HL7 middleware framework for laboratory notification for notifiable diseases

Presented by Donald Peterkin
Institute of Environmental Science and Research (ESR)

Crown Research Institute

Four sites across New Zealand

Main areas of work are

- Forensic Science
- Environmental Science
  - Food Science
  - Water Science
- Health
  - Health Intelligence Team
What we do

Provide the means for the collection of notifiable disease data from all 20 Public Health Services around the country

- Notifiable diseases are required to be reported under
  - Health Act 1956
  - Tuberculosis Act 1948

- 85 disease are notifiable under these acts

- Up until December 2007 all notifications to Medical Officers of Health were done by General practitioners
Situation

• New Legislation in December 2007, Laboratories were now required to notify on confirmation of a positive sample

• No current methods for Laboratories to notify Medical Officers of Health (MOH)

• No messaging standard for electronic notifications in NZ

• No means to capture and transmit each message
System Requirements

• Laboratory Information Management Systems (LIMS)
  ➢ To exchange data electronically
  ➢ A national messaging standard adhered to
  ➢ Use of a secure network to transmit
  ➢ National guidelines for notification

• Store the result in a solution
  ➢ Be able to capture the message
  ➢ Store the result in a solution
  ➢ Notify the Medical Office of Health
System Design

• Laboratory Information systems were modified to send HL7 message

• Used Health Link as the message carrier

• Windows service used to move message

• Java Composite Application Platform Suite (JCAPS) was used as a message manager

• Windows service used to insert into EpiSurv database

• EpiSurv notifies medical Officer of Health
System Architecture

- Community
- Diagnostic
- Laboratory

Labs

Message Broker

HL7 Message

HL7 Handler

PHS

EpiSurv(Web Application)

Notification DB

EpiSurv DB

Direct Laboratory Notification Middleware
# Message Structure

<table>
<thead>
<tr>
<th>ORU laboratory results message</th>
<th>ACK 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>MSA</td>
<td>Message Acknowledgement</td>
</tr>
<tr>
<td>PID</td>
<td>Patient Identification</td>
</tr>
<tr>
<td>PV1</td>
<td>Patient visit</td>
</tr>
<tr>
<td>OBR</td>
<td>Order detail</td>
</tr>
<tr>
<td>OBX</td>
<td>Observation/result</td>
</tr>
<tr>
<td>NTE</td>
<td>Notes and comments on results information</td>
</tr>
<tr>
<td></td>
<td>Segment Name</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
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</tr>
<tr>
<td></td>
<td>Message Acknowledgement</td>
</tr>
<tr>
<td></td>
<td>ERR</td>
</tr>
<tr>
<td></td>
<td>Error</td>
</tr>
</tbody>
</table>
HL7 Message

MSH|^~\&|MLC|wdlab1|EpiSurv|esrendms|20150624091602|PKI|ORU^R01|0109002756^08c56102-bb8b-40fb-931c-937dd5a81d1d|P|2.4

PID|||ABC1234||MOUSE^MICKEY^L||19250101|M||40 DISNEY STREET^^DISNEY WORLD^^5555^

ORC|OK||DELPHIC

OBR|0001|15033325483800000^MLC01|15033325483800000^MLC01|3800^Faecal Culture^L|R|201506221504|201506221013||""||201506221505||M0012607^COOPER^PAUL^^^^^NZMC|||||201506240916||MB|C||episurvPN^PalmerstonNorth^^^^^^HF~61202^UNIT^PUBLIC^^^^^L~M0015886^UNIT^PUBLIC^^^^^NZM

OBX|0001|CE|29308-4^Diagnosis^LN||CAMP^Campylobacteriosis^99NZESRDC|||

OBX|0002|FT|3800^Faecal Culture^L|| ....FAECES.......\br\ Description : Pale Mucoid\br\ CAMPYLOBACTER E.I.A.\br\ Campylobacter antigen : POSITIVE\br\ ...FAECES CULTURE...\br\ No Salmonella, Shigella or Yersinia enterocolitica isolated.\br\ Reported by: JRDM -RLP|||

C-
Performance Analysis
Next Steps

- Change from JCAPS to Rhapsody
- Possibility of using FHIR (Fast Healthcare Interoperability Resources) instead of HL7 2.4
- Using Connected Health and Web services
- Expanding notification to General Practitioners
- Extracting result information out of message to be inserted into EpiSurv
Thank you for listening

QUESTIONS

Donald Peterkin

Donald.Peterkin@esr.cri.nz

www.surv.esr.cri.nz