Amplification of Syndromic Surveillance's Role in Miami-Dade County

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OBJECTIVE

To describe how the Miami-Dade County Health Department (MDCHD) has expanded Electronic Surveillance System for the Early Notification of Community Based Epidemics (ESSENCE) for specialized research in addition to daily surveillance activities

BACKGROUND

Syndromic surveillance is an approach used to monitor trends of illness in communities. It relies on pre-diagnostic health data rather than laboratory-confirmed clinical diagnoses. Its primary purpose is to detect disease outbreaks and unusual public health events earlier than possible with traditional public health surveillance methods. MDCHD has been using ESSENCE as part of its comprehensive syndromic surveillance since 2005 and has conducted numerous studies using the system alone or in combination with other surveillance datasets.

METHODS

Syndromic surveillance in Miami-Dade County consists of ESSENCE, Public School Absenteeism, 911 call center data as well as daily Poison Control reports. Fourteen of the county's largest hospitals participate in ESSENCE. ArcGIS and SAS have been used for expanded research studies since 2005 on the following topics: hurricane related injuries, influenza-like illness (ILI), teenage suicide and drug abuse, injury, a special mass gathering event, and comparison of underreported communicable disease cases compared with the State of Florida electronic disease reporting system, Merlin.

RESULTS

During the 2005 Hurricane season, ESSENCE was used to monitor hurricane-related injuries and possible outbreaks. When Hurricane Wilma hit South Florida on October 24, 2005, ED visits for back pain, leg and foot wounds, snake and spider bites reached a historical high during the days surrounding the hurricane compared to the rest of the year. The findings prompted MDCHD staff to request Johns Hopkins University Applied Physics Laboratory (JHU/APL) to add injury as a regular detectable syndrome. In 2005, MDCHD also requested that JHU/APL include ILI as a daily alert syndrome. ILI patterns have shown that the percentage of ED visits attributable to ILI was much higher among children than adults and that different age groups peaked during different seasons. We also used ESSENCE as a core part of enhanced public health surveillance for a special mass gathering event: Super Bowl XLI. Both ESSENCE and 911 call center data detected a statistically significant increase in the number of motor vehicle accident injuries on the day of and one day after the Super Bowl. ESSENCE detected a significant increase of cases with Respiratory Syndrome lasting for 8 days after Super Bowl Sunday which was not related to any particular outbreak. Historically, respiratory syndrome alerts have lasted for a maximum of 5 days. ESSENCE has also been used to monitor communicable diseases and explore under-reported cases compared with Merlin. Research on animal bites and chicken pox related ED visits has suggested that communication with our health care providers could be enhanced due to lack of reporting. Lastly, research on suicide and substance abuse related ED visits among teens indicated that teenage suicide-related ED visits have been lowest in the summer and on the weekend and 75% of visits have been for suicide ideation and 25% were for attempt. Younger teens (10-14 years) were more likely to visit the ED with substance abuse than older teens aged 15-19 years. Seasonality showed that ED visits for drug abuse was higher in the fall season.

CONCLUSIONS

ESSENCE has facilitated our extended research by broadening its search engine to gather information for investigations on diverse topics. Although its primary function initially was developed for the early detection of unusual public health event, we have amplified our system to its optimal and thereby acquired informative statistics that can serve to improve public health in our community.