OpenMRS mobile integration into OpenMRS Multi-drug Resistant Tuberculosis (MDR-TB) module for improved management and monitoring of community based MDR-TB treatment program in a low-resource setting

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Abstract and Objective

Multidrug-resistant Tuberculosis (MDR-TB) is becoming an increasing problem globally. Drug resistance occurs due to non-compliance of regular Tuberculosis (TB) treatment or via transmission through an MDR-TB patient. Community based treatment is used to improve compliance and generate awareness about prevention and cure. To monitor community care, mobile technology is used to collect data in the field, and monitor validity of the encounter by capturing the GPS location for point of data collection, to ensure that the treatment supporter was entering data at the appropriate location. Data collected on the mobile phone is uploaded via GPRS to the OpenMRS[1] database with the MDR-TB module. This gives program managers a comprehensive database and helps them monitor the patients' progress and the treatment supporter's attendance and data entry at the patient's home. This technology has improved validity of the data collected and project managers have identified problems in their field site quickly and acted upon them accordingly.

Keywords:

MDR TB, TB, Tuberculosis, Drug-resistant, Compliance, monitor, Treatment, Mobile, OpenMRS, Electronic, Data collection.

Introduction

Multidrug-resistant Tuberculosis (MDR-TB) is becoming an increasing problem globally. In 2000, according to a mathematical model, 3% of all TB cases were estimated to be MDR-TB cases, and Pakistan is estimated to have one of the highest burdens of the disease[2]. Drug resistance occurs due to non-compliance of regular TB treatment or via transmission through an MDR-TB patient. Community based treatment is used to improve compliance. Open source technologies were used to aide in management of the program and monitoring the field site.

Methods

OpenMRS, and more specifically, the OpenMRS MDR-TB module was used as the electronic medical record system to maintain a comprehensive database of all encounters with an MDR-TB patient in the program. This Module was designed to provide an easy and intuitive 'front-end' to support the treatment of MDR-TB. For community outreach and treatment, the Xforms module within OpenMRS was used to take advantage of cell phone based data collection from the field which linked directly to a patient record, allowing a comprehensive electronic medical record for the MDR-TB patient. In the program every patient is assigned a treatment supporter, who visits the patients' home twice daily to directly observe consumption of the drugs. The cell phone allows the treatment supporter to search for the patient and enter important information like the current GPS location, whether medication was taken, whether there were adverse effects, are there any other members in the household who could be suspected of having TB, all of which is saved and uploaded to the central server from the field. In this way, the program manager can see exactly where the treatment supporter was located during data entry, at what time the data was entered and the current status of the patient. A video that captures the methodology is available: http://www.youtube.com/watch?v=U7RoBIO1xaU

Conclusion

Using cell-phones as data collection tools help validate data, monitor field workers and assess the progress of the program, particularly well if it is linked with an Electronic medical Record system.

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[1] Open source Electronic medical Record System
http://www.openmrs.org
[2] http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102268296.html