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Implementing and Evaluating a Laboratory Information System to Optimize the Treatment of Tuberculosis Patients in Peru

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Abstract and objective

Multi-drug resistant tuberculosis patients in resource-poor settings experience large delays in starting appropriate treatment and may not be monitored appropriately. A web-based laboratory information system "e-Chasqui" has been deployed in three laboratories and 12 health centers in Peru to reduce communication delays and missing or error-prone laboratory. Since November 2005, 30696 culture and 7237 drug sensitivity test results have been entered with 99% viewed online by health personnel. High user satisfaction and heavy use led to e-Chasqui being expanded to more institutions. In total, e-Chasqui will serve institutions providing medical care for over 3.1 million people. A study is being performed to measure its impact and generalizability.

Keywords:

Clinical Laboratory Information System, Computerized, Evaluation Studies, Developing Countries

Introduction

Treatment for MDR-TB in Peru is often delayed by over three months after initial presentation.(1) These potentially dangerous delays occur because of long test processing time, cumbersome communication procedures, and loss of specimens and test results. Similar problems are prevalent in other settings including South Africa.(2). An electronic information system can improve the handling of these data between institutions. Decreasing treatment delays and ensuring an appropriate drug regimen should improve outcomes and reduce transmission.

Methods

Partners In Health has developed a web-based medical record system (PIH-EMR)(3) to support the treatment of TB, with data on 15523 patients. We created a web-based laboratory information system, "e-Chasqui" to connect laboratories to health centers to reduce delays and facilitate communication and analysis. e-Chasqui includes tools to improve data quality, notify health centers of new results, alert physicians and create laboratory reports. Here we report on the system's implementation, use, and preliminary results from its evaluation.

Results

e-Chasqui has been implemented in the national reference laboratory, two of five regional laboratories in Lima and twelve health centers. Since its implementation in November, 2005, 28600 smear, 30696 culture and 7237 drug sensitivity test results have been entered. In 2006, 99.5% of all DST results and 98.8% of all culture results for the 12 pilot HCs were viewed online. Due to user satisfaction and heavy use, public officials have asked to expand the system to 3 other laboratories and over 10 other health centers. In total, e-Chasqui will serve a network of institutions providing medical care for over 3.1 million people.

Conclusions

This experience demonstrates the possible benefits of a web-based laboratory information system in a low resource setting. A retrospective and prospective randomized study is being performed to measure its impact on delays, errors, and quality of care, including time to prescribe an effective drug regimen. Using this experience we are developing a module to manage lab data for MDR-TB treatment in Lesotho and Rwanda, based on a new EMR architecture, OpenMRS (www.openmrs.org).

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