

Arizona's Near Real Time School-based Syndromic Surveillance Program

Lea Trujillo, PhD, Yue Qiu, MPH, Kenneth Komatsu, MPH, Laura Erhart, MPH

Arizona Department of Health Services, Phoenix Arizona

OBJECTIVE

1) Describe a near real-time school-based syndromic surveillance program that integrates electronic data records and a two-way health alert system for early outbreak detection, notification, and possible intervention for Arizona schools. 2) Demonstrate the public health utility of this system for early detection of influenza among school children.

BACKGROUND

Arizona Department of Health Services (ADHS) and Arizona School Nurse Consortium (AZSNC) developed and implemented a software called Child Health Indicator Program (CHIP) to assist school nurses in electronic management of student health records. The nurses use the software to collect information on student health conditions with 266 nursing diagnosis codes, including acute and chronic illnesses, immunizations and injuries. In 2005, ADHS added infectious disease syndrome categories to the software, including influenza-like illness (ILI), rash, and gastrointestinal illness (GI), with corresponding case definitions. Although Arizona has provider-based sentinel surveillance system for ILI, laboratory-reporting of positive influenza tests, and absenteeism surveillance from some schools, these passive surveillance systems may not detect local epidemics [1]

METHODS

The School-based Syndromic Surveillance Program (SSSP) is designed to receive data on high priority conditions daily and on all conditions weekly. The de-identified data are sent securely via the internet to the AZSNC server, from which health department epidemiologists can download the data. The pre-selected high priority codes being entered into the system trigger an automated alert message to request nurses to upload critical codes immediately. The alert email is sent to ADHS and the local health department concerning the flagged cases with the school ID, diagnosis code, encounter date and limited student demographics. SSSP also allows epidemiologists to monitor student health status with weekly aggregated data on diagnosis codes, query the database using selection criteria, and follow up on individual cases. In turn, tailored public health-related alert messages can be sent via SSSP to school nurses, such as excessive heat warnings and high pollution advisories. To demonstrate the public health utility of SSSP, SSSP ILI data from the 2006-2007 school year were compared with those from laboratory-confirmed influenza case reports and sentinel provider ILI data.

RESULTS

Currently, 340 schools (from 10 of 15 counties) throughout Arizona use CHIP, representing 20% of the school population. During the 2006-2007 school year, 242 schools submitted approximately 1.6 million school nurse visit records via the SSSP.

ILI and influenza data from different data sources reveal similar seasonal patterns. Analysis of weekly ILI data suggest that school breaks or closure could decrease influenza-related morbidity or delay the peak of influenza season. This result is consistent with findings from other studies [2]. SSSP data also suggest that the ILI season starts earlier than indicated by reported cases and the sentinel ILI data.

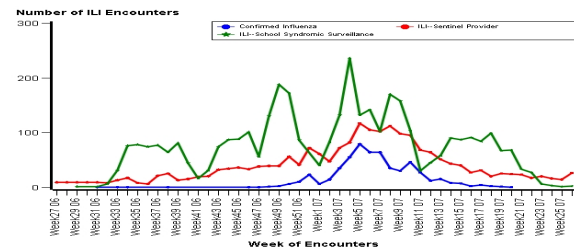


Figure 1— ILI among children from CHIP (green) compared with sentinel surveillance system (red) and laboratory reporting (blue), July, 2006-June, 2007.

CONCLUSIONS

The SSSP uses an existing system of collecting school health information for near real-time surveillance of school health status. Analysis of ILI data shows that SSSP can assist epidemiologists in monitoring and tracking student health conditions for early outbreak detection.

CHIP, with minor changes, makes an efficient public health surveillance tool for monitoring both chronic and acute conditions among school students without burdening school nurses with a separate or manual reporting system. Additionally, the system allows public health to alert school users of health related events or emergencies and, with further development, could alert public health users when counts exceed threshold levels.

REFERENCES

- [1] Holmberg SD, Layton DM, Ghneim GS, Wagener DK. State plans for containment of pandemic influenza. *Emerg Infect Dis.* 2006; 12:1414-7.
- [2] Heymann A. Influence of school closure on the incidence of viral respiratory diseases among children and on health care utilization. *Pediatr Infect Dis J.* 2004 Jul; 23(7):675-7.