

Closing the loop in disease surveillance activities Providing feedback where it matters most – locally

Abstract

The purpose of this project was to send feedback resulting from the analysis and interpretation of disease surveillance data to public health officials charged at the local level with preventing the spread of communicable diseases. Too often, the attention and effort involved in disease surveillance activities are concentrated on field data collection, followed by quality control and analysis. Although these are all fundamental stages, disseminating the findings is another important aspect of a comprehensive system. This last step, however, is susceptible to downsizing and discontinuation when resources and time become limited.

This project aimed at providing information usable by local health departments and clinicians to improve their awareness of disease incidence where they live and work, with the intent of improving disease control activities, including the recognition of the importance and usefulness of surveillance activities.

Introduction / Background

Public Health Surveillance of significant events involves the systematic collection, analysis and interpretation of the data, and the dissemination of findings. This is sometimes referred to as “Information for Action.” In North Carolina (population 8.5 million), the surveillance for certain communicable diseases of public health significance began in the first years of the 20th century. Remarkably, the first County Health Department was formed in Guilford County in 1911 to combat hookworm, a common intestinal infection at the time. The list of diseases considered a threat to the public health and therefore placed under surveillance grew over the years, to include currently about 70 diseases and conditions followed by the General Communicable Disease Control Branch of the Epidemiology Section, NC Division of Public Health, in addition to tuberculosis, HIV infection and AIDS, and several sexually transmitted diseases, handled by others in the Epidemiology Section. Physicians who suspect or diagnose these diseases and conditions in their patients are required by law to report cases to the local health department. The system is considered passive, in that public health officials are at the receiving end of this data exchange, and typically do not actively seek reports from physicians. Non-compliance with rules of the NC Administrative Code is a misdemeanor, but the minimal resources assigned to surveillance are not spent on enforcing the contributory aspect of the system.

At the local level, surveillance related activities, such as gathering additional disease specific information about risk factors in reported patients and forwarding reports to the state level are some of the duties of the public health nursing staff. They are also charged with reacting to the situation documented by the reports, e.g., investigating outbreaks and providing the recommended control measures to limit the spread of the reported illness. Although the report information does transit through the local health department, there is usually little or no compilation for analysis of all received reports of notifiable diseases due to lack of time or sufficient epidemiologic training in most local health departments.

At the state level where the reports are forwarded for review and analysis, the same dual responsibilities threaten the extent to which these data are exploited for disease control on the basis of inference made from analysis of all received reports. Over the years, efforts to share feedback with local public health partners resulted in periods including regular but not frequent reports, susceptible to interruption consequent to obstacles such as staff shortage and software changes. The reports were produced and mailed quarterly along with other documents requesting collaboration for improving the quality of disease surveillance. They were also heavily dependant on the level of attention I could maintain for this activity. They required to fit output data into multiple text and graphic templates, and were also developed using several software packages that were gradually dropped from state maintained standards. The present project was undertaken to provide monthly communicable disease surveillance feedback to all local health departments in North Carolina, with the leverage of the Regional Public Health Regional Surveillance Teams (PHRST). These were established in 2002, through new federal funding directed to improve public health preparedness and response at the state and local level. In their first years of existence, these teams concentrated in networking, training and planning activities, as well as contributing to the public health response to outbreaks and natural disasters. In addition to the direct benefit for local public health professionals, this project was thought of as an opportunity for regional teams to add another area of expertise and exchange in their interaction with their local and state partners.

Project Description, Objective and Methodology

The purpose of this project was to provide disease surveillance feedback at the local level in a manner taking the fullest advantage of electronic surveillance data and communication. This is needed in order to provide local feedback to data from the 100 NC counties, grouped in 86 local health departments. This project will be the primary mode of reporting back to local health departments until at least the end of 2007, when a comprehensive Electronic Disease Surveillance System, NC EDSS, currently under construction is expected to be deployed. This reporting meets programmatic needs, with the purpose of maximizing the impact of disease surveillance in detecting and controlling potential infectious threats in the community, one of the legal mandates of local health departments.

Having moved in November of 2002 into a leadership role for enhancing epidemiology and surveillance capacity for the state under the CDC Cooperative Agreement for Public

Health Emergency Preparedness, I was in a position to facilitate the multidisciplinary actions needed for this project to be developed and deployed. It would take coordination between:

- Epidemiologists at the state level,
- Epidemiologist with the NC Center for Public Health Preparedness
- Working with PHRST staff to recruit their interest and cooperation, present and install the software programs needed to produce local and regional surveillance feedback reports
- This being for the benefit of the main recipient target, nurses and managers at the local health department level, and
- State level Internet Technology staff to create needed secure messaging capability.

In the first years in this new position, I concentrated on multiple grant related contract development and execution, and now wanted to go beyond the disease surveillance studies and evaluations we had been able to do, and also ensure strong basic surveillance components.

The technical skills to develop the programs were made available through grant funded contracted activities by recruiting the assistance of a public health epidemiologist from the NC Center for Public Health Preparedness. This epidemiologist was fully knowledgeable of the software package most used for field epidemiologic activities, the MS Windows compatible version of EpiInfo, which she teaches extensively to public health professionals at all levels. The report format was inspired by the format originally used, and designed to provide monthly feedback including status for all reportable diseases and conditions at regional and county level, with the addition of descriptive epidemiologic reports for a group of diseases of interest because of their frequent occurrence, severity, or potential for outbreaks, such as salmonellosis, shigellosis, hepatitis A, meningococcal invasive disease, and tick borne diseases. These reports provide feedback on cases reported by onset date, gender and age group, race and ethnicity in table format. Histograms are inserted in the reports to provide graphic representation of the distribution of month of onset and age group of cases.

Distribution of monthly update files of reported cases of communicable diseases will be through the North Carolina Health Alert Network. This required the state bioterrorism and emergency preparedness IT team to adapt the system by adding a new option allowing the sending of message only to PHRST teams. The variables of interest to produce these descriptive epidemiologic reports will be extracted and distributed monthly from the state database of all reported cases. By providing statewide data to the teams, those interested in verifying diseases incidence in counties bordering their region will be able to do so. This method of sharing update files as attachment to HAN alert messages allows the distribution to be made in a secure manner, as required when handling health records. Also for the purpose of compliance with HIPAA, the Health Insurance Portability and Accountability Act, all seven PHRSTs will have a letter of Grant of

Authority attesting that this activity is conducted in their role as contracted representatives of public health authorities assisting local health departments.

Results

The report format and generating software programs were developed over the spring and summer of 2006, and the CPHP epidemiologist who wrote these programs and I met several times over this period to discuss issues and options. This epidemiologist made a presentation of these surveillance reports at the state annual Epi Team conference in May of 2006. This conference has very good penetration in the local health departments, with several hundreds of their staffs attending each year. Most members of the PHRST teams also attend this conference. Local health departments were given a sample of their own county report at the end of this presentation. Customization of the programs by region lasted into the fall.

The chief of the Office of Public Health Preparedness, a branch of the DPH Epidemiology Section, approved and supported this initiative in the summer, and all seven Public Health Regional Surveillance Teams were contacted in July 2006 to plan site visits for presenting, providing a live demonstration with discussion of the technical and epidemiologic aspects of this activity, and installing the programs on their computers. Meetings were held with all seven teams between September 12 and October 26, 2006.

After discussing with senior BT IT staff the needed changes to the NC Health Alert Network to allow file sharing with PHRSTs only as planned, approval was obtained to make these modifications on November 6, 2006, from the BT Grant Principal Investigator, who also chairs a committee charged with making recommendations to improve NC HAN.

Leadership Development Opportunities and Conclusion

Although providing disease surveillance feedback to our local partners was clearly needed and a project expected to be welcomed, it was not guaranteed that choosing to recruit the partnership of our Public Health Regional Health Teams would be welcomed. While based with host counties, they operate under their own leadership at the Office of Public Health Preparedness and Response, and have become accustomed to a pool of activities where surveillance has not yet been a prominent factor. Collaboration and coordination among several groups of highly skilled but diverse public health partners was key to the success of this project. This included public health epidemiologists at the NC Center for Public Health Preparedness, Public Health Regional Surveillance Team members (physicians, nurses, epidemiologists, industrial hygienists and administrators) and their supervisor, a public health physician leading the Public Health Preparedness effort at the state level, and senior staff of the Public Health Preparedness Internet Technology group, who are often absorbed by competing priorities.

The concept, development and implementation of this project were very well received and supported by all partners, including in a couple of instances where repeated rescheduling was needed. All understood and agreed that this was not only interesting and useful, but also was part of their mission. This in turn reinforced the sense of mutual trust that exists among us. This project represents one of the building blocks of a general improvement of the use of surveillance as contributing to the control of communicable diseases at the local level.

Other developments and initiatives in that area include providing the ability for local and regional public health professionals to also monitor hospital emergency department visits and Poison Center calls for their area of jurisdiction through the use of the NC DETECT early event detection system, which provides near real time information. Meanwhile, the physician reported cases database, from which data for this project are extracted, is undergoing complete transformation with the building of the NC Electronic Disease Surveillance System, NC EDSS. This is a major task for all epidemiologists and other investigators working in the Epidemiology Section, which will take many months before completion and deployment. The present project allowed to improve surveillance at the local level now, and provides a bridge until an improved feedback reporting capacity is brought to all these partners as a component of NC EDSS.