

# Evaluation of Syndromic Surveillance Systems in Singapore

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## Introduction

Singapore's syndromic surveillance programmes include the monitoring of polyclinics and emergency departments (ED) attendances for acute diarrheal illness, acute respiratory infections, influenza-like illness, acute conjunctivitis and chickenpox. We evaluated these syndromic surveillance systems for its representativeness, usefulness and data quality and identified areas for improvement.

## Methods

The syndromic surveillance systems (acute diarrheal illness, acute respiratory infections, influenza-like-illness, acute conjunctivitis and chickenpox) were evaluated based on the Updated Guidelines for Evaluating Public Health Surveillance Systems from the United States Centers for Disease Control and Prevention.

Data from 18 primary care clinics and 7 hospitals, which are sent to the Communicable Diseases Division of the Ministry of Health (MOH) on a weekly basis, was analysed. Interviews with the data management teams of the 2 polyclinic clusters and health information teams of the 7 hospitals were also conducted to learn about the data collection, storage and generation methods.

## Results

### Representativeness

- Only 19% of primary care patients seek treatment at public primary healthcare facilities according to the 2010 MOH Primary Care Survey.

- Tendency for patients to seek treatment at private primary care clinics due to shorter waiting times.

- However, a higher proportion of patients who require secondary and tertiary care seek treatment at public healthcare institutions.

- In 2012, 77.1% of admitted patients were in public hospitals

### Usefulness

- The system is able to track aberrant increases in weekly attendances after seasonality trends are accounted for.

- An upward trend for diarrheal and upper respiratory tract infection (URTI) attendance is usually observed at the start and middle of the year possibly due to travellers returning from school holidays

- Any large magnitude of increase in attendances that deviates from the seasonality trend will trigger public health authorities to investigate (e.g. during the influenza A (H1N1) pandemic in 2009).

- Usefulness may be further enhanced if data is provided on a daily or alternate day basis, to facilitate closer monitoring and more rapid intervention, if necessary.

### Data Quality

- Data collected is generated based on ICD 9 and 10 codes.

- Data quality will be affected under the following circumstances:

- Notifying physicians are not familiar with the specific ICD codes to use

- Technical errors such as wrong coding by the physicians, wrong input of codes for certain syndromes in the programme or wrong codes were used during data generation.

## Conclusions

The existing syndromic surveillance systems are useful in tracking aberrant increases in weekly attendance. Data collected is also relatively accurate, although it may be lacking in representativeness for primary healthcare facilities.

The system can be improved by also tracking attendances for private primary healthcare facilities. With the rolling out the electronic health records, getting practitioners on board will better allow authorities to monitor attendances in a timely fashion. Data submission intervals can also be shortened from weekly to eventually daily basis to achieve faster response and intervention should there be outbreaks detected.

Other sources of information should be explored to enhance the current syndromic surveillance systems. This includes monitoring of geriatric population, absenteeism rate in educational institutions and prescription drug sales. Forecasting tools could also be utilised and integrated in the future. Integrating new and traditional information sources may provide better resolution on potential adverse public health events and will allow public health authorities to better prepare themselves for any potential pandemics or emergencies.

## Keywords

Surveillance; Syndromic; Evaluation

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