Using Business Intelligence Tools to Automate Data Capture and Reporting

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OBJECTIVE

We report here on how the North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT) uses business intelligence tools to automate both data capture and reporting in order to run a comprehensive surveillance system with limited resources.

BACKGROUND

NC DETECT serves public health users across North Carolina at the local, regional and state levels, providing early event detection and situational awareness capabilities. At the state level, our primary users are in the General Communicable Disease Control Branch of the NC Division of Public Health. NC DETECT receives 10 different data feeds daily including emergency department (ED) visits, emergency medical service (EMS) runs, poison center calls, veterinary laboratory test results, and wildlife treatment.

In order to fulfill our users' needs with NC DETECT's limited staff, business intelligence tools are utilized for the acquisition and processing of our multiple, disparate data sources as well as reporting our findings to our numerous end users. Business intelligence can be described as a broad category of application programs and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions.

METHODS

Data files are downloaded via the internet using both Encrypted File Transfer Protocol (FTP) and Secure Hyper Text Transfer Protocol (HTTPS). Scheduling software automates the capture of ED data every 12 hours and the remaining data sources daily. An off-the-shelf Extraction, Transformation and Loading (ETL) tool, capable of receiving data from any of nearly 200 data types including ASCII, HL7 and XML, allows for easy data mapping and data quality checks while loading to multiple database tables simultaneously. Process monitoring and data quality reports are generated and distributed via email automatically daily.

Customized reports with criteria selection options provide users the ability to review only the data they desire and are authorized to access.

RESULTS

NC DETECT currently receives data from 82 hospital-based emergency departments, 250 EMS agencies, 3 veterinary laboratories, the state poison control center and a regional wildlife center. Of the approximately 139,000 records received daily, our ETL tool identifies and removes duplicate records, appends new records, conducts merges, and updates records as new data are received.

Users of the data, which include 11 Public Health Epidemiologists located in the major hospitals, state-level epidemiologists and the Public Health Regional Surveillance Team (PHRST) members, view an average of 35 Case Reports daily, as well as output from the CDC's Early Aberration Reporting System (EARS), for the various data sources.

CONCLUSION

NC DETECT has a staff of 15 people, only 4 of whom work full-time on this system. In addition to building and maintaining the databases that make up NC DETECT, they are also responsible for developing, maintaining, and evaluating syndrome definitions, EARS processes and output, the web-based portal used to access the data, and ensuring the validity and reliability of the data and the surveillance output. By utilizing business intelligence tools to automate both the capture and dissemination of data, the staff has more time to concentrate on data quality issues such as incomplete and missing data, mis-mapped data and maintaining continuity.

Early event detection efforts often need to establish comprehensive surveillance systems utilizing multiple data sources with limited staff and funding. Appropriate use of business intelligence tools may prove valuable in accomplishing these goals.

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