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ABSTRACT

Design and development of a standards-based model to publish public health reporting criteria

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Objective
In this paper, we describe the content and functional requirements for a knowledge management system that can be authored by public health authorities to inform reporting facilities 'what's reportable where'.

Introduction
State laws mandate clinicians and laboratories to report occurrences of reportable diseases to public health entities. For this purpose, a set of case-reporting specifications are published and maintained by public health departments. There are several problems with the existing case-reporting specifications: (1) they are described on individual state websites and posters and not structured or executable; (2) the specifications are often misleading representing case classification rather than case reporting criteria; (3) they vary across jurisdictions and change over time; and (4) reporting facilities are required to interpret the criteria and maintain logic in their own systems.[1] To overcome these problems, we are designing and developing a prototype system to represent case-reporting specifications that can be authored and maintained by public health and published openly.

Methods
To determine the content and functional requirements, we reviewed existing reportable disease lists and rules, fact sheets, and CSTE Position Statements. We used ethnographic methods to obtain feedback from public health authorities. To model the knowledge using standards, we reviewed existing HL7-structured documents including the Clinical Document Architecture. The knowledge management system allows public health authorities to author, store, and publish knowledge-concerning reporting logic and specifications (Figure 1). For this demonstration project, the reporting entities will be able to view human-readable specifications, download structured content using web services for execution within their own systems, and subscribe or query for updates. Knowledge authoring, publication, and access are provided through service-oriented architecture.

Results
After review of the websites from Utah, LA County, Colorado and Washington State for communicable disease and environmental/occupational diseases, we identified 103 reportable events, of which only 62 were included among the nationally notifiable list. The reportable events included diagnoses, laboratory results, clinical observations, interventions, outbreaks, and intent. We identified the following content requirements to represent reporting specifications: (a) detection criteria that includes clinical and laboratory findings; (b) constraints including characteristics of the patient, encounter, laboratory or clinical setting; (c) reference resources; and (d) reporting action details including the reporting time frame and so on. We have designed a model workflow for public health authorities to author reporting specifications, allowing for default content based on the CSTE disease specific 'Position Statements'. We are developing the use case for accessing the information in both human-readable and machine-processable format. We are storing the knowledge assets in XML and exploring the HL7-structured document format to structure reporting specifica-

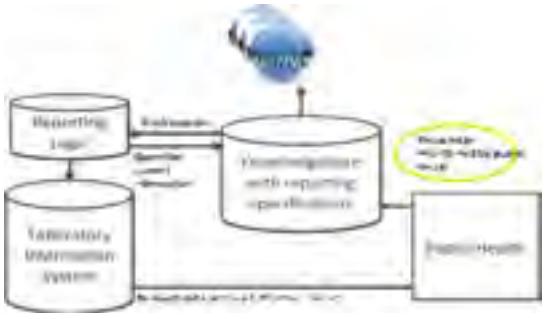

Figure 1 Future process for laboratories to determine 'what is reportable where' and maintain logic.

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tions. We are exploring models to represent laboratory criteria for improved linkage to the relevant pairs of LOINC/SNOMED mappings.

Discussion

We have demonstrated the modeling of a knowledge management system using existing standards. The development of a prototype knowledge management system that allows public health authorities to author, store, and publish knowledge-concerning reporting specifications will help inform the development and implementation of a national system.

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