

## Evaluation of A Tuberculosis Control Programme

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**Abstract:** High tuberculosis defaulter rate and lower notification rate are major impediment to effective Control of tuberculosis (TB) in Buhera District. To elucidate factors that associated with high defaulter rate, we conducted an evaluation of TB control programme in the district. A cross sectional study design was used and a program evaluation framework was used to identify inputs, processes, out puts and outcomes of the TB control programme in Buhera district. A total of thirty one healthcare workers who included nurses, Environmental Health Technicians and Laboratory staff, participated in the study. We also reviewed TB records and found that total of 1470 patients were screened for tuberculosis in the year 2012 and 645(43.9%) of the patients were initiated on tuberculosis treatment. One hundred and thirteen (17.5%) of the patients were on Health facility directly observed treatment (DOT), 199(30.9%) were on community DOT and 333(51.6%) were on family DOT. Five hundred and sixteen (80%) of the patients were screened for Human immunodeficiency Virus infection (HIV); 360(69.8%) tested HIV positive and 140(39%) of the patients were initiated on ART. Inadequate staff trained in TB case management impacted negatively on the performance of the program. High defaulter rate due to patients travelling from other districts calls for strengthening of cross district collaboration TB meetings.

**Keywords:-** Default, Notification rate, Program evaluation, Tuberculosis, Zimbabwe

### I. Introduction

In 1993, the World Health Assembly (WHA) declared tuberculosis (TB) a "global emergency." About 9 million new cases of TB and 1.4 million death were reported in 2011. An estimated 1.37 million TB cases (15% of total) were HIV positive; 79% of these cases were in the African region. Globally TB incident rates peaked at 142 cases per 100,000 populations in 2004 and declined to 139 incident cases per 100,000 populations in 2007. However, the rate of decline is less than 1% per year and is therefore slow (WHO, 2012). In Africa, at least 2.8 million new cases are notified annually. The WHO African Region contains only 12% of the world's population but contributed 31% of the global total of notified TB cases in 2007. More than 23 countries of the region have TB prevalence rates equal to or greater than 300 cases per 100,000 populations. Among the 15 countries in the world with the highest estimated TB incidence rates per capita, 13 are in Africa and the highest notification rate of 1198 cases per 100,000 populations was in Swaziland. Zimbabwe was ranked 22<sup>nd</sup> among the 22 high burden TB countries (HBC) in the world in 2011. It has an estimated incidence of about 40,000 new smear positive TB cases (incident rate of 298/100,000) and incidence of 104,000 of all forms of TB incident rate of 782/100,000 (WHO, 2013).

### II. Tuberculosis control

Tuberculosis Control Programme in Zimbabwe is being implemented in all districts under the supervision of National Tuberculosis Control Programme Unit. The country has a functional TB policy which put more emphasis on the following points. Sputum microscopy for diagnosis and follow up provided free of charge; short-course chemotherapy provided free of charge in the public health sector; TB services available at all levels of the health delivery system being integrated into the primary health care system to ensure efficient case finding, particularly for sputum smear positive patients and collaborative TB/HIV activities at all levels.

The aim of the National Tuberculosis Control Programme is to reduce the mortality, morbidity, and transmission of tuberculosis in Zimbabwe, in line with the global benchmarks and the Stop TB Partnership targets. The TB control programme aims to detect at least 70% of new infectious TB cases, to successfully treat at least 87% of new infectious TB cases, to reduce the prevalence of TB and death due to TB in Zimbabwe, to reduce the social and economic burden placed by TB upon families and communities in Zimbabwe and to eliminate TB as a public health problem in Zimbabwe (MOH&CW Guidelines for management of tuberculosis in Zimbabwe. 2011).

Review of Buhera district TB annual report for 2012 shows that the defaulter rate for TB was at 12% which is above a National standard of less than 5% defaulter rate. In addition the district has a notification rate

of 357 per 100 000 which is far below a national target of 782 per 100 000 (WHO. 2009). Evaluation of this program is going to assist the district through identification of gaps in program implementation so that they can refocus their program. This evaluation is also going to help District managers to assess the quality of TB control programme being implemented in the district.

Delay in diagnosis of TB may be attributed to limited availability of resources to perform prompt diagnosis (for example, lack of facilities for X-rays and sputum test at village and township level health facilities) was a risk factor for TB diagnostic delay. Shortage of trained health providers at TB control facilities (for example, county TB dispensary and designated county hospitals for TB care), and geographical barriers were important causes of TB diagnostic delaying (Ying, et al. 2013).

In Kenya healthworkers who reported providing DOT were slightly more likely to have attended more TB trainings, than those who did not employ DOT when treating patients (mean of 2.0 vs 1.3 trainings). Health workers employed within facilities processing a high volume of smear microscopy slides (i.e. hospitals) were less likely to directly observe TB patients' treatment. Health workers within facilities participating in the national DOTS program were more likely to implement DOT. On the other hand, health workers were more likely to perform DOT for patients if they worked in facilities with a higher mean TB drug supply score. In the multivariate model, receipt of training in TB treatment was the most significant predictor of use of DOT. Training also had a cumulative effect on DOT provision, for each additional type of training received; health workers were 20% more likely to use DOT. Receiving supportive supervision was also a significant determinant of performance of DOT (OR 3.2, 95% CI: 2.0- 5.0). Working in a facility with a stable TB drug supply also favored use of DOT (OR 1.2, 95% CI: 1.1-1.4). The barriers to carrying out DOT were identified as working in a facility that did not participate in the national DOTS program and working in a facility where a high-volume of smear microscopy is performed (e.g. tertiary referral hospitals). Physicians and clinical officers were more likely than other providers to provide Isoniazid Preventive Therapy (IPT) (48% vs 32%,  $p=0.02$ ). Each additional year of post-basic education favored the provision of IPT. Staff with more years of experience either in diagnosing or treating opportunistic infection in HIV positive persons more often provided IPT (Mitchell, Colvin, Klinkenber, Heus and Sitenei, 2013).

A study by Muture, Keraka, Kimuu, Kabiru, Ombeka and Oguy (2011) on factors associated with default from treatment among tuberculosis patients in Kenya it was found out that unfavorable health facility factors, such as unavailability of drugs on scheduled clinic days, failure by health providers to offer health education on TB, failure to articulate the need for treatment compliance, and failure to appropriately manage drug side-effects were also cited as reasons for default. Other factors included limited access to health care and waiting too long for services. Some unfavorable health-care personnel attitudes cited included being unfriendly, unsympathetic and lack of dignity (Muture, et al 2011).

A study by Elbireer (2011) on Tuberculosis treatment default among HIV-TB co-infected patients in urban Uganda found that a number of health facility factors were associated with defaulting: Waiting times at the clinic averaging two or more hours (OR = 4.2 [95% CI: 2.18–8.02]); staff conduct perceived as bad or just fair (OR 2.7 [95% CI: 1.02–7.25]); not having been given a chance to express concerns about TB treatment (OR 3.5 [95% CI: 1.67–7.21]); not receiving adequate health education on the duration of treatment and the risk of discontinuing it (OR 5.3 [95% CI: 1.94–14.57]); and having experienced drug unavailability (OR 4.75 [95% CI: 2.29–9.84]).

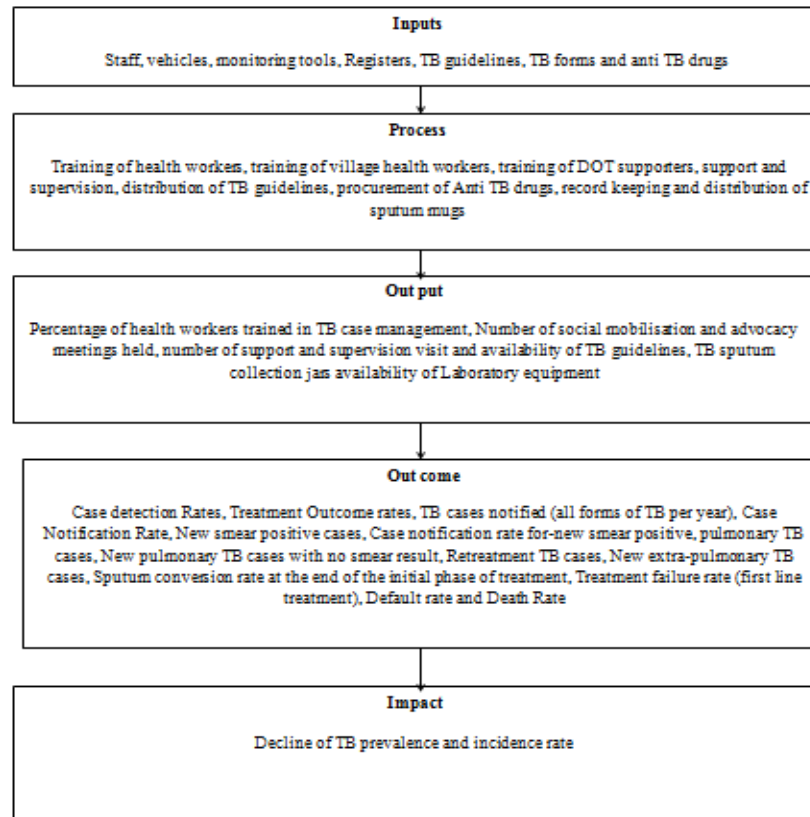
In another study in Karichi by Nisar, Ahmed and Rao (2009) it was found that most common reason for TB default was dissatisfaction of services provided at the clinic as expressed by (33.33%) patients. Six (25%) patients were taking treatment from General Practitioners; five (20.83%) were of the opinion that substandard drugs would be given at clinic, four (16.66%) were not aware of their disease and did not bother to collect the report while one (04.16%) patient said that he could not attend due to the long distance.

A case study by (WHO, 2010) which was conducted in four districts of Eastern Uttar Pradesh in India found out that factors contributed to poor performance at the district level were: vacancies in staff positions, a low number of designated microscopy centres (DMC) as per population norms, absence of commitment from MO-TCs, absence of refresher/re-training courses, lack of regular, supportive supervision and monitoring. Furthermore, there were fewer referrals from the Non-DMC PHIs, and the big hospitals; their NGOs/PPs were not involved in PPM. In addition, factors such as lack of streamlining of finance-related issues and non-payment of honoraria to DOTs providers contributed to low performance.

### **III. Methodology**

We followed a cross sectional study design in the study. A program evaluation framework was used to identify inputs, processes, outputs and outcomes of the TB control programme in Buhera district, Manicaland Province. We selected 23 out of the 31 Health centres in the District were chosen for the study through simple random sampling. The study population included Health workers, Medicins Sans Frontiers TB support staff and TB records in Buhera District. Permission to proceed was granted by the Provincial Medical Director,

Manicaland Province and the Africa University, Faculty of Health Sciences. Moreover, informed consent was sought from participants before carrying out the study. We then collected data using 3 instruments: a checklist to identify inputs, processes, out puts and outcomes of the TB control program, an interview schedule to determine the inputs, processes, out puts and outcomes of TB control programme and knowledge levels of health workers on TB case management and their training needs on TB control programme and an interviewer guide to collect data from key informants who were the District TB coordinator, District Medical Officer, District Nursing Officer, District Health Promotion Officer, District Environmental Health Officer and the District Pharmacist. Data was analysed for descriptive statistics using Epi-info version 3.3.2.



**Figure 1** Logical frame work for TB control programme in Zimbabwe

### Results

A total of thirty one healthcare workers, 14(45.2%) males and 17(54.8%) females were recruited in the study. They included 7(22.6%) Registered General Nurses, 14(45.2%)Primary Care Nurses, 2(6.5%)State certified nurses, 6(19.4%)Environmental health technicians and 2(6.5%)laboratory scientists. Table 1 below summarizes the demographic characteristics of the participants.

**Table 1:** Demographic characteristics of respondents in Buhera district 2013

Variable	Categories	Number	Percentage (%)
<b>Sex</b>	Male	14	45.2
	Female	17	54.8
<b>Designation</b>	Environmental Health Technicians	6	19.4
	Laboratory scientist	2	6.5
	Primary Care Nurse	14	45.2
	Registered General Nurse	7	22.6
<b>Years in service</b>	Median years in service	=5yrs	Q1=3yrs Q3=9yrs
<b>Years in TB control</b>	Median years in TB control	=5yrs	Q1=3yr Q3=7yrs

All thirty one healthcare workers mentioned that productive cough, chest pains and night sweats were the three major symptoms of Pulmonary TB, 29(94%) health care workers mentioned that the intensive treatment for TB is 2 months and the continuation phase is four months. 16(51.6%) healthcare workers mentioned that the diagnostic tools used to confirm TB are biopsy, sputum microscopy, chest x-rays and clinical history while 4(12.9%) healthcare workers defined TB defaulter as any TB case whose anti-TB treatment was interrupted for at least 2 consecutive months for any cause without approval of the attending physician. Table 2 shows the knowledge of respondents.

**Table2:** Knowledge of respondents on TB control programme in Buhera District 2013.

Variable	Number of health workers reporting variable n (%)
<b>Three major symptoms of TB:</b> Productive cough for more than 2 weeks, Night sweats and Chest pains	31 (100%)
Knowledge of TB diagnosis	16 (51.6%)
Knowledge of the treatment of TB	29 (93.5%)
Knowledge of TB defaulter	4 (12.9%)

**Inputs for TB control program**

Twenty one (95.5%) of the health facilities transport sputum to diagnostic centres while 1 (3.6%) transported sputum to diagnostic centres by local environmental health technicians (EHT). Eleven (35.5%) of the health facilities reported that they have functional motor cycles, 18 (77.4%) of the health facilities had functional telecommunication system and 8(36.4%) of health facilities had stock outs for anti TB paediatric formula. One (4.5%) of health centres have stock outs of laboratory request forms for three months, 7(31.8%) of health centres have stock outs of TB guidelines, 10(45.5%) of health facilities have no TB manual for more than six month and 7(31.8%) of health facilities have no Information Education and Communication (IEC) for TB. Two of the diagnostic centres are both manned by Laboratory Scientists, two at Murambinda mission hospital and one at Birchenough bridge hospital. All (two) of the laboratories had no stock out of laboratory reagents, and no stock outs of sputum jars ,all microscopes were functioning and they had adequate slides .

**Process**

Twenty seven (87.1%) of the health care workers interviewed reported that district supervisors make supportive supervision visits for TB, 6(21.4%) of the health care workers reported that the last visit for the district supervisors was more than six month ago, 16(57.1%) reported that the last visit for the supervisor was between 1 to 3 months ago and 4(14.3%) reported the last visit for the supervisors was between 3 to 6 month ago. Twenty three (74.2%) got feedback from the district supervisors and 11(35.5%) have held health centre level meeting with community on TB. One (3.3%) of the health care workers interviewed had minutes for health centre level meeting on TB. Fourteen (45.2%) of health care worker reported that defaulter tracing is done by Village Health workers while the rest is done by environmental health technicians

### **Out puts of the TB control programme**

Twenty one (95.5%) of the health facilities had village health workers trained on DOTs and 18 (58.1%) of health care workers have problems in tracking defaulters. Ten out of the 31 healthcare workers interviewed had received training on TB case management. Four (12.9%) were EHTs, 1(3.2%) was a Laboratory scientist, 4(12.9%) were PCNs, 1(3.2%) was an RGN while there was no SCN who reported having received this type of training.

### **Outcome of the TB control programme**

We reviewed TB records and found that total of 1470 were screened for TB in the year 2012 and 645(43.9%) of the patients were initiated on TB treatment. One hundred and thirteen (17.5%) of the patients were on Health facility DOT, 199(30.9%) were on community DOT and 333(51.6%) were on family DOT. Five hundred and sixteen (80%) of the TB patients were screened for HIV and of those screened for HIV, 360(69.8%) tested HIV positive and 140(39%) of the patients were initiated on ART

### **Key informant findings**

Two of the Key informants had been trained in TB case management, and they applauded the improved case detection of TB through the use of Gene-expert machine in both of the diagnostic centres and the management of Drug resistant TB in the district. They also agreed that training in TB case management is beneficial in the control of TB in the district. All key informants indicated challenges of shortage of healthcare workers trained in TB case management, patients coming out from other district and shortage of EHTs in the district. The key informants also indicated that shortage of EHTs, patients from other districts seek for better treatment and diagnostic services and false physical address by patients contributed to higher defaulter rate in the district.

## **IV. Discussion**

All 31 health facilities are implementing the TB control program in Buhera district. This study revealed that a few health workers have been trained in TB case management program and this has a negative effect on the TB control program. A review of TB control programme in Kenya 2013 on Factors Influencing Kenyan Health Workers' Performance of TB Skills found that healthworkers who reported providing DOT were slightly more likely to have attended more TB trainings, than those who did not employ DOT when treating patients (Mitchell et al 2013).

Community health education on TB is very important in the control of TB especially in the rural areas where most of the community members did not have access to adequate information on TB. Therefore it is also important to facilitate access to health facilities by patients, provide environmental health technicians with adequate motor cycles, and encourage outreach activities whereby health workers in rural areas can actively seek their patients instead of passively waiting in health centers in order to optimize the use of available services and skills. Inadequate information on TB defaulter among healthcare workers in the district impacted the control of TB negatively and this has been shown by very few health workers managed to define who is a TB defaulter. A study by Muture et al (2011) on factors associated with default from treatment among tuberculosis patients in Kenya found out that failure by health providers to offer health education on TB and failure to articulate the need for treatment compliance were also cited as reasons for default.

More than half of the healthcare workers have experienced challenges in defaulter tracing and this has contributed to higher defaulter rate reported in the district. The key informants also highlighted that most of the patients are coming from other districts travelling very long distances to seek for better treatment and this also contribute to higher defaulter rate in the district. A study by Elbireer.(2011) on Tuberculosis treatment default among HIV-TB co-infected patients in urban Uganda found that individual patient characteristics associated with defaulting included living at a distance of 10 km or more from the clinic

The district is relying with the Partner (MSF-Belgium) to collect sputum on weekly basis from all the health centers in the district. It is very crucial for the district health executive to provide transport for sputum collection in the district since the partner is winding up its operations in the district.

## **V. Conclusion**

The TB control program in Buhera district is not performing as expected. Inadequate staff trained in TB case management impacted negatively on the performance of the program. High defaulter rate due to patients travelling from other districts calls for strengthening of cross district collaboration TB meetings. This review underscores the need for tuberculosis district supervisors, policy makers, professional bodies, and NGOs working in district to train health workers to address changing trends in tuberculosis management. Current guidelines on TB management should also be made available to health workers. Since most of the health

facilities have not done any health center level meeting with community on TB, communities need to be educated about TB prevention and control.

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