

Abstract

Computerization in the field of medicine has been a boon to diagnosis, treatment, and rehabilitation. Doctors and pharmacists have gained powerful tools such as clinical decision support systems (CDSSs), which advise physicians at the point of care. This provides for a means for medical officials to store and query patient data; however, information collected by hospitals, especially smaller clinics, is difficult to cross-reference and share with other institutions in a secure manner, if at all.

To address this lack of compatibility, a CDSS program capable of predicting the ailments of a given patient by cross-referencing a database was designed with collaboration in mind. Given input, such as age, gender, geographic location, and observed symptoms, the program polls similar patients using a mean-squared error heuristic from a database. It then produces a catalog of ailments relevant to the input, ordered by correlation. As such, the program's prediction model becomes more accurate with a larger, and more pertinently, a more diverse set of patient data.

As discussed, many medical centers collect, but do not make full use of, patient information. By utilizing the program designed in this study, hospitals can minimize data fragmentation by storing their information in a single secure database. Additionally, if the program were adopted as a standard, proliferation of data between institutions would greatly improve the prediction heuristic.