

Optimizing data analysis tools to support healthcare workers in Peru

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Abstract

Large healthcare projects in developing countries need to track data for clinical care, patient outcomes, medication supplies, and research. These heterogeneous information needs are compounded by the wide range of skills and experience of staff. We describe analysis tools designed to bridge these requirements in a tuberculosis (TB) treatment project in Peru.

Introduction

Socios En Salud has been managing drug resistant tuberculosis in Peru¹ for a decade, treating almost 3000 patients to date. Information on these patients is entered in a web-based electronic medical record² (PIH-EMR). When patients are enrolled in MDR-TB treatment, their previous TB treatment history, contacts and previous diagnoses are recorded along with their current clinical assessment. Drug prescriptions, laboratory results and outcomes are also recorded.

Design requirements

The PIH-EMR was designed to support a range of data management needs including: clinical care, program monitoring, research studies and drug procurement. In designing this system there was a need to balance local data management with the benefits of a more centralized system. Each area had its own information management system that consisted of spreadsheets and small databases. The developers needed to strike a balance between giving people the ability to maintain their files of information and ensuring that all teams were working with the same data set. Some work with clinical data from individual patient records or groups of records; others needed only aggregate information for reporting purposes. A consistent patient numbering system was needed to ensure uniformity of information. A wide range of technical expertise had to be accommodated. There are highly skilled users well-versed in Structured Query Language (SQL) MS Access queries or SAS; other users have very limited computer skills. Many of the EMR users were skilled in MS Excel, which while useful for analyses, can be problematic for data storage due to its flat file structure and lack of data integrity checks. Creating web-based analyses for the majority of these users was a more acceptable alterna-

tive to requiring them to learn MS Access or a statistical program. Other advantages were precise control of access to medical data, and the ability to transform normalized data in the EMR to a format suitable for download and analysis in Excel or similar programs.

Results

Typically 30 staff including doctors, nurses, researchers, pharmacists and managers utilize EMR analyses for:

- Clinical care: detecting problems with drug regimens, adverse events and slow response to treatment.
- Reporting: monthly reports to the Global Fund for Fighting AIDS, Tuberculosis and Malaria (GFATM) and to the Gates Foundation.
- Drug management³: assessment of future drug needs to assist in ordering medications from international suppliers and detection of possible stock-outs or excess drug stock.
- Research studies and programmatic evaluations, with several already published or in progress.

Discussion

It is important that information systems used in developing countries develop tools to support the information needs of local staff as well as central reporting. We are working on similar systems in the Philippines and for HIV in Haiti.

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