Assessing effects of the e-Chasqui laboratory information system on accuracy and timeliness of bacteriology results in the Peruvian Tuberculosis Program

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Abstract

We created a web-based laboratory information system, “e-Chasqui” to connect public laboratories to health centers to improve communication and analysis. After one year, we performed a pre and post assessment of communication delays and found that e-Chasqui maintained the average delay but eliminated delays of over 60 days. Adding digital verification maintained the average delay, but should increase accuracy. We are currently performing a randomized evaluation of the impacts of e-Chasqui.

Introduction

Cases of multidrug-resistant tuberculosis have been rising in many countries. Excellent results have been achieved by Partners In Health (PIH) and its sister organization, Socios en Salud (SES), in Peru, where 6,300 patients have started or completed treatment. To support this treatment, PIH developed an open source, web-based medical record, the PIH-EMR(1).

Background and requirements

Initiation of MDR-TB treatment in Peru takes, on average, over 140 days after initial presentation.(2) These potentially dangerous delays occur because of the long test processing time, cumbersome collection and communication procedures, and loss of specimens and test results. Similar problems are prevalent in other settings including South Africa.(3) An electronic information system can reduce these delays.

Methods

We created a web-based laboratory information system, “e-Chasqui” to connect laboratories to health centers (HCs) to reduce delays and facilitate communication and analysis. e-Chasqui includes tools to improve data quality, notify HCs of new results, alert physicians of high-risk patients and create laboratory reports. We performed a pre and post implementation assessment of the communication delays and are currently performing the data quality assessment.

Results

e-Chasqui has been implemented in the national reference laboratory, two of five regional laboratories in Lima and 12 HCs. Since its implementation in November, 2005, 19900 smear, 21196 culture and 3076 drug susceptibility test (DST) results have been entered. In 2006, 99.5% of all DST results and 98.8% of all culture results have been viewed online. Due to user satisfaction and heavy use, public officials have asked to expand the system to several other sites.

A previous study(2) showed that the average communication time for a DST result between the regional laboratory and the HC was 8 days with 10% of results taking over 60 days to arrive at the HC. Analyzing the first 363 DSTs after the e-Chasqui implementation, the average communication delay was 8.6 days (standard dev. of 5.28) where the majority of the delay (5.1 days) was in entering the result. The maximum delay was of 31 days and only 4.7% of results had communication delays of over 20 days.

Conclusion

This experience demonstrates the initial benefits of implementing a web-based laboratory information system in a low resource area. This system was able to reduce the number of results with large delays and make communication more predictable for clinicians.

Quality control tools such as digital verification by the laboratory director increased the communication delay, however, they should significantly improve data quality. Currently, we are performing a study to comparing data quality before and after the implementation.

A prospective randomized evaluation is being performed to measure the impact of e-Chasqui on delays, errors, and quality of care, including time to prescribe an effective drug regimen.

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References


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