to the patient,44% agreed, 19% were neutral and 4% strongly disagreed that Dots is important to patient in the community. The results in this section show the important role played CHVs/CHCs in community tuberculosis care in Bungoma county. The findings are in agreement with other studies as seen in literature review. Barger (2013) in his researcher on community involvement says, all programs including successful TB control, require an uninterrupted drug supply. Many health programs name irregular drug supply as the main reason why patients are unable to complete treatment. The distribution of curative medication has been found to be the most acceptable, effective and sustainable function of the CHVS provided the supplies are adequate (Wali et al 2012). It was seen to empower the community by providing access to treatment, to enhance the status of CHVS and to address the true needs of the community. Community attaches a higher value to those who give palliative and curative and lower value to CHVS who give preventive and promotive care. M. Hadlkey gave the following lessons from community TB. In a study in the United states of America by Patrick K.Moonan et al (2015), found that Universal DOT by community Volunteers for tuberculosis is associated with decrease in acquisition and transmission of resistant tuberculosis'

These data suggest resistance is less likely to develop and be transmitted when persons with tuberculosis are managed with universal DOT as compared to selective DOT. This provides additional support for recommending management of patients with universal DOT as the best strategy for preventing the development and transmission of drug-resistant tuberculosis. In a study in Hlabisa in South Africa show that incidences of tuberculosis in Africa is increasing dramatically and fragile health systems are struggling to cope (Wikinson et al 2010). Potential coping capacity may lie within affected communities but this capacity needs to be harnessed if tuberculosis is to be controlled (Wikinson et al 2010). Since 1991 all patients with tuberculosis in

Hlabisa health district, South Africa have been eligible for community-based directly observed therapy (DOT). Patients are supervised either by a health worker (HW) in a village clinic, or in the community by a community health worker (CHW) or a volunteer lay person (VLP). Tuberculosis incidence increased from 312 cases in 1991 to 1250 cases in 1996. By December 1995, 2622 (87%) of 3006 patients had received DOT, supervised mainly by VLP (56%) but also by HW (28%) and CHW (16%). The proportion supervised by HW fell from 46% in 1991 to 26% in 1995 ($P = 0.0001$). More patients supervised by VLP (85%) and CHW (88%) than by HW (79%, $P = 0.0008$) completed treatment. Case-holding by HW declined more between 1991 and 1995 (84% to 71%, $P = 0.02$) than did case-holding by both CHW (95% to 90%, $P = 0.7$) and VLP (88% to 84%, $P = 0.4$). Mortality was similar (4–6%) and stable over time, irrespective of the supervisor. High tuberculosis treatment completion rates are achievable and sustainable for several years in resource-poor settings despite a massively increased case load if community resources are harnessed. Patients may be more effectively supervised by voluntary lay people than by health workers under these circumstances, without being placed at increased risk. These findings by David Wilkinson in Hlabisa South Africa suggest that community supervisors may be an essential component of any DOT strategy.

4.6 Defaulter tracing and contact screening influence on implementation of community tuberculosis care.

In this section the researcher looked into the roles of community health volunteers in tracing tuberculosis patient who have defaulted from medication and role played in contact screening of the smear positive tuberculosis patient.

Table 15 Defaulter tracing and conduct screening

In table 15 below, the participants were asked whether defaulter tracing is done, and how many defaulters have they traced in the last six months

1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree

		Correlations				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Strongly Agree	Pearson Correlation	1	.918	-.918	-.954	-.972
	Sig. (1-tailed)		.130	.130	.097	.075
	N	3	3	3	3	3
Agree	Pearson Correlation	.918	1	-1.000**	-.756	-.985
	Sig. (1-tailed)	.130		.000	.227	.055
	N	3	3	3	3	3
Neutral	Pearson Correlation	-.918	-1.000**	1	.756	.985
	Sig. (1-tailed)	.130	.000		.227	.055
	N	3	3	3	3	3
Disagree	Pearson Correlation	-.954	-.756	.756	1	.857
	Sig. (1-tailed)	.097	.227	.227		.173
	N	3	3	3	3	3
Strongly Disagree	Pearson Correlation	-.972	-.985	.985	.857	1
	Sig. (1-tailed)	.075	.055	.055	.173	
	N	3	3	3	3	3

** . Correlation is significant at the 0.01 level (1-tailed).

The result were those who strongly agree to have participated in defaulter tracing had person correlation=1, agree =

4.6.2 Reasons why tuberculosis patient default according to CHVs/CHCs.

In this sub-section the CHVs/CHCs were asked some of the reasons that make patients to default from treatment.

Table 16 what are some of the reasons in your opinion patient default treatment

Item	Frequency	percentage
Poverty	110	39
Pill Burden	80	29
Long Distance To Facility	30	11
Unfriendly Hcw	50	18
None	10	4
Total	280	100

Table 16 above reveal that poverty lead as the reason patient default from treatment= 110 (39%) respondent strongly agreed, pill Burden = 80 (29%) was the second reason, long distance to the facility= 30 (11%) respondent agreed as the reason to why patient stop medicine, unfriendly health care providers =50 (18%) and none= 10 (4%) found no reason the patient should default from medication. From the above results it is clear most patient will miss to collect their medicine on their clinic days because they lack money for transport or probably they sleep without: this despite the fact that tuberculosis medication is free of cost in all government and faith based facilities. Of more concern is the unfriendly health care workers 18%, which should be addressed urgently. The results of this study relates well with other finding Africa as seen in the following paragraph.

In Sub-Saharan Africa, several social and economic factors such as low income, lack of social support, low education, financial problems and inability to afford services have been linked to TB treatment adherence. Older age, the male sex, inadequate knowledge, ignorance on need for treatment compliance and stigma are among reported patient-related factors that influence default in the region (Muture et al). Reported health care system-related factors for default include poor service provider attitudes, negative attitude by tuberculosis patients towards the treatment centre, running out of drugs, access to health services and living near

to treatment centre . Side effects, drugs too strong, and feeling better are among therapy related factors that influence TB treatment default while HIV co-morbidity is among the condition-related factor reported . Studies on TB treatment default in Nairobi, and the country at large, have not been documented. This study correlates well with Muture et al 2012 where factors such as poverty, system related factor, access to health being some of common findings.

4.6.3 The type of information documented in community unit tools.

In this section the researcher sought to find out how the community health volunteers/community health committees do monitoring of their work. The participants were asked the type of record they keep and type of information recorded in them.

Table 17: Type of information documented

Item	Frequency	percentage
Number who records information on DOTS	150	54
Number who records information on defaulters	50	18
Number who records contacts traced	80	28
Total	280	100

Table 17 above shows that the number of CHVs/CHCs who recorded information on community DOTS =150 (54%), which means majority of the community health volunteers observe patient swallow their medicine. The number who recorded information on defaulter traced=50 (18%) , means that not many but some 18% are involved in returning patient who have defaulted their medication. This is also important in maintaining good treatment outcome, avoiding development of drug resistant TB and helping to reduce transmission of the disease in the community. The number who recorded contacts traced= 80 (28%) in the community monitoring tools. This means the community health volunteers/ community health committee's members are

involved in active case finding (ICF). This is a very important activity where all cases who are diagnosed with tuberculosis, their homes, work place are visited by CHV, who all contacts of any sign and symptom of tuberculosis and if found to have any of the sign/symptoms are referred to the health facility for further investigation and possible treatment. These results compare to almost 100% with other studies as seen in the literature review. A recent analysis of global tuberculosis (TB) case notification data estimated that only 27% of new smear positive cases that arose in 2000 were detected by the current recommended strategy (DOTS) and only 19% were successfully treated (Mercedes et al). These results suggest that while good TB treatment success rates have been achieved under DOTS, low case detection rates remain an obstacle to the long-term success of TB control programs. Current World Health Organization policy emphasizes passive case finding in contrast with the identification of cases through screening by CHV. This strategy has been based on the expectation that passive detection of individuals ill enough to seek medical care is far more cost-effective than population-based screening by CHVs and compliance was higher in those who have identified themselves as symptomatic (Iliana F. Pachao 2010). Nonetheless, the failure of national TB programs to detect the vast majority of few infectious cases suggests that active screening strategies should be reevaluated in an attempt to improve case detection and, thereby, increase access to TB treatment (Pachao 2010). Contact investigation for cases of active pulmonary TB is standard practice in developed countries (James Bayona 2011).

Through this process, household and other close contacts of infectious case subjects are identified by community volunteers and tested for TB infection and disease. Several recent studies conducted in high burden areas have shown that active case finding among household contacts yields substantially more TB cases than passive case detection. Other groups have suggested that active case finding should be extended to high-risk communities at large, rather than only focus on households of case subjects (Muraya 2013). In a study, done in Northern Lima, Peru by Mercedes et al describes and evaluate a simple active case finding strategy in contacts of case subjects with active TB in a high incidence shantytown in Lima, Peru by CHVs. This is an area characterized by poor health indicators; in the year 2000, annual public health expenditure per capita in Peru was 238 U.S. dollars (USD), average income was 130 USD, and infant mortality in Lima was 19 per 1,000 live births. Although the incidence of new TB cases was approximately 170 per 100,000 per year at the national level, rates are much higher in the

densely populated shantytowns surrounding Lima; masked pockets of incidence can be as high as 340 per 100,000.¹³ He assessed active case finding in two different contact groups; the first group included individuals who were household contacts of case subjects with pulmonary TB, while the second group included residents of the case subjects' neighborhoods who may have had more casual contact with the patients. Since active case finding does not preclude self-referral, they measured the prevalence of TB detected through combined active and passive case finding in comparison with passive case finding alone in both of these groups, and they also describe the risk factors associated with failure to self-refer.

The result of TB prevalence detected through combined active and passive case finding among 1,094 household contacts referred by CHVs was 0.91% (914 per 100,000), much higher than with passive case finding alone (0.18%; 183 per 100,000; $p=0.02$). Among 2,258 neighbors, the combined strategy detected a TB prevalence of 0.22% (221 per 100,000) in contrast to 0.08% (80 per 100,000) detected through passive case finding alone ($p=0.25$). Risk factors for being diagnosed through active case finding in contrast with self-report included age ≥ 55 years (odds ratio [OR] 5.5; 95% confidence interval and female gender (OR 3.9; 95% CI 0.99, 22.3). James Bayona et al (2012) concluded that risk of active TB among symptomatic household contacts of active case subjects in that community was very high. Results suggested that contact screening by CHVs in such settings may be a powerful means of improving case detection rates for active TB disease.

4.7 The influence of training on implementation of community tuberculosis care.

In this section, the researcher sought to the views staffs from the ministry of health on community based tuberculosis care in Bungoma county and their roles. The section covers how community health extension worker work, their roles, training of CHVs/CHCs, public barasas, School health programs, monitoring and evaluation, the success and what the CHEW think should be to community based tuberculosis care in Bungoma county. The number of CHEW interviewed were 22 out of sampled 34 giving questionnaire return rate of 64%.

4.7.1 Organization of the community units.

In this section the researcher looked the number of community units managed by one community health extension worker and the funding for trainings and other operations. The results are shown in figure 18 below.

Table 4.18 Number of community units managed by one CHEW.

Item	frequency	Percentage
one	9	41
two	11	50
more than 3	2	9
Total	22	100

Table 4.18 shows the number of community units managed by on community health extension workers indicating one= 9 (41%). This means she/he takes care of 20 CHVS/CHCs and trains them on community based tuberculosis care. Two= 11(50%), the community health extension worker handles two community units consisting of 40 CHV/CHCs and trains them on community TB. More than three =2 (9%) means the CHEW manages more than 3 community units and more than 60 CHCs/CHVs, and has train them on community tuberculosis care. The results shows that the majority of CHEWS manages two community units (50%) followed by one units 41% giving them ample time to train the CHCS/CHVS and the public in general. This study generally agrees with research work on empowerment of the community,

A community consists of individuals and families who live together in some form of social organization and unity (Giuliano Gargioni 2012). Communities exist in the context of a larger society that should help the personal development of each individual, recognizing that his or her dignity is the fundamental value, the society needs to respect and support. Every government has

the responsibility to provide essential social services, including education and health services, to all its citizens in order to ensure that every person has a real opportunity for personal growth and development (Lana et al). However, scarce resources, poverty, malnutrition, insecurity, displacement and the global epidemics of HIV, malaria and tuberculosis pose formidable threats to the vast majority of people in the world (Chakaya et al). The experiences presented in this study show that enhancing the empowerment of people based on increased knowledge and direct involvement in decisions that influence their lives is an effective way of organizing health services Giuliano et al 2014). Global initiatives aimed at tackling development, poverty and disease express a renewed effort for global solidarity, but they can be more focused and effective if the people who are more severely affected by these conditions are involved in shaping the answers (WHO publication2014).

4.7.2 The role of the community health extension workers in implementation of community based tuberculosis care in Bungoma county.

In this section the researcher looked at various roles played by community health extension workers in implementation of community based tuberculosis care in Bungoma county. Some of the roles were trainings, defaulter tracing, intensive case finding, health promotion, tuberculosis prevention and monitoring and evaluation.

Table 4.19: To what extend do you agree to have the following roles as a chew

Item	Strongly agree	Agree	Somewhat agree	Disagree
Trainings	30%	26.70%	31.70%	11.50%
Intensive case finding/defaulters tracing	28.30%	30%	30%	11.70%
health promotion	30.00%	40%	10%	20.00%
prevention of tb	25.00%	40.00%	25.00%	10.00%
monitoring /evaluation of tb	24.00%	34.00%	22.00%	20.00%

Table 4.19. Shows the results of the study on the roles of the CHEWS, on training =30% strongly agreed that training of CHVs/CHCs and large community as their role. This is significant in the sense by training community own resource person, implementation community tuberculosis will be harnessed: 26.70% of the respondent agreed, 31.70% somewhat agree and 11.50% disagree that training is part of their responsibility. In general 87.40% agreed training to be part of their responsibilities. On intensive case finding/defaulters tracing =28.30% strongly agreed, 30% agreed, 30% somewhat agreed and 20% disagreed that intensify case finding/defaulters is their role. Majority 88.20% were in agreement that intensified case finding/defaulters tracing was their responsibility. The findings affirm the role played by the CHEWS in the implementation of community based tuberculosis care in Bungoma county. On health promotion =25% strongly agreed to providing health promotion activities as part their duty. 40% agreed, 25% somewhat agreed and 10% disagreed that health promotion was part of their responsibility. Overall the majority 90% agreed that health promotion is major responsibility in implementation of community based tuberculosis care. Finally on monitoring and evaluation = 24% strongly agreed that monitoring and evaluation is part of their work as CHEWS, 34% agreed, 22% somewhat agreed and 20% disagreed that monitoring and evaluation was their role. The majority of the respondent agreed that monitoring and evaluation was the responsibility of the CHEWS.

The study results from other parts of the world, Kenya included suggest that the above roles are implemented by CHEWS by 50% as in the following citation from literature review. In a study published in European Respiratory Journal in 2015 titled “Towards tuberculosis elimination; an action framework for low incidence countries identified training as the major factor (Giovanni et al 2015). Central coordination under government stewardship, which can be enhanced through establishment of a national TB policy committee, should ensure the development of a national strategic plan for TB elimination embedded in national health and social sector plans, and accountability for its implementation. .To tackle the threat of TB and of other health problems, educate communities how to take care of their health, understand and promote healthy behavior and take responsibility for providing care and support for sick people. Moreover, by being fully aware that TB is a serious transmissible but curable disease and that diagnostic and treatment services are freely available to all, people can effectively contribute to refer early to the health services every person who may have TB (Chakaya et al 2013). National health services

confronted by the global threat of the TB epidemic should not miss this opportunity. Community involvement in TB care and prevention also provides a chance to communities and civil society organizations, including patients' and activists' groups, to foster their empowerment in matters that strongly affect the common good of a society (Sean Armstrong 2013). In another study by C.D.C South Africa 2015 in Eastern Cape in South Africa, showed that training of Health care Workers, community Volunteers and general public lead improved tuberculosis care. Training helped the development of community based strategy to identify Tb cases and ensure early referral by CHV for screening and treatment. In addition training assisted provincial health department to integrate Tb treatment cases with HIV and other health services (International Union against Tb and lung diseases 2014). Training also provided skills to properly manage multi-drug and extensively drug resistant Tb and to support patient drug adherence (CDC Atlanta 2014).

The results of this study showed trained 20,308 Health care workers (CDC 2014) by USAID funds. Also National training on new package of training material on National Tuberculosis Control Programme (NTCP) guidelines, follow up with role out training on revised and new sections of guidelines including the gene xpert algorithms with 389 participants (CDC 2015). Other areas of success after training are increased Hiv testing of Tb patient from 74.5 % to 93 % (NTCP South Africa 2014)., increased uptake of Isoniazid preventive therapy from 30% to 65% and improved supportive supervision (Limenako et al 2015)..

4.8 The role of community health extension workers in implementing community based tuberculosis through school health program.

In this section the researcher investigated the played by the CHEW in providing school health program. The areas looked at are the number of CHEW who conduct school health program and how school they visited in the last quarter of 2015.

Table 4.20. Number of community health extension workers who conducted school health program.

item	Frequency	Percentage
Yes	16	72.00%
No	8	28.00%
Total	22	100

Table 4.20 above shows the results of the of community health extension workers who participated in school health program. Those who said yes =16 (72%) and no =8 (28%). What this means is that the majority 72% of community health extension workers participated school health education and only few 28% did not participate in school health program.

Table 4:21 if yes how many schools did you visit in the last 3 months

item	Strongly agree	Agree	Somewhat agree	Disagree
1-5	50.3%	21.7%	15.5%	12.5%
6-9	25%	37.6%	20.6%	16.8%
None	21.3%	28.9%	37.4%	12.4%

In table 4.21 results shows the number schools covered by community health extension workers in three months, Those who covered between 1-5 schools and strongly agree =50.3%, agree= 21.7%, somewhat agree= 15.5% and who disagreed =12.5%. Overall 87.5% of the respondent agreed to have covered between 1-5 schools, by training school pupil/students on tuberculosis care in Bungoma County. For those who covered between 6-9 days and strongly agreed =25%,

agreed =37.6%, those who somewhat agreed =20.6% and those who disagreed =16.8%. In general majority of the respondents 82.6% carried school based tuberculosis education. This means that the CHEWS helped to train many people on tuberculosis care in Bungoma County. A small percentage 8% did not visit any school in the last three of 2015. The results of this study are in agreement with studies done by National tuberculosis program. In Kenya a survey conducted by National Tuberculosis and Leprosy Program (NLTP) showed that 5230 Health care workers were trained by Global fund and USAID funds. The results lead to increased case finding from 70% to 80% (NLTP reports 2014). There was also increased cure rate from 84% to 89%, increased HIV testing among Tb patients from 80% to 93%, uptake of antiretroviral drugs from 60% to 90% (NLTP reports 2015) The total community volunteers trained were 4000 contributing significantly to above achievement and 750 schools reached with Tb information countrywide .

4.8.1 Opinion of the CHEWS on improvement of community strategy in Bungoma county.

In this section community to their suggestion on how to improve community strategy of which community tuberculosis care also fall. Some of the responses were payment of stipend to community health volunteers, more training for CHEWS and CHVs, increasing the number of CHEWS, benchmarking with other counties and transport to CHEW among many others.

Table 4.22: what can be done to improve community strategy?

	Strongly agree	Agree	Somewhat agree	Disagree	Rank
Stipend to chv	14.8%	50.8%	24.8%	9.8%	3
Training of chew	19.5%	50.3%	25%	5.5%	4
Employ more chew	17.5%	42.5%	26.8%	13.3%	1
Bench mark with other counties	13.0%	51.4%	24.8%	10.8%	2
Transport for chew	21.0%	37.8%	33.5%	7.8%	5
Provision of IEC material	22.8%	51.3%	16.8%	9.3%	6

Table 4.22 shows the results of the suggestions of the study participant on improvement of community strategy in Bungoma in which community tuberculosis care belong. The respondents were asked open ended to give their suggestion and the results are as follows. Those who strongly agreed that stipends to CHVs= 14.8%, agreed =50.3%, somewhat agree =24.8% and those who disagreed =9.8%. From this results majority of respondent 80% wanted community health volunteers paid a monthly stipend as an incentive for their volunteer services and they were ranked three overall in order of priority. Those who strongly agreed that employ more CHEWS= 17.5%, agreed= 51.4%, somewhat agree =24.8% and those who disagreed = 13, 3%. In all 93.7% suggested more CHEWS to be employed which will enable two CHEWS per community unit other than the current situation as already seen in this where majority are 1-2 community units and this proposal was ranked number one in ascending order. In another suggestion those who strongly agreed on benchmarking with other counties =13.0%, agree = 51.45, somewhat agree =24.8% and disagree =10.8%. Generally 69.2% agreed that benchmarking is important in improving community strategy performance and were number two in the ascending order. The next suggestion was on provision of transport means to the CHEWS, strongly agree =21%, agree =37.8%, somewhat agree= 33.5% and disagree = 7.8%. Overall 92.3% of the respondents agreed that CHEWS needed to be provided by means of transport for them to do their work more effectively and they ranked five in the ascending order. Lastly on the suggestion on provision of IEC material, those who strongly agreed = 22.8%, agreed =51.3%, somewhat agree =16.8% and disagree =9.3%. Majority 89.9% of the respondents agreed that more information educational and communication material s are needed to make community to do much better. These suggestions by the respondents are also cited by other researches as seen in the literature review here in quoted. Health services and local communities working together can bring practical solutions that respond to the needs of people where they live. Health services can provide resources, facilities and professional expertise to complement people's efforts to take responsibility for their own health (WHO publication 2014). Political commitment and community involvement are powerfully sustained by using advocacy, communication and social mobilization. Advocacy ensures political and financial commitment to place TB high on the development agenda and to involve the people affected and their communities (WHO 2014). Communication facilitates dialogue and information sharing; helping people to understand and to influence positively their health-related

behavior and helping health services to better understand the personal and social aspects of health problems to provide more adequate answers (Paula et al 2010). Social mobilization refers to promoting the active the involvement of people with TB and communities in health initiatives.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The purpose of the study was to investigate the roles community health volunteers in implementation of community based tuberculosis care in Bungoma County in Kenya. The chapter focuses on the summary of the findings, related discussions and recommendation.

5.2 Summary of findings

5.2.1 Increasing awareness creation as an influence in implementation of community tuberculosis care

From the study, 87.71% of the respondents are involved in awareness creation during home visits and only about 13% of the respondents have never talked about tuberculosis during home visits. The study also sought to find out what community health volunteers talk about during home visits. 47% talked about symptoms/signs, 34% talked about prevention of tuberculosis, 16% talked about diagnosis of TB, and those who never talked about tuberculosis during home visits. In total 97% of the CHVs/CHCs interviewed were involved in tuberculosis awareness creation in Bungoma County. The study also found out that only 38% received used IEC material from the government/partner to assist them creation awareness during home visits. On the other hand a large number of CHVs/CHCs were not supplied with IEC material on tuberculosis care (62%).

The findings therefore mean that the CHVs/CHC members were passing information to the public which was not uniform and consistent and there is danger of passing wrong information. The importance of IEC material like posters can be read by many people for a long time therefore constantly raising awareness in the society. In this question on IEC, during literature review, the researcher did not find similar study at that time. 68% of the participant agreed that they talk about tuberculosis care during their action days which some hold monthly and others quarterly. Those who hold quarterly meetings 62% of them were the majority and those hold monthly meeting were 38%. Action days are public function, and the public attend the meeting, therefore those hold monthly meeting increase public awareness more than those who hold quarterly. Those who said no= 91 (32%), represented a missed opportunity to tuberculosis

awareness in the community. Those groups of community health volunteers/ community health committee's members should be targeted for training or sensitization on awareness creation.

5.2.2 Access to direct observation of treatment influence implementation of community based tuberculosis care

The study showed that= 44% of the respondents strongly agreed that DOTS is done in the community, 37% agreed, 15% were neutral, 0% disagreed and 5% strongly disagreed. From these findings a total of 76% of CHV/CHCs have done DOTS and this has improved patient outcomes. The research findings in this section show CHVs implementing community based tuberculosis care (CB-DOTS) in the most effective ways. 2=52% of the respondent strongly agreed that DOTS is done in phases, that is the intensive phase hat last two months and continuation phase of four months, 44% strongly agreed and 4% were neutral. 3= 44% of the respondents strongly agreed the definition of DOTS as observing the patient swallow their medicine, 33 agreed, 19 were neutral and 4 disagreed. In total 77% of all participants understood the meaning of DOTS and a small percentage of 23 did not know the meaning of DOTS. 4= 56% of the respondents strongly agreed to have collected drugs from the patients during the course of their work.33% agreed, 7% were neutral and 4% strongly disagreed. In all 89% of the CHCs/CHCs agreed to have collected medicine for their patient increasing adherence and reducing defaulter rate. 5= 33% strongly agreed that Dots is important to the patient, 44% agreed, 19% were neutral and 4% strongly disagreed that Dots is important to patient in the community.

5.2.3 Defaulter tracing and contact screening influence on implementation of community tuberculosis care

Most respondents, pearson correlation =1 strongly agreed that defaulter tracing is part their work and another similar number pearson correlation =1 agreed to having done defaulter tracing in the last six month. The study also revealed that poverty lead as the main reason patient default from treatment= 110 (39%) respondent strongly agreed, pill Burden = 80 (29%) was the second reason, long distance to the facility= 30 (11%) respondent agreed as the reason to why patient stop medicine, unfriendly health care providers =50 (18%) and none= 10 (4%) found no reason the patient should default from medication. From the above results it is clear most patients will miss to collect their medicine on their clinic days because they lack money for transport or

probably they sleep without food: this despite the fact that tuberculosis medication is free of cost in all government and faith based facilities. Of more concern is the unfriendly health care workers 18%, which should be addressed urgently.

On monitoring and evaluation the study showed that the number of CHVs/CHCs who recorded information on community DOTS =150 (54%), which means majority of the community health volunteers observe patient swallow their medicine. The number who recorded information on defaulter traced=50 (18%) , means that not many but some 18% are involved in returning patient who have defaulted their medication. This is also important in maintaining good treatment outcome, avoiding development of drug resistant TB and helping to reduce transmission of the disease in the community. The number who recorded contacts traced= 80 (28%) in the community monitoring tools. This means the community health volunteers/ community health committee's members are involved in active case finding (ICF).This is a very important activity where all cases who are diagnosed with tuberculosis, their homes, work place are visited by CHV, who are contacts and have any sign/ symptom of tuberculosis are referred to the health facility for further investigation and possible treatment.

5.2.4. The influence of training on implementation of community tuberculosis care.

The results on training were given by ministry of health employees, the CHEWS. The results shows the number of community units managed by on community health extension workers indicating one unit= 9 (41%). This means she/he takes care of 20 CHVS/CHCs and trains them on community based tuberculosis care. Two units= 11(50%), the community health extension worker handles two community units consisting of 40 CHV/CHCs and trains them on community TB. More than three units =2 (9%) means the CHEW manages more than 3 community units and more than 60 CHCs/CHVs, and has train them on community tuberculosis care. The results shows that the majority of CHEWS manages two community units (50%) followed by one units 41% giving them ample time to train the CHCS/CHVS and the public in general. On the roles of the CHEWS, the results on training =30% strongly agreed that training of CHVs/CHCs and large community as their role. This is significant in the sense by training community own resource person, implementation community tuberculosis will be harnessed: 26.70% of the respondent agreed, 31.70% somewhat agree and 11.50% disagree that training is part of their responsibility. In general 87.40% agreed training to be part of their responsibilities.

On intensive case finding/defaulters tracing =28.30% strongly agreed, 30% agreed, 30% somewhat agreed and 20% disagreed that intensify case finding/defaulters is their role. Majority 88.20% were in agreement that intensified case finding/defaulters tracing was their responsibility. The findings affirm the role played by the CHEWS in the implementation of community based tuberculosis care in Bungoma County. On health promotion =25% strongly agreed to providing health promotion activities as part their duty. 40% agreed, 25% somewhat agreed and 10% disagreed that health promotion was part of their responsibility. Overall the majority 90% agreed that health promotion is major responsibility in implementation of community based tuberculosis care. Finally on monitoring and evaluation = 24% strongly agreed that monitoring and evaluation is part of their work as CHEWS, 34% agreed, 22% somewhat agreed and 20% disagreed that monitoring and evaluation was their role. The majority of the respondent agreed that monitoring and evaluation was the responsibility of the CHEWS.

On school health program, the results showed the number schools covered by community health extension workers in three months, Those who covered between 1-5 schools and strongly agree =50.3%, agree= 21.7%, somewhat agree= 15.5% and who disagreed =12.5% . Overall 87.5% of the respondent agreed to have covered between 1-5 schools, by training school pupil/students on tuberculosis care in Bungoma County. For those who covered between 6-9 days and strongly agreed =25%, agreed =37.6%, those who somewhat agreed =20.6% and those who disagreed =16.8%. In general majority of the respondents 82.6% carried school based tuberculosis. This means that the CHEWS helped to train many people on tuberculosis care in Bungoma County. A small percentage 8% did not visit any school in the last three months of 2015.

On improvement of community strategy the study results showed that most suggestions of the study participant on improvement of community strategy in Bungoma in which community tuberculosis care belong. The respondents were asked open ended to give their suggestion and the results are as follows. Those who strongly agreed that stipends to CHVs= 14.8%, agreed =50.3%, somewhat agree =24.8% and those who disagreed =9.8%. From this results majority of respondent 80% wanted community health volunteers paid a monthly stipend as an incentive for their volunteer services and they were ranked three overall in order of priority. Those who strongly agreed that employ more CHEWS= 17.5%, agreed= 51.4%, somewhat agree =24.8% and those who disagreed = 13, 3%. In all 93.7% suggested more CHEWs to be employed which will enable two CHEWS per community unit other than the current situation as already seen in

this where majority are 1-2 community units and this proposal was ranked number one in ascending order. In another suggestion those who strongly agreed on benchmarking with other counties =13.0%, agree = 51.45, somewhat agree =24.8% and disagree =10.8%. Generally 69.2% agreed that benchmarking is important in improving community strategy performance and were number two in the ascending order. The next suggestion was on provision of transport means to the CHEWS, strongly agree =21%, agree =37.8%, somewhat agree= 33.5% and disagree = 7.8%. Overall 92.3% of the respondents agreed that CHEWS needed to be provided by means of transport for them to do their work more effectively and they ranked five in the ascending order. Lastly on the suggestion on provision of IEC material, those who strongly agreed = 22.8%, agreed =51.3%, somewhat agree =16.8% and disagree =9.3%. Majority 89.9% of the respondents agreed that more information educational and communication materials are needed to make community mobilization to do much better.

5.3. Conclusion

The study sought to find out the influence of community health volunteers on implementation of community based tuberculosis care in Bungoma County. From the results majority of the respondents both CHVs/CHCs and CHEWS are implementing community based tuberculosis care.

On average majority of the community health volunteers/ community health committees members were involved in awareness creation on community based tuberculosis care. This enabled members of the public to be aware of signs/ symptoms of tuberculosis, diagnosis and treatment. It also enabled the community to take preventive measures against tuberculosis infection. A good number of used IEC materials to pass their message to the public as well use of school health programs and home visits. However many of CHVs/CHCs (>50%) were not provided by IEC material.

Majority of the respondents participated in defaulter tracing and contact screening of smear positive tuberculosis patient; though a good proportion were not able to do the same. Generally majority of the respondents were aware the tools used to monitor community tuberculosis, most lacked these tools. Again the majority of the respondents participated in observation of patient while on treatment; some CHVs/CHCs participated in collecting drugs for patient which improved treatment outcomes.

From the study most of community health extension workers agreed to be involved in training of community health volunteers/ community health committee members and the general public. The CHEWS are also involved in health promotion activities, defaulter tracing, intensive case finding and monitoring and evaluation of community based tuberculosis care in Bungoma County.

5.4. Recommendations

The following are the recommendations that were obtained from the study:

1. Community health volunteers/ community health committee's members should be paid monthly stipends, so that they dedicate more time on the community work.
2. There is need to employ more CHEWS, so that there are two CHEWS per community unit.
3. The Kenya government and Bungoma county government should get more involved in the of community units: since the study indicate majority are from development partners hence allocate more money.
4. All community health volunteers/ community health committees' members should be trained on the technical module, for them to provide quality services in the community.
5. The government to provide to all CHVS/CHCS with data capture tools and standardized standard operating procedure to every units
6. The CHC/CHVs should be provided with enough IEC, written both in official/ National and local language for better understanding of all communities.

5.5. Areas for further research

1. The researcher suggests that, knowledge, attitude and practises to be contacted on both CHV/CHCs and the CHEEWS.
2. Exit interview to be contacted on patient on tuberculosis treatment to determine the contribution of CHVs on their care.
3. Retrospective study to determine the number client referred by CHVs/CHCs.

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APPENDICES

APPENDIX I: LETTER OF TRANSMITTAL

Dear Respondent,

I am a student at University of Nairobi pursuing a Masters degree in Project Planning and Management and carrying out a research on ‘The roles of community health volunteers on implementation of community based tuberculosis care, prevention and control in Bungoma county’. I am requesting for your assistance. Do assist by filling in the questionnaire provided. The information will be helping me accomplish the research objectives. All responses will be treated with total confidentiality.

Thank you.

Yours faithfully,

LODI PAUL SICHANGI.

3. Level of education (highest affordable)

Primary education

Secondary education

Tertiary (specific)

None

4. Have you ever been trained on community Tb care?

Yes

No

5. If yes how long was it?

One day

Three days

6. If yes in (5) did it add value to you in Tb management

Yes

No

7. Who supports your C.U?

GOK

Partners

None

SECTION B

QUESTIONNAIRE ON AWARENESS CREATION

1. Do you ever talk about tuberculosis while visiting homestead on your routine work?

Sometimes

Always

Never

2. If positive response in above, what do you talk about? (Tick the correct appropriate)

Symptoms and signs of TB

Diagnosis

Prevention

None of the above

3. Are you given IEC material that contain TB message

Yes

No

4. if yes in (3) how frequent

Once in a year

Never given

Always

5. Do you hold action days in your CU.?

Yes

No

6. If yes how frequent?

Monthly

Quarterly

Biannually

Annually

7. Have you ever talked about TB in action day or Barazas

Yes

No

8. If yes how often

Quarterly

Monthly

9. In your opinion, are Tuberculosis patients face stigma in your community?

Yes

No

10. If yes above, which type of stigma? (Tick where applicable)

a). Isolation

b). Use of separate plates

c). Not visited by friends

d) Sent back to the village to avoid shame in town

e) Women with TB divorced/chased by husbands

f) Gossip/teasing

g) Mocking

h) Finger pointing

i) Church leaders condemn TB patients for promiscuity, adultery, breaking moral laws

j) In school, children with TB or coughing forced to sit near open window

k) Children separated/isolated from others

l) Children teased i.e “your parents died because of their bad behaviour”

m) In market, people stop buying from a market seller who is suspected to have TB or HIV

11. What are some of the effects of stigma on TB patients?

i. Personal shame

ii. Self-blame

iii. Isolation

iv. Loneliness

- v. Loss of status
- vi. Loss of self esteem
- vii. Depression
- viii. Denial and anger
- ix. Violence and alcoholism
- x. Suicide and death
- xi. Family quarrels, mutual blame and conflict
- xii. Separation and divorce
- xiii. Property grabbing
- xiv. Defaulting treatment or getting tested

12. What can you do to reduce stigma?

- a). Involvement of patients, providers and commitment
- b) Use of “home care volunteers” to disseminate information about TB.

C). QUESTIONNAIRE ON ACCESS TO DIRECTLY OBSERVED TREATMENT

1). Have you ever done directly observed treatment to TB

Patients?

Yes

No

2). If yes in above question. How long.

Intensive phase

Continue non phase

Not sure

3). what exactly entails DOTS

Observe patient swallow TB medicine and record on patient's card

Give patient TB medicine to swallow at his own time

Note aware of it

4). Have you ever collected TB medicine for TB client from the health facility

Yes

No

5). If yes above under what circumstances?

Patient too sick to reach health facility

It is my responsibility

Patient has paid me

6). How many patients have you observed swallow medicine in last 2 quarter of 2015

None

<10

> 10

7). In your opinion what is the advantage of direct observation of treatment?

. Improvement of treatment outcome (better outcome)

- . Reduction in death rate
- . Reduction in defaulter rate (out of control).
- . Reduces the possibility of drug resistance
- . None

QUESTIONNAIRE ON DEFAULTER TRACING AND CONDUCT SCREENING

1). Have you ever done defaults tracing for TB clients

Yes

No

2). If yes above how many defaults have you traced in last 6 months

0

<10

>10

3). what are some of the reasons in your opinion patient default treatment

Poverty- lack of money for transport

Pill burden (many drugs)

Long distance to facility

Long duration of treatment

Unfriendly HCW

Any other, specific.....

4). of contact tracing; have you ever visited contacts of smear positive TB and screened them

Yes

No

5). If yes in the last 3 months how many contacts have you screened

0

1-10

11-20

<20

6). what do you do if you find a client has symptoms of TB

Treat

refer to nearest facility

Give health education

Nothing

7).. Do you have a chalkboard in your CU?

Yes

No

8). If yes, do document TB information in the chalkboard?

Yes

No

9). Which type of information do you document?

Health talk on TB

No. of patient on DOTS. (CBDOTS)

No. of defaulters traced

No. of contacts traced

10) Do you have the following document?

a) TB referred forms

Yes

No

12) Contact tracing form

Yes

No

c) Default tracing form

Yes

No

d) Community TB log book

Yes

No

13). If yes, do you use them correctly

Yes

No

QUESTIONNAIRE TO HEALTH CARE PROVIDERS (CHEW).

1. How many community units do you manage?

One

Two

> Three

2. How is the community units in your area funded?

Gok

Partner

Community itself.

None

3. Please list down your roles as a CHEW in Tb control in the community.

.....
.....
.....

4. How many public Barasa did you hold in the last 3 months?

None

<2

> 3

5. Do you hold school Health program in your area of jurisdiction?

Yes

No

6. If yes in above question; how many schools did you visit in the last 3 months?

.1 – 5

.6 - 9

.None

7. Do you have records as regards community Tb yes?

Yes

No.

8. If yes in above question; please list down the records / reports you submit

.....
.....
.....

9. If yes above, list down the successes

.....
.....
.....

10. In your opinion, do you think community strategy is succeeding?

Yes

No

11. Please list down; what you think can be done to improve community strategy?

.....
.....
.....

APPENDIX III: TIME FRAME

Activity	JANUARY 2014	Nov. 2014 to march 2015	MAY 2015 To AUGUST 2015	FEBRUARY2015	APRIL 2015
Research topic identification and development of researcher proposal		Refine the proposal	Defend the proposal and Collection of data	Cleaning, coding, analysis and recommendation.	Presentation of the researcher findings.
Presentation of the proposal					

APPENDIX IV: RESEARCH BUDGET


Activity	Quantity	Unit cost (ksh)	Total (ksh)
Stationery			
Pens and pencils	10	15	150
Note books	5	125	625
Rulers	3	20	60
Erasers	5	20	100
File	2	45	90
Flash disc	1 (2GB)	400	400
Calculator	1	600	600
Typing & photocopy costs	2 copies of proposal development	@800-	1600/=
Facilitation and meals	20 people @1000/=-	@1000/ =	20000/ =
		TOTAL	24025
Data collection			
Transport	For 2 trips	4000	8000/=
	10	@500/=	5000+
		TOTAL	13000/=
		<u>GRAND TOTAL</u>	<u>37025/=</u>

APPENDIX V: DETERMINING SAMPLE SIZE FOR RESEARCH ACTIVITIES

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	140	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	382	75000
210	136	1100	285	1000000	384

APPENDIX VI: MAP OF BUNGOMA COUNTY

APPENDIX VII: NACOSTI APPLICATION BANK SLIP

 **KCB** Date: 20/05/2016

C R E D I T A D V I C E
C A S H D E P O S I T

KCB BUNGOMA ACCOUNT DETAILS

Account AT KCB KIPANDE HOUSE A/C NO: 1104162547

A/C REF: 005241970364

NAT COMM FOR SCI ,TECH AND INNOV


Current Account-Corp Inst. Bankin

We have credited your above account with 1,000.00 KES

=====

Kenya Shillings ONE THOUSAND ONLY

CASH PAID IN BY: PAUL LODI SICHANGI Signature :



APPLICATION FOR RESEARCH FEE

Transaction Number: TT161414NHY2 at 11:50:13 On 20/05/2016

Thank you for banking with us. You were served by: MOLLYNE BUSUKU

*** Advice not valid unless Transaction Number is shown ***

PAP-1064 Beam Version 11 (Revised Sep 2010)