**Use of Routine Data
in Evaluation:**
Technical Brief

July 2020

Assessing Healthcare Quality Using Routine Data:
Evaluating the Performance of the National Tuberculosis Program in South Africa

This document is part of a series that describes how routine data were used in research and evaluations of health programs and projects. Data for Impact (D4I) has compiled these examples from its own work and the work of others found through a literature review—and consultation with the original authors—to compare ways routine data can be appropriate for evaluations and to shed light on its benefits and shortcomings for evaluation.

A companion guidance document compiling these lessons is available at the [D4I website](). This suite of materials may be useful for others contemplating using available and routine data in their own work.

This brief discusses the value of routine facility data on treatment for tuberculosis in assessing quality of care in South Africa and for informing policy considerations. Access the full report [here]().

Program Description

Standard models of quality of care assessment in developing countries include observational studies, health facility assessments, patient and provider interviews, or focus groups, all of which can be time-consuming and expensive to perform. In South Africa, researchers sought to evaluate a method of assessing quality of care using data from routine health information systems that are readily available and much less costly to collect.

Researchers used the National Tuberculosis (TB) Control Program as a proxy for the health system because all public health facilities in South Africa offer TB diagnostic and treatment services. TB is the world's leading cause of mortality from infectious diseases. In 2018, nearly 10 million TB cases were diagnosed, with 1.2 million deaths (World Health Organization, 2019). South Africa has one of the highest TB burdens in the world and has lagged behind in important performance indicators, such as prompt TB diagnosis, follow-up testing to ensure treatment is effective, and drug resistance testing. The evaluation in South Africa judged facility performance on these indicators against national standards to evaluate quality of care at health facilities.

Researchers used routine data from all public health facilities in South Africa to identify facilities that had sub-standard performance on TB diagnosis and follow-up testing relative to the national guidelines. Because all facilities offer TB diagnostic services and have been sensitized to the threat posed by TB disease, these measures are potentially accurate measures of quality of care more generally.

Rationale for the Use of Routine Data

The use of routine data to broadly assess quality of care is a cost-effective and efficient method relative to traditional observational studies or health facility surveys. Due to the rise in electronic data collection and reporting systems in developing countries, routine data are increasingly available. The use of routine data also has the potential to deliver results quickly, because data are already collected and pose minimal ethical constraints because the data are typically aggregated and, therefore, pose little risk of violations to patient confidentiality.

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The methods used in South Africa offer national-level results, trends over time, and standardized comparisons across facilities—all of which are difficult or costly to obtain using traditional methods.

Evaluation Questions

The assessment focused on the delivery of specific services to improve health, as opposed to the more traditional foci of quality of care assessments, such as coverage, efficiency, and equity. This novel focus enabled researchers to answer the following questions:

1. What is the geographic distribution of poor performance of TB diagnosis and follow-up testing?

2. Is "quality mobility" possible? That is, can health facilities improve quality relative to their peers?

3. Can health policy influence the quality of care in health facilities?

Such an evaluation can help inform health system strategic planning and guide interventions to improve quality. And, evidenced-based targeting of resources can help improve the quality of health facility service delivery.

Data Description and Data Management

Retrospective TB testing data from public health facilities were extracted from the South Africa National Health Laboratory Service (NHLS) database for tests conducted between 2004 and 2011. The period was selected as a time prior to the introduction of widespread polymerase chain reaction (PCR) testing for TB (e.g., GeneXpert Mycobacterium tuberculosis/ resistance to rifampicin [MTB/RIF]) to ensure it would be generalizable to other countries and also because it offered a sufficient assessment period for detecting trends. Data were extracted for patients aged 16–64 years old from 3,939 health clinics and 429 hospitals (more than 24 million tests). Facility testing rates were calculated according to standards from the National TB Program and the World Health Organization (WHO).

The assessment focused on health facility-level indicators for clinical testing rates based on guidelines from the South African National Department of Health's tuberculosis management protocols that follow standards set by the WHO. Three metrics were analyzed: (1) diagnosis based on two patient specimens, (2) the adherence to guideline-defined treatment monitoring, (3) and the identification of drug-

resistant TB (DR-TB) using drug sensitivity testing (DST) among patients experiencing treatment failure. These metrics were selected because they are considered clinical behaviors of critical importance to the control of TB: diagnosis, treatment monitoring, and identification of DR-TB, and because they are routinely recorded at facilities and reported to the TB program.

Assessment of Usability and Quality of Data

The authors cited poor patient record linking as a limitation in the evaluation. For example, testing records that had missing or inadequate facility identifiers had to be dropped from the analysis. This data quality problem led to an underestimation of true testing rates because some tests that were conducted could not be included. However, other target measures, such as trends over time and inter-facility comparisons, were not affected.

The authors estimated the data on testing to be upwards of 90 percent complete overall, and 95 percent complete for the three primary indicators of interest. Because all TB patients in South Africa are tested by the public laboratory system (even if they are treated at a private health facility), and because the NHLS laboratory database is an internal system, not requiring external data, it constitutes all data on testing for TB in the country. Facilities from KwaZulu-Natal were excluded from this analysis due to limited data availability (data from KwaZulu-Natal were not fully digitized at the time).

Data Analysis Methods Used

These three measures (second specimen, monitoring tests, and DST) analyzed at varying time periods following initial diagnosis were used to create 15 facility-level indicators of performance along a continuum from poor to good. Pearson's paired correlation coefficients were used to measure correlations between facility performance rates. Ordinary least squares regression analysis robust to unequal variances was used to detect differences in testing rates by province and location type. Locally weighted kernel regression smoothing was used to produce curves of the distributions of testing rates. Smear or culture-negative cases and extrapulmonary TB were also excluded from the analysis.

Limitations in Using Routine Data for Evaluation

Diagnosis and follow-up of TB patients depends not just on provider knowledge and skill, but also patient behavior. Patients must show up to health facilities to be tested, and return for follow-up examinations. A comprehensive assessment of the performance of these diagnostic measures requires an in-depth

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understanding of patient demographics. A limitation was the loss of individual patient details in the aggregated laboratory data used for the evaluation.

Researchers also reported that data cleaning took a lot longer than expected, but in the end was worth the effort. When drawing conclusions, they were careful about the effects of missing data and about considerations on patients, clinics, and populations that may have been excluded from the data.

What Worked Well?

Researchers reported strong support from the NHLS was critical to the success of the evaluation. Because the original data set wasn't cleaned and didn't include meta-data, they shared these outputs with the NHLS during the evaluation so as to benefit future researchers.

Conclusion

The TB program quality of care evaluation is a good example of the efficiencies and practicality of using routine data for evaluation. In fact, the lead author expressed that routine data are a rich but underutilized resource. Other researchers were skeptical of the quality of NHLS TB data, but this study demonstrated how useful routine data could be. This study resulted in five high-quality publications that produced useful policy recommendations.

References

World Health Organization. (2019). Global Tuberculosis Report 2019. In *WHO*. World Health Organization. http://www.who.int/tb/publications/global_report/en/

To learn more, visit www.data4impactproject.org