Michigan: Sharing Critical Data through the Antimicrobial Resistance Laboratory Network

Innovations in Informatics: Laboratory Success Stories

Contributor: Kelly Jones, Reference Bacteriology Unit Manager, Nathan Haddock, LIMS Administrator, Michigan Department of Health and Human Services

Working with the Association of Public Health Laboratories' (APHL) Technical Assistance (TA) Team and the CDC's Antimicrobial Resistance (AR) Program, the Michigan Public Health Laboratory (PHL) upgraded its dataflow of AR laboratory reports to CDC from intermittent, manual CSV uploads to daily, automated HL7 messaging. This upgrade resulted in efficiencies for the laboratory and higher quality data for CDC's AR Lab Network.

The situation

As a member of CDC's AR Lab Network, the Michigan PHL must transmit timely, high-quality laboratory results to CDC for all funded AR testing. According to a 2019 CDC report, AR is one of the greatest public health challenges of our time, causing 2.8+ million infections and 35,000 deaths in the US every year. CDC relies on the AR Lab Network to contain emerging threats through early detection and aggressive response. Michigan receives funding and training from CDC to perform testing for special pathogens; Michigan also conducts whole genome sequencing and molecular testing for select pathogens, including *Candida auris*.

Until January 2025, Michigan reported these results through two separate manual processes. The PHL entered data regularly into REDCap; the lab also intermittently uploaded a CSV file for each pathogen to CDC's Data for Action on Antimicrobial Resistance Threats (DAART) portal on the AIMS Platform. While the CSV contained more information than REDCap, it still included only a fraction of the data that Michigan's laboratory information management system (LIMS) had available on any given test. But with such limited reporting frequency, CDC was not getting the full picture in real time of emerging and novel AR threats. The duplicative reporting required valuable staff time in Michigan and at CDC, time that could be better used in critical laboratory operations, testing and disease surveillance.

Impact

- **Staff hours saved**
- **Improved data quality**
- **Real-time data**
- **Holistic view into a public health threat**

Transitioning AR reporting to HL7 messaging benefited both the Michigan PHL and CDC's AR Program. The HL7 message contains more and higher quality data than the original CSV file. The new automated process eliminates duplicative data entry, saves staff time for Michigan and CDC and reduces the need for manual quality review and monitoring.

Working with APHL TA expedited Michigan's implementation process by supplementing PHL resources and ensuring that all test messages passed validation before Michigan began onboarding with CDC.

Michigan's participation in the AR Lab Network ultimately supports the Network's mission to **rapidly detect and respond to emerging AR threats.**

The solution

Michigan implemented an automated data exchange with CDC to send HL7 2.5.1 messages directly from its LIMS to DAART in near real-time. Michigan enrolled in a cohort to receive TA from APHL. The TA team guided Michigan through each step of the implementation, including assessing current workflows, designing a technical solution, and testing and validating a set of predefined test scenarios. Once Michigan met the necessary onboarding milestones, they sent limited production data to CDC for review and ultimately cut over to production in January 2025.

Michigan: Sharing Critical Data through the AR Lab Network

Reflections

Collaboration

This implementation required collaboration across diverse partners. At times, this project required support from multiple staff within Michigan, including laboratorians, data integration analysts and centralized IT resources. More broadly, this was a collaboration between the Michigan PHL, APHL TA, the DAART technical staff and the CDC AR program. The Michigan team collaborated with APHL TA to overcome barriers and fill resource gaps.

Challenges

Michigan encountered several challenges while working on this project. First, the transition to HL7 had to align with Michigan's test validation schedule. Michigan's AR testing program was adding tests for AR fungal infections; CDC requires laboratories to send these results via HL7 rather than CSV, thus pushing the need for Michigan's transition. Second, while Michigan has used other services on AIMS, this was the first time that the lab sent HL7 through AIMS, and thus additional effort was required to establish and test the connection. Finally, this implementation required time and investment from AR experts, HL7 specialists and data integration analysts, and finding time from these experts among competing priorities, including a renovation to the microbiology lab, was challenging.

Suggestions for others

CDC made the transition to HL7 a clear priority in its funding vehicles for the AR Lab Network participants; there are value proposition materials available for PHL leadership if needed. PHLs can work with APHL to schedule and plan the transition and thereby budget the appropriate staff time. PHLs should take advantage of all TA that is offered to ease resource constraints. Depending on the solution selected, vendor support may be necessary. While the HL7 implementation requires work on the front end, the ease of communication is worth it.

Up next

The new solution is flexible and extensible. Michigan can add conditions and more data as the AR Lab Network and AR monitoring evolves. Next up: Michigan plans to implement a new laboratory information management system (LIMS).

The AR Lab network is nearly 10 years old, and it is continuing to expand, enhancing surveillance and encouraging better public health outcomes.

APHL TA has helped about two thirds of AR Lab Network PHLs transition to HL7 and will launch more implementation cohorts this year to further expand HL7 reporting.

Better, more timely data supports early detection and aggressive response.

Share your laboratories' success stories!

Help us reveal what the public health community stands to lose without dedicated and long-term support. Share your story with APHL by scanning the QR code or visiting bit.ly/Lab-Informatics.

The Innovations in Informatics: Laboratory Success Stories series from the Association of Public Health Laboratories (APHL) showcases innovations and enhancements in informatics. It highlights the critical need for ongoing, targeted and sustainable informatics funding, while celebrating the progress that has been made.

APHL ASSOCIATION OF PUBLIC HEALTH LABORATORIES®

7700 Wisconsin Avenue, Suite 1000, Bethesda, MD 20814 | www.aphl.org | 240.485.2745 | info@aphl.org