Assessing the Impact of Syndromic Surveillance Systems on Routine Public Health Practice: Identifying and Evaluating Syndromic Signals

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OBJECTIVE

We describe the development and implementation of a protocol for identifying syndromic signals and for assessing their value to public health departments for routine (non-bioterrorism) purposes. The specific objectives of the evaluation are to determine the predictive value positive, sensitivity, and timeliness of the surveillance system, as well as its costs and benefits to public health.

BACKGROUND

One hope for syndromic surveillance systems is that they improve public health practice by augmenting health departments' traditional systems of surveillance for naturally occurring disease. However, their utility for this purpose has not been convincingly demonstrated [1]. The National Bioterrorism Syndromic Surveillance Demonstration Program (NDP) [2] is collaborating with the Massachusetts Department of Public Health (MDPH) to develop and implement a protocol to assess the utility of syndromic surveillance for non-bioterrorism events. The NDP is evaluating data from ambulatory care settings in five states, while MDPH will assess three different data types in Massachusetts. This abstract describes methods for identification of syndromic surveillance signals and for comparing them to outbreaks identified by public health agencies. The development of target event definitions, procedures for collecting this information, and development of databases to store it are reported separately.

METHODS

This evaluation is being implemented during the summer of 2005. Participants include personnel at state or local health departments in California, Colorado, Massachusetts, Minnesota, and Texas, and in the following data-providing health-care organizations: Kaiser Permanente Northern California, Kaiser Permanente Colorado, Harvard Vanguard Medical Associates, HealthPartners, Austin Diagnostic Clinic, Austin Regional Clinic, and Scott and White. The surveillance areas will be the catchment areas of the health plans in the greater metropolitan areas of San Francisco, Denver, Boston, Minneapolis-St. Paul, and Austin. Signals will be detected using a 3-day spatial and temporal scan statistical (SaTScan) method [3,4]. Thresholds for alerting will be set at one false signal per year, per two years, and per three years for low, medium, and high-priority alerts, respectively. Alerts to health departments will be automated, either via the respective state's web-based health alert network [5] or via e-mail from the surveillance system's data center. Each data-providing site will have clinical response capability, including the ability to access line-lists and medical records of patients contributing to signals/alerts and the ability to respond in a timely fashion to public health queries resulting from alerts. Data on alerts and on outbreaks/clusters of acute infectious disease ascertained by any means will be collected by participating health departments in two uniform Access databases developed by MDPH. The analysis will focus on predictive value positive, sensitivity (taking the set of outbreaks/clusters recognized by the health department as the gold standard), timeliness, and impact of alerts on public health practice.

RESULTS

Health departments have been recruited in all five states. The evaluation period is expected to begin at most sites in August 2005.

CONCLUSIONS

This prospective evaluation is expected to provide much-needed data on the utility, costs, and benefits of an ambulatory care-based syndromic surveillance system for public health practice.

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