

Evaluation of TB Dots Surveillance System-Sindh Province 2012-13

* Naveed Masood, ** Jawaid Hussain Lighari, *** Atta Muhammad Chandio, ** Noor Ali Samoon, **** Irfan Ali Arbab

ABSTRACT

Objective: To evaluate the TB (Tuberculosis) DOTS (Directly Observed Treatment, Short Course) surveillance system in Sindh.

Methods: Qualitative and quantitative assessment of system attributes was done from November 2012 to January 2013 in Sindh Province according to the CDC guidelines 2001. Available literature was reviewed. Stakeholders were identified and engaged in the evaluation process; face to face interviews were conducted with the help of structured questionnaire. The data collected was statistically analyzed and results were tabulated.

Results: Case definition is simple and easy to understand. Staff is trained in data collection and dissemination to concerned authorities. System has flexibility and accepts new health related events. Data quality is good and timeliness is average; system cannot pick epidemics timely. Sensitivity was 44.6% and PPV was 45.3%. The acceptability is average with less public private collaboration and representativeness is average as system covers 23 districts of Sindh but does not exist at most of the primary health care level.

Conclusion: TB DOTS does not exist at primary care level health Facilities. There is poor response in the reporting of TB patients in the private health sectors and they do not follow TB-DOTS strategy. The routine reporting system fails in timely identification of outbreaks as the three months it takes for the TB data to reach from the Health Facilities to the district and provincial team does not take timely action or intervention response. No integration with other health system and less public private collaboration.

Key words: TB, Surveillance, Evaluation, Sindh.

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INTRODUCTION:

Worldwide Tuberculosis (TB) a major communicable disease is a significant health problem specially in developing countries, causing widespread morbidity and mortality caused by *Mycobacterium tuberculosis*. It is estimated that 1/3 population in the world is infected with *mycobacterium tuberculosis*. It affects every age group.^{1,2}

Globally, more than 95% of new cases and deaths reported from developing countries.³ More than 50% of total cases are reported from the two regions South-East and Western region, while African region attributed to about 25% of the total cases.³ The case fatality rate exceeded 50% in some African countries where HIV prevalence rate was high.⁴

Every year, about 420,000 new TB cases are being emerged worldwide and half of them are sputum smear positive. Globally, Pakistan ranks sixth amongst tuberculosis high burden countries and responsible for 5.1% of total national burden and contributes 61% of the disease load in the Eastern Mediterranean Region. An estimated about 275,000 new cases with annual incidence rate of 410/100,000, mortality rate of 0.66/100,000.⁴

* Technical Support Officer & Alumni FELTP Pakistan.
 ** Assistant Professor, Community Medicine Deptt. PUMHSW Nawabshah.
 *** Dean & Professor Community Medicine Deptt. PUMHSW, Nawabshah.
 **** Medical Officer Cardiology, Deptt PUMHSW Nawabshah

Correspondence to:

Dr. Naveed Masood Memon

Technical Support Officer & Alumni FELTP Pakistan.
 Email: jawaid.lighari@gmail.com

High prevalence is related to peoples living below the poverty line, overcrowding, poor living standards, malnutrition, sanitary condition associated with high risk of transmission, factor that impair the host defense against TB infection, war, and diseases such as HIV Infection, Smoking, Diabetes Mellitus, Alcohol Abuse and Indoor Air Pollution and inadequate availability of anti-tuberculosis therapy (ATT), poor compliance with drugs, underfunding of National Tuberculosis control Programmes (NTCPs), and non-adherence to programme policies. The identification of risk group is also helpful to make strategies for early detection of targeted people in need of tuberculosis treatment. More research is needed on suitability, feasibility and cost effectiveness of these intervention options.⁵

Apart from other reasons, malnutrition is the significant risk factor of childhood Tuberculosis. Malnutrition and Tuberculosis are the inter-related burden among worldwide; from the research it is observed that malnutrition is the predictor of Tuberculosis Disease. It is also suggested that nutrition supplement given, have a significant benefits during the course of Tuberculosis Treatment specially in children.⁶

In Pakistan since 2000, the National TB Control Program (NTP) is a vertical program involved in making guidelines and providing resources to preventive, diagnostic and curative services against TB from Primary to Tertiary care health facilities in Pakistan since 2000. NTP has a surveillance system with the objectives to monitor the disease burden and trends, to assess health status of a specific population, describe the natural history of disease, and evaluate the preventive and control interventions. Evaluation is an important tool for policy makers that help to improve the performance and productivity of health programs.^{7,8}

Evaluating public health surveillance systems on Province level is to determine the gaps in the system because despite of improved case registration under DOTS, it failed to achieve required targets of case detection and treatment success. It is WHO recommendation that every surveillance system should be evaluated

periodically to improve surveillance system usefulness, quality and efficiency.⁹

Surveillance Evaluation is the Systemic collection of information about the activities, characteristics and outcomes of programs. Program evaluation helps to assess the program performance, make judgements, and improve its effectiveness and inform future program development¹⁰.

Evaluations of the NTP Tuberculosis surveillance system has been conducted at provincial level to cover up the existing gaps of knowledge and with objectives to identify strengthens, weakness and proposed recommendations.

METHODS:

According to the updated CDC Guidelines 2001 for Evaluating Public Health Surveillance Systems the below mentioned steps were followed:

1. Defining purpose of the evaluation
2. Identification and engagement of stakeholders in the evaluation process.
3. Description of the System in terms of:
 - * Purpose of the system
 - * Operational arrangements
 - * Resources used to operate the system
4. Gather reliable evidence regarding the performance of the system and describe the System in terms of standard attributes in accordance with the CDC Guidelines.
 - * Conclusions and recommendation.

Study Design: This was a descriptive evaluative study to evaluate the TB surveillance system in Sindh Province, "Updated Guidelines for the Evaluation of Surveillance Systems 2001" by Centers for Disease Control and Prevention (CDC) was used.

Study setting and duration: The study was conducted in Provincial Directorate of Health, District Health Offices (DHO) and TB sentinel sites of Sindh province from November 2012 to January 2013.

Study population: Interviews were conducted with key stakeholders, that include, Director TB Control Program, Deputy Director Provincial TB control Program, District TB focal person, Medical Officers Tuberculosis Sentinel sites, TB DOTS centers at Taluka Hospitals, Reporters, Operators, Lab technicians. Patients and Parents of the Patients.

Data Collection: From all stakeholders the face to face interview conducted and collected information regarding surveillance system attributes including (simplicity, flexibility, data quality, predictive value, sensitivity, timeliness, acceptability, representativeness and stability). Other relevant information collected by review of documents of TB control Program i.e. Guidelines, Case reporting forms, Quarterly and annual reports.

Data Analysis: For analysis of timeliness & representativeness, Sensitivity and Positive Predictive Value, the frequency, percentage were used. Attributes with scores greater than > 80% ranked as Excellent, and Good between 61%-81%, and 50%-60% ranked average and below 50% were ranked as Poor.

Description of TB Surveillance system (Organization and Structure of Surveillance System)

The National Tuberculosis Control Program established in 2000, the objectives were to increase the cure rate of positive cases to at least 85%; and to increase the detection of new cases to 70%. The Federal role in the National Tuberculosis Program is provision of policy framework, technical assistance, supervision, surveillance, co-ordination, research and development and advocacy. While Provincial role in the National Tuberculosis Control Program is planning, accessing funds, management of program, implementation of Sentinel sites at different health care level.¹³ Sentinel sites providing diagnostic and curative services to the community. Tuberculosis Surveillance system uses different reporting and recording forms in which data is being collected and analyzed at provincial and national level for further dissemination its findings towards ministry of health and WHO country office. Fig:1 describes the flow of data from Sentinel sites of health facilities to Provincial office of Directorate General Health services Sindh.

RESULTS:

The results of evaluation were obtained by analyzing system attributes described in the

Updated Guidelines for Evaluating Public Health Surveillance system 2001.¹¹

Following List of attributes were assessed in the evaluative study;

- * Simplicity
- * Flexibility
- * Data Quality
- * Acceptability
- * Sensitivity
- * Positive Predictive Value
- * Representative
- * Timeliness
- * Stability

Simplicity: The Simplicity of Tuberculosis DOTS Surveillance system as per CDC guidelines is "Good" because the operational case definition used for selection of cases is uniform and throughout the program at every level and using standard and Simple case definition. Staff is sufficiently trained in data collection, managing, and its dissemination to concerned authorities. The reporting Performa provide all relevant information regarding demographic, exposure history, health seeking behavior, contacts and treatment.

Flexibility: Surveillance system easily accommodates, accepts and forward to new health related events with additional time, personnel and allocated funds. The staff is skilled enough to manage in case definition or additional technology. System accepts, process and forward another system's information. Variation in funding will critically affect the overall performances of the program. Flexibility of the surveillance system is graded "Average" as per CDC guidelines.

Data Quality: Diagnosis is based on Case definition supported by Clinical presentation, Radiology and Sputum microscopy. Collected data entered and transferred in record registers and then trained person gather the data in reporting forms. Completeness of the reporting form was more than 90%. There is no mechanisms for monitoring or controlling any mentioned or reported data errors. Data transferred manually in hard copies from the Sentinel sites to District health office.

Table-1: The results of the evaluation of TB-Dots surveillance system in Sindh Province based on the system attributes as per CDC guidelines.

S. No.	System Attributes	Results
1.	Simplicity	Good (70%)
2.	Flexibility	Average (60%)
3.	Data Quality	Good (75%)
4.	Acceptability	Average (60%)
5.	Sensitivity	44.6%
6.	Positive Predictive Value	45.3%
7.	Representativeness	Average (60%)
8.	Timeliness	Average (60%)
9.	Stability	Good (70%)

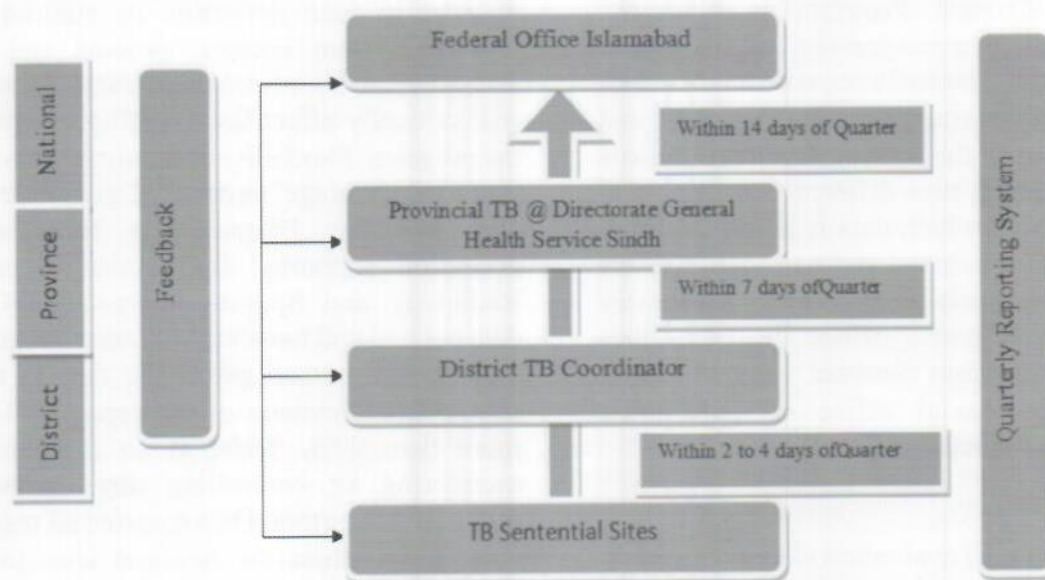
Acceptability: Surveillance system exist at District, Taluka and some rural health centers. It does not exist at Basic health unit level as there is full participation of national and international agencies. Sentinel sites reporting regularly within stipulated time but there is quarterly reporting system, hence unable to detect any outbreak

earlier. Less integration and coordination with other health system and it has also been observed and assessed with less involvement of private health sectors including clinics, major hospitals and pathological laboratories.

Sensitivity: Sensitivity of the Tuberculosis surveillance system calculated by using formula from CDC updated guideline in which $A/A+C$, where A represent the true positive cases and C represent for false negative cases hence, A+C is the total number of positive cases (true positive and false positive) In the year 2013, the expected number of TB cases were 110800, while the data reported total number of TB cases were 49484, in this way; Sensitivity (%): $49484 / 110800 \times 100 = 44.6\%$.

Positive Predictive Value: Positive Value Predictive calculated using the CDC updated guideline. $A / (A+B)$, where A is true positive and B is false positive. As the reported cases of Tuberculosis= 49484 while smear positive (confirmed cases) =22437 PVP (%) = $22437 / 49484 \times 100 = 45.3\%$.

Representativeness: The representative of TB DOTS Surveillance system is not so good owing to less involvement of public and private sectors. This system is being operated in all districts of the Sindh province. Many public and private health



Flow Chart of Tuberculosis Dots Surveillance System

care providers do not use evidence based approaches to TB diagnosis and treatment. Representativeness is affected by poor access to health care facilities because most of the communities have low socioeconomic status and accessibility in terms of outreach areas.

Timeliness: The system disseminate the information from diagnostic center to district for compilation and analysis and then at provincial TB Directorate on quarterly basis (every 3 months) hence, the system unable to detect epidemic earlier for timely intervention.

Stability: The system is working effectively and managed efficiently. System provides curative service, well equipped with computer and other logistics. System responds to the cases in time and is reliable and has ability to collect, manage data without any disruption and delay. Variation in funding will effect on performances of the system.

DISCUSSION:

Tuberculosis (TB) is a substantial public health issue that is preventable and curable. About one-third world's population is infected with this disease.¹⁰ Tuberculosis DOTs is a cost-effective way to control TB, an immense threat to human health and its socioeconomic development.¹¹

Evaluation of surveillance systems helps the decision makers to identify gaps, set objectives for future planning, resource allocation and implement future interventions against disease.¹²

Collected data and information was efficiently used by district and provincial stakeholders to know the magnitude of disease, time trends and distribution of disease among population.

Surveillance system was simple with uniform case definition to detect true cases and collecting comprehensive information. Trained staff are sufficiently trained to easily accommodate new health related events and can make it more flexible with regard to case definition, reporting mechanism, laboratory and diagnostic tools with procedure. Surveillance system collect, compile the data on every three months from sentinel sites to provincial directorate for in-depth

analysis, delaying in reporting system and ultimately with delayed feedback is also much concerned. Hence, timely detection of outbreaks or any uneven pattern could be delayed and resulting the deferring the early intervention for control and prevention. So, it is significant that reporting system should be at least monthly basis for timely necessary intervention.

The usual observation of Tuberculosis DOTs system was that it exit only at District, Taluka and selected Rural Health centers. It lacks at Basic health unit level, as the most of the population residing at rural areas with low socio-economic status; they are unable to get DOTs services at door steps. Most of the exposed and high risk population seek health care services through private sectors, as system shows the low sensitivity that was 44.6%, that means system does not pick the cases and missing immense number of cases; it could be owing to unavailable number of sentinel sites at gross root level and poor health seeking behaviors among the population. It was also observed that the less integration with private health sectors and pathological laboratories and low coordination with other vertical health programs. Therefore, it is highly relevant that TB DOTs services should be augmented at Basic health level including mass awareness and health education services must be expedite with effective co-ordination with all public-private stakeholders. Good level of acceptability assessed among the stakeholders estimated by their participation in quarterly and annual review meetings, appropriate dissemination of data with up to 90% completeness towards provincial stakeholders for analysis and feedback. With regard to stability, system is well equipped with computer and other necessary logistics and providing curative services.

It is significant that surveillance data should be utilized for public health intervention and policy making. The high incidence and prevalence of tuberculosis in Pakistan requires consistently public health actions; regular discussion regarding program performances. Good data quality with evidence-based are essential to ongoing health care system strengthening.

CONCLUSION:

TB DOTS does not exist at First care level health facilities. There is poor response in the reporting of TB patients in the private health sectors and they do not follow TB-DOTS strategy; these sectors seem out of loop. Surveillance system fails in timely detection of outbreaks owing to the quarterly reporting mechanism hence, it takes three months for the data to reach from the health facilities to the district and then provincial level; it does not allow for timely intervention or mitigation response. There was integration with other health system and less public private collaboration.

RECOMMENDATION:

Tuberculosis DOTS should be expanded up to First level health care facility. The private practitioners (GPs) must be sensitized regarding TB DOTS strategy hence they can refer the high suspected cases to the sentinel site for registration and timely treatment, there should be integration with other health system and increase public private collaboration. Reporting system of Surveillance system should be monthly or weekly basis so timely epidemic can be picked for early interventions. Lady Health Workers should be trained and involved in reporting of T.B suspects cases. The refresher trainings of all the concerned stakeholders should be done at regular intervals. T.B surveillance system is the primary source of data but system is no feedback mechanism. Therefore, it is recommended that policy maker should develop a mechanism for feedback within surveillance system.

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