Automated Data Acquisition: Data Collection and Integration for the Alberta Real-Time Syndromic Surveillance Net (ARTSSN)

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OBJECTIVE

In this presentation we describe the creation of an IT architecture and infrastructure to integrate data from four sources to support real-time syndromic surveillance for injuries, toxic exposures and notifiable diseases in Capital Health, Alberta, Canada.

BACKGROUND

The ability to provide real time syndromic surveillance throughout the Capital Health Region is currently undeveloped. There are limited mechanisms for routine real time surveillance of disease or conditions of public health interest, e.g. communicable diseases, toxic exposure or injury. Toxic exposure and injury while preventable are not notifiable in Alberta and as a consequence there is no real-time surveillance system to identify burden of disease or opportunities for intervention. The notifiable disease system is reliant on paper-based forms which are slow, prone to human error, and labor intensive to convert to electronic database format for flexible analysis and interpretation. Finally there is no system to link the data collected on the same individual in each database without compromising confidentiality. ARTSSN is designed to remedy these deficiencies.

METHODS

The ARTSSN data repository collects a subset of "event specific" information in real-time. This information includes

- calls from Capital Health residents to our nurse staffed Health Link Call Centre about health concerns– 130 selected protocols
- Emergency Departments visits chief complaints, discharge diagnosis and relevant laboratory results
- Notifiable Disease laboratory reports
- Public school absenteeism data

The data from these sources is augmented to include derived data that would be useful such as geo-references based on health jurisdictions and/or postal codes.

This event driven data model supports the retrieval of clinically relevant data from operational environments and/or electronic health record repositories on an as needed basis.

RESULTS

We have created an automated, scalable data repository and a terminology translation service to provide common translation service that improves grouping and standardization across data sources to aid syndrome matching.

The repository stores no patient identifiable demographics, and preserves confidentiality. We describe our mechanism to link an individual's data across databases using a surrogate key linkable to a master patient index. The advantages of this system are to improve the usefulness of the database and allow access to personal information about notifiable diseases for authorized users.

METRIC: Presently, the ARTSSN repository contains (growing daily) approximately:

- 700,000 notifiable lab reports with 1,250,000 tests performed.
- 400,000 call center results with 130 protocols:
- 1,800,000 emergency room visits
- Absenteeism records of K-6 students, tracking on approx. 140,000 students

CONCLUSIONS

ARTSSN's highly scalable repository supports the real time integration of data from multiple sources with the flexibility to add new data sources on the fly.

It enhances public health surveillance through early (real time) and automated, communicable disease injury and toxic exposure surveillance using syndromic data from multiple sources.

The repository offers maximum confidentiality without compromising necessary patient tracing in notifiable disease outbreak management

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