

North Texas School Health Surveillance: First-Year Progress and Next Steps

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Objective

This article shares key findings and next steps following an evaluation of the first-year results of a pilot project in which Tarrant County schools used a Web-based system to share their health data daily with Tarrant County Public Health (TCPH) epidemiologists, who can use the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE)¹ to analyze the data. By implementing a syndromic surveillance system that focuses on school-aged children and youth, where infectious diseases often emerge first and spread rapidly,² the project is intended to detect and monitor influenza outbreaks leading to the implementation of timely public health prevention measures that can reduce the magnitude of influenza outbreaks in the community.

Background

In March 2007, TCPH and its grant-funded best practices center, The Southwest Center for Advanced Public Health Practice (APC), initiated design and development of a Web-based communications portal to leverage ESSENCE (a surveillance system that collects health indicator data such as emergency room chief complaint data), strengthen an already productive partnership with school nurses, and facilitate enhanced surveillance of absenteeism and Influenza-Like Illness (ILI) in schools. ILI is defined as fever (temperature of 100° F or greater) and a cough and/or a sore throat in the absence of a known cause other than influenza.³ The project was intended to ease information exchange between TCPH and Tarrant County schools regarding influenza and other public health matters, support early detection of ILI by making it simple for schools to report absenteeism data and ILI, provide school nurses with one-stop access to resources that can help them promote disease prevention and health-enhancing activities, and focus public health resources in response to early detection of increased ILI and student absenteeism rates.

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The system launched in the fall of 2007, represents an innovative way to address seasonal influenza, which causes approximately 36,000 deaths and 200,000 hospitalizations annually in the United States,⁴ while causing significant economic impact⁵ due to increased work and school absenteeism.² Interest in influenza surveillance is also increasing with growing recognition of the importance of early detection to facilitate effective response to a pandemic.⁶

The threat of pandemic influenza and new or emerging disease such as Severe Acute Respiratory Syndrome (SARS) prompted the U.S. Department of Health and Human Services to recommend that schools “consider developing in concert with the local health department a surveillance system that would alert the local health department to a substantial increase in absenteeism among students.”⁷ Tarrant County’s system meets that need and transcends absenteeism data by quantifying ILI in schools. Research has indicated that absenteeism data alone is insufficient to assist a health department in assessing the causes for increases in student absences;⁸ it is also essential to know the reasons for student absences.

Unfortunately, schools are not equipped to obtain specimens for laboratory testing, nor do they have access to physician diagnoses to confirm influenza or other conditions. They can, however, classify a child as having ILI. The list of ILI symptoms is short, reasonably clear, and certainly understandable to school nurses. Capturing data on ILI yields insight on how the student population is being affected throughout the school year and especially at the height of the influenza season. This data, coupled with laboratory findings, Sentinel Provider Surveillance Network (SPSN) data, and hospital emergency department syndromic surveillance data such as that available in ESSENCE, can help epidemiologists track and characterize influenza as well as target public health’s limited resources to control its spread.

System Description

TCPH’s School Health Surveillance System features several primary Web pages. The “landing page” after log-in is an online report form (see [Figure 1](#)) that school nurses use to report their school’s health data each day. Data fields that are pre-filled, based on system and user account information, include school name, Independent School District

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(ISD), enrollment, and report date. Besides total absences and absences due to ILI, the system seeks the number of students seen in each nurse's office, the number of students the nurse saw as having ILI, the nurse's perception of the school's ILI level, information on school closures, faculty absences and faculty absences due to ILI. Other pages in the portal provide users with maps of changing disease patterns, access to influenza prevention resources, news items, analysis, and specific action items suggested by TCPH.

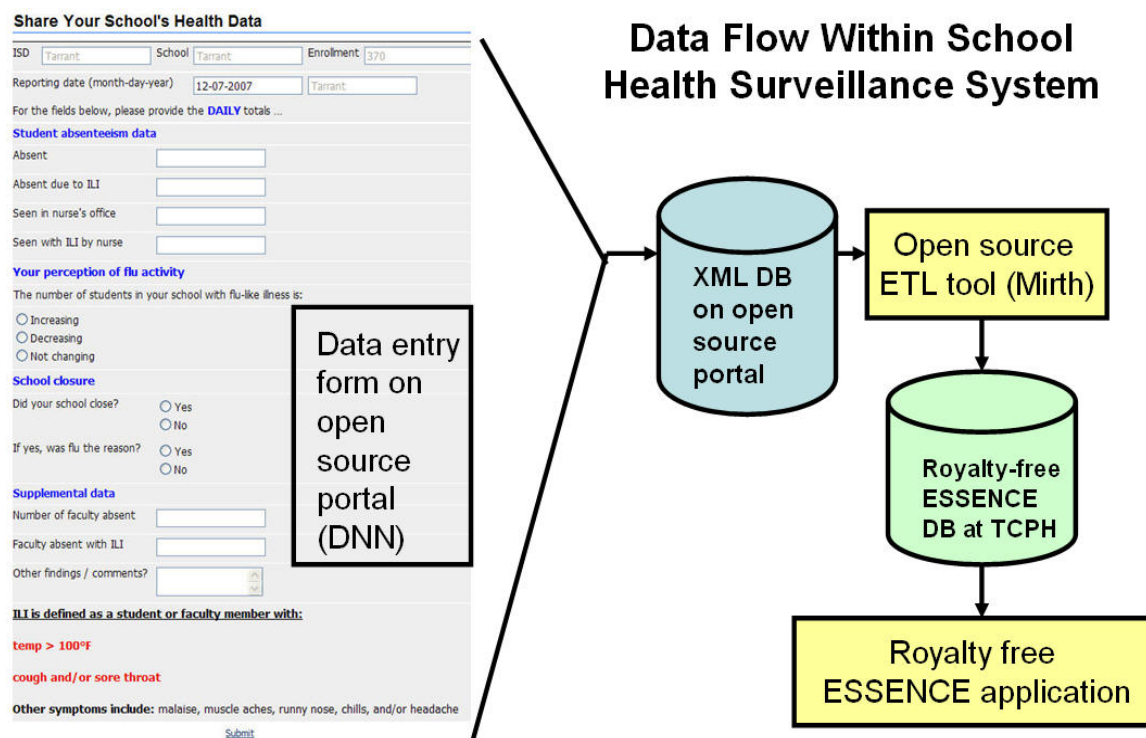


Figure 1: School nurses enter data in the system, (built on the open source Dot Net Nuke platform⁹) via a simple online form. Data is captured in an Extensible Markup Language (XML) database, managed and moved using an open source Extract Transform and Load (ETL) tool and loaded into ESSENCE for public health analysis. The approach is affordable and replicable for public health agencies seeking enhanced biosurveillance capabilities.

Evaluation Methods

An evaluation report, written after the first year of the pilot project, followed guidance from the Centers for Disease Control and Prevention (CDC) on evaluating public health surveillance systems¹⁰ and also reflects “key informant” interviews. The report, available online,¹¹ describes the CDC guidance and how evaluators interviewed system users and key informants to determine whether the approach taken in Tarrant County achieved the goals of

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enhancing information exchange between public health and schools and facilitating early detection and response to both seasonal and pandemic influenza. The evaluation also assessed whether the system was used effectively and efficiently by school nurses and system users by concentrating primarily on process objectives and outcomes of four main focus areas (system performance, recruitment and training, system use, data management,) and impact outcomes of one main focus area, public health response, to assess how TCPH used the incoming data to focus resources for targeted specimen sampling, vaccinations, and other efforts to mitigate the impact of influenza.

The evaluation focused on measuring process outcomes, with intended outcomes defined by process objectives and the activities of the project. However, the evaluation was limited significantly because the system evaluated is not yet mature and not yet generating targeted levels of data. Similarly, an assessment of impact or effect outcomes, which measure changes in behavior, practices, or beliefs for a system such as Tarrant County's, was also limited because such changes typically require more time than only a year.

First-Year Results

The TCPH School Surveillance System was successful to some extent in every area for which it could be reasonably assessed at the end of the first year of use. Not every project objective was met to completion, but improvement was noted at each level throughout the project's first year. The system is a viable way to collect school health data in a rapid, automated manner. More than 200 school nurses in seven of Tarrant County's 16 Independent School Districts (ISDs) were trained to use the system and the online report form, which they could complete in less than five minutes. Unfortunately, the quality of data obtained initially was highly variable and difficult to reasonably assess due to a low level of reporting of ILI at approximately 60% of nurses in seven of 16 ISDs (44%). When participating schools reported total student absences, that data was of high quality, but it was not consistently shared. Still, despite imperfect and incomplete data, TCPH did review the data reported, considered it in relationship to other available surveillance data streams, and took appropriate actions.

Because recruitment of school participation is a lengthy, somewhat difficult process, there is no assurance that the amount and quality of the data received will improve rapidly. However, if the project maintains a level of progress

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similar to that seen in the first year, the data quality will be more satisfactory and deeper program evaluation will be feasible.

Next Steps

TCPH and the APC are now working to improve data quality and school participation levels. School nurses and other prospective system users will continue to be trained, with an emphasis on generating reports more frequently and completely. Attendance clerks are expected to be engaged in the reporting program; they'll get calls or notes from parents who will receive from TCPH a document, available in English and Spanish, that provides instruction on when, why and how to report influenza as a reason for their children's school absences.¹² Meanwhile, changes have been made to the report form to prevent text characters from being entered into numerical data fields and options are being studied to simplify the user log-in process and make it easier to get technical help.

Based on the program's first-year success, the system is being expanded regionally to Dallas and Denton Counties and school-based health clinics and child care centers will also be approached to participate. Eventually, the system is expected to be broadened to address diseases other than influenza. All these next steps should make the system more effective while also accommodating better measurement of its success. For example, to further assess the system's efficacy and level of sensitivity, the APC and TCPH would like to conduct studies that could compare the number of students absent with ILI reported through the system and the actual number of students with ILI who were absent through validation of the data (physician notes, follow-up with parents after student returns to ascertain reason for absence, etc.) and also by comparing it to data schools report to the Texas Education Agency (TEA), typically through their use of the Public Education Information Management System (PEIMS) system.

Conclusion

The system has proven promising. As a result of the system's implementation in schools, TCPH epidemiologists now focus their public health resources, such as targeted specimen sampling and prevention materials, in areas with defined increases in ILI and student absenteeism rates. School nurses have access to a plethora of public health

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information, including ILI maps of the county and North Texas region, the county and state's weekly influenza report, action items posted by TCPH epidemiologists, and much more. In evaluation surveys, school nurses said they were able to share their data easily and they were interested in information available on the portal. Used with data from complementary biosurveillance systems, the system can help public health monitor health trends and respond to findings in partnership with schools. If participation rates improve as expected, the system will be increasingly useful for health situational awareness.

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