

# Analysis of Implementation barriers of Directly Observed Treatment Short course therapy (DOTS) program: Case of TB patient care in Machakos County, Kenya

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## Abstract

Despite the success of the implementation of the Directly Observed Treatment Short Course (DOTS) programme to control and prevent tuberculosis (TB) in Kenya since the year 1996, new TB cases continue to emerge in communities, a significance of the disease transmission. The success of the DOTS programme require total adherence to TB treatment for those infected and appropriate control measures as stipulated in the WHO TB treatment guidelines to include trained manpower to manage the TB patients, adequate treatment facilities and surveillance. The main objective of this study was to examine the implementation of the DOTS programme and TB patient care in Machakos County. A pre-tested self administered questionnaire was used to collect data from health workers and 3 Focus Group Discussions were held with TB patients, health workers and patient care takers. The data was analyzed by use of statistical package for social sciences (SPSS) version 16. For qualitative data, notes taken during Focus Group Discussions was summarized to what was agreed on and presented in narrative. Finally the findings are discussed and appropriate interpretation made. The results of this study reveal a majority (90.9%) of health workers in TB treatment facilities are not trained on TB management posing challenges to drug dose administration and advice in continuity of patient care. In addition (45.5%) of workers reported patient absenteeism, (18.2%), refusal of treatment, (18.2%) staff shortage and drug shortage which are prequisites to TB transmission, drug resistance, relapse and subsequent death. Training of health workers, additional staff, facility infrastructures improvement and diagnostic facilities which are in poor state were reported as urgent for DOTS programme implementation. The study community strongly belief once you have TB you are infected with HIV/AIDS which causes fear that results to secrecy of status. Additionally the community members practice secrecy of their member's illness posing challenge to TB prevention and control efforts. The study recommends health education dissemination on best practices of TB and treatment adherence by the Ministry of health and to demystify the disease in communities.

**Key words:** Implementation of DOTS programme, TB patient care in Machakos County

## 1.0 Background information

Despite the implementation of the Directly Observed Treatment Short Course (DOTS) programme in Kenya that is recommended the world over for treatment, control and prevention of TB, the disease continues to spread with devastating effects in communities. The global tuberculosis report 2013 show 9 million people develop TB every year and 3 million are missed by health systems. Tuberculosis is of global concern, a major cause of illness and death in the world especially in low and middle income countries due to single infectious agent *Mycobacterium tuberculosis* and occasionally by *Mycobacterium bovis* and Africanus bacteria (WHO, 2014).The disease is mainly transmitted through air mainly by coughing or sneezing. Tuberculosis symptoms include coughing, night sweats, fever, loss of appetite and weight loss. If not treated, each person with active TB infects on average 10-15 people every year. The global TB research report show failure to complete TB treatment and mismanagement of medicines lead to 1.4 deaths every year (WHO, 2012).Currently, 450,000 multidrug resistant TB patients (MDR-TB) have been diagnosed with virtually all the world countries reporting cases of the extensively resistant tuberculosis cases (XDR-TB), (WHO,2012).

Sub-Saharan Africa carries the greatest proportion of new TB cases per population with over 225 cases per 100,000 population in the year 2012.The TB burden increased with the advent of HIV/AIDS in the early 90's and people infected with HIV are 21-34 times likely to be infected with TB.

Kenya with a population of 43 million people is among the countries that contributes about 80% of TB cases and is ranked 13<sup>th</sup> among the 22 high burden World countries. The current data (WHO, 2013) show there is approximately 132,000 new TB cases and incidence rate of 142 new sputum smear positive cases per 100,000 populations each year The reported MDR-TB cases in 2012 were 1,344, laboratory confirmed were 225 and those started on treatment were 202. Tuberculosis is treatable, can be prevented and controlled if the internationally recommended strategy for TB treatment, prevention and control (DOTS) recommended measures are applied and adhered. The DOTS package in TB treatment is to ensure early case detection and diagnosis of

TB through quality assured bacteriology, provision of standardized treatment with supervision and patient support. In addition in this package are effective drug supply, management, monitoring of performance and impact, and adequate financing through political commitment (WHO, 2013). In Kenya, the most affected are mainly the young and economically productive in age groups 15 – 45 years which has caused a significant reversal of the benefits of good health and socio economic development in the communities (MOH, 2006). Further the emergence of HIV/AIDS has further complicated TB control measures due to stigma that is associated with the epidemic. In the year 2012, Kenya recorded 35,837 TB/HIV positive patients. An estimated 48% of new TB patients are co- infected with HIV and 50%-60% of the TB infected patients in Kenya are HIV infected (WHO, 2013; MOH, 2007). Tuberculosis is infectious and its transmission is sustained where there is misconception and poor practices in regard to effective prevention, treatment and control. The current efforts in the DOTS programme implementation has shown positive results but little effort has been made to assess the facilities' operations, status and TB patient access to health care as per the WHO standards which will be addressed in this study.

### **1.1 Statement of the problem**

Despite Kenya's achievement of the recommended success in new case sputum smear and positive detection rate that has reached the WHO target of 70% and 72%, respectively, and treatment success rate of 85% since the year 1997, TB transmission continues to be witnessed in Kenyan communities. The current information (WHO, 2012) report MDR-TB cases in 2012 were 1,344, laboratory confirmed 225 and those started on treatment were 202, an indication of TB that is resistant to treatment is spreading in communities. In Machakos County, between the years 2005-2009, an average of 3,000 new TB cases was continually diagnosed. This pose a health risk to the study community and other communities living in other Districts as TB is air borne, spreads very fast is infectious, this require urgent control measures. Studies in Kenya show transmission of TB is thought to occur in families due to close contacts with TB patients, poverty conditions, malnutrition, and in communities at large. There is however little documented information available in studies in Kenya that show the current status in the DOTS programme operations/ implementation in treatment facilities to compare with the WHO stipulated TB treatment guidelines. The WHO recommend total adherence to TB treatment for those infected, availability of trained manpower to manage the TB patients, adequate treatment facilities and TB surveillance. The information gap could shed more light on TB transmission and will be addressed in this study.

## **2.0 literature review**

### **2.1 Tuberculosis (TB) leading killer**

The WHO Global TB (2013) current data show tuberculosis is still a major health problem with 8.6 million new TB cases and accounting for 1.3 million people's deaths in the world in the year 2012. Among the TB deaths, 320,000 were HIV-positive. Tuberculosis (TB) is the leading killer of people co- infected with HIV/AIDS, the highly stigmatized disease the world over (WHO, 2009; 2010). Tuberculosis is transmitted through air by in prolonged close contact. The TB germs spread from person to person through cough, sneeze or spit that propel them to the air that is inhaled by the uninfected. If not treated, each person with active TB infects on average 10-15 people every year (WHO, 2009).

### **2.2 Environments of Transmission**

The WHO estimates by the year 2020 there will be 1 billion people infected with TB bacillus, 200 million people will develop clinical tuberculosis and 35 million will die from the disease if preventive measures are not instuted,a, a prediction that needs to be closely monitored. Reports indicate Multi-drug resistant tuberculosis (MDR – TB) has become a major problem in several countries in Europe, Africa, Asia and it threatens the rest of the world (UNAIDS, 2005). Studies have consistently shown that TB is transmitted in environments of poverty, inadequate ventilation, overcrowding and malnutrition WHO, (2010). It is estimated TB will rob the world poorest countries of an estimated 1-3 trillion US dollars over the next 10 years. Reductions of TB incidences require improvement in socio-economic conditions that lead to access of quality care and its rational use (WHO, (2010).

### **2.3. TB control programmes**

In the developed world, successful TB control programmes have emerged where committed policy makers, public health and communities develop well defined strategic plans, demonstration areas and trained manpower inputs (World Bank, 2007). MDR-TB and XDR-TB have emerged in countries with no stringent measures of TB control due to unsatisfactory treatment success rates, general lack of infection control measures, outdated

manuals and guidelines, inadequate labs, weak surveillance of drug resistant TB services, limited general access to TB services and inadequate human resource (WHO, 2009). In order to remove the threat of TB, communities need to be empowered through awareness of primary issues and healthy behaviors. The TB epidemic cannot be addressed without involving those most affected by the disease, and the resulting consequences of their sickness (WHO, 2010). The communities can help provide practical solutions to the problems many people face when they fall ill and need diagnosis and proper care as well as lead to more interventions by health care professionals (WHO, 2010).

#### **2.4. Global burden of TB**

Sub-Saharan Africa which is home to 11% of the world's population has a disproportionate burden of tuberculosis as the continent reports more than a quarter of the global burden of TB (WHO, 2014). The continent carries the greatest proportion of new TB cases per population with over 225 cases per 100,000 population in the year 2012 reported (WHO, 2013). The TB burden increased with the advent of HIV/AIDS in the early 90's. People infected with HIV are 21-34 times likely to be infected with TB. In Africa more than 5 million of the 13 million Africans now living with HIV will develop TB and more than 80% will die early deaths (KEMRI, 2000). Tuberculosis remains an important but neglected cause of adult and childhood morbidity and mortality in the African region (WHO, 2004). The epidemic has reached emergency proportions despite significant efforts by member states in collaboration with the world health organization, other donor and technical partners in the implement the internationally recognized DOTS programme (WHO, 2005).

An estimated 1.6 million new TB cases and 600,000 deaths occur annually in the region that is also ranked 9<sup>th</sup> out of the 22 global TB high burden countries in the world responsible for 80% of total global TB burden (WHO, 2010). The HIV epidemic is now considered the most important factor driving the TB epidemic that is threatening to overwhelm even effective TB programmes in the region. It is estimated that about 30-50% of the newly diagnosed TB cases are also HIV positive and 40% of all HIV deaths in the region are due to TB (WHO, 2004; WHO, 2010). Tuberculosis has social and economic burden on ill people and their families. The poor people are especially vulnerable to TB because of their underlying health status, diverse living conditions and their limited treatment access.

#### **2.5. Implementation of the DOTS**

Kenya started the implementation of the DOTS programme since the year (1993) and achieved 100% coverage by the year 1996. Despite this, the country is ranked 13<sup>th</sup> among the 22 World countries with high TB burden that collectively contribute about 80% of TB cases. The global estimates show the country has approximately 132,000 new TB cases and incidence rate of 142 new sputum smear positive cases per 100,000 populations (WHO, 2009). According to the latest surveillance and estimates of TB incidence, Kenya is the first country in Sub-Saharan Africa to have achieved the global targets for both case detection and treatment success. In 2007, the DOTS case new sputum smear and positive detection rate reached WHO target of 70% and 72%, respectively, and treatment success rate of 85%. Tuberculosis is mainly affecting the young and economically productive age groups 15 – 45 years and has caused significant reversal of the benefits of good health and socio-economic development in Kenyan communities (MOH, 2006).

Further HIV/AIDS has further complicated TB control measures due to stigma that is associated with the epidemic. The fear of association of the two diseases has been reported in studies in Kenya to cause delay to seek treatment for those infected with TB (Wesonga, 2002; Ayisi, 2011; Mutinda *et al.*, 2013). An estimated 48% of new TB patients are co-infected with HIV and 50%-60% of the TB infected patients in Kenya are HIV infected (CDC, 2007; MOH, 2006., WHO, 2010). The WHO recommend control measures of early and accurate diagnosis, immediate accurate treatment which is supported and supervised so that drugs are taken for the appropriate duration of time. This should be complemented with awareness creation of primary issues of TB and healthy behaviors in communities and those affected (WHO, 2013). In a recent study to assess community vulnerability to TB in Kenya, (Mutinda *et al.*, 2013) observed a widespread misconceptions of TB that result to fear, resulting to secrecy of status and enhancement of the disease spread.

### **3.0 Research Methods**

#### **3.1 Study site and respondent selection**

Machakos County was randomly selected for this study. The County, like the rest of the 47 Counties in Kenya, has new cases of TB that continue to be witnessed. The study was carried out in Central and Athi River Divisions of Machakos County in Kenya, formally in Eastern Province. Cluster and simple random sampling by lottery was used to select the Divisions (clusters). To achieve this, a list of all the 12 Divisions of Machakos

County was made and a simple random sampling by lottery was done that selected Athi-River and Central Divisions. The two Divisions have three major TB health treatment facilities namely; Mutituni, Machakos Level 5 Hospital and Athi-River which were purposely selected for the study. Health workers deployed in the TB treatment facilities were purposely selected for the study on basis of deployment. Tuberculosis patients and patient care takers were randomly selected from the three TB treatment health facilities during clinic attendance. The 2009 census in Kenya show, Machakos County is inhabited by 293,434 persons with a growth rate of 2.0. Poverty level stands at 60%, the area has unreliable rainfall with subsistence farming as the main source of income (KNBS, 2009). There is 160 health facilities distributed in the 12 Divisions that deal with preventive, promotive and curative services.

### **3.2: Interviews**

Data was collected from TB patients, health workers and TB patient care takers, through Focus group discussions (FGDS). In addition, health workers filled in questionnaires. Focus group discussions were used to collect qualitative information, which was summarized and recorded narrative. In total 3 focus groups were held with 46 participants. The groups consisted of 8-10 participants that comprised of TB patients, care takers of TB patients and the health workers. For the discussions, meetings with different groups were arranged in the representative TB health facilities, for TB patients, TB patient care-takers and for health workers respectively.

For the TB patients and TB patient care takers data was collected during clinic visits. Simple random sampling was used to select the participants who met the study criteria and consented. The Focus group discussions were guided by a facilitator who is the principal investigator and participation was on voluntary basis. A private room was identified to ensure privacy, and the respondents were made aware of the purpose of the discussion. Permission was obtained from each one of them. A written list of the topics for discussion was formulated as a series of open ended questions which were used for each group. Notes were taken by a trained interviewer. Responses from the groups were compared and summarized as was agreed on and presented narrative. Overall, the information from FGD's for the different group categories were recorded in three days, each group per day.

#### **3.2.1 Participant selection**

For the TB patients, selection was done mainly during clinic days. To achieve this, ballot papers were prepared and written yes or no, folded then put in a container and mixed thoroughly. The TB patients who entered the treatment room and who met the study criteria were informed of the nature and purpose of the study. Informed verbal consent was obtained from each of the respondents who consented to participate. They were then asked to pick a ballot paper that was prepared. This ensured an equal chance of representation or inclusion. Only the respondents who picked papers written yes were recruited for the study and were requested to participate in the discussions. To ensure no repetition of participation, patients TB/clinic number was marked and oral confirmation of identity by the patient was accepted.

As for the TB patient carers, selection was done similarly on clinic days as they accompanied the TB patients for treatment. A similar selection procedure as that of the TB patients was used and the TB patient identification number of those they accompanied was used to ensure no repetition and for identification.

Health workers completed the questionnaire in their respective clinics on appointment and a focus group discussion was held in one of the sampled TB treatment health clinics on a non-clinic day when they were less busy. Prior to the filling of the questionnaire, instructions were given to the respondents on how to fill in to ensure completeness of the information. In total 12 health personnel were found deployed in the TB health facilities who worked on day duties and 11 of them filled in the questionnaire. The questionnaires had closed-ended questions that were analysed quantitatively and open ended questions that permitted free responses that gave qualitative information and reported verbatim. Preparation of the study tool was done in English.

### **3.3 Ethical clearance**

The study protocol was done after approval by Mt. Kenya University and clearance was given by the Ministry of Higher education, Science and Technology, Ministry of Medical Services and the Medical Officer of Health, Machakos County.

### 3.4 Data analysis

Data was analyzed using the Statistical package for Social Sciences (SPSS) version 16.0 for descriptive statistics and Pearson's Chi-square tests to test relationships. For qualitative data, notes taken during Focus Group Discussions were summarized to what was agreed on and presented in narrative. Finally the findings are discussed and appropriate interpretation made.

## 4.0 RESULTS

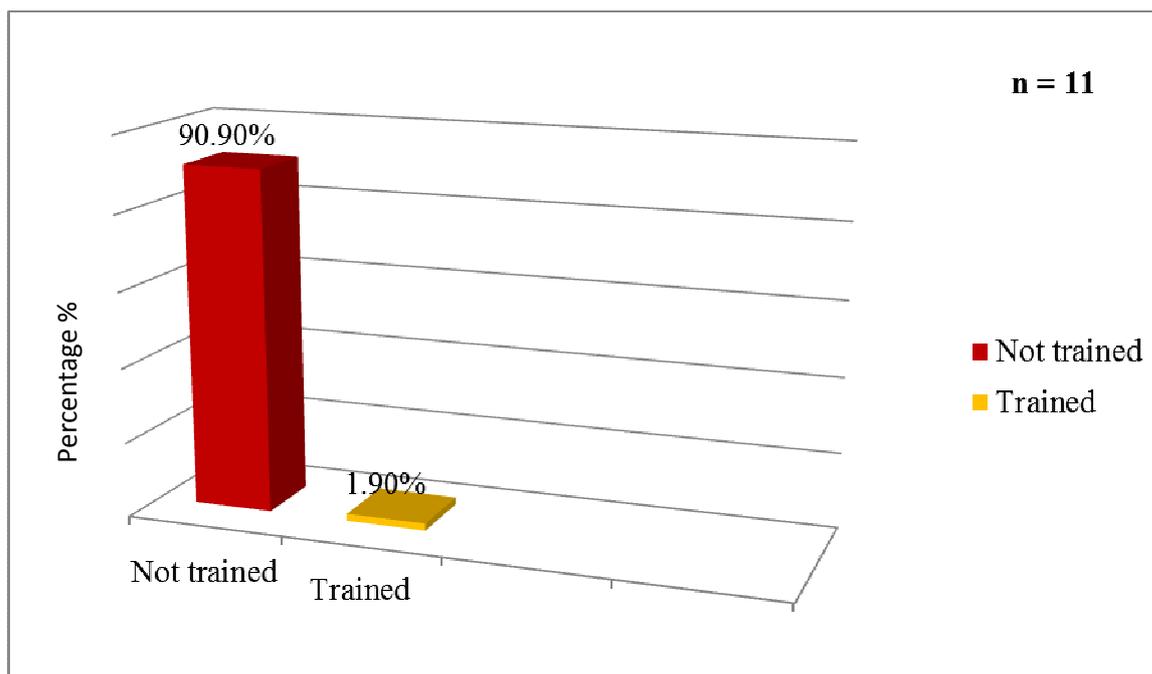
### 4.1: Focus group discussions (FGD's)

In total 46 respondents participated in Focus group discussions that were used to collect qualitative information. The groups consisted of 8-10 respondents who were 18 years and above and consented to the interview. A written list of the topics for discussion was formulated as a series of open ended questions for each group which were used. Notes were taken by a trained interviewer. Responses from the groups were compared and summarized as was agreed. The notes made out of the discussions were then summarized and what was agreed on presented in narrative.

### 4.2: Access to health care of TB patients.

#### 4.2.1: Health workers training in TB management n=11

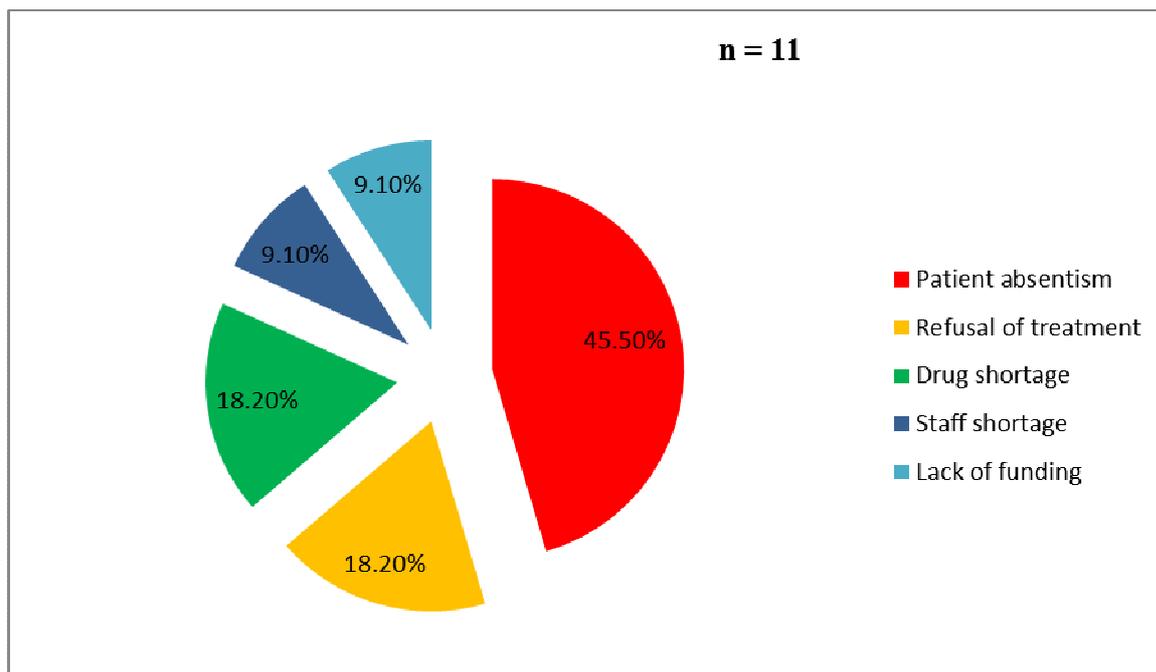
Out of a total 11 health workers in the TB treatment facilities, only 1 (9.1%) was trained in the management of TB patients while 10 (90.9%) were not trained. Figure 1



**Figure 1: Training of health workers on TB management**

#### 4.2.2: Common problems encountered by health workers in the treatment of the TB patients.

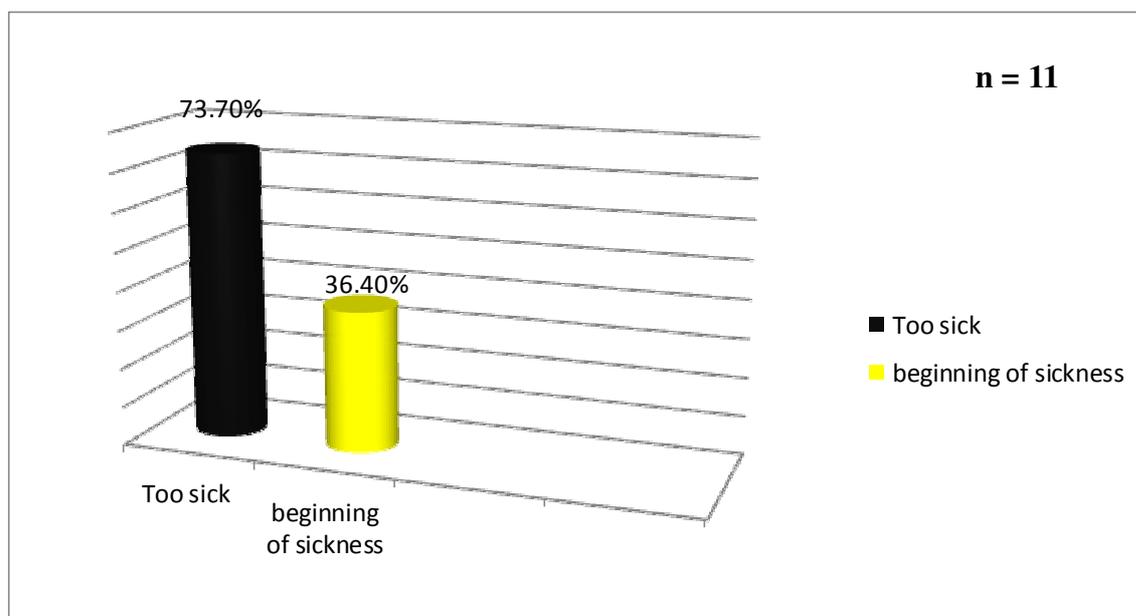
In figure 2, the common problems encountered by health personnel during patient care includes; patient absenteeism 5 (45.5%), refusal of treatment 2 (18.2%), drug shortage 2 (18.2%), staff shortage 1 (9.1%) and lack of funding 1 (9.1%).



**Figure 2: Problems encountered by health workers in the care of TB patients.**

#### 4.2.3: TB patients' condition on first encounter with health workers

On enquiry on the patients' condition on first contact, 7 (73.7%) of health workers said patients report for their first treatment when they are too sick, some at advanced stages of the disease, 4 (36.4%) said some patients report a few weeks at the beginning of the signs and symptoms. Figure 3



**Figure 3: TB patient's condition on first encounter with health workers**

#### 4.2.4 Suggested requirements of service delivery in TB treatment facilities by health workers n=11

Health workers identified improvements in service delivery as follows; the need for training of health workers on TB management n=10 (90.9%), need to increase more workers n=6 (54%), Infrastructure improvement (buildings, space and ventilation) n=4(36.4%), Increase X-ray facilities and other equipments and food supplements n=1(9.1%). Table 1

**Table 1: Suggested requirements in TB treatment facilities by health workers n=11**

Suggested TB clinic facility requirements	
1.Taining of health workers on TB management	n=10 (90.9%)
2.Increase more workers to manage TB patients	n=6 (54%)
3.Infrastructure improvement (buildings, space and ventilation)	n=4 (36.4%)
4.Increase X-ray facilities and other equipments and food supplements	n=1(9.1%)

## 5.0 DISCUSSION

### 5.1: Practices of TB by TB patients

Fear and secrecy of positive TB status has been widely reported in this study and in Kenyan communities who belief that once infected with TB, you have HIV/AIDS (Mutinda *et al.*, 2014; Wesonga, 2002).In a study to assess community vulnerability to TB, (Mutinda *et al.*, 2013) found the belief is significant across age groups, gender and educational status  $p<0.005$ .The community members cited similarity of symptoms and tendency to develop HIV infection once you are infected with TB as the reason to believe there is a relationship. The findings concur with (Wesonga, 2002) in a study involving slum dwellers in Nairobi that the society associate TB with HIV infection and this cause's societal stigma hence default from TB treatment. Studies in Ethiopia (Gebremariam *et al.*, 2010) observed similar findings that the community believe there is association of TB and HIV, and feared this would predispose them to stigma. Further in a stigma related study in Thailand (Kipp *et al.*, 2011) observed low level of education, beliefs that TB increases the chances of getting HIV infection were associated with higher TB stigma. In studies (CDC, 2007) show high prevalence of HIV predicts high vulnerability to TB and must be controlled. In a study (Gebremariam *et al.*, 2010) in Ethiopia observe there is need for culturally sensitive information and educational efforts to address misconceptions of TB and HIV by health personnel. In this study the culture of secrecy of one's sickness was prevalent and secrecy of positive status were observed as a factors that could enhance TB transmission. Awareness creation on TB to educate the community on the cause, clinical presentation, and mode of transmission, prevention and treatment adherence is urgent. In addition efforts to destigmatize TB should be initiated

### 5.2: Health seeking behavior of TB patients

The TB patients initially sought treatment from herbalists, witch doctors or private clinics which delayed formal treatment in designated health facilities resulting to worsening disease progression and health risk to the community. In a study in the same community on health seeking behavior among 316 TB patients in Machakos county (Mutinda *et al.*,2013) observed when TB patients realized they were sick, the majority (81.4%) did not seek formal treatment in the designated TB treatment facilities. Further it was established most of them (75.5%) bought drugs or visited a private doctor; others bought herbal medicine or visited a witchdoctor. Only (18.6%) initiated formal treatment by visiting a health facility for proper diagnosis. In a related study on TB in Western Kenya (Ayisi *et al.*, 2011) found that most of TB patients initially self- treated with herbal remedies or drugs from kiosks before seeking professional care. The findings further agree with a study in Tanzania (Hinderaker *et al.*, 2011) that TB patient from rural and urban settings sought traditional healers before initiation of formal treatment.

In the study to assess vulnerability to TB, (Mutinda *et al.*, 2013) a majority of the TB patients (78.2%) took more than one month and some even up to one year to begin formal treatment. In a DOTS implementation programme more than 30 days delay to initiate TB treatment is considered a prolonged period after onset of the TB disease symptoms (Mesfin *et al.*, 2009). The findings agree with findings in a study that investigated reasons for delay in initiating treatment among TB patients in a DOTS programme in Ethiopia that nearly half of TB

patients delay seeking health care at district health facilities while getting treatment from informal sources (Mesfin *et al.*, 2009). In a related study that observed delay to seek diagnosis among TB patients in Nepal (Basnet *et al.*, 2008) agree with this study that delay to seek treatment have risks of transmission of TB, further suggesting identifying the reasons for delay in diagnosis and treatment is important to reduce suffering of patients. In a study in South Africa (Cramm *et al.*, 2010) observe that 95% of the respondent said people with TB fear what others will say, and this stigma affect case holding and case finding. In addition, (Basnet *et al.*, 2011) suggest increasing public awareness of TB and expansion of the facilities with assured quality could be helpful to curb delay in diagnosis. In Vietnam (Huong *et al.*, 2007) similarly observe delay to seek treatment by TB patients for an average of 4 weeks and observe, analysis of delay can indicate target group areas to strengthen the referral system.

This study calls for all inclusion TB surveillance to be undertaken in all communities beginning with the private practitioners, community healers to individuals and families to report suspected cases of TB. This suggestion agrees with a study in Cameroon (Njosing *et al.*, 2011) that harnessing the enormous potentials through a multi-disciplinary approach to include traditional healers in TB/HIV service delivery is indispensable. This will go a long way to demystify fear and misconceptions about TB in the community through strict surveillance, proper health education on mode of transmission, clinical presentation early diagnostics/ treatment adherence and its relationship with HIV/AIDS.

### **5.3: Problems encountered in TB treatment facilities by health workers**

The study established majority (90.9%) of the health workers attending to the TB patients were not trained on management of TB. The workers are deployed in the TB facilities on a rotational basis and orientation done by the previous workers who were not trained. This was reported to pose a challenge and confusion in the giving of drug dosages which are many and the majority lack knowledge to deliver relevant advice to patients. Further, health workers listed problems encountered in their routine care of TB patients as follows; patient absenteeism reported by (45.5%), refusal of treatment (18.2%), drug shortage (18.2%) staff shortage (9.1%) and poor funding (9.1%). In addition, the study observes poor infrastructure and diagnostic services to be prevalent and inadequate. In most of TB treatment centers, rooms are small with poor ventilation. The workers further observe ignorance of TB disease progression knowledge on most of the TB patients. These problems are grave in as far as implementation of DOTS programme is concerned and risk to continuity of patient care. In addition they are known to enhance transmission of TB and are a risk to drug resistance. In a study on XDR-TB global implications for public health, (Raviglione *et al.*, 2007) show evidence that resistant TB develop as a result of failure to implement the measures recommended by WHO stop TB strategy. Among these is to strengthen health care systems and primary health care services with good practices. This can only be achieved through trained health care providers which were observed to be highly deficient in the study area.

According to the study of TB in Tugala ferry South Africa, where TB is highly prevalent (Basu, 2007) found that about half of XDR-TB transmission could be prevented by addressing overcrowding in hospitals, improving ventilation, enhancing HIV treatment and providing faster diagnostic tests. Similarities in factors posing challenges in the TB treatment facilities resulting to resistant TB were observed in studies in China (Guang Xue He *et al.*, 2008) where drug resistance are nearly twice the global average, inadequate use of antituberculous drugs in public hospitals, lack of supervision of treatment, absence of infection control measures and availability of TB drugs without a prescription. For effective treatment of TB, (CDC, 2007) recommend prevention of transmission through sustained partnership between health providers, local and state public practitioners and TB patients.

Further to prevent TB transmission, (CDC, 2007) emphasize the public importance to understand the basic facts about how the disease evolve, transmission and how to protect own health and that of others. Health workers in the study TB health facilities report most of the community members are ignorant of TB clinical presentation, and illiteracy makes some of them to ignore their illness. In a study on barriers to tuberculosis care in Ethiopia, (Gelle *et al.*, 2010) observed lack of formal access to health services and traditional beliefs leading to self treatment were a hindrance to bio-medical diagnosis and care of TB patients. Further suggested basic training of health workers on TB management is necessary for giving health education, and drug distribution. In addition (Awafeso *et al.*, 2008) points that countries that applies appropriate care through qualified staff and other productivity measures have recorded improvements in TB case detection and cure rates.

In conclusion health workers describe the DOTS programme as the best in TB control compared to other measures especially if patient's medication is directly observed by health personnel. It improves care, adherence to treatment and prevents patients from developing MDR-TB. If well implemented, it will be difficult to have

treatment default which enhances TB transmission. The suggestions concur with a study in Cameroon (Njosing *et al.*, 2011) that adherence to TB treatment require uninterrupted supply of drugs, human resources and established infrastructure. Further in effort in TB control in the study area, health workers suggest the need for an all inclusion in training including private practitioners who should attend to all updates in TB management and initiate efficient monitoring in their facilities, have adequate diagnostic facilities with minimal charges for screening, observe infection prevention and provide free drugs for TB treatment. In addition to TB prevention and control, all health workers regardless of duty deployment station should be trained on TB management since they treat TB patents in other areas including the wards and outpatient services.

#### 5.4 Conclusion

There is fear of stigmatization and isolation once diagnosis of TB is made due to lack of knowledge on TB in the study community. Barriers to TB health care access are evident with lack of trained health personnel to manage TB, poor facility infrastructure and inadequate TB surveillance. This should be addressed by training of health workers on TB management, addition of more trained personnel, improvement of facility infrastructure, diagnostic facilities and proper defaulter tracing systems are necessary for proper implementation of DOTS programme. Information to demystify the association of TB and HIV/AIDS is urgent.

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