

Syndromic Surveillance in Ontario: Current Initiatives and Future Directions Workshop Proceedings

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Sutton Place Hotel, Toronto, ON

Hosted by the Ontario Agency for Health Protection and Promotion (OAHPP)

Planning Committee:

Amira Ali, Senior Epidemiologist, Ottawa Public Health

Dr. Natasha Crowcroft, Director, Surveillance and Epidemiology, OAHPP

Dr. Richard Davies, Cardiologist, University of Ottawa Heart Institute

Dr. Anna Majury, Kingston Regional Public Health Lab/OAHPP

Dr. Kieran Moore, Director, Queen's Public Health Informatics

Rachel Savage, Epidemiologist, OAHPP

Adam van Dijk, Epidemiologist, KFL&A Public Health

Agenda:

See Appendix A

BACKGROUND and OBJECTIVES

An early strategic priority for the Ontario Agency of Health Protection and Promotion (OAHPP) is rapid public health threat detection and response with the aim to support and build provincial capacity to manage communicable diseases adequately. Innovative surveillance approaches, such as syndromic surveillance, have been proposed as a method to enhance rapid disease detection. Syndromic surveillance uses health-related data, groups of symptoms that collectively indicate or characterize a disease (e.g. ILL, presenting diagnoses from emergency room data), or treatment and information seeking data (e.g. pharmacy sales and internet hits), to rapidly signal a possible increase in cases more quickly than traditional surveillance systems.

In "Vision to Action", the Agency Implementation Task Force identified that the Agency would be well positioned to assume a leadership role in identifying and assessing emergent non-traditional surveillance approaches such as syndromic surveillance (Vision to Action, p.44). Currently in Ontario, several health departments participate in regional syndromic surveillance initiatives in partnership with the Ontario Ministry of Health and Long-term Care (MOHLTC), primary care and academia. Additionally, at the provincial level, the MOHLTC supports a Syndromic Surveillance Ontario (SSO) initiative, which consists of a web-based knowledge transfer portal, as well as the exploration of Telehealth and emergency department data for syndromic surveillance.

Given the presence of existing players within this field, a workshop on Syndromic Surveillance in Ontario was planned by the OAHPP with the following objectives:

1. To find out what is occurring in Ontario in the field of syndromic surveillance (SS)
2. To discuss the added value and/or application of SS to public health in relation to routine surveillance tools as well as in emergencies or large gatherings
3. To discuss the direction Ontario should take in terms of SS
4. To define what the role of the OAHPP should be in this domain
5. To start building a SS network

RESULTS

This section summarises workshop outputs, organized by the workshop objectives they address, which were generated through presentations and small group, break-out discussions. In total, 74 individuals participated in the workshop, representing over half of the public health units in Ontario; the Ontario MOHLTC and Public Health Agency of Canada; Queen's, Toronto, McMaster, and Ottawa Universities; and the OAHPP. Webcast participants (n=10) were unfortunately unable to participate in the break-out sessions and so their views are not reflected here.

Objective 1 - To find out what is happening in Ontario in the field of syndromic surveillance

Presentations from Dr. Richard Davies, Dr. Kieran Moore, Dr. Hazel Lynn and Jason Garay outlined syndromic surveillance (SS) systems currently running in Ottawa, Kingston, Grey Bruce and York Regional public health departments. Presentations from Karen Hay and Pia Muchaal provided a provincial and national perspective of existing data sources which are currently being harnessed for early disease detection. Dr. Gunter Eysenbach and Brenna Ammons outlined alternative data sources currently being explored as valuable and cost effective additions to SS, while Dr. Patty Daly described Vancouver Coastal Health's approach to enhanced public health surveillance for the Vancouver Olympics.

Presentation video clips with powerpoint slides are located at www.oahpp.ca.

Objective 2 - To start building a syndromic surveillance network

The workshop planning committee identified that the generation of a SS network could provide a positive platform to share knowledge on syndromic surveillance. Currently, the MOHLTC hosts a Syndromic Surveillance portal (www.publichealthontario.ca); however, many felt that the site was difficult to navigate and did not lend itself to informal information sharing.

The workshop itself was viewed as a 'first step' to the creation of a listserv or wiki which will be dedicated to idea generation, SS updates and data sharing among those in the field.

Objective 3 – To discuss the added value and/or application of syndromic surveillance to public health in relation to routine surveillance tools

Break-out discussions explored the following set of questions. The following is a summary of the discussion:

A) What is the added value of SS in public health?

- Syndromic surveillance adds value to traditional surveillance methods by providing additional data which can be used to form a more complete picture of the health of a community. SS provides situational awareness which assists with timely decision support and offers context for looking at other data sources. Data generated via SS must be integrated with other surveillance data; it is not viewed as a stand alone data source.
- Another added value of SS is timeliness of data especially during possible emergency situations/novel threats (i.e. Pandemic Influenza, Walkerton/SARS type outbreaks).
- The process of developing SS systems facilitates and enables data access and sharing. Public health access to clinical data sets is also legitimized.
- SS facilitates collaboration by connecting public health with other health systems which collect data. This helps foster relationships and improves connectedness.

B) What do we want and need out of SS? (i.e. what is its application to public health)

- Public health wants and needs a timely, rapid, universal system with continuous support and evaluation to provide a real-time indication of what is happening in the community. Conflicting systems do not facilitate data sharing and is ultimately a poor use of resources. Current systems should be evaluated and validated to find the most appropriate system to use.
- Information that precedes diagnosis is needed to provide situational awareness, enable faster response and improve decision-making.
- SS data should be used to communicate precautions (perhaps via media) and modify behaviour of consumers and health care providers.
- More than one SS system is needed so that the systems can be used in conjunction to more accurately understand the current situation.
- The development of SS systems require:
 - o Standardized definitions as well as common reporting procedures and response protocols across Ontario
 - o Infrastructure for collaboration and communication
 - o Better methods to distinguish real signals from noise
 - o Capability to link with national data sources and to be bilingual
 - o An understanding of how SS will answer questions of importance to public health
 - o Consultation with the hospital sector and Local Health Integration Networks (LHIN)

C) Are there particular situations where SS is useful?

- Preparation for special events and earlier detection of widespread outbreaks, such as the mung bean outbreak and listeriosis, were two examples cited by participants.

D) Should SS be universally applied or used as a sentinel system in key locations?

- Some workshop participants felt that a sentinel system is easier to implement, cost effective and could more manageably facilitate a thorough evaluation of the system.
- Sentinel systems require standardized protocols for data collection and analysis. They also need to be scalable should the system prove to be useful and cost-effective. Value is added by integrating the data with other sources; the SS systems should not operate in a silo. Variation in resources and infrastructure at the regional level could be barriers.
- Other participants felt that the value is diminished if only a small area is involved in SS (i.e. system should be applied universally). For example, pandemics and cross jurisdictional outbreaks would be harder to detect with a sentinel system. Due diligence requires a universal system to be in place for the detection of a potential, major event.

E) Is SS cost-effective compared to other methods of surveillance?

- An evaluation, including cost-benefit analysis, is needed for all of the disparate SS systems. A review of the scientific literature would be useful.
- Up front costs of SS system set-up may not outweigh benefits in the long run (i.e. may not detect a lot of disease). The cost of false alarms should be determined.
- The review of SS in past Olympics demonstrated little payoff. Improved communication systems may be the best early disease detection approach.
- Costs and benefits are difficult to measure; may be better assessed through mathematical modeling. The benefits may also depend on the type/data source of SS.
- Pre-existing linkages reduces the cost and time in developing systems. Use of existing data sources also reduces cost.

F) What should the public health response be to aberrations flagged?

- Aberrations flagged must be confirmed by putting the data into context using other available surveillance data. If a real alert is detected, an investigation should be initiated. Various networks should be notified (including public health labs) to determine scope and initiate enhanced surveillance/testing. Interventions such as immunization clinics must be delivered in a timely fashion.
- A concern of workshop participants is the lack of resources for public health response to alerts detected. Risks/liability exist if no action is taken.
- Standardized response protocols and training are needed, along with coordinated mechanisms for response to alerts and flags between jurisdictions.

Objective 4 - To discuss the direction Ontario should take in terms of syndromic surveillance

Break-out discussions explored the following set of questions:

- A) Given competing surveillance priorities, how much effort/funds should go towards SS?
- Some workshop participants felt that the province should be focusing efforts on improving timeliness of traditional surveillance data (including laboratory surveillance) as a first priority. Improving timeliness could deliver some of the potential benefits of SS without the additional costs. Enhancement of existing systems will be a more cost-effective approach, while SS will be an important complementary data source. Ontario needs a solid foundation with infectious disease reporting and surveillance (i.e. iPHIS) before it explores SS.
 - Various sources of SS data (i.e. emergency room visits) may be of more value to public health than others (i.e. OTC sales) and should receive more efforts/funds for development.
- B) Should SS focus on existing sources of data only or should it include primary data collection?
- Participants agreed that the use of existing data sources would be a more cost-effective approach. Refining what is already available and trying to linking this data with existing data sources such as laboratory data were viewed as useful approaches.
- C) Should SS methodology be developed for other conditions and then applied to infectious diseases later?
- SS methodology could be applied to climate change/environmental issues.
 - Likely most relevant for infectious diseases, but for major events, we need information on extreme temperature-related illness and injuries.

Objective 5 - To define what the role of the OAHPP should be in this domain

There was a large degree of agreement between the different break-out groups on many aspects but no consensus on the role of the OAHPP. The different ideas proposed could be characterized in two major roles for OAHPP: 1. centralized leadership and support, and 2. methodological expertise. Although several groups proposed that centralized leadership should be a role for the OAHPP, several were non-committal about which institution should lead (MOHLTC or OAHPP).

1. Centralized Leadership and Support

- Facilitate, analyze and coordinate syndromic surveillance in Ontario
- Provide guidance on data sharing and access agreements, including privacy issues
- Fund projects looking at other potentially valuable sources of data (i.e. water surveillance, heat/cold data, electronic health records, OTC, animal surveillance)
- Foster collaborations
- Provide leadership to support universally applied system across the province

2. Methodological Expertise

- Conduct evaluations and cost benefit analyses of current systems. Unintentional benefits need to be included in any cost analysis. For example, in York Region, providing

benchmarking reports to schools on absenteeism rates opened doors for education on hygiene, etc which facilitated a decline in absenteeism rates.

- Identify and assess key data sources for syndromic surveillance; assess what disease issues SS should focus on; and define syndromes for analysis.
- Study the impact of using chief complaint vs discharge diagnosis for SS
- Provide expertise in interpreting results and determine thresholds for response (i.e. grading severity of alerts and appropriate response). Standard response algorithm and protocol should be developed.
- Approach the current, smaller systems now running to lead the way on specific positives and lessons learned from these groups.

ADDITIONAL COMMENTS:

- Some participants felt syndromic surveillance was not the proper term for this field. Suggestions for revision of term included Enhanced Electronic Surveillance, or that we need a problem based term, not a technology based term. These proposals redefine the field towards the broader field of bioinformatics and away from the original concept of syndromic surveillance as applied in recent years.

DISCUSSION AND NEXT STEPS

In general, workshop participants seem to appreciate the potential for SS to add value to traditional public health surveillance through the provision of timely data for situational awareness and decision support. If implemented provincially, SS systems would need to provide a real-time indication of what is happening in the community and produce data that can be used to communicate precautions to the public and health care providers. The development of a universally applied system would require standardized syndrome definitions, reporting procedures and response protocols. Concerns were raised by workshop participants on the benefit of SS given its cost and additionally, on the lack of resources for public health response to aberrations that are flagged. Given these concerns, suggestions were made for the OAHPP to conduct evaluations including cost benefit analyses of current systems and also, to focus efforts on strengthening existing surveillance systems (i.e. laboratory surveillance). In addition to these roles, some workshop participants felt that the OAHPP would be a key position to provide centralized leadership and support for SS in the province, which would also include methodological support and expertise. Other participants or groups were less sure about where the leadership role would naturally fall.

The workshop was positively evaluated and no major suggestions for improvement were made with the exception of improving OAHPP's capability of providing webcasts which support adequate participation and engagement. Several actions for follow-up were articulated in the evaluations, which included:

- summarising the discussion, reviewing suggestions, sharing feedback, prioritizing next steps and making the report public
- establishing a working group with members from OAHPP, public health units, MOHLTC and external stakeholders
- setting up a SS network

Following these suggestions, next steps for the OAHPP will be to create a Wiki site hosted on the OAHPP server dedicated to syndromic surveillance which will house a copy of this report. Feedback on this report will be solicited from workshop invitees and participants and incorporated into the final report. The final report will be posted to the OAHPP's public website (www.oahpp.ca) along with video clips of the presentations and presentation slides. The outputs of this workshop will also be highlighted in an upcoming issue of "Start Up", an OAHPP newsletter designed to update the public and stakeholders on new developments within the Agency.

Appendix A - AGENDA

- 8:30am **Registration and Continental Breakfast**
- 9:00am Greetings from **Dr. Vivek Goel**, CEO and **Dr. Natasha Crowcroft**, Director Surveillance and Epidemiology, OAHPP
- 9:15am **Dr. Richard Davies**, Cardiologist, University of Ottawa Heart Institute
ASSET
- 9:35am **Dr. Kieran Moore**, Queen's University Department of Emergency Medicine and Community Resident, KFL&A Public Health
Emergency Department Syndromic Surveillance (EDSS)
- 9:55am **Karen Hay**, (A) Manager, Infectious Diseases Surveillance Infectious Diseases Branch, Public Health Division, Ministry of Health and Long-term Care
Telehealth
- 10:15am **Break**
- 10:30am **Dr. Patty Daly**, Vice President, Public Health and Chief Medical Health Officer, Vancouver Coastal Health
Public health surveillance for the Vancouver Olympics
- 11:00am **Break-out session:** *What is the added value/application of syndromic surveillance to public health?*
- 12:00pm **Lunch**
- 1:00pm **Dr. Hazel Lynn**, Medical Officer of Health, Grey Bruce Health Unit
Early CBRN Attack Detection by Computerized Medical Record Surveillance (ECADS)
- 1:20pm **Dr. Gunther Eysenbach**, Senior Scientist, Centre for Global eHealth Innovation & Department of Health Policy, Management and Evaluation, University of Toronto
Internet-based surveillance
- 1:40pm **Jason Garay**, Manager Infectious Diseases Control Division, York Region Community and Health Services Department
School Absenteeism
- 2:00pm **Break**
- 2:15pm **Pia Muchaal**, Epidemiologist, Centre for Foodborne, Environmental and Zoonotic Infectious Diseases, Public Health Agency of Canada
Alternative Surveillance Alert Program (ASAP)
- 2:35pm **Brenna Ammons**, Graduate Student, McMaster University
Use of Cross-sectional Surveys and Laboratory Diagnostics in Respiratory Virus Surveillance
- 2:55pm **Break-out session:** *What is the priority for syndromic surveillance in Ontario? What role should the OAHPP play?*
- 3:55pm Summary of day and recommended outputs