

Indexing Infectious Disease Information into a Relational Database for Useful Queries

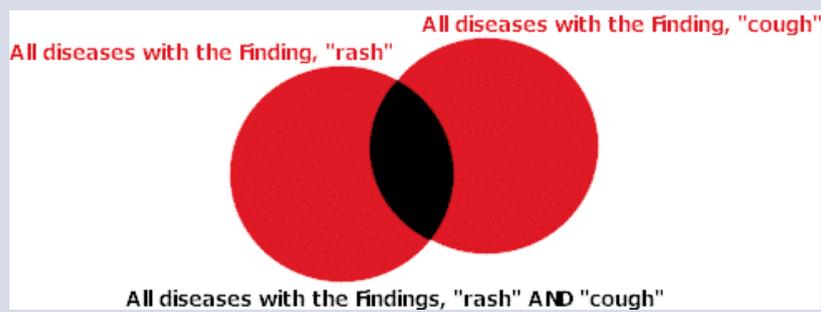
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Introduction

In the twenty-first century, we now have new tools for indexing infectious disease information (the relational database) and for disseminating that information worldwide (the Internet). A book such as the *Control of Communicable Diseases Manual* has a helpful index, but it does not provide the powerful queries of a relational database, nor can it be accessed by the millions of computer-users around the world.

What is an Intelligent Database?

Figure 1.



OutbreakID® is an example of an intelligent database, in which one can store systematized indexes and retrieve matching diseases quickly. The designer of an intelligent database selects all the relevant information in a particular knowledge domain and maps it using indexes and categories. The goal is to take advantage of the computer's infinite capacity to store information, and to make it as easy as possible for the health professional to access that information. OutbreakID contains no hidden algorithms. A query results in a list or an intersection of lists. When two circles intersect as shown in Figure 1, the area of intersection represents the results of a query for two criteria (an AND search).

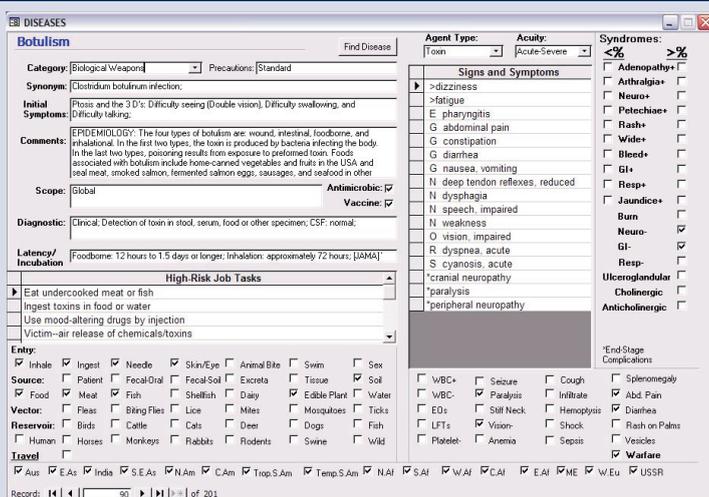
What is Zoom-Intersection?

OutbreakID was designed for zoom-intersection. Two or three criteria are all you need for a query that will reduce the results list for more accurate differential diagnoses. Table 1 shows some examples of important criteria to use in searches. An effective query will combine one or more criteria in one column with one or more criteria in a second column. Add an ENDEMIC criteria (not shown in table) if you want to limit the search to a specific region of the world. The search criteria are the indexes that were built into the tables at the beginning of the project, not the ambiguous and unsystematized indexes that are added at the end of a book.

Table 1.

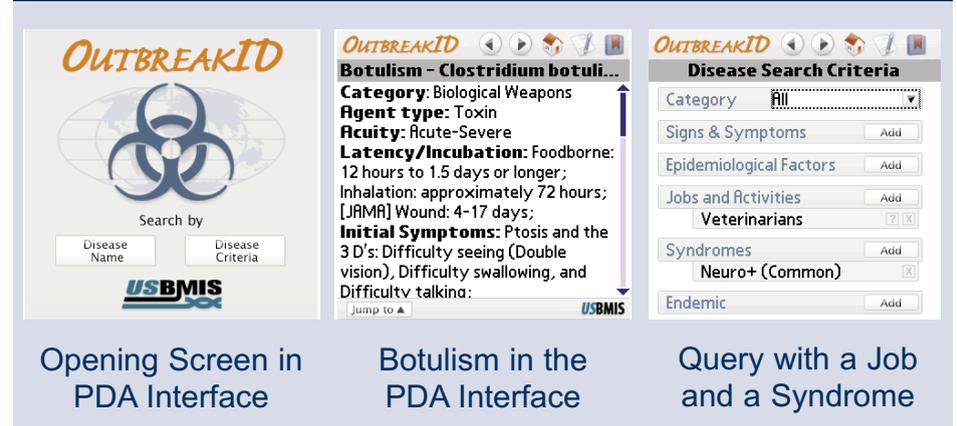
FINDINGS	EPIDEMIOLOGY	JOBS	SYNDROMES
Abdominal pain	Inhale	Butchers	GI + (fever)
Brain abscess	Ingest	Child caretakers	Neuro + (fever)
Encephalitis	Animal bite	Veterinarians	Resp + (fever)
Pneumonia	Food	Farmers	Rash + (fever)
Jaundice	Water	Firefighters	Bleeding + (fever)
Seizure	Fleas	Fishers	Neuro - (no fever)
Skin infection	Mosquitoes	Family doctors	Resp - (no fever)
Stiff neck	Ticks	Foresters	Ulceroglandular

Access User Interface



Microsoft Access is the software used to develop and update OutbreakID. The profile for the disease Botulism is shown above. Botulism is present in all regions of the world; it produces the "Neuro-" syndrome (neurological symptoms without fever) and sometimes the "GI-" syndrome (gastrointestinal symptoms without fever).

PDA User Interface



Each disease profile shows initial symptoms, incubation period, signs and symptoms, and associated high-risk activities. For infectious diseases, the application shows where the disease occurs in the world; how it is diagnosed in the laboratory; its source from patients, water, soil, and animal excreta or tissue; its route of entry into the body by inhalation, ingestion, or skin; and the insect vectors and animal reservoirs.

Conclusions

All useful infectious disease information can be collected and indexed into a relational database to help practitioners quickly build differential diagnoses and find detailed information about the causes of outbreaks. A Internet-based database of this kind could be kept up to date with the latest information and would be accessible to health practitioners everywhere.