Development of an HL7 Message Structure to Electronically Report Notifiable Condition Information from Healthcare to Public Health

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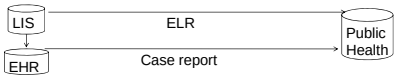
Background

- Clinicians must report 'notifiable conditions' to public health authorities to initiate appropriate investigation and control measures
- Current reporting process is manual, inefficient, and may lead to delays in case investigation
- 23% of all Utah reports in 2007 were misdirected to the wrong local health department jurisdiction (unpublished data)
  - ~ 60% of reports did not contain patient address
  - Negative impact on man-power and timeliness
- No standards exist for electronic **case** reporting from a healthcare facility to public health
- Utah Department of Health is authorized to require that standards be used for electronic health information exchange (House Bill 47 passed in 2008)
- Case reporting vs Electronic Laboratory Reporting (ELR)



Goal

Create an extendable standards-based model for transmission of case and supporting laboratory information from healthcare to public health

Methods

Reviewed the following:

- Guideline for electronic transmission of nationally notifiable conditions from public health entities to CDC (PHIN implementation guide, 2007)
- Guideline for electronic transmission of laboratory based reporting (ELR) of notifiable conditions using HL7 v2.3.1 (PHIN implementation guide, 2004)
- Messaging protocol for the exchange of electronic medical records with the Massachusetts Department of Health (2006)

Ascertained requirements for the content and functionality of the initial case report from the following sources:

- Core data fields identified by the Confidential Morbidity Report (CMR) standardization workgroup led by CDC and CSTE
- Opinion expressed by public health surveillance practitioners from 2 local health departments and the Utah Dept of Health
- Content of current paper case reports generated from Intermountain Healthcare EHR and faxed to public health
- Observation of workflow associated with processing a case report at Salt Lake Valley Health Department

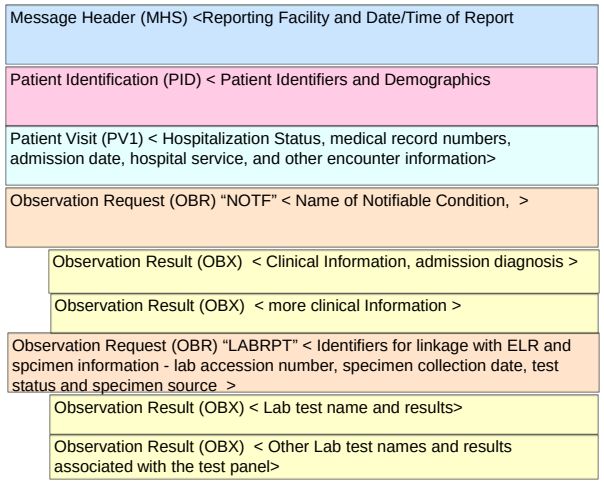
Major Requirements Identified

- Include sufficient information in the case report to positively impact health department workflow and enable:
  - identification of primary contact at reporting facility if more data is needed
  - routing of the case report to the correct jurisdiction for investigation
  - assessment of urgency for triage
  - linkage of case-report with ELR and other records for the same event
- Message structure should:
  - Link demographic, clinical, encounter, and associated lab data, including positive and negative results for all results generated by a lab test panel that includes the confirmatory test (eg. Hepatitis panel)
  - Be extendable for future enhancements
- Transmit case-report from healthcare to public health using standard vocabularies and enable re-routing among local and state public health systems

Model Proposed for Initial Implementation

- Use Health Level Seven (HL7) v2.5 message standard
- Adopt Notification Type Identifier (NOTF) and Associated Lab information identifier from PHIN Implementation Guide (2007) to be used in OBR.4 segments
- In the LABRPT OBR/OBX, include specimen identifiers and all results for lab tests ordered in a single panel, including negative results, to link with ELR and facilitate information for case investigation

Figure: Proposed Message Structure Illustrating Key Concepts in Message



Issues Encountered

- Existing LOINC concepts for "date of diagnosis" were specific for Cancer
- No LOINC codes existed for "previous admission date", "previous discharge date", or "date/time clinician was alerted about the notifiable condition". This information was requested by public health
- Use of the NK1 segment would reduce the number of other new LOINC concept requests

Conclusion

The proposed model can be used to transmit an initial case report from healthcare to public health and is extendable to include other information as needed

Future Work

- Recommend that LOINC make selected concepts usable across disease categories and request new LOINC concepts necessary for notifiable condition reporting
- Complete mapping of laboratory tests to LOINC codes
- Consider using other HL7 segments (eg. SPM, NK1) to transmit data currently sent in OBX segments
- Implement SNOMED for name of notifiable conditions
- Complete implementation and evaluation of model to transmit initial case reports from Intermountain Healthcare to Utah Department of Health
- Evaluate the impact of the electronic transmission of case reports on workflow at local and state health departments

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