Experience with Message Format and Code Set Standards for Early Warning Public Health Surveillance Systems

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ABSTRACT
Among the prerequisites for rapid development of early warning public health surveillance systems are standards for message formats and code sets. Researchers and practitioners of public-health surveillance (PHS) have been building on standards used in clinical information systems. We discuss standards in the context of our experience building the Real-Time Outbreak and Disease Surveillance System (RODS), an early warning system for PHS that we have developed over the last three years.

INTRODUCTION
In response to the terror attack on the World Trade Center of 9/11/2001 and subsequent anthrax bioterrorist events, Congress has appropriated significant funds for the development of early warning public health surveillance systems. However, the development and rapid deployment of such systems is hindered by a lack of widely implemented message format and code set standards.

EXPERIENCE
Our experience with message format and code set standards is the following:

• Health Level 7 (HL7) is a widely implemented message format standard
• There is considerable variation among vendors and health systems in HL7 implementations
• Because of the above, customized HL7 interfaces are almost always required when adding a hospital or other clinical data provider to an early-warning public health surveillance system
• The reason for visit field of HL7 registration messages is nearly universally used and populated with free text
• No code set is widely implemented in sources of clinical data useful for early warning public health surveillance
• LOINC and SNOMED-CT are emerging code set standards, but there are barriers to their use

STANDARDS EFFORTS
The Centers for Disease Control and Prevention (CDC) have been leading the charge to define and promote standards for public health surveillance (PHS) in general (and thus for early warning PHS). For example, their National Electronic Disease Surveillance System (NEDSS) effort provides recommendations for a standard HL7 message format, a standard code set for test names, and a standard code set for microorganisms for electronic laboratory reporting, among numerous other PHS standards.

The CDC have also partnered with the healthcare information technology industry in the form of the eHealth Initiative by forming the Public-Private Sector Collaboration to Improve Public Health and Health Care Quality. Because of participation by prominent vendors, there is hope that the standards promoted will gain acceptance and be widely implemented.

CONCLUSION
There is an urgent need to develop and deploy early warning systems. However, the lack of uniformity in the implementation of HL7 and the lack of widespread adoption of standard code sets combine to create a significant impediment to rapid deployment. To ameliorate the problem, developers, researchers, and vendors must formulate, promulgate, and widely deploy standards for the transmission of data from clinical systems to PHS systems. Such efforts are under way under the auspices of the CDC.

Acknowledgements
This work was supported by grant GO8 LM06625-01 from the National Library of Medicine and contract 290-00-0009 from the Agency for Healthcare Research and Quality.

REFERENCES