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Evaluation of the TB Surveillance System in Harare City Health Department, Zimbabwe in 2013

ABSTRACT

***INTRODUCTION**: Tuberculosis is a significant cause of morbidity and mortality in Zimbabwe and many other African countries where case fatality rate exceeds 50 % due to HIV/AIDS coinfection. Zimbabwe is among high TB burdened countries that account for 80 % of all new TB cases in the world. Surveillance is a critical component of successful TB control as it provides essential information needed to identify potential transmission, deaths, and establish priorities for control. The objective of this study was to evaluate the TB surveillance system in Harare City to determine whether Tuberculosis is efficiently and effectively monitored and to assess whether surveillance system addresses the TB control priorities.*

***METHODOLOGY** This was a descriptive cross-sectional evaluation study using the CDC surveillance evaluation guidelines to assess the performance of TB surveillance Harare City Health department from January to September 2013. Fifty-five health care officers involved in TB surveillance at 11 health facilities were included in the study. Seventy notification forms filled in from January 2013 to September 2013 were reviewed. Data were collected using an interviewer-administered questionnaire and CDC checklist to assess the surveillance attributes and Epi Info was used for data entry and analysis.*

***RESULTS**: People were knowledgeable about TBSS with 93% being aware of the TB screening test and 18% knowledgeable of all the five standard questions used in TB screening while 53% knew about 4 of them. Only 22% of respondents could state all the seven clinical case definitions of TB. However 60% were not aware of the objectives of the TBSS. About 64% of the respondents indicated that they have analysed TB data and 69 % indicated that the surveillance system was useful. On simplicity, the majority, 52 (95 %) of the respondents indicated that it is easy to use the case definitions used in TB classification of patients. Seventy percent indicated that the compilation process was fairly simple. The TBSS was acceptable to 100% of the respondents and 64 % indicated that compilation of TB data does not affect other duties. On flexibility, 76 % of the respondents showed that the TB notification form could accommodate additional diseases and 75% indicated that other health conditions be included were HIV. Over 60% were submitted on time to the next level and 69% indicated that they receive feedback.*

Conclusion

The surveillance system addressed the TB the control priorities and effectively monitors the disease in the City. However, further, there is need special training in TB surveillance in areas like data management, fixed dose drug combinations, MDR, XDR, , refresher training in TB case management.

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Introduction

Tuberculosis (TB) has remained one of the world's deadliest communicable diseases notwithstanding the World Health Organization (WHO) having declared TB a global public health emergency in 1993 (WHO, 2014). More than 95% of new cases and deaths occur in low and middle income countries with 25% cases reported in the African region (Vasankari et al., 2007; WHO, 2013). Tuberculosis continues to be a significant cause of morbidity and mortality in Zimbabwe and many other Sub-Saharan African countries where case fatality rate exceeds 50% due to HIV/AIDS coinfection (Tessema et al., 2009). In 2010, Zimbabwe was ranked 17th of the 22 TB high burdened countries that together account for approximately eighty percent of all new TB cases arising each year in the world **(**Global TB report, 2010).

One of the reasons why progress of the Millennium Development Goals (MDGs) and the Stop TB Partnership, which aimed to significantly reduce the burden of tuberculosis by 2015, has been slow may be due to poor surveillance of the disease in developing countries. In order to measure the progress towards these targets and to evaluate the impact of TB control programmes, routine monitoring of TB incidence, prevalence and mortality rates through case notification and evaluation of treatment outcomes, routine surveillance data is required (WHO, 2008). Therefore, public health surveillance is a critical component of successful TB control as it provides essential information needed to identify sentinel events, such as potential outbreaks, recent transmission, multi- drug resistance and deaths, establish priorities for control and prevention activities, and strategically plan use of limited resources as well as identifying strengths and weaknesses and make recommendations (Muhammad et al., 2012; Saeed et al., 2013). Evaluation is also a very important tool for policy makers in measuring the performance of the of health program and in this case, to determine whether Tuberculosis is monitored efficiently and effectively (German et al., 2001; Sosin, 2003).

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In Zimbabwe TB surveillance data are collected at local, district, provincial and national levels for the purposes of providing baseline data, goal setting, monitoring program performance, and assessing case detection rates and for the evaluation of TB treatment outcomes. Rural and urban health centers have the role of identification, initiating, supervision and observation of treatment and follow-up of contacts and defaulters. The district and provincial levels are the basic management units for TB control. They are responsible for diagnosis, treatment and follow-up of patients, supervision, monitoring of treatment, registration and compilation of reports. (Zimbabwe Tuberculosis Control Program National TB Guidelines- Fourth Edition). Early warning of epidemics is therefore essential for effective and rapid control, while information on endemic communicable disease is essential for monitoring the disease.

A well-functioning disease surveillance system according to the World Health Organization protocol for disease surveillance and response systems needs to be periodically assessed so that it continues to reflect national disease control priorities, remains efficient and takes advantages of opportunities for the integration of new surveillance methods and techniques that improve the efficiency of the system (WHO; 2001). The objective of the study was to evaluate the TB surveillance system in Harare City in Zimbabwe.

METHODOLOGY

This was a descriptive cross-sectional evaluation study using the CDC surveillance evaluation guidelines to assess the performance of TB surveillance Harare City Health department

Study population

Two categories of the population consisting of human respondents and TB notification forms and outcome treatment reports from January 2013 to September 2013 were sampled**.** Fifty-

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five health care officers involved in TB surveillance at 11 health facility centres were included in the study. Seventy (1/10) notification forms filled in from January 2013 to September 2013 were reviewed. This sample size was based on a similar study in 2008 where an evaluation of the TB Surveillance system was conducted in Harare by Muyengwa et al. (unpublished data).

Study sample

Six out of the eight administrative districts of Harare were randomly selected by picking the first 6 districts from a hat. Eleven clinics were randomly selected out of 28 clinics in the 6 districts using the same method. The two TB diagnosing centers at Wilkins and Beatrice Road Infectious Hospital were purposively included in the study. Health facility TB focal persons available on duty were included in the study. All the officers in the TB surveillance programme at the participating sites were included in the study. One out of every ten notification forms filled in from January 2013 to September 2013 was reviewed.

Data Collection

Data were collected using an interviewer-administered questionnaire to gather information on the health worker knowledge of the TB surveillance system. A review of 70 TB treatment notification forms and 33 outcome treatment reports for the period January 2013 to September 2013 was also performed mainly to assess data completeness.

A checklist developed from CDC updated guidelines for evaluating surveillance systems was used to evaluate the TB surveillance systems attributes according to simplicity, flexibility, timeliness, accessibility, completeness, data quality, stability and availability of resources. To assess the simplicity of the surveillance system, the evaluation assessed the easiness of the application of the TB case definitions, the type and amount of data collected, time taken to complete investigation forms and the easiness of information flow.

Ethical Considerations

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Written permission was sought from and granted by the Director of Harare City Health department. Informed verbal consent was obtained from all the study participants. The study objectives and purpose was explained to the participants individually and the participants were given the opportunity to ask questions. Participants were given a choice on whether to participate in the study or not and their choice was respected. Confidentiality was assured and maintained by not including any identifier information on the questionnaire forms and all forms were secured with limited access to only study personnel throughout the study.

Data Analysis

Epi info version 3.3.2 was used for data entry. Means, frequencies and proportions were calculated for quantitative data. Information collected on the checklist was analysed manually to extract information on data quality and resources available.

RESULTS

Socio-Demographic Characteristics of Respondents

Fifty-five health care workers from Harare City Health Clinics were interviewed between the 21st and 30th of October 2013. Forty-three (78 %) were females and fifty (91 %) were nurses with different levels of certification. Over 70 % of the respondents indicated that they had been in service for more than 10 years, with a median service period of 15 years and had been performing TB surveillance duties for a median period of 4 years. Thirty-six currently were working in the Out-patient Department (OPD) and the Primary Care Clinic (PCC). Over 80% of the respondents indicated that their role in TB surveillance included all of the following roles: Diagnosis Notification, treating patients, coordination, updating register, follow-up on patients. The graph below shows the distribution of the roles indicated by the respondents in the TB surveillance

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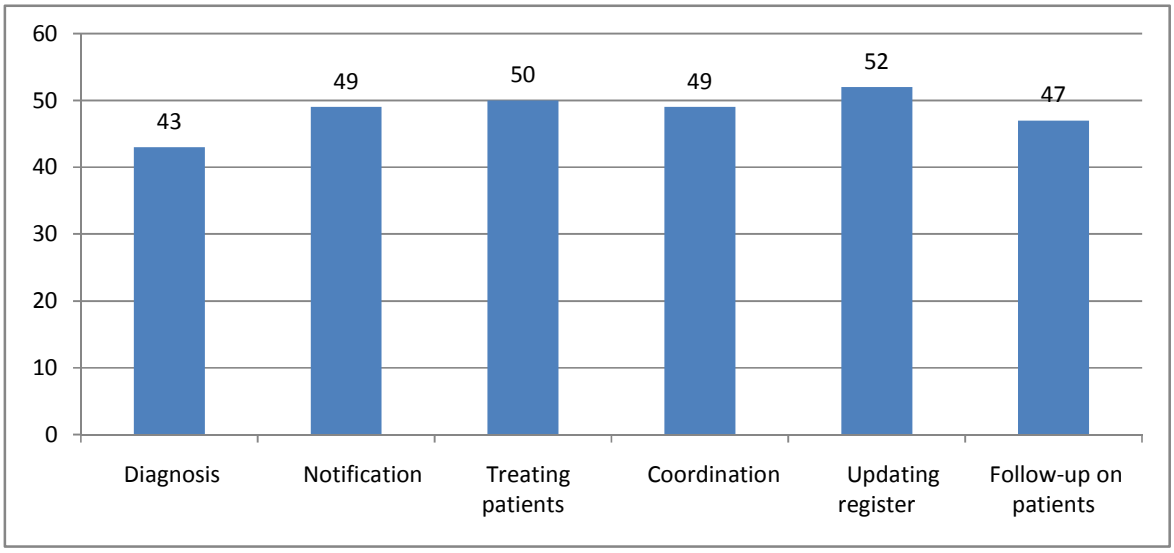

Figure 1: Role in TB Surveillance

Knowledge of the Surveillance System

When asked to specify the five standard questions used in screening TB patients, Ten (18 %) managed to specify them all with 29 (53 %) managing to specify 4 questions. Although, 51 (93%) knew the test used to screen for TB in children, only 29 (58 %) could correctly specify how it is administered. On TB case definitions, 12 (22%) were able to correctly define all the 7 clinical case definitions of TB asked. The majority, 38 (69%) were not able to correctly define Extreme Resistant TB as shown in Figure 2 below.

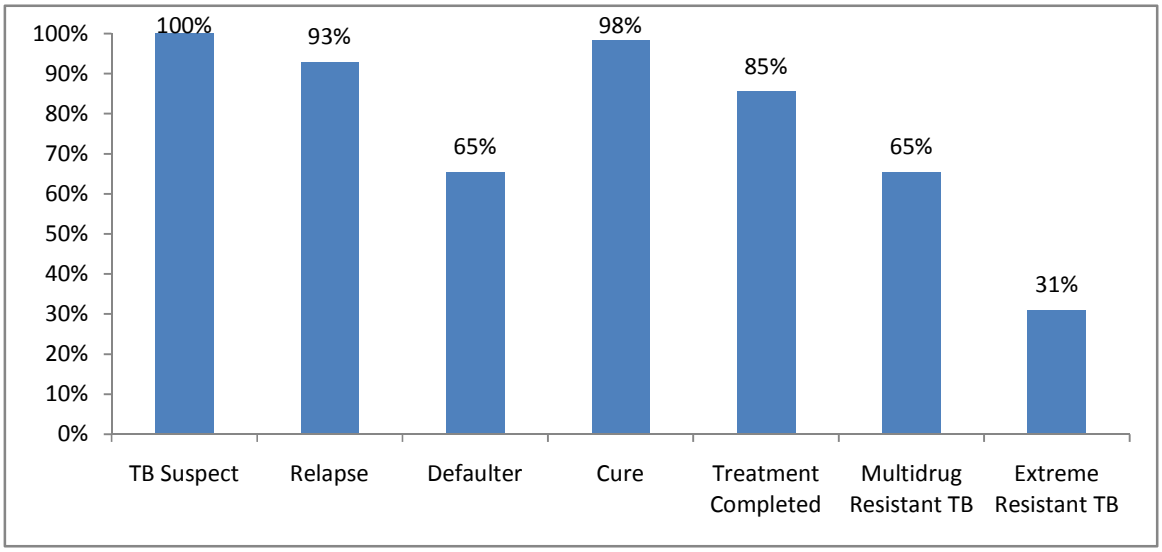

Figure 2: Correct Clinical Case Definitions

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Further questioning on TB showed that 35 (64 %) of the respondents were able to correctly specify the steps a TB case will undergo and the forms that need to be completed.

The majority of the respondents, 33 (60 %) could not specify the objectives of the TB surveillance system and as shown in Figure 3 below, Less than 30 % could specify at least one. However 49 (89 %) of the respondents indicated that TB surveillance data that is collected is used at the local level.

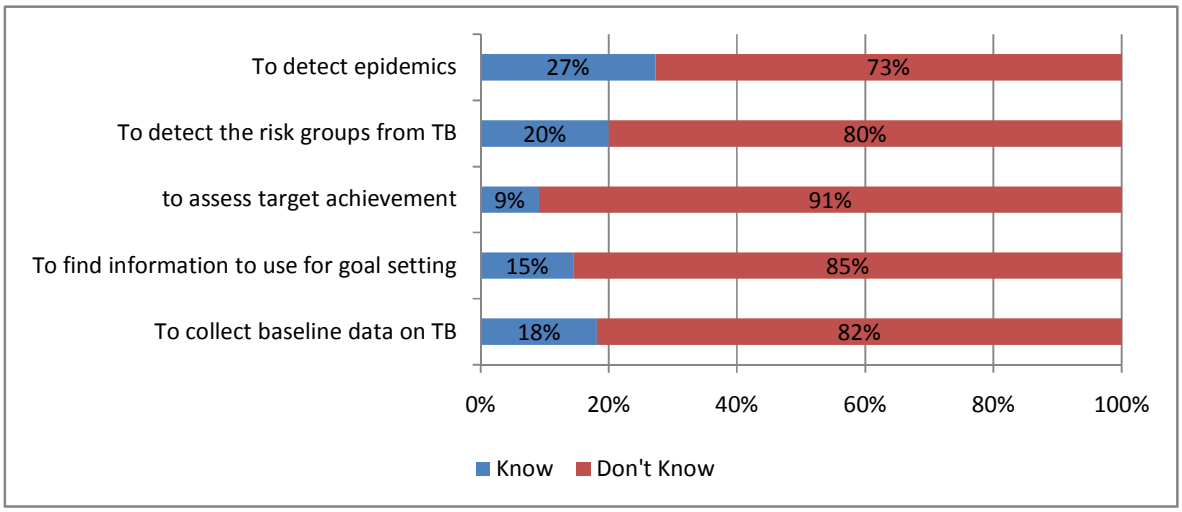

Figure 3 Objectives of the TB Surveillance System

Nearly 50 % of the respondents indicated that the TB data is used mainly for monitoring disease trends and monitoring TB treatment success and failure.

Usefulness of the TB Surveillance System

Thirty-five (64%) of the respondents indicated that they have analysed TB data and 37 (69 %) also indicated that the surveillance system is useful. However, those who did not think it was useful did not give a reason.

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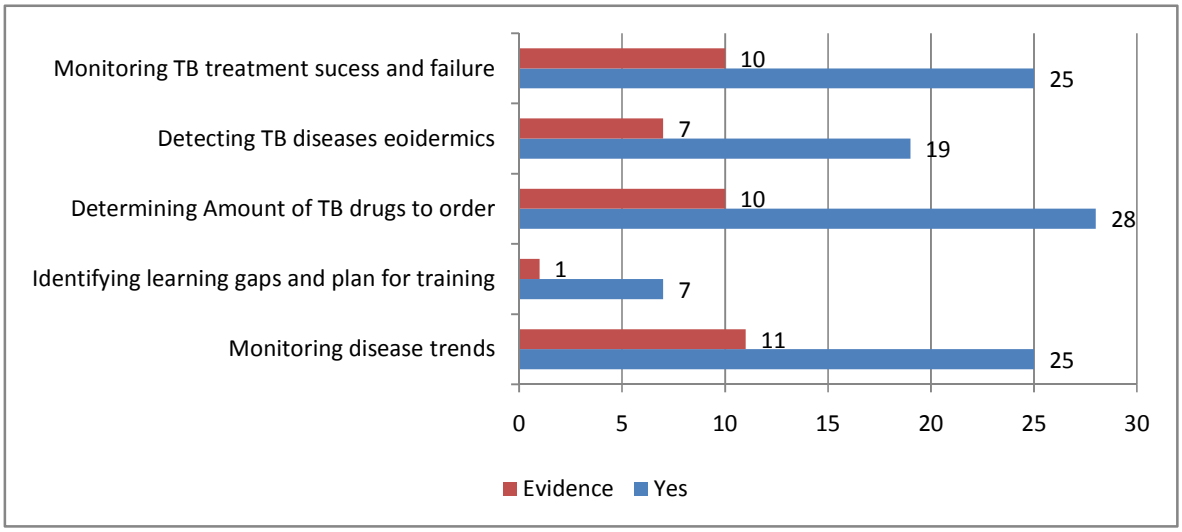

Figure 4: How TB data collected is utilized

Simplicity

The majority, 52 (95 %) of the respondents indicated that it is easy to use the case definitions used in TB classification of patients. Further, 42 (76 %) indicated that they had compiled TB disease surveillance data for submission to the next level. Those who had compiled the data also indicated that it took them a median time of 8 hours to extract the data, another 8 hours to compile the report and less than 8 hours to finally submit the data to the next level . However, 31 out of 42 respondents (74 %) who compile data indicated that the compilation process was fairly simple and seven out of 42 (70 %) found the process difficult and the main reasons indicated were that registers need to be merged and some information is missing, paper-based system has challenges and time constrains, multiple duties. Eight (15%) indicated that surveillance work takes less than 10 % of their time but for 10 (31%) it takes more than 50 % .Further, 45 (82%) indicated that they need special training in TB surveillance in areas like data management, fixed dose drug combinations, MDR, XDR, GeneXpert®, refresher training in TB case management and New M & E tools

Acceptability

All the respondents indicated that they were willing to continue participating in TB surveillance work. Although 17 (31 %) of the respondents indicated that compiling TB data affects their ability to complete other tasks, 35 (64 %) indicated that compilation of TB data does not affect other duties.

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Timeliness

As shown in Figure 5 below, over 60% of the forms and reports were submitted on time and the due date was correct too. However, where there were delays because of the following main reasons given for the delay: Shortage of staff, transport problem, missing data and heavy work load.

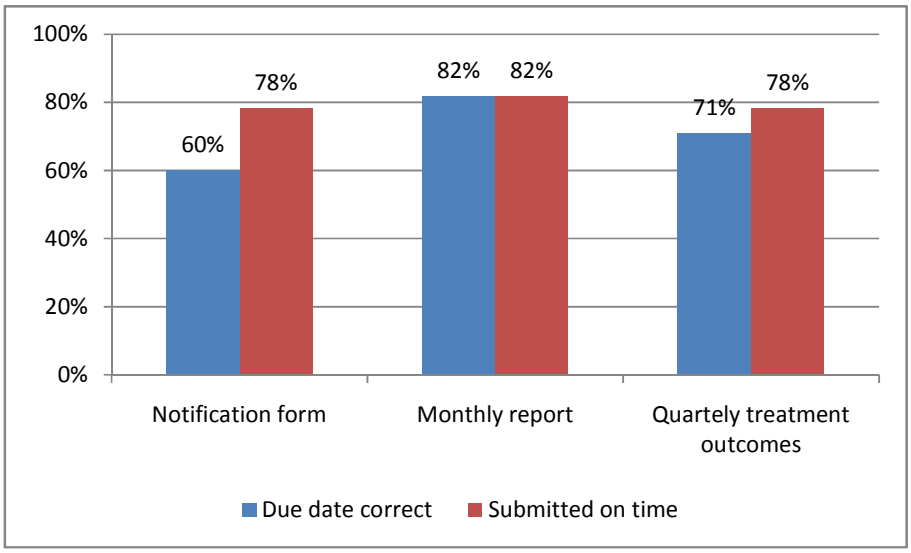

Figure 5: Submission of Forms and Reports

Flexibility

The majority, 42 (76 %) of the respondents felt the TB notification form could accommodate additional health conditions or diseases as it has a column for 'other' already and this would compliment patient management. 41 (75%) of the respondents also indicated that other health conditions need to be included on the TB forms. These would include, (in order of number of times mentioned), Diabetes Mellitus, hypertension, any disease that lowers the immune system (such as HIV), cancers, Kaposi sarcoma, malnutrition, chronic diseases and sexually transmitted infections (STIs)

Feedback

Although 16 (39%) of the respondents indicated that they do not receive feedback, the majority, 38 (69%) indicated that they do receive feedback and 16 out of 38 (42%) received within the last 4 weeks.

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Facility Level assessments

At all the health care centres assessed, 100% of all the forms were mainly completed by the nurses as shown in Table 1 below except for the contact tracing form which was also completed by the EHT at 5 health care centres. Further, it was noted that 90% of data on notification forms was complete and accurate. Of the 11 notification forms evaluated,7(63.6%) were completed by a nurse, 1(9.1%) were completed by a TB nurse. The rest were either completed by EHT or Clerk. Nine (81.8%) of the transfer forms were completed by a nurse, 1 (9.1%) by a TB nurse and 1(9, 1%) were completed by EHT..Forty-five (45%) TB contact tracing forms were completed by the nurse , 1 (9.1%) were completed by TB nurse and the rest was completed by EHT. Over 70% of both TB Monthly and quarterly summaries were completed by a nurse and over 60% of all treatment outcome forms were filled in by a nurse.

Over 72 % of the health care centres have all the required utilities to do their work except a functional fax machine and internet connectivity which was only available at one site . Further, although 6 (55 percent) had transport, 4 out of 6 had no dedicated transport.

Ten health care centres were checked on human resources. Over 70% of the posts are filled for all the health care centres. However, 3 out of 10 (30%) health care centres had laboratory posts, of which all are filled except one . Health care centres with matron posts were all filled.

Nine out of eleven (82 %) of the health care centres were sending notification reports on time since January, but one centre only started in June and for the other one, it was not clear whether they were being sent as only 2 months out of 10 months checked could be confirmed . However, sending of outcome reports was not as consistent. Less than 50% of the health care centres sent in outcome reports during the entire 10-month period reviewed. Of the 11 healthcare centres assessed on timeliness of surveillance, 9 (81.8%) sent the TB notification reports on time from January to May and it improved to 90.9% from June to September and then dropped to 54.5% in October. An average of 18.2% of the outcome reports were sent on time from January to May and the increased to 54.5% from June to October.

All 11 health care centres have all the TB drugs and laboratory reagents (for those with laboratories) and equipment available . However, 6 out of 11 (55%) of the health care centres had drug stock-outs in the past year, but no reagent stock-outs were indicated for

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health care centres with laboratories. Only one site had an X-ray machine and it broke down just for one day. All the health care centres indicated that the staff compliment was not adequate and one site indicated that this had been made worse by its proximity to a busy bus terminus where commuters find it easy to seek treatment at the nearest centre following arrival in Mbare.

Table 1: Pharmacy and Laboratory Department

Drug available	Health Care Centres N=11	Status/Comment
Isoniazid(H) - Yes	10(90.9%)	
Rifampicin(R) - Yes	11(100%)	
Ethambutol(E) - Yes	11(100%)	
Pyrazinamide(Z) - Yes	11(100%)	
Streptomycin(S) - Yes	11(100%)	
Lab Reagents- Yes	6(54.5%)	*5/11 Health Care Centres have no laboratory*
Microscopes- Yes	6(54.5%)	*5/11 Health Care Centres have no laboratory*
Sputum Jars- Yes	10(90.9%)	
Drug stock outs in the past year - Yes	6(54.5%)	• *Pyrazinamide, INH and Rifa (FDC stock out in August* • *INH for 3/12 intermittently* • *Paeds INH and Rifa expired June this year for 2 months stock out + FDC Paed(3in1)* • *FDC 4 in 1 Erratic supply stocked*

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		out for 3 weeks • *Paeds 3 in 1 stockout for 3 weeks*
Reagents stock out in the past year- No	6(54.5%)	*5/11 Health Care Centres have no laboratory*
Breakdowns in the X-Ray Department in the past year- Yes	1(9.1%)	*1/1 – For 1 A day of 2 due to the processing machine failure* *10/11 Health Care Centres have no X-Ray Department*
Staff compliment adequate- No	11(100%)	• Need for a statistical Officer and a Radiographer • Needs review since clinic caters for the commuters from Mbare bus terminus and workload has increased, now dealing with 3 timesmore than population of Mbare

DISCUSSION

Knowledge on the objectives of TBSS was low among the study participants. Most participants however confused the objectives of the TB control programme with those of the surveillance system. Less than 30 percent could specify at least one. It was noted however that the objectives of the TB surveillance system were not displayed in most of the clinics assessed. Knowledge on TB case definitions was also noted to be low as only 22 % were able to correctly define all the seven clinical case definitions of TB asked. The majority (69%) were not able to correctly define XDR TB while 35% were not able to define MDR TB. This is in sync with the sentiments that most respondents reported that they are in need of training in XDR and MDR TB. These findings are in synch with those found by Muchedzi and

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Kamagate (2005). Muchedzi and Kamagate in an evaluation of the TB surveillance system in Harare prisons in 2005, found that knowledge on the system and flow of data was poor. Muchedzi and Kamagate (2005) in an evaluation of the TB surveillance in the Harare City Health Department in 2007 found that less than half of the study participants had knowledge of the TB surveillance objectives. The findings from this evaluation suggest that knowledge on the TB surveillance objectives and flow of data in the Harare City health workers is still low. However all the respondents knew how to define a TB suspect (100%), relapse (93%), cured (98%) and treatment completed (85%). This may be attributed to the number of years of experience in the TBSS of the study participants which was quite high with a median number of 4 years participating in TB surveillance duties. The high knowledge may also be attributed to the TB Monitoring and Evaluation trainings for health workers conducted in the city health department.

Although the TBSS was reported useful by all the study participants, little written evidence to support data analysis and use of data at local level was found suggesting that there may be very little data analysis and use of data for decision making at health facility level. Manyora (1998) in an evaluation of the TB surveillance system in Mashonaland East found that TB data were not being used for public health action. However, evidence of data analysis found at district level suggest the need for trainings in data analysis to be cascaded down to health facility level. According to the CDC guidelines for evaluating surveillance systems, taking ‘action’ is what distinguishes a surveillance system from merely data recording.

The acknowledgement of the acceptability of the TBSS by the study participants is complemented by the improvements in data completeness observed as well as the timeliness of submission of the 2013 first, second and third quarter outcomes report. Though timeliness

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of notification once a patient was diagnosed was generally good , the unavailability of a tracking system to check on timeliness of submission of the notification forms, monthly and quarterly reports made it difficult to objectively assess timeliness of submission of reports to the next level.

The correct reporting of treatment outcomes improves the quality of the data reported. Correct reporting of treatment outcomes is of paramount importance as it has a bearing on the calculation of the indicators used for monitoring TB Treatment success and failure rates which are key indicators for TB program performance.

The majority of the respondents reported TBSS as flexible as it accommodated the reporting of other conditions like HIV and this was also supported by studies done by Muchedzi and Basera (2003).

The availability of adequate TB stationery, clear defined roles for operating the TBSS through TB focal persons and TB District coordinators made the TBSS stable. Though internet connectivity in all the clinics save for one was not functioning, its absence does not affect the functioning of the TBSS.

The high knowledge in TB screening, TB case definitions and patient registration procedures serves as a reflection of the skill of the health care providers in identifying and reporting cases making the system sensitive in picking up TB cases. However the low knowledge in knowing how the Mantoux test is administered for TB screening in children may indicate that the procedure is either not done in most of the clinics or is done wrongly. This may compromise patient management. According to Review of Childhood TB activities carried out by the National TB Program in 2011, the incidence of new cases of TB in children at 59 per 100 000 is much lower compared to adults figures of 782 per 100 000. This may suggest an under representation of young children or that the disease is less common in children.

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Through analysis of data recorded by the system, the system is able to detect changes in TB disease patterns and treatment outcomes. An increased number of TB cases notified for 2011 were observed from 2010. According to the CDC guidelines for evaluating Surveillance systems, a sensitive system has the ability to monitor changes in the number of cases over time. Though the system has managed to detect cases of MDR-TB through the use of the GeneXpert® machine, the high proportion (69 percent) of study participants who were not able to give the correct case definition of XDR-TB may indicate that some cases are being missed. However, knowledge on MDR at 65 percent was reasonable.

The TBSS is representative as it enables the description of TB occurrence over time and its distribution in the residents of Harare by place and person and all the health facilities in the Harare City Health Department are involved in the system and collect data in a uniform way through the use of standardized registers and forms. The lack of consistent feedback from the MOHCC to the HCHD on the performance of the TBSS is a cause for concern which need to be addressed as dissemination of information to those who need to know and use it is of paramount importance in the operation of any surveillance although 42 reported that they last received feedback in the last 4 weeks.

CONCLUSION

The system is simple, flexible, stable, representative, and acceptable to the Health care workers and data completeness is commendable. The extent to which the system is sensitive in picking up children with TB and MDR-TB cases is unknown. Data analyzed is being used to improve the TB program performance at Program level. Knowledge of the objectives of the TBSS was significantly low in the health care workers. Knowledge on TB screening, case definition and patient registration was however high.

Lack of documentation of data analysis at local level makes it difficult to ascertain the extent of use of data at local level. The timeliness of submission of reports cannot be objectively

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measured and the accurate reporting of treatment outcomes serves to improve the quality of data reported.

Stationary and most utilities for the smooth functioning of the TBSS was available in almost all the health care centres. The non-availability of dedicated transport to enable prompt follow up of TB cases and contacts may hinder the effectiveness of the programme in combating TB in communities.

RCOMMENDATION

In order to improve the TB Surveillance system, the respondents suggested that case investigation forms must be completely filled, as well as dedicating staff responsible for TB surveillance. The health workers needed to be equipped with current TB information so that they can maintain high standard of TB surveillance and give quarterly feedback reports. It was also suggested that the surveillance system should improve space for TB management, follow-up for TB case contacts, staff compliment, frequency of training workshops and reliable transport.

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