Development of an Electronic Notification System for Influenza like Illness Sentinel Surveillance

Mehnaz Adnan
Traditional Sentinel Influenza Like Illness (ILI) Surveillance in New Zealand

- Established in 1991 as part of the WHO Global Influenza Surveillance and Response System
- Operated nationally by the Institute for Environmental Science and Research (ESR) in the winter season (from April to September) every year
- Voluntary participation of General Practices (~ 60 in 2014)
- GPs or practicing nurse manually count numbers of ILI patient consulted and specimen taken with their age group and fax to public health service (PHS)
- Each PHS manually collated the information collected from GPs and fax to national ILI coordinator at ESR for further reporting/surveillance
Drawbacks

• Time consuming

• Putting additional pressure on the practice and public health staff during the winter season

• Generates a limited amount of data i.e. ILI counts for each practice and their age groups
Opportunity

- Most general practices use one of the propriety practice management systems (PMSs)
- Used for E Referrals, laboratory test ordering
- Offers the opportunity to automate the process of GP based ILI sentinel surveillance
What we have done

- Used PMS to implement an electronic method for sentinel ILI notifications
- Facilitate GPs to:
  - Fill in an electronic form at the time of patient consultation in their PMS
  - Submit the form in real time
  - Sent to national surveillance system using an HL7 message
  - Real time integration with ILI national database
Content Analysis

• Who were involved:
  • Public Health Physicians
  • National ILI coordinators

• Four categories of information identified:
  • Reporting Information
  • Health Practitioner Information
  • Patient Information
  • Clinical Information
Influenza Like Illness NZ

Clinical Information
Specimen Collection

Influenza Like Illness (ILI) Review
Date of encounter*  17/03/2016

Clinical Review
Cough*  Yes  No
Measured Fever >= 38C or history of fever*  Yes  No
Total days since start of symptoms*  Please select
Patient has consented and specimen has been taken?*  Yes  No

Medications
Has the patient had antiviral medication?*  Yes  No

Medications*  Browse for More Medications

Influenza Vaccination Review
Influenza vaccination status this year (Jan onwards)*  Given elsewhere
Vaccinated elsewhere details*  Please select
Was the influenza vaccination given in the last 14 days?*  Yes  No  Unknown

Specimen Collection
Specimen date*  17/03/2016
Specimen type*  Please Select
An acute respiratory illness with onset during the last 10 days with:
- a history of fever or measured fever of $\geq 38^\circ C$, AND
- cough requiring
- a general practice consultation
System Architecture
HL7 Message Implementation

- Implemented using HL7 version 2.4 REFI 12 format
- Compliant with New Zealand Referrals, Status and Discharges Messaging Standard - HISO 10011.3

- Two types of messages are included:
  - ORU message -> Receive ILI notification information from PMS
  - ACK response message -> Send the acknowledgement or rejection to message sender.
## HL7 message types and segments

<table>
<thead>
<tr>
<th>ILI Notification Message</th>
<th>Acknowledgement Response Message</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Segment Name</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>MSH</td>
<td>Message Header</td>
</tr>
<tr>
<td>RF1</td>
<td>Notification Number</td>
</tr>
<tr>
<td>PRD</td>
<td>Practitioner Details</td>
</tr>
<tr>
<td>PID</td>
<td>Patient Details</td>
</tr>
<tr>
<td>ORC</td>
<td>Common Order Segment</td>
</tr>
<tr>
<td>NTE</td>
<td>Notes and comments on results information</td>
</tr>
</tbody>
</table>
Pilot Implementation and Evaluation

- In three general practices in Capital and Coast Region for 2015 winter season
- Comparative study with 3 general practices in the same region using manual method for ILI notifications
Comparison between Electronic and Manual Notification

<table>
<thead>
<tr>
<th>eILII</th>
<th>Total Practices</th>
<th>Total Patients Enrolled</th>
<th>Total Cases</th>
<th>Total Specimen</th>
<th>Manual</th>
<th>No of Practices</th>
<th>Total Patients Enrolled</th>
<th>Total Cases</th>
<th>Total Specimen</th>
</tr>
</thead>
</table>
Comparison between Electronic and Manual Notification

![Comparison between Electronic and Manual Notification](image)
Time Taken by Electronic Notifications to Process
Improvements

- Developed a system for the electronic transmission of ILI case reports from primary care to the national collections
- An electronic form integrated with PMS allowing:
  - Pre-populated patient, provider and clinical information from EHR/PMS
  - Field validation and consistency checks
- System uptake -> 66% ILI cases reported using eILI system within the region
- Improved efficiency -> Average 24 minutes per notification
- Clinicians found the system easy to use and efficient
Current Status – 2016 Flu Season

- National roll out in 84 General Practices
- Integrating the output in New Zealand national flu surveillance
References


Thank You