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Alternative Surveillance Alert Project

Development of an Alternative Surveillance Alert Project (ASAP): Syndromic Surveillance of Gastrointestinal Illness Using Pharmacy Over-the-Counter Sales

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MOTIVATION

A primary aim of community health surveillance is to provide timely and accurate information on the health status of residents and to inform for public health action. At present in Canada, most notifiable infectious diseases, including enteric infections, are identified through laboratory confirmation and therefore there is a significant lag time between patients becoming ill, seeking primary health care and notification of public health officials. In the case of a severe and sudden introduction of an infectious agent in a community (unintentional, or as an intentional act of bioterrorism), this lag time is the biggest hindrance in implementing effective interventions to control the numbers becoming ill or even dying.

In an effort to decrease the impact of severe gastrointestinal disease events on the population, the **Alternative Surveillance Alert Project (ASAP)** will investigate the use of alternative data sources in creating early detection systems for enteric disease outbreaks in the community.



The Alternative Surveillance Alert Project

An alert system developed through **ASAP** would be intended for use in monitoring gastrointestinal disease trends at the community, the provincial and the national level. Two alternative data sources that are presently being considered as syndromic surveillance tools for enteric disease are pharmacy over-the-counter anti-diarrhoeal and anti-nauseant sales data, and monitoring of calls to 24/7 Telehealth lines. The reporting and analytic structure for these alert systems will be based on gastrointestinal disease related data, however it is clear that these could be equally effective in monitoring other syndromes such as respiratory and allergy related illnesses. The initial focus of this project will be on pharmacy sales data.

A simple and expedient mechanism to collect and monitor anti-diarrhoeal sales information on a daily or weekly basis would potentially provide local health officials with a straightforward and timely system to detect changes in community health parameters. Initially focusing on pharmacy sales data, the **ASAP** approach will be developed through a sequence of pilot projects as outlined below. In the past, initiatives using pharmacy data have failed mainly due to time and staff requirements (Emde et al. 2001, Rodman et al. 1997). The aim is to create a system that will ensure confidentiality, automate the data downloading process, and automate a statistical program that would only produce alerts when the unit sales trend for a pharmacy exceeds a predetermined level.

A number of stages are projected in the organisation and implementation of **ASAP** at the community, the provincial and the national level. As a result, several tiers of support and participation are necessarily involved in creating this system. Individual pharmacies, pharmacy retail companies, public health units, the provincial Ministries of Health, and the federal ministry of health are all critical to the success of **ASAP**. The impetus behind their involvement is the realisation of improved health in the population.

SUPPORTIVE RESEARCH

By monitoring daily or weekly sales of over-the-counter products related to gastrointestinal illness at the community level, an abrupt increase in unit sales could provide early warning of a potential outbreak situation. Published studies that have explored the relationship between pharmacy sales data and enteric outbreaks involving *Cryptosporidium*, include one in Milwaukee, Wisconsin (Proctor et al., 1998) in 1993, and the other in the Battleford's area of Saskatchewan (Stirling et al., 2001) in 2001. An *E.coli* O157:H7 outbreak in Walkerton, Ontario (2000) has also been investigated in the same manner. In all of these studies using retrospective data, the pharmacy sales mirrored the epidemic curve. Figures 1 and 2 portray the close relationship between the unit sales from the pharmacy and the epidemic curve for the outbreak periods in North Battleford and Walkerton. Of particular importance is the fact that the marked peaks in sales coincided with the peak of the epidemic curve. In both cases, the precautionary and boil drinking water advisories were issued several days after the sharp climb in over-the-counter sales. Had the pharmacy data been available in real-time, health officials could have been alerted to the sudden increase in gastroenteritis in their community sooner, and taken steps to investigate and to minimise human illness earlier. It is also important to compare the relatively small counts of confirmed cases available to public health officials (which would be received several days after the onset of disease) relative to those determined to be epidemiologically linked based on a retrospective investigation.

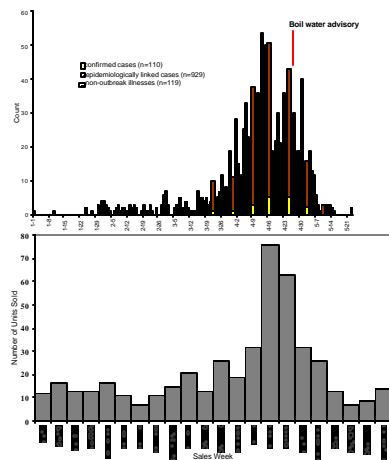


FIGURE 1. Weekly over-the-counter anti-diarrhoeal sales (below) compared to the epidemic curve (above) for the North Battleford *Cryptosporidium* outbreak in the spring of 2001. (#cases=1039)

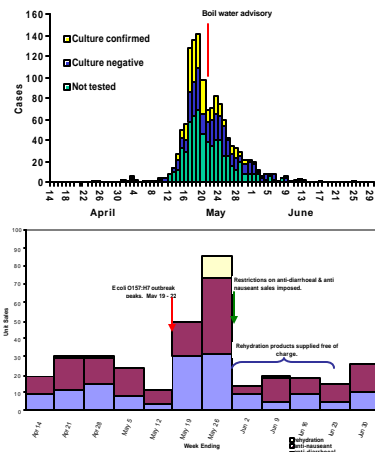


FIGURE 2. Weekly over-the-counter anti-diarrhoeal, anti-nauseant and rehydration product sales (below) compared to the epidemic curve (above) for the Walkerton *E.coli* O157:H7 outbreak period in

PILOT PROJECTS

Phase 1

- Enrol select pharmacies with varying modes of sales data collection.
- Create and test statistical 'alert' algorithms that
- Detect deviations from the norm.
- Determine feasibility of prospective data collection.
- Develop automated system of data transferal.
- Solicit review by local public health authorities.

Phase 2

- Involve sentinel pharmacies in multi-provincial review of system.
- System refinement through collaboration with pharmacies, health units, provincial Medical Officers of Health, Health Canada.

ROLLOUT OF ASAP FOR NATIONAL, PROVINCIAL AND COMMUNITY SURVEILLANCE OF SEVERE GASTROINTESTINAL ILLNESS EVENTS.

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