

# **Emergency Department Data Quality Best Practices**

**Clifton Barnett, MSIS, Amy Ising, MSIS, Debbie Travers, RN, PhD, Anna Waller, ScD**  
*University of North Carolina, Chapel Hill, NC, US*

## **OBJECTIVE**

The purpose of this project is to describe the initiatives used by the North Carolina Disease Event Tracking and Epidemiologic Tool (NC DETECT) to ensure the quality of ED data for surveillance.

## **BACKGROUND**

Data quality for syndromic surveillance extends beyond validating and evaluating syndrome results. Data aggregators and data providers can take additional steps to monitor and ensure the accuracy of the data. In North Carolina, hospitals are mandated to transmit electronic emergency department data to the NC DETECT system at least every 24 hours [1]. Protocols have been established to ensure the highest level of data quality possible. These protocols involve multiple levels of data validity and reliability checks by NC DETECT staff as well as feedback from end-users concerning data quality. Hospitals also participate in the data quality processes by providing metadata including historical trends at each facility.

## **METHODS**

Before a hospital moves into production and its data are available for viewing in NC DETECT, it must go through "Initial Test" and "Advanced Test" cycles. To move past Initial Test requires that a hospital meet file format standards, complete the Metadata Survey and begin transmitting live data. The Metadata Survey provides NC DETECT staff with information about historical data trends at the ED; this information is the benchmark against which observed trends in the collected data are compared.

Once a hospital has met these requirements, and moved into Advanced Test, NC DETECT actively monitors the content of the data.

The data quality monitoring processes utilized can be grouped into two categories: checks against individual data elements, and checks against aggregate trends. Data quality assurance for individual data elements includes monitoring timely receipt of valid content and continuity of data elements that should not change, i.e. time of visit, discharge disposition, etc. The aggregate trends monitored (for each hospital) include a) number of visits/day, b) percentage distributions for disposition, transport, acuity and insurance codes and c) percentage of visits that receive a diagnosis code, percentage that receive an injury code and percentage that receive a procedure code.

## **RESULTS**

Regular data quality monitoring utilizing the protocols described above has revealed many common data inaccuracies. We discovered many hospitals update the ED chief complaint and disposition with the hospital disposition for admitted patients (must be fixed), or are unable to distinguish between ED and hospital procedures (often can't be fixed). Internal codes are often mapped incorrectly to the standardized coding required by NC DETECT. One example that was first noticed by one of our end users involved hospitals miscoding and inconsistently coding county of residence based on zip code.

Unacceptable delays in receiving key data elements are also a common issue. Discharge disposition, diagnosis, injury, and procedure codes are commonly subject to delay. We conducted an aggregate study of the timeliness of ICD-9-CM final diagnosis codes transmitted to NC DETECT [2]. We found significant delays in receipt of diagnosis data in NC DETECT, compared with chief complaint data.

These findings are communicated to the relevant facilities. Their responses can involve sending back data to fill in gaps, amending their internal data extraction and data entry processes, and correcting programmatic errors in their hospital information system(s).

## **CONCLUSIONS**

Data quality is an important aspect of a sound surveillance system. Working with hospitals to perform periodic audits of the data, including manual checks of ED visits at both ends to ensure that data are being extracted, standardized, transmitted and processed accurately, is very important. Informed end users can also be very valuable partners in monitoring data quality. Establishing protocols that can be implemented in a methodical manner is an essential step for insuring that collected data are accurate.

## **REFERENCES**

- [1] North Carolina General Statute 130A-480.  
[http://www.ncleg.net/EnactedLegislation/Statutes/HTML/ByChapter/Chapter\\_130A.html](http://www.ncleg.net/EnactedLegislation/Statutes/HTML/ByChapter/Chapter_130A.html). Accessed June 30, 2006.
- [2] Travers, D.A., Barnett C., Ising, A. & Waller, A. (in press). Timeliness of emergency department diagnoses for syndromic surveillance. Proceedings of the American Medical Informatics Association Annual Symposium, November, 2006.