

Using Syndromic Data to Investigate Gastrointestinal Illness Associated with Water Quality Complaints in Houston

Olushola Adeleye, MD, MPH.¹, Mary Carvalho, MPH.¹, Melissa Halm, MPH.¹, Anthony Eshofonie, MD, MPH.¹, Arnulfo C. Rosario Jr.², MD, MPH, Debo Awosika-Olumo, MD, MS, MPH.¹ ¹*Bureau of Epidemiology and Administrative Services Division² Office of Surveillance and Public Health Preparedness, Houston Department of Health and Human Services*

OBJECTIVE

To investigate public concern over a possible increase in gastrointestinal (GI) illness associated with water quality complaints in Northeast Houston.

BACKGROUND

In February of 2007, the Bureau of Epidemiology (BOE) received a request from Houston Department of Public Works to investigate a possible rise in GI illness associated with complaints about poor water quality in a Northeastern Houston neighborhood. To investigate this complaint, BOE combined case report data with syndromic data from our Real-Time Outbreak Disease Surveillance (RODS). The Houston RODS collects and synthesizes real-time chief complaint data from 34 area hospitals and health facilities, representing approximately 70% coverage of licensed ER beds in Harris County. The system uses a Naïve Bayes Classifier to categorize ER chief complaints into 7 different syndromes, including gastro-intestinal illness.

METHODS

To investigate temporal and spatial trends, case reports and GI syndrome complaints from June 2006 to March 2007 were aggregated and mapped to the home zipcode using ArcGIS 9.1. The RODS GI syndrome data included any ER chief complaint that states pain, cramps, distension or swelling anywhere in the abdomen, nausea, vomiting, or diarrhea. The case report data included confirmed *Salmonella*, *Shigella* and *Campylobacter* associated illness, which comprise ~90% of GI-related cases reported to the BOE.

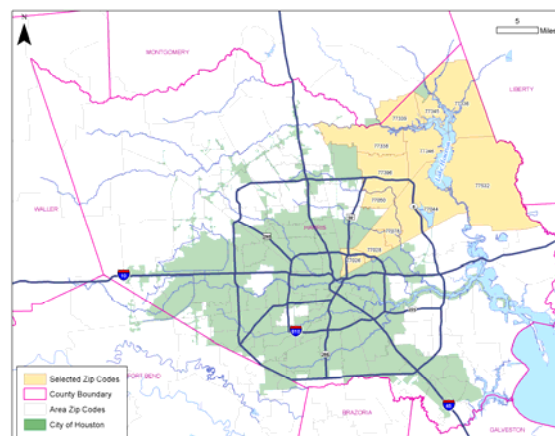


Figure 1: Geographic area in Northeastern Houston (yellow) with water quality and GI illness complaints.

RESULTS

RODS and case report data demonstrated a steady increase in GI complaints during the time period of interest, a trend seen in previous years. In both cases, the increases in GI complaints were primarily in children 4 years of age or younger. While the spatial distribution of GI related illness was visually heterogeneous across zip codes, the Northeastern Houston area had generally low levels of illness and did not show any unusual increase during the time period of interest.

CONCLUSION

Combining syndromic and passive surveillance data allowed BOE to identify temporal and spatial trends in GI complaints to answer the public's concern about GI illness associated with water quality. Both data sources were complimentary, showing similar results in spatial, temporal and demographic analysis. While initially designed as an early event detection system, syndromic data has proven to be a rich data source for supporting case reporting in the City of Houston, Bureau of Epidemiology.