

**Background:**

In September 2004, Kingston, Frontenac and Lennox & Addington (KFL&A) Public Health began conducting a 2-year pilot project to develop and evaluate an Emergency Department Syndromic Surveillance (EDSS) System in collaboration with the Ontario Ministry of Health and Long Term Care, Queen's University, Public Health Agency of Canada, Kingston General Hospital and Hotel Dieu Hospital. The Real-time Outbreak and Disease Surveillance (RODS) System was selected as the surveillance tool best suited for the project; the University of Pittsburgh's RODS Version 3.0 was modified to meet Canadian surveillance requirements. In order to continuously meet the dynamic public health needs of the population, the EDSS system is now transitioning into an improved platform that will enhance situational awareness for public health issues. With this development, the name of the system has changed to Acute Care Enhanced Surveillance (ACES).

**Purpose:**

The ACES system is a real-time syndromic surveillance system with temporal and spatial capabilities that enables public health to better protect the health of the community, while also allowing hospitals to monitor emergency department volume, admissions, and surge capacity. This helps prepare for high volumes of patients, particularly in the event of a flu pandemic. The goals of the system are to monitor changes and trends in the incidence of endemic disease and detect new or emerging infectious disease threats. ACES' syndromic surveillance capabilities can be useful in a variety of situations, including:

- Acting as an early warning system for emerging pathogens
- Routine monitoring of respiratory and gastrointestinal illness
- Public health emergencies, such as extreme weather events
- Mass gatherings, such as the 2015 Pan American Games in Ontario

**Methods:**

The ACES system monitors visits to emergency departments at over 100 hospitals across Ontario, spanning twenty-six Health Units. Data is captured from approximately 10,000 visits and 2,700 admissions per day. All data is collected by participating health care facilities during the registration and triage process. Details describing both the patient and the visit are entered into the hospital's computer system in 'real-time' within minutes of speaking with the triage

nurse. The system seamlessly collects this information from the data that is already collected by hospitals and therefore has no impact on staff workload. Data elements collected by ACES include: patient demographics (age and sex), postal code (first 5 digits), the date and time of the visit, chief complaint(s), CTAS Triage code, Febrile Respiratory Illness (FRI) Screening results, admission diagnosis (if recorded and available), discharge diagnosis, whether the patient arrived by emergency medical service, and whether there was admission to the Intensive Care Unit.

Information from each emergency department visit across all sites is collected centrally within the ACES system where it is classified into several syndromic categories based on the chief complaint or admission diagnosis. Anomaly detection using various detection algorithms takes place automatically to detect increasing numbers of visits for different syndromes. Alerts generated by the ACES system are immediately posted to the website and emailed to health professionals monitoring the system. The secure web-based interface allows epidemiologists or other health professionals to monitor the collected information, and assess the emergency department visits that comprise the alert to determine if there are any patterns related to demographics, location, or timing of the cases that would justify further investigation by public health staff.

**Privacy and Security:**

On November 1, 2004, the Personal Health Information Protection Act (*PHIPA*), Ontario's new health care privacy legislation, came into effect. The 'Privacy and Confidentiality Charter for Acute Care Enhanced Surveillance' outlines the policies, principles, and procedures for ACES that are necessary to meet the intent of *PHIPA*. A Privacy Impact Assessment has also been conducted. ACES regularly reviews its policies and procedures to ensure they are in alignment with *PHIPA* and any other applicable privacy legislation. All ACES participants must sign Data Sharing Agreements (DSA) between KFL&A Public Health, the Local Public Health Agency, and the Health Care Institution. The DSA has been drafted to ensure compliance with the *PHIPA* and outlines the privacy obligations of ACES participants.

**For more information, please contact:**

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