Research Article

Are the TB Data Qualities Good Enough? Facility Based Cross Sectional Study in Benishangul Gumuze Regional State, North West Ethiopia

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ABSTRACT

Back ground: Recording and reporting of data is a fundamental component of providing quality care to patients with tuberculosis (TB) and disease control. When high-quality data are available, successes can be documented and corrective actions taken to address identified problems. In Benishangul Gumuze regional state in Ethiopia data quality is not routinely assessed and there is a concern on TB/HIV surveillance data quality.

Methods: A facility based cross-sectional study was conducted in 13 randomly selected public health facilities which were engaged in diagnosing and treatment of TB in the region. Each selected facility was visited to assess the quality of TB/HIV routine data, over one year period. Data was collected using a structured data capture form. Availability, completeness, accuracy, timeliness of surveillance data as well as concordance of reporting by the TB program and the health management information system, HMIS was assessed.

Results: The overall quality of TB/HIV routine data as measured by the average score for source document availability, data accuracy, completeness and timeliness of reporting was found 81.1%. In 9 of 13(69.2%) health facilities, above 85% had kept the required TB source document in their TB unit. The proportion of TB patients tested for HIV and TB treatment success rate in the TB program report and HMIS report differed by 15% and 20% respectively.

Conclusion: The quality of routine recording and reporting of TB and TB/HIV data was found to be considered inadequate. There is need for capacity building of all cadres of health care staff with respect to TB program recording and reporting followed by regular supervision to ensure quality data are available to guide TB/HIV control activities in the region.

Keywords: Data Quality, Accuracy, Timeliness, Availability, TB, Ethiopia

Background

Recording and reporting of TB and TB/HIV routine data is a fundamental component of care of patients with TB. Quality surveillance data is necessary to monitor trends in the TB epidemic at global, national and sub national levels; to monitor progress in the treatment of individual as well as cohorts of patients and ensure continuity of care when patients are referred between health-care facilities. In addition reliable data are needed to plan, raise funds for implementation and to evaluate programmatic efforts to control TB, including forecasting the numbers of cases and the associated requirements for staffing, medicines and laboratory supplies. Currently, the World health organization (WHO) advocates for a change from paper to electronic based recording and reporting system to improve the quality of data and increase the applicability of the surveillance data [1-4].

The Ethiopian ministry of health identified that information quality and strategic use of data remains weak within the health sector, particularly at the peripheral levels of woreda and facility. There measuring the success of disease control relies on a strong Monitoring and Evaluation (M&E) systems that produces quality data related to program implementation. The development of the health management information system (HMIS) was made a priority since 2008 [5,6].

The Ethiopian ministry of health has deployed a standardize TB recording and reporting system at all levels of the health care system applied in all regions of the country. The Health Centre (HC) and hospital, usually the diagnostic centers for a defined health service area (HSA), are the focus of activities. All forms and registers are standardized throughout the country and designed to capture all key TB and TB/HIV collaborative activities with a minimum set of forms and case definitions following WHO guidance [7].

In Benishangul Gumuze regional state data quality is not routinely measured therefore the existing level of TB and TB/HIV data quality in the region is not known. There is a concern about the quality of the TB/HIV surveillance data therefore to know the level of data quality at the peripheral service delivery level; this operational research was conducted to assess the quality of routine surveillance data of the TB control programme in the region.

At the same time the assessment can serve as a base line to monitor data quality at all health operational levels of TB prevention and control program and can help design interventions to improve the data if needed.

Materials and Methods

A facility based cross-sectional study was conducted in Benishangul Gumuze regional state, North West Ethiopia, between August 30 and September 30, 2019. Benishangul-Gumuze Regional State is one of the nine regional states of the federal democratic republic of Ethiopia. The region is

administratively composed of 3 zones and 20 woredas. The region has a total area of approximately 50,380 km2 with altitude ranging from 580 to 2,731 meters above sea level. The population of the region was estimated at 993,500 people in 2014 based on the projections from 2007 census with 50.7% male and 49.3% female. The annual population growth rate is estimated at 3% per annum. Of the population, 13.5% and 86.5% of the people are living in urban and rural areas respectively. Two general hospitals, 33 health centers and 378 health posts make the regional health care service coverage 87% (i.e. 87% of the population in the region have health service access). The average estimated distance between health facilities is not yet known. According to 2017 regional health bureau annual report, TB case detection rate was 46% and treatment success rate 84%respectively. Of the TB patient 72% was tested for HIV with 6% being co infected.

There were 412 health facilities providing health services in the region of which 34 met the inclusion criteria, i.e. public hospitals and health centers that are engaged in diagnosing and treatment of tuberculosis. From each of the three administrative zones two woredas were randomly selected, one conveniently selected special woreda was added making a total of 7 woredas selected for the study. Eleven public health centers and two public general hospitals, from the seven selected woreda totaling 13 health facilities were included in the study. Each facility was visited to assess the quality of surveillance data. Data were collected by trained data collectors using a structured data capture form. Data collectors were health professionals who were working in the TB clinic and who had received basic in-service TB care training. The data capture form was adapted from the WHO data quality manual [8].

Data were collected and analyzed to measure accuracy of data, completeness of the documents, timeliness of reporting and availability of source documents, the operational definitions are outlined in box 1. The TB program and HMIS reported data were used independently to measure and check consistency of proportion of TB patients tested for HIV, TB/HIV co infection rate, TB treatment success rate and TB cure rate between both reports over a one year period (the year 2017).

The TB program and HMIS report indicators were selected by inclusiveness of their nominator and denominator in both TB program reports and HMIS reports independently.

Ethical approval sheet was obtained from the AHRI/ALERT Ethical review committee; in addition a permission letter was obtained from the Benishangul Gumuze Regional State Health Bureau. Written consent was obtained from the head of each health facility before starting data collection. Data were entered in EPI-Info version 3.4.3 and analysis was done by SPSS version 21. The collected data was computed into four data quality dimensions (see Box 1) and the information was present by tables and figure.

Box 1: Operational Definition of Variables

According to WHO, data quality includes four dimensions (accuracy, completeness, timeliness and availability of source documents). Each variable is operationalized as follow [8].

Accuracy: It is the produceablity of the same number of TB cases at different source document. It is measured by computing the recounted case over the count case by cross checking from the TB Laboratory Register to the unit TB Register, from the unit TB Register to TB Laboratory Register and from the unit TB Register to patient treatment card times hundred.

Completeness: It is the inclusiveness of complete information of each TB cases recorded of one year period on unit TB register. Unit TB register completeness rate is the average completed column over the total number of TB case recorded on unit TB register times hundred.

Timeliness: The updating of information system or submission of report in the recommended time. Timeliness was measure by grade 0 to 2 as out lined below [8]. Grade 2 when all report respect 3rd day of the end of the respective quarter; grade 1 if the delay exceeds 3rd day of the respective quarter for one of the report; grade as 0 if one of the quarterly reports in the last 4 quarters were not sent to upper level or copy of sent reports not kept at district level. Timelines was calculated the mean grade of four report divided eight (i.e. Grade 2 times four) times hundred.

Availability of source document: Reviewing the availability of required source documents of TCP. The availability of required source document was measured by grades 1. The availability of the unit TB registers, Laboratory TB register, quarterly reports on TB case registration, quarterly report on TB drug order for the reporting period and transfer document (i.e. a counter-party document sent from facility receiving the patient to facility sending the patient). Grade 0 to 1 according to availability of these 4 sources document availability was calculated. The mean score over maximum total grade times hundred.

Consistency of TB program report and HMIS report: TB program report and HMIS report data was used independently to measure and check consistency of proportion of TB patients tested for HIV, TB/HIV co infection rate, TB treatment success rate and TB cure rate over one year period, 2012. The formula of each indicator was based on FMOH of Ethiopia TBL-HMIS indicators version 1.0, 2007.

All thirteen selected public health facilities participated in the study and had started directly observed short course chemotherapy (DOTS) between 2004 and 2016. The unit TB register was the only source documents present in all facilities (Table 1). In none of the health facilities, the document for transfer out of patients, i.e. a counter-party document sent from facility receiving the patient to facility sending the patient, was available. Fifty percent of the facilities had all required source documents while a quarter had less than 86% of the required documents. All observed available source documents were as per the latest format from the Ethiopian FMOH.

The median accuracy of the assessed documents was 69.8%, with 25% of health facility with accuracy of 85% and above, while 25% had accuracy below 84.5%. As shown in Table 2, the accuracy of data differed for different source documents, for example the difference between the accuracy from Unit TB register to Quarterly new case report and the accuracy of data from Unit TB register to TB treatment card was 66.2% (Figure 2).

Table 1: Availability of different source document in health facility of Benishangul Gumuze regional state, Ethiopia, assessed between, August 2014 to September 2019.

Source document (N=13)	Availability (n/%) Yes	No
Unit TB register	13/100%	0/0%
Laboratory TB register	12/92.3%	1/7.7%
Quarterly case notification reports on TB case registration	11/84.6%	2/15.4%
Quarterly report on TB drug order	9/69.2%	4/30.8%
Transfer document/counter party document	0/0%	13/100%

Table 2: TB recording and reporting data accuracy rate by Source document and TB type in 13 health facilities of Benishangul Gumuze regional state, Ethiopia, from August 2014 to September 2019.

Source document	Number of cases		Accuracy (%)	Minimum	Maximum
	Recounted TB cases	Counted TB cases			
From the TB Laboratory Register to the unit TB Register					.
Smear positive PTB	73	88	82.6	25	100
From the unit TB Register to the TB Laboratory Register.					
Smear positive PTB	65	114	57.0	0	100
From the unit TB Register to TB Treatment Cards				0	93.4
All forms of TB	173	365	43.4		
Smear negative PTB	65	170	38.3		
Smear positive PTB	48	70	68.0		
EPTB	60	125	47.7		
From unit TB Register to the quarterly report				100	150
All forms of TB	452	422	110.6		
Smear negative PTB	156	130	119.7		
Smear positive PTB	134	119	112.5		
EPTB	162	173	93.9		
Mean accuracy			**67.2**		

TB=Tuberculosis, EPTB=Extra Pulmonary Tuberculosis

Completeness was high with a median completeness rate of the unit TB register of 98.8%. While for 25% of the facilities it was below 91%. Completeness of unit TB registers was above 85%, date treatment started (100%),, date HIV test offered (98.8%), patient type (category)(100%) and date treatment outcome(85.6%). For 6(46.2%) of the facilities completion rate of the unit TB register was 100%.

Only a quarter of health facilities reported in time, as 23.2% of health facilities had sent their four consecutive quarterly reports within the recommended period. Nearly half, 46.4 % of health facilities had sent at least three quarterly reports to upper level. The remaining 53.6% had sent their quarterly report either after the recommended time or had not sent it to upper level at all.

Comparing the consistency between the TB program report (quarterly case finding and treatment outcome report) and the HMIS report showed that for cure rate and TB HIV co-infection rate the values were very similar. However the proportion of TB patients tested for HIV differed by 15 % between the two reports (Figure 1).

Also, treatment success rate differed substantially by 20% (61.4% in program report versus 84.1% in the HMIS report).

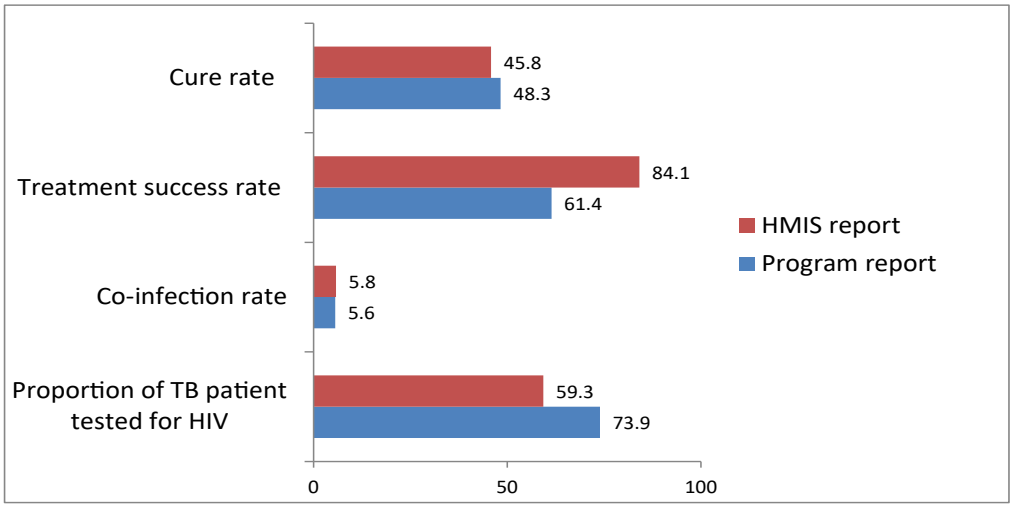

Figure 1: Comparison of four selected key programmatic indicators to monitor TB/HIV activities as reported in the TB program report and HMIS report over one year period in the health facilities of Benishangul Gumuze regional state, North West Ethiopia from August 30 to September 30/2019.

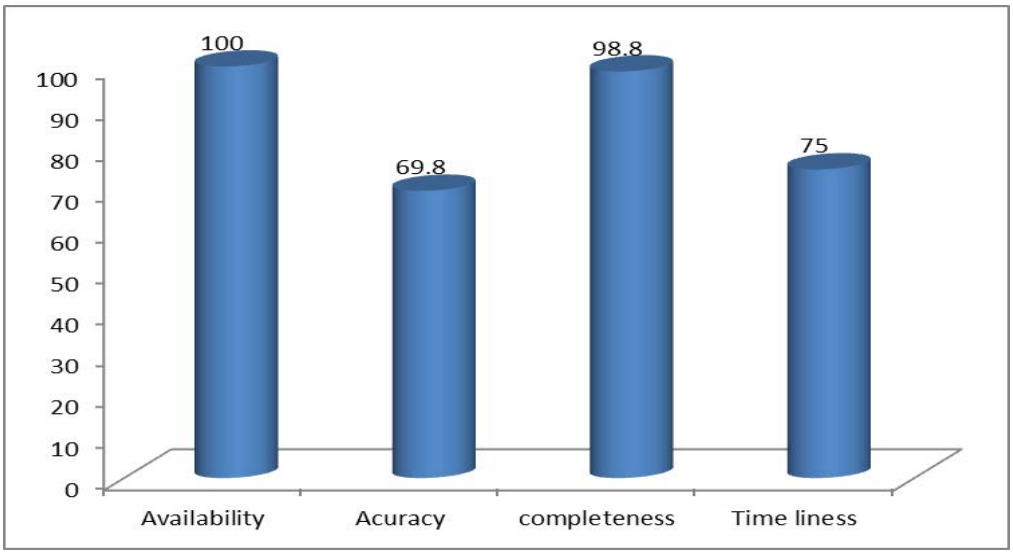

Figure 2: The median of data quality dimension of TB recording and reporting over one year period in the health facility of Benishangul Gumuze regional state, North West Ethiopia from August 30 to September 30/2019.

Discussion

The overall quality of TB/HIV routine data as measured by the average score for source document availability, data accuracy, completeness and timeliness of reporting was found 81.1%. Standardized unit TB register were in place in all health facilities however, none of the health facilities had counter reference documents for transferring out TB patients. This suggests that after transfer out of TB cases, the health facilities are not updated on the status/outcome of their TB patient. The facility is required to report to facility sending the patient on the outcome of all TB patients they received. Our findings are comparable to a study conducted in six region of Ethiopia which showed that, required source documents were available in 31 of 32(95%) service delivery sites 11. This finding indicates that missing simple or limited investment to place and use counter reference document in TB unit can adversely affect data quality in TB control programme. In the other hand, data accuracy at the facilities showed that both under reporting and over reporting occurred. Under reporting was more common with over reporting. For different source documents the accuracy varied, for the TB laboratory register it was only 57% while for the unit TB register was 82.6%.

A study conducted in six regions of Ethiopia including Benishangul Gumuze regional state shows that, three quarters of health facilities had reported a decrease in data accuracy rate fall within the accepted range, i.e. between 85% and 130%. 11% had accuracy rate less than 70% and 7% were above 130%. Under reporting was observed. Compared to this our finding indicates a lower data accuracy rate in Benishangul Gumuze region also underreporting was more commonly observed in the region. It was observed in the two general hospitals that referring a patient to the nearest health center immediately after Lab diagnosis by clinician without registering the patient in the unit TB register was common. This indicates TB patient referred from the primary source facility are registered as a transfer in and may not reported as a new. This can affect treatment outcome report at all level. Previous study in Ethiopia

shows that, 21 of 31(68%) facilities were sent their report within agreed national reporting period [9]. This is higher than our study findings. This means information system was not updated timely between health facility and next upper reporting level within the recommended time. In turn this affects plan of TB control program in the country.

Although both the TB program report and HMIS report have the same data source in all TB unit of the health facilities of the region, both reports showed significant differences in some indicators. The proportion of TB patients tested for HIV differed by 15% while the TB treatment success rate differed by 20% between the two reports. This finding shows inconsistency between TB program report and paper based HMIS report was there in the region. Even though both reports are quarterly base reports, TB program reports are mostly used by world health organization (WHO) and HMIS reports are used by ministry of health. The discrepancy may be happen due to difference in reporting calendar among two different reports from health facilities and efforts to make similarity in the calendar of both reports were done by health bureau.

Data recording and reporting is necessary to monitor progress in the treatment of individual patients and groups (cohorts) of patients, to plan, raise funds for implement and evaluate programmatic efforts to control TB. As a general, to monitor trends in the TB epidemic at global, national and sub national levels, for instance poor data quality can affect the quality of TB care which in turn limits the TB control programme. A study conducted in Tanzania shows that data-use workshop with active engagement of data users themselves can improve health data quality and enhance health care staff capacity for information use, presentation and analysis for decision-making in the region as well as in the country level [10]. Previous study conducted in Namibia also shows that Knowledge, attitudes and practice of health care provider are key factors influencing the quality of data in the TB control programme and they suggest that advocating capacity building of all cadres of staff with respect to TB programme data and conducting frequent audits, and review meetings that will involve both clinicians and laboratory technologists will assist in the correct use of TB records and promote practices that improve the accuracy of data in TB unit in order to enhance data quality[1].

Limitation of this study was; it does not involve qualitative data on the side of the head of the health facilities and TB clinic focal person where the discrepancy occurred. Therefore, determinant factors of data quality are missed.

Conclusion

This study showed that TB data quality in the health facilities of the region was not good enough. Referral and transfer out system of bacteriologically confirmed TB cases shall be in line with national guideline. Capacity building for all cadres of health care staff with respect to TB program recording and reporting followed by regular supervision is a need since staff rotation from TB unit to other service area is common in most health facilities of the region. Conducting a study to know associated factors for poor data quality would be considered to address the underlying factors and develop adequate interventions plans.

References

1. Linda VK. Factors Influencing the Quality of Data for Tuberculosis Control Programme in Oshakati District, Namibia.University of South Africa 2010.
2. Katherine F. The global plan to stop TB 2011-2015: transforming the fight towards elimination of tuberculosis 2010.
3. CDC. TB Program Evaluation Handbook: Introduction to Program Evaluation. Centers for Disease Control and Prevention 2006.
4. Hannah M. Tuberculosis Global Report, France. WHO 2012.
5. Global Fund. The Global Fund To Fight Aids, Tuberculosis And Malaria, Office Of The Global Aids Coordinator 2015; 30.
6. Health Management Information System (HMIS). Facilitator's Guide for Training of Trainers 2010; 1:1.
7. Federal Ministry Of health, Ethiopia (FMOH). National Guidelines for TB, DR-TB in Ethiopia. Sixth edition 2018.
8. World health organization (WHO). Manual on use of routine data quality assessment (RDQA) tool for TB monitoring. Geneva, WHO Stop TB Department 2015.
9. Gebrekida. Data quality and information use a systematic review to improve evidence, health and reproductive health. The African health monitor S14.
10. Jorn Braa. Improving quality and use of data through data-use workshops: Zanzibar,United Republic of Tanzania. Bull World Health Organ 2012; 90: 379–384.

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