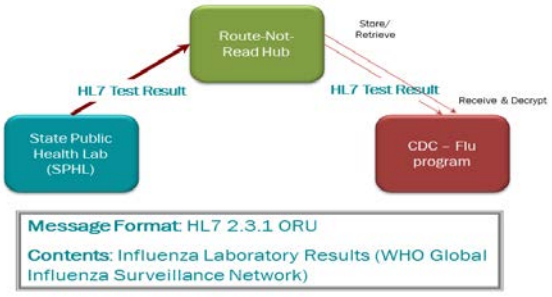
Electronic Laboratory Surveillance Messaging (ELSM)

Overview

Reliable and timely methods for data exchange are critical for public health surveillance. APHL Informatics is collaborating with the Centers for Disease Control and Prevention (CDC), State Public Health Laboratories (SPHLs), and with APHL's Infectious Diseases program to help SPHLs implement electronic data flows from SPHLs to CDC. APHL, CDC, and the laboratory community have developed the Elaboratory Laboratory Surveillance Message (ELSM) to allow laboratories to efficiently send surveillance data to CDC in an automated manner. Currently, two of APHL's interoperbaility projects utilize ELSM. First, the Public Health Laboratory Interoperability Project (PHLIP) team has developed the ELSM to send influenza testing results to CDC as part of the World Health Organization (WHO) Global Influenza Surveillance Network. Next, the Vaccine Preventable Diseases (VPD) Project team has opted is utilizing the ELSM to transmit VPD testing results from reference laboratories to CDC.

Influenza ELSM Data Flow

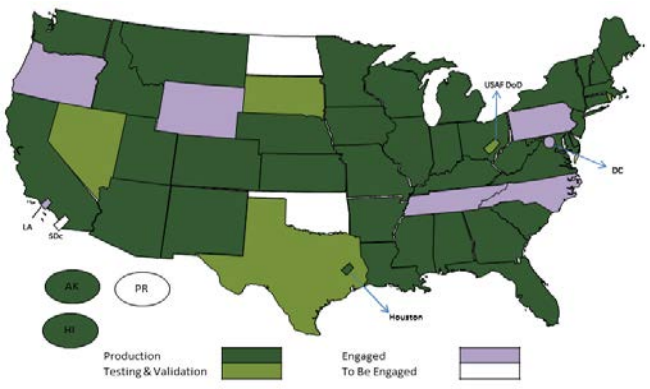


Influenza ELSM Partners

- Association of Public Health Laboratories (APHL)
- Centers for Disease Control and Prevention (CDC)
- State Public Health Labs (SPHLs)

Influenza ELSM

- The accurate and rapid exchange of information about influenza tests and results among public health laboratories and their partners is essential to the prevention and control of influenza.
- All PHLs are required to send both positive and negative results to CDC for influenza testing. Before PHLIP, states used a variety of legacy systems, including fax, email, and web portal.
- The Influenza ELSM contains granular data, often pulled directly and automatically from the laboratory's LIMS and transformed to a constrained 2.3.1 HL7 format. Not only does this automation ease the reporting burden for laboratorians, it ensures the timely and accurate flow of information to the CDC. Analysis-ready data is sent from SPHLs to CDC in near real-time, in some cases, within minutes.



SPHLs in production with Influenza ELSM as of May 2013

- Through PHLIP, CDC and APHL have helped more than three quarters of SPHLs implement ELSM for Influenza directly to CDC, and more laboratories are testing or engaged.
- Flu ELSM data are partially used to power FluView, a weekly influenza surveillance report prepared by the Influenza Division at CDC. FluView is available at www.cdc.gov/flu/weekly.
- Efforts are now underway to expand the amount and quality of the information captured to include pyrosequencing and additional epidemiological data. PHLIP teams are preparing to apply the ELSM system to other Nationally Notifiable Diseases (NNDs).

VPD ELSM Partners

- Association of Public Health Laboratories (APHL)
- Centers for Disease Control and Prevention (CDC)
- California Department of Public Health Laboratory
- Minnesota Department of Health, Public Health Laboratory Division
- New York State Department of Health, Wadsworth Center
- Wisconsin State Laboratory of Hygiene

Vaccine-Preventable Diseases (VPD) ELSM

- Despite widespread vaccination, morbidity from VPDs remains significant in the United States. Concomitantly, the diagnostic capacity for most VPDs in SPHLs) has diminished. To address these issues the CDC, in collaboration with APHL, is establishing four SPHLs in California, New York, Minnesota, and Wisconsin as diagnostic VPD Reference Laboratories.
- These laboratories will conduct diagnostic testing on specimens from states and CDC and send VPD results, both positive and negative, to CDC as an ELSM data feed.
- VPD Reference Laboratories will also maintain capacity, proficiency and appropriate clinical test licensure in molecular diagnostics and other required testing procedures to assist CDC in routine molecular testing for VPDs.
- All four reference laboratories will use HL7 v.2.5.1 messages. These messages will follow the uniform messaging standards developed by the PHLIP community and will use harmonized vocabulary.
- The primary purposes of the VPD Reference Laboratories are to: 1) Provide reference capacity for molecular and serologic testing to support PHLs and CDC in a shared service model; 2) Provide surge capacity, as required, in the event of an outbreak; 3) Provide quality control and proficiency standards for the assays performed in conjunction with the project; and 4) Improve informatics capability and data capture of VPD information by providing laboratory expertise to assist with the harmonization of method and result vocabulary to create standard HL7 messages common across all VPD Reference Laboratories.
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Electronic Laboratory Surveillance Message

The APHL Technical Assistance Team is working with public health laboratories (PHLs) involved in the PHLIP and VPD Projects to map local LIMS codes to standardized codes, and to build the technical architecture and PHINMS routes needed for the ELSM data exchange with the CDC. In both cases, laboratories transmit ELSM to CDC via HL7 messages.

The ELSM uses the following coding systems and value sets:

- LOINC: For orderable and resulted tests;
- SNOMED-CT: For code-able test results and: specimen type and/or source site;
- UCUM: For Unit of measures for quantitative (numeric) results; and
- Other HL7 tables and value sets as specified in the ELR251PH-Implementation Guide.

For more information on the **Electronic Laboratory Surveillance Message projects**
visit www.aphl.org/aphlprograms/informatics/collaborations/phlip
or contact Linda Cohen, Informatics Program Manager at phlip@aphl.org