

# Input and Sharing of Infectious Disease Data at the Grassroots Level

## TJHSST Senior Research Project

### Computer Systems Lab 2009-2010

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## Abstract

This project aims to create a user-friendly system to input, manipulate and view patient data. The system involves a MySQL database being manipulated by a user interface coded in PHP and HTML. Such a system is useful both for the maintenance of patient records within an individual clinic or hospital as well as the sharing and networking of data on a regional level, such that the data can be used for disease surveillance. The long-term goal is to implement this system in rural regions of sub-Saharan Africa using laptops such as those used by the One Laptop Per Child initiative

## 1 Introduction

The purpose of this project is to create a user-friendly database and interface which can be used to enter, manipulate, and view

pertinent data on individual patient case reports. Electronic patient records systems are commonly implemented in the United States; however, the goal there is most often keeping records for individual patients, not disease surveillance and sharing of information. This system will allow for easy networking between individual computers and databases while maintaining patient confidentiality.

## 2 Background

The idea for this project was inspired by an interest in disease surveillance in areas with little advanced technology. Therefore, the program must be simple to implement on basic computers and easy to use, even for people with minimal experience using computers. Additionally, it is important that information be gathered in a way that is pertinent to both patient care and large-scale disease surveillance. Background research involved

determining what specific fields of information were necessary to achieve these goals, as well as ways to avoid common pitfalls in electronic health records systems. One major concern is that the use of single-word diagnoses does not fully and accurately reflect the reality of individual cases. For example, seeing "Malaria" written as a diagnosis on a patient record does not give important information about severity, specific symptoms, pre-existing conditions, and alternative diagnoses and why they were rejected. Such information is crucial to keeping useful patient records, as well as for detecting widespread patterns for disease surveillance.

### 3 Methodology

The project relies on PHP and HTML programming being used to manipulate a MySQL database. The main focus is the creation of the user interface, which will provide for both inputting and viewing of patient data. The basic framework of the interface is a "report form," modeled after hard-copy patient report forms, where the user will fill in basic patient information (name, age, etc.) as well as clinical information (diagnosis, lab confirmation, fatality). When the user submits this information, it is entered into a MySQL database. Other portions of the user interface allow the user to search for an individual patient record by name, and then update that record as necessary (i.e. if a diagnosis has now been confirmed by the lab). Once the basic input/search/update func-

tions have been established, the next steps will be allowing for output of information compiled from the entire database. For example, this could include allowing a user to search for the number of cases of malaria diagnosed in October 2009, and compare it to the number of diagnoses for the same month the previous year.

The final step will be to program a networking option. The goal is for a user to be able to press a button which will transfer all of the data in a local database into a database maintained on the regional level.

Preliminary testing will involve fake data generated to mimic actual input, in order to uncover potential errors and discrepancies between intended input and user interpretation of instructions. Eventually testing will include data garnered from case reports reflecting the types of cases likely encountered in the field where this system would be put to use. The purpose of testing is to establish the robustness of the search and output functions, as well as to check the program's ability to catch any anomalies in the input of patient data.

### 4 Expected Results and Value to Others

This project is meant to create a system that can be implemented in rural clinics in sub-Saharan Africa, where there are high incidence levels of multiple infectious diseases. In the long term, it is hoped that the sim-

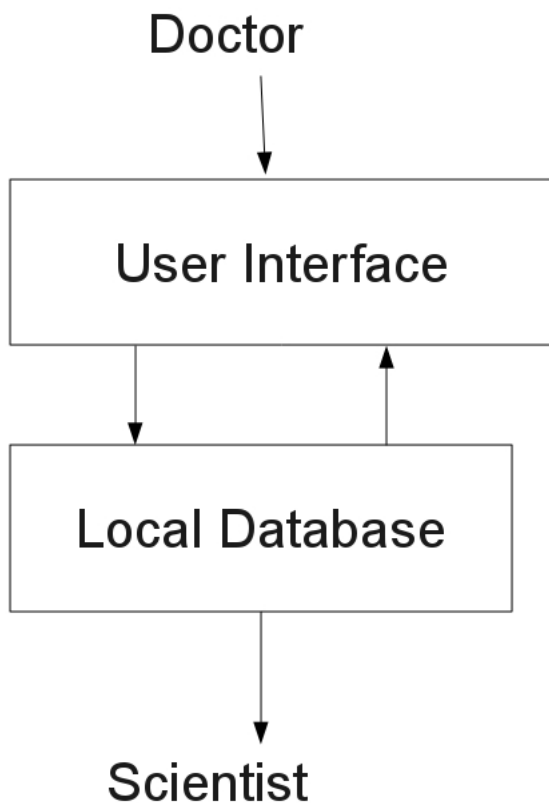


Figure 1: A basic flowchart for the communication of information

ple computers used by the One Laptop Per Child initiative, which are ideal due to their low cost and ability to network easily, can be distributed to clinics and used by doctors to communicate information about cases of infectious diseases both amongst each other and with the scientific research community.

## 5 Bibliography

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