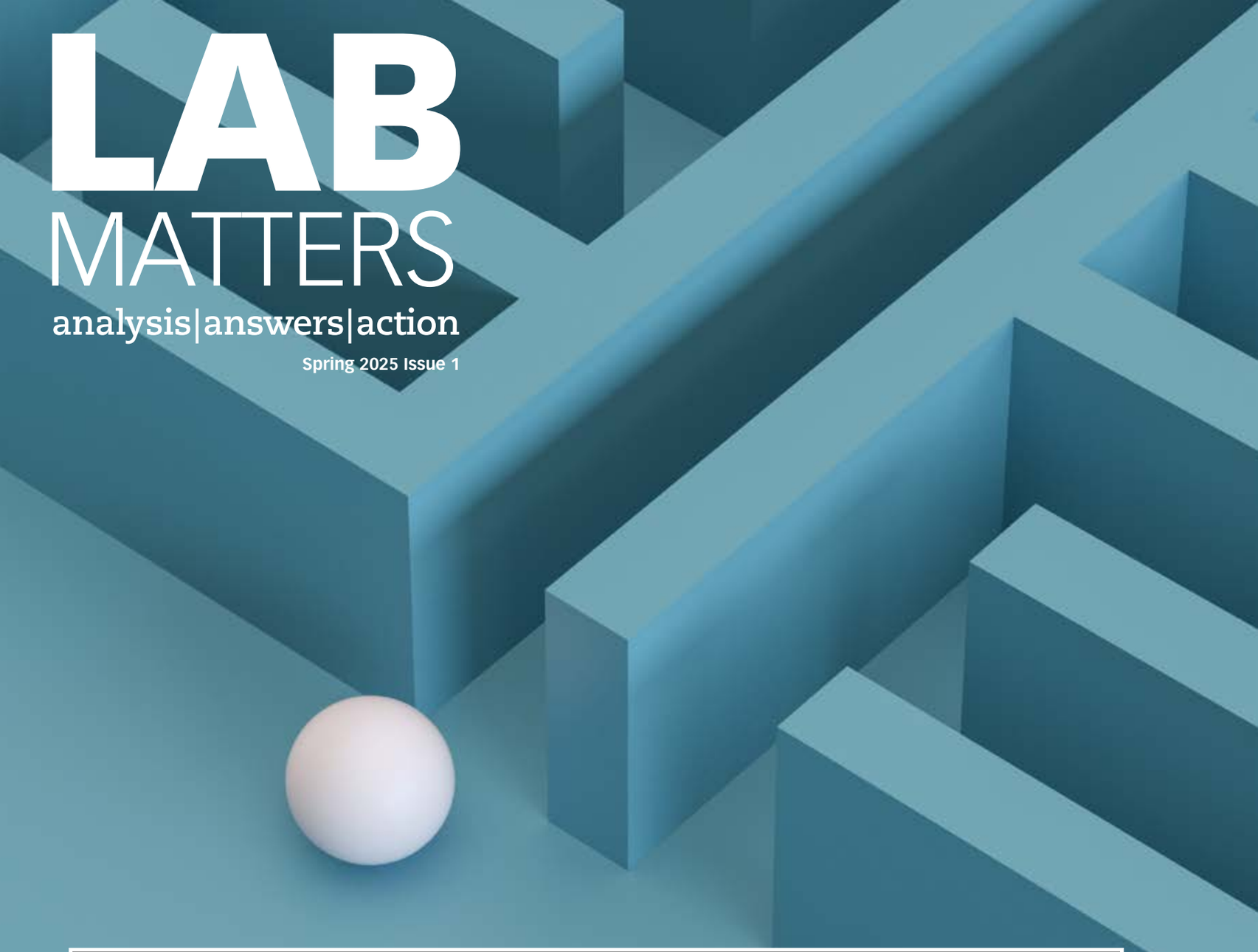
LAB MATTERS
analysis|answers|action
Spring 2025 Issue 1



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ASSOCIATION OF PUBLIC HEALTH LABORATORIES

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October 5–9, 2025 • Providence, RI

Advancing HIV, STI and Viral Hepatitis Conference
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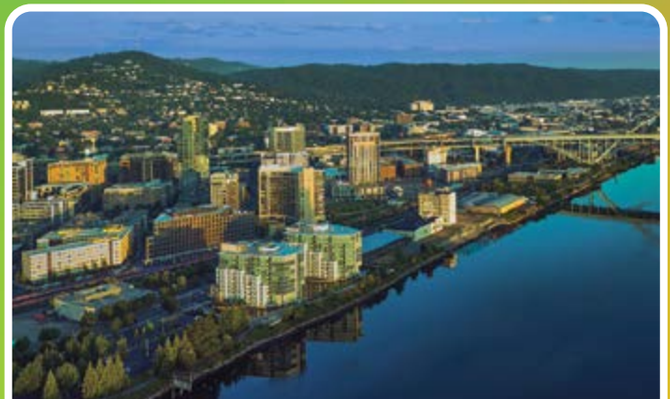

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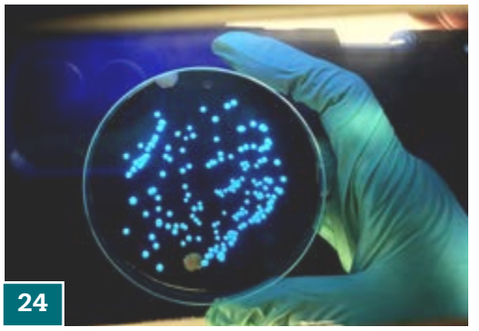

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Quality Systems and Analytics

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The Association of Public Health Laboratories (APHL) works to strengthen laboratory systems serving the public's health in the US and globally. APHL's member laboratories protect the public's health by monitoring and detecting infectious and foodborne diseases, environmental contaminants, terrorist agents, genetic disorders in newborns and other diverse health threats.

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Decision Making Through Uncertainty

From APHL President Megan Crumpler and CEO Scott Becker

On Wednesday, January 28, APHL received a stop work notice on all our global health work due to the Executive Order regarding a freeze on foreign assistance. The stop work notice was retroactive effective January 24, and its duration was for at least 90 days and possibly longer. At that time, it included all of our work under PEPFAR and Global Health Security. As a result, we had had no choice but to halt work in over 50 nations—including shuttering APHL offices in 10 countries—which affected more than 100 individuals based both in the US and internationally who supported this work.

While this decision was incredibly difficult for our affected staff and the broader APHL community, it also represented a tremendous setback for our work to strengthen laboratory systems serving the public's health globally. This includes APHL staff sequencing mpox in Thailand and supporting emergency response to Marburg in Tanzania. It includes support for the Kakuma Ammusait Laboratory in Kenya—the first laboratory in a refugee setting to attain ISO accreditation. It includes the sequencing capacity in Honduras that APHL helped build from scratch. The opening and staffing of the 11th APHL country office in Botswana has also been halted.

While we hoped for a reversal of this notice when it was announced, all the above activities—and many, many more—were stopped.

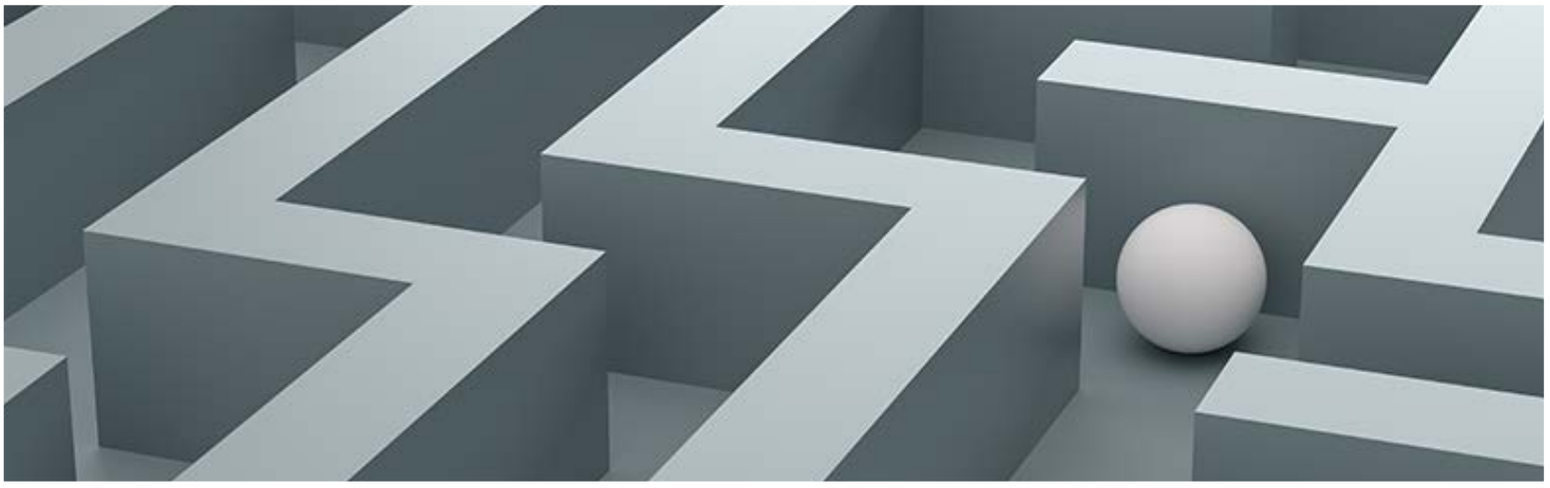
Part of the reasoning for this drastic stoppage of such critical work was the association's desire to protect our members and the association. During the pandemic, APHL built a very public reputation for being truth-tellers; even though those within the public health community already knew of our reputation, others only became familiar with public health laboratories during that very turbulent time. We were, and still are, being overly cautious to ensure we can continue serving our members and deliver transparent, just-in-time facts and data so they can continue their vital mandates within their communities. As we are sure you are aware, making any kind of decision that is based upon changing information—especially those that affect the lives of our staff and members—is fraught with difficulties.

One thing that does not change, however, is the ability of our public health laboratory stories to deliver not only facts and data but also convey the value of public health laboratory science. In these times, it will be more critical than ever to convey the value of our work, as well as the financial impact on different communities, both domestically and internationally. What happens when rabies testing has to be paused due to a decrease in funding? What about STI testing? What if wastewater testing is put on hold during an epidemic? What communities will suffer? Stories like these are vital in conveying not only the financial value of our work, but the value to all of our partners and communities.

APHL continues to sort through the information on the executive orders and relevant court cases, and we are working through the challenges that the pause on communications from the Department of Health and Human Services has brought. We are seeing continued improvements in the communications flow between federal agencies and our members but it's very much a work in progress.

As of March 1, we were able to bring our Global Health staff back and are actively working with our country offices to deliver the services we are so passionate about across the globe. We will continue to share updates as we learn more and we are also keeping an eye on future developments that could continue to affect our members and staff, such as the impending reconciliation bill, as well as a potential shutdown of the federal government.

For almost 75 years, APHL has been a trusted messenger for our members and federal partners. Our commitment to safeguarding public health extends far beyond our national borders, and all of our colleagues are truly like family to us. Taking a moment to acknowledge the significance of the time we are in is natural; we will continue our ongoing efforts to protect the health and well-being of the public. ■



Building a Career in Public Health Laboratory Science

By **Amra Handzic**, MBA, senior specialist, Academic Partnerships and **Hailey Reiss**, specialist, Academic Partnerships

Public health laboratories play a vital role in safeguarding community health, responding to disease outbreaks and maintaining environmental quality. If you are drawn to a dynamic and meaningful career dedicated to protecting the public from diseases and health threats, a career in a public health laboratory could be the perfect fit.

Career Pathways in Public Health Laboratories

Public health laboratories offer career pathways for professionals at every stage, from entry-level to leadership roles. Those with high school diplomas, associate's degrees or certifications can begin as laboratory technicians, sample processors or assistants, gaining essential experience in sample handling and data documentation while building a foundation for future advancement.

For individuals with bachelor's degrees in sciences, including biology, microbiology or public health, mid-level roles such as laboratory scientists, microbiologists and quality assurance coordinators are available. These roles involve diagnostic testing, research and data analysis to support public health initiatives. Certifications from credentialing agencies such as the American Society for Clinical Pathology Board of Certification (ASCP BOC) can further enhance qualifications for these positions.

Advanced roles, including laboratory supervisors, managers and laboratory directors, may require master's or doctoral degrees, extensive experience and advanced certifications. These roles plan implementation of work, oversee operations and make strategic decisions ensuring that laboratories align with public health objectives.

Insights from Current Public Health Laboratory Professionals

Katrina G. Erwin
Public Health Microbiologist II
San Luis Obispo County Public Health Laboratory

Erwin's journey highlights the challenges and rewards of a public health laboratory career. Her diverse responsibilities range from conducting tests for influenza, norovirus and rabies to SARS-CoV-2 sequencing. She also trains future microbiologists, ensuring the next generation is equipped for California's certification process. Reflecting on funding challenges that led to job loss in 2013, she emphasizes the importance of professional networks in navigating career setbacks. "Build strong networks through conferences, training opportunities and mentorship," Erwin advises.

Ryan Allen
Clinical Microbiology Unit Manager
Kansas Health and Environment Laboratories

Allen's path from research laboratories to managing a clinical microbiology unit showcases the value of adaptability and continuous learning. His role involves overseeing regulatory tasks, training staff and managing operations. He emphasizes the importance of communication across various departments to bridge gaps and ensure efficiency. His advice to aspiring professionals includes attending professional meetings, building networks and exploring diverse roles within the public health infrastructure.

Emily Large
Laboratory Operations Coordinator
Arizona State Public Health Laboratory

Large's career began amidst the COVID-19 pandemic, evolving quickly into operational and quality improvement roles. A memorable achievement was coordinating a vaccine distribution project and navigating logistical hurdles like hazardous materials regulations. Her journey underscores the significance of teamwork, adaptability and embracing challenges as pathways to growth. She encourages newcomers to explore internships and fellowships, noting that, "public health laboratories have many facets, so there's likely a place for everyone."

Future Opportunities in Public Health Laboratory Science

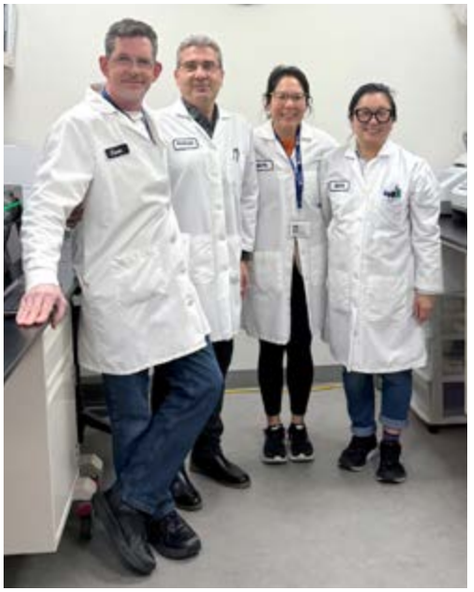
The future of public health laboratory science is bright, with advancements in genomics, molecular testing and digital tools creating new career opportunities. Global health challenges continue to drive demand for skilled professionals, making public health laboratories a field of growing importance.

A career in public health laboratories is not just a job—it is a chance to make a lasting impact on public health. From entry-level positions to leadership roles, this field offers diverse pathways for growth and innovation. For those ready to embark on this dynamic journey, the advice is clear: build your skills, expand your network and embrace the opportunities ahead.

Explore further resources, professional development programs and certifications to kickstart or advance your career in this vital sector. ■

Career Pathways and Serendipity Intersect at San Mateo Laboratory

By **Rudolph Nowak**, MPH, senior specialist, Marketing and Communications



Left to right: Fellows Jason Rose, Hedayat Hosseini, mentor Kristina Hsieh and fellow Phoi Tran pose at the San Mateo County Public Health Laboratory. Photo: San Mateo County Public Health Laboratory.

Most fellows are recruited out of college as graduates or postgraduates. Some fellows may be early-career scientists looking for opportunities to advance their careers. But three recent fellows illustrate that every career pathway is different.

Those pathways sometimes intersect and can lead to serendipity.

When Kristina Hsieh, DrPH, became the San Mateo County Public Health Laboratory director in 2023, she received calls from colleagues asking about opportunities at her new laboratory. They also passed along the names of people looking for positions and even career changes.

Among the names passed along were Jason Rosé, who has a PhD in pharmacology; Phoi Tran, who has a PhD in biology; and Hedayat Hosseini who has a PhD in food safety and quality control.

Bringing Them Onboard

Hsieh had candidates, but not necessarily job openings. That is when she learned about the Public Health Laboratory Fellowship Program: an APHL-CDC Initiative.

"I was thinking, '(Hosseini) has previous history in food science, and we really need someone to do sequencing. He could easily transition to doing infectious diseases.' The APHL program allowed us the opportunity to pursue that," Hsieh said.

Tran was a colleague of Hsieh's from the California Department of Public Health who was thinking of transitioning out from what is now the Department of Cannabis Control.

"She (Hsieh) said 'I have a need for someone to do wastewater testing and you could apply for this fellowship.' It sounded fun and I wanted a change," Tran said.

Tran said the fellowship offered the opportunity to take a break from running the same tests repeatedly.

"I felt like my ability to research had taken a nosedive because I fell off from the new evolving and emerging science," Tran said. "So, it is fun to be back in science and getting to use new technology."

Rosé was another recommendation from a colleague within San Mateo County and happened to be a former high school chemistry and biology teacher.

"I found out Jason has a background of being a retired high school teacher who taught chemistry but also taught different classes that were infectious disease related. And it just so happened that he wanted to switch careers from teaching and pursue a clinical laboratory scientist license," Hsieh said.

Rosé forwarded his CV to Hsieh and she contacted him.

Rosé's fellowship was as a laboratory assistant, which allowed him to gain hands-on experience in a public health laboratory since his ultimate goal is to get certified and become a public health microbiologist.

Cultivating Experience

"San Mateo is a small laboratory of about 15 people. So, everybody does a little bit of everything," Rosé said. "It's a lot of fun seeing how all the basic laboratory science ties into everything that I've lectured on for the last 20 years."

Rosé also used his teaching background and his own fellowship experience to develop a training syllabus for incoming fellows to the laboratory.

"It's to help them because Hedayat and Phoi and I have a lot of laboratory background experience. These (incoming) fellows have college, so it's very different for them as opposed to us. I think they'll have a little more support and I'm happy to do it," Rosé said.

Even with the experience of these three fellows, there was still a learning curve.

"While they are seasoned, they were unfamiliar with this laboratory and how it operates, Hsieh said. "The nice thing is that they've been working for a long time, they understand what's needed, they are independent thinkers and they are proactive about pursuing and completing projects."

The addition of experienced fellows has also been a benefit to Hsieh.

"We were able to bring up our sequencing capabilities and were able to expand wastewater and get it into a more consistent place," Hsieh added. "I think the mixture of experience and backgrounds makes the laboratory more efficient, increases our capacity with limited resources, and allows us to be a small but mighty laboratory that can continue to expand with minimal expansion to our budgets."

Hsieh and the San Mateo laboratory will continue to benefit as Hosseini and Tran have extended their fellowships for a second year and Rosé has accepted a permanent microbiologist position. ■

APHL™ | LEARNING CENTER

Expert training at your fingertips!

The Association of Public Health Laboratories (APHL) is thrilled to officially launch the APHL Learning Center (ALC) with over 250 professional development opportunities and growing!

The ALC is APHL's new learning management system that offers high quality educational activities on a variety of topics in convenient formats, from laboratory-specific resources to those serving the broader public health community. You can search for and enroll in training, complete evaluations and manage your certificates all in one place.

Begin by browsing the course catalog to view all available trainings. When you are ready to enroll, use your APHL credentials to sign in and access your training. If you're new to APHL, create a free account to enroll in our professional development opportunities.

Take advantage of the APHL Learning Center to access on-demand trainings and resources to strengthen your public health laboratory work.

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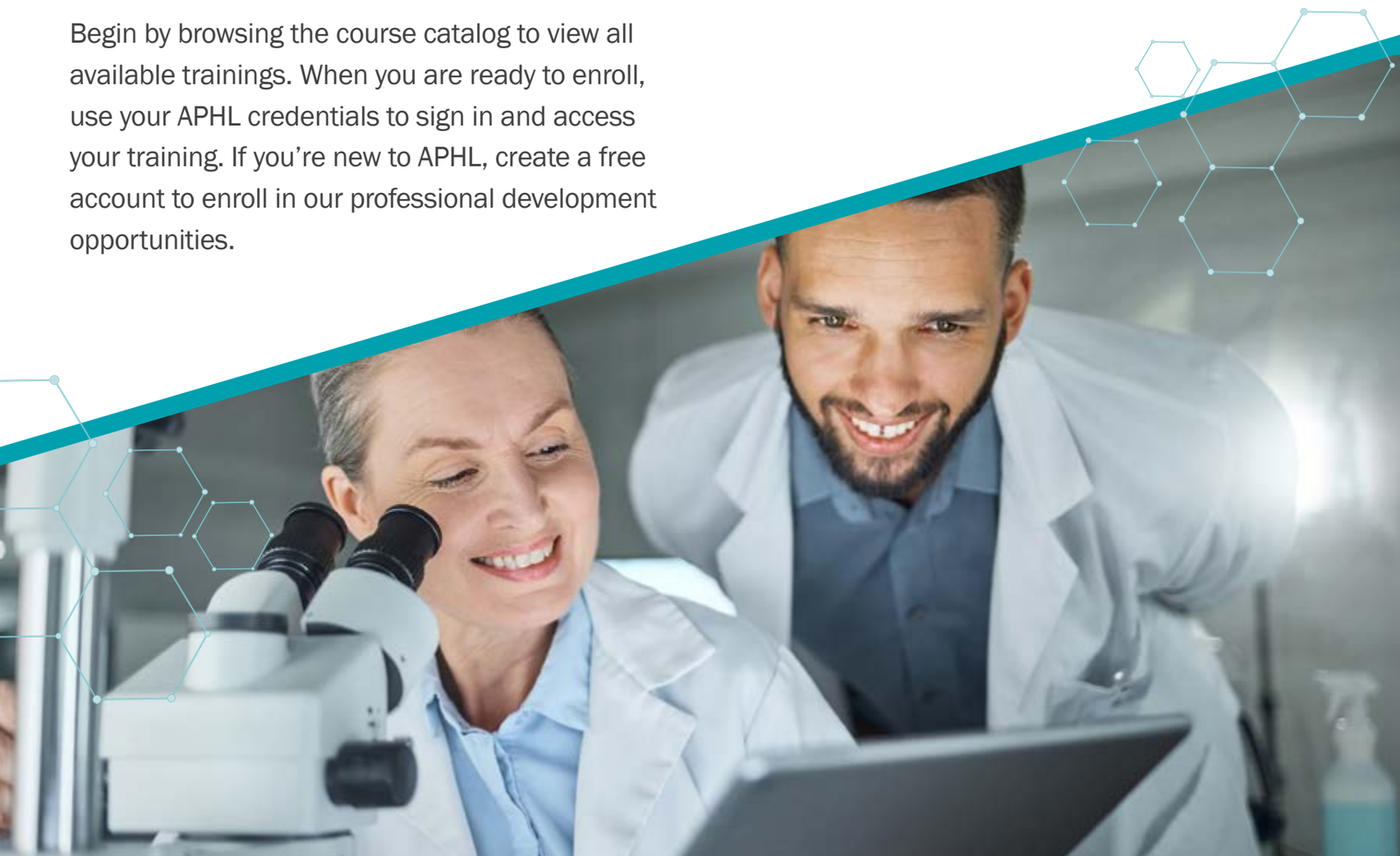


Massachusetts Successfully Completes Laboratory System Improvement Program Assessment

By **Sanjib Bhattacharyya**, PhD, associate laboratory director; Massachusetts State Public Health Laboratory; **Rebekka Davis**, intern, Massachusetts State Public Health Laboratory; **Kylee Noga**, executive operations assistant, Massachusetts State Public Health Laboratory; **Dawn Fukuda**, ScM, assistant commissioner, Massachusetts Department of Public Health and director, Bureau of Infectious Disease and Laboratory Sciences; and **Nicolas Epie**, PhD, HCLD(ABB), director, State Public Health Laboratory, Bureau of Infectious Disease and Laboratory Sciences, Massachusetts Department of Public Health

The Massachusetts State Public Health Laboratory (SPHL), Bureau of Infectious Disease and Laboratory Sciences conducted its second Laboratory System Improvement Program (L-SIP) assessment on September 9, 2024. Due to the fact that the previous assessment was completed in 2008, SPHL's decision to conduct this assessment was based on the need to have an updated analysis to identify the system's current strengths, identify improvement opportunities and obtain feedback from diverse partners. Forty-five attendees representing 18 clinical, environmental, academic and research laboratories, and preparedness partners, as well as local, state and federal agencies participated in this recent assessment.

The L-SIP assessment day began with a welcoming address from Dr. Robert Goldstein, Commissioner of the Massachusetts Department of Public Health. During the morning introductory session, the L-SIP process was reviewed with attendees, highlighting Essential Service #2 as an example, to "Investigate, diagnose, and address health problems and health hazards affecting the population." Participants were then split into three breakout groups, each led by a facilitator. The facilitators were leaders from Indiana Public Health Laboratory, Vermont Public Health Laboratory and Vermont Agriculture and Environmental Laboratory. The goal for each group was to evaluate the laboratory system performance for three of the 10 Essential Public Health Services, so that at the end of the day all 10 essential services had been discussed.

Commissioner of the Massachusetts Department of Public Health Dr. Robert Goldstein gave welcoming remarks. Photo: Massachusetts State Public Health Laboratory.

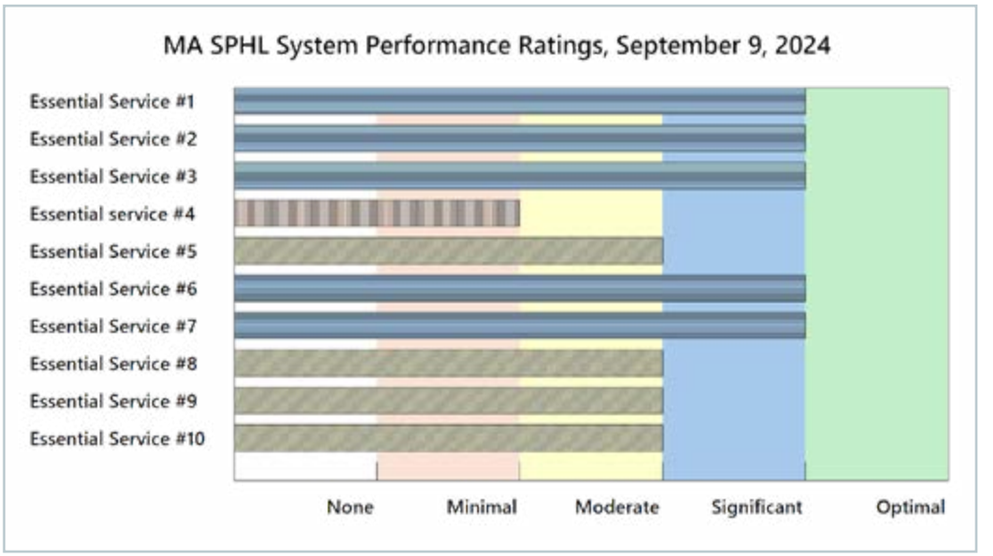


Table 1.

The groups rated how the current system is operating compared to the standards described for each Essential Service. Five of the Essential Services were rated as "Significant," with 50–75% of the performance described being met within the system; four were rated as "Moderate," with 25–50% of the performance met; and one was rated as "Minimal," with a 0–25% performance rating. (**Table 1**)

As attendees discussed the many strengths of the SPHL system, they also discussed program and service areas that could use improvement. For example, participants agreed the laboratory system was functioning well regarding sampling, testing and compliance, but felt that there is a strong need for staying on top of cutting-edge technologies and improving electronic communications and reporting. Other general focus areas for improvement included expanded partnerships, and better staff recruitment, training and retention. The L-SIP assessment data will provide guidance in planning next steps for the system improvements, mainly the Essential Services rated "Minimal" or "Moderate," but also priorities that were identified in the "Significant" category. A subset of SPHL staff and leadership will continue to collaborate to address each of these areas through working groups and further partner feedback.

The proposed post-L-SIP activities include:

- Convene system partners on a regular basis as a method to improve communication and engage partners in action items.
- Form an advisory/steering committee and subcommittees with representation from the SPHL system to address minimally or moderately scored areas through strategic planning, and by identifying resource and funding opportunities.

Laboratory system partners thoughtfully analyzed the system's performance. Photo: Massachusetts State Public Health Laboratory.

- Explore opportunities to engage in meaningful applied research with clinical and academic partners.
- Provide virtual and in-person training opportunities including educational presentations, table-top exercises on aspects of disease outbreak control, technology development, data sharing and preparedness.
- Continue to stay on top of cutting-edge testing capabilities and engage in dialogue with system partners to improve response.

Overall, participants were pleased with the process and felt using the assessment tool was an effective way to share ideas, identify performance gaps and start developing plans for system improvements. SPHL hopes to share lessons learned and valuable feedback from attendees to improve current practices and policy for public health actions in Massachusetts and beyond.

"A long-awaited L-SIP assessment allowed for a holistic review of the laboratory system's strengths and improvement opportunities," said Dr. Sanjib Bhattacharyya, associate laboratory director for SPHL. "Critical feedback received from system partners will contribute to improving our services and positively impact the lives of the residents of the Commonwealth."

The tools and resources that will be developed through the forthcoming improvement phases of the L-SIP process will be shared and applied not only for the benefit of the SPHL system, but also for the community as a whole and New England regional laboratory partners, contributing to and supporting the nation's public health response moving forward.

Harnessing the Power of the Research Bench for Public Health Action

By **Steven Kelly**, technical product manager, Streck

Streck ARM-D® Kits are multiplex qPCR kits capable of detecting AR variants across multiple resistance gene families, NDM, KPC, OXA-48, VIM, IMP, OXA-143, OXA-48, OXA-24/40, OXA-51, OXA-58, OXA-23, OXA-198, OXA-134 and OXA-372. For Research Use Only. Not for use in diagnostic procedures. Photo: Streck.

As nucleic acid analysis technologies advance to become faster and more accurate, laboratories can acquire more genetic data for infectious diseases, cancers and hereditary diseases than ever before. However, these data are only impactful if they are verifiably correct.

To ensure accurate analysis, public health laboratories rely heavily on laboratory-developed tests (LDTs). These LDTs can range from verifying the reliability of complete blood count methodology to surveilling a hospital and surrounding community for antimicrobial-resistant microorganisms. The latter can be especially impactful, as the rapid genetic identification of the microorganisms causing an infection—and any associated antimicrobial resistance (AR) mechanisms—can result in faster, more appropriate treatments and improved patient outcomes. Public health programs such as the Antimicrobial Resistance Laboratory Network (AR Lab Network) and the National Wastewater Surveillance System (NWSS) rely on LDTs to verify their methods for detecting infectious disease microorganisms and resistance mechanisms.

Comprehensive and Economical LDT Options for AR Surveillance

Both the AR Lab Network and NWSS have included the Streck ARM-D® Kits in their LDTs for AR detection and genetic confirmation of phenotypic analysis. These kits detect a comprehensive list of AR gene family variants, including NDM, KPC, OXA-48, VIM and IMP. Because Streck ARM-D Kits have a wide range of coverage, they detect gene family variants that other kits may fail to detect, lowering the costs associated with having to retest bacterial isolates and wastewater samples and ensuring that only positive samples are sent for comprehensive whole genome sequencing.

Recent Changes to LDT Recommendations

Though laboratory technologies have advanced with relative ease, the evolution of LDTs has not been as smooth. In May 2024, the US Food and Drug Administration (FDA) reached a final ruling for regulations that ensure the safety and effectiveness of LDTs, ending over a decade of discussions.

Per this rule, FDA regulations were amended to explicitly state that *in vitro* diagnostic products (IVDs) are to be considered devices under the US Food, Drug and Cosmetic Act, even when the IVD is manufactured or developed by a laboratory, as is the case with LDTs. This means that the FDA has expanded enforcement discretion with LDTs.

For laboratories that run surveillance tests that are not being used for diagnosis and/or patient treatment decisions, like the AR Lab Network and NWSS, a change in LDT regulation is less likely, as Section V.A.2.c (third paragraph) of the Final Rule states that the FDA will generally not expect compliance with these tests. In this case, we expect Streck's ARM-D Kits will continue to serve as a valuable surveillance tool to support AR testing in the public health sector. ■

Streck is an APHL Gold Level Sustaining Member.

Empowering Public Health Laboratories: The Benefits of Automation in Molecular Diagnostic Testing

By **Jonathon Zowalki**, product manager, Hologic and **Ashley Nenninger**, PhD, senior manager, Scientific Affairs, Hologic

The Serology Team at Wisconsin State Hygienic Laboratory. Photo: Hologic.

The Molecular Diagnostics Team at the State Hygienic Laboratory at the University of Iowa. Photo: Hologic.

For decades, public health laboratories have been on the frontlines of testing for locally and globally emerging pathogens. While there are shared diagnostic goals across the public health laboratory network, individual laboratories have their own distinct testing priorities.

Molecular diagnostic testing systems, which offer flexibility and scalability, are key to supporting the unique testing needs and dynamics of each public health laboratory. Open channel functionality on these systems enables laboratories to customize their testing menus by integrating laboratory-developed tests (LDTs) alongside commercially available *in vitro* diagnostic (IVD) assays. LDTs are often used to respond to local infectious diseases and changing clinical needs facing specific communities when a commercial testing solution does not exist.

LDTs have historically been implemented on manual platforms, which require significant operator hands-on-time. By automating manual testing workflows, laboratories can process larger volumes of tests with fewer resources, potentially speeding up diagnoses and enabling timely public health interventions.

Dr. Allen Bateman oversees the Communicable Diseases Division at the Wisconsin State Hygienic Laboratory. In the face of increasing testing demand, his laboratory turned to Panther Fusion® Open Access®, a sample-to-result molecular testing system that enables automation of LDT and IVD testing workflows simultaneously.

"The Panther Fusion system's automation for SARS-CoV-2 testing really streamlined our testing during the depths of the COVID-19 pandemic, so we sought additional uses for this high-throughput automated workflow," said Bateman. "As an AR Lab Network Regional Laboratory, the volume of specimens for *Candida auris* PCR was very high (often over 100 per day) and growing, and we were using manual extraction and PCR approaches. We validated an LDT for *C. auris* PCR on the Panther Fusion Open Access and went live in January 2024. The relief among our testing staff was immediate, and they continue to really appreciate the automated nature of the testing. We will soon go live with an LDT for Carbapenem-resistant *Acinetobacter baumannii* (CRAB) colonization testing, which we expect to have a similar streamlining effect and relief among microbiologists."

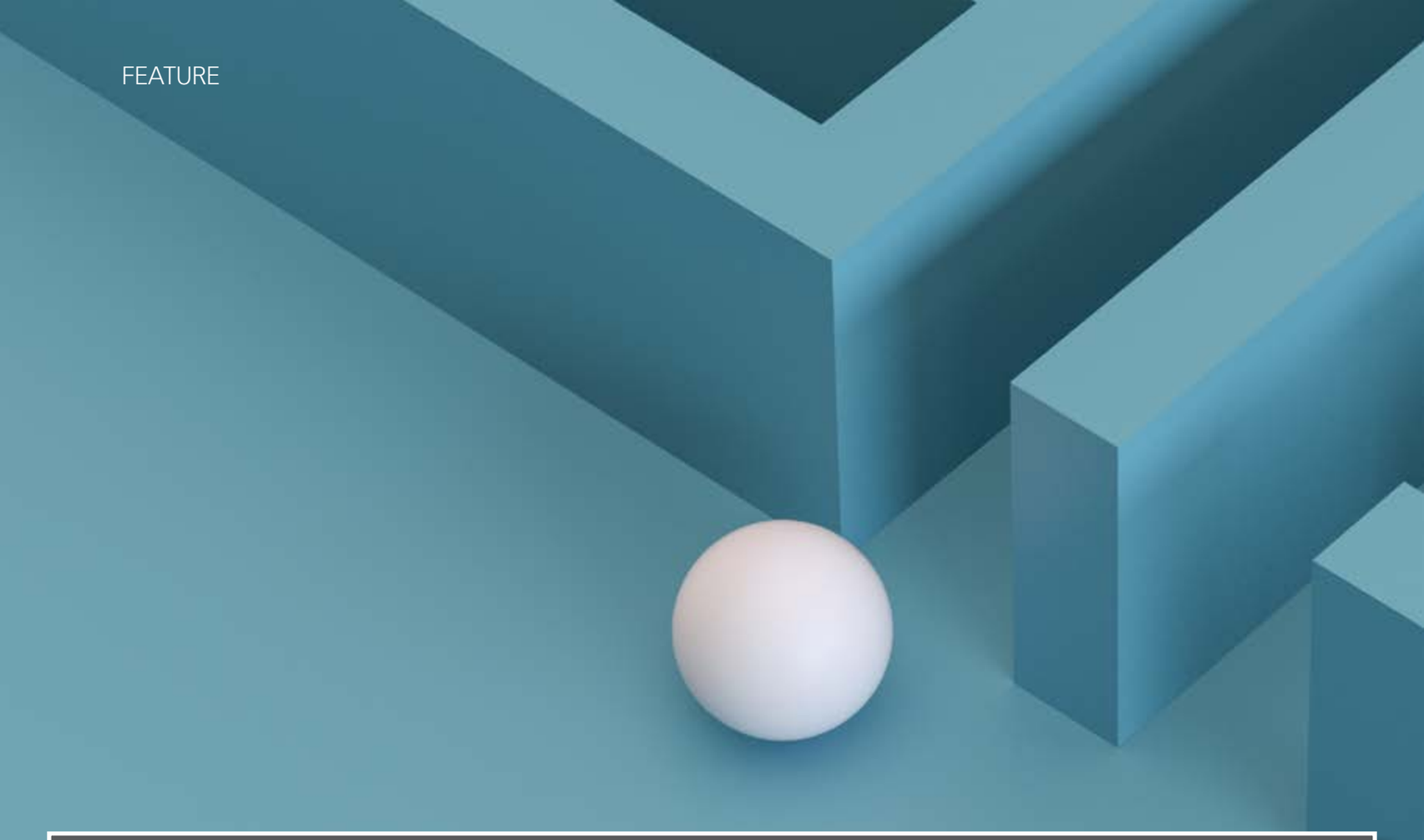
Public health laboratories continue to see similar benefits when automating workflows for tests that are associated with fluctuating testing volumes, such as seasonal pathogens. Megan Ahmann, a fellow at the State Hygienic Laboratory at the University of Iowa, utilizes automation to support their environmental surveillance efforts in ticks in addition to their other clinical LDTs.

"We were able to create bi-directional interfacing between the Panther Fusion system and our LIMS," said Ahmann. "Through this process, our LIMS directs worklists of specimen IDs and their assigned assays to the Panther, and in turn, the Panther automatically relays and populates the results after processing back to our LIMS in real-time. This feature virtually removes the need for manual test assignment, eliminates technician transcription error when resulting, and significantly reduces overall turnaround time, especially with high-volume testing. For laboratory-developed PCR assays, this seamless sample-to-result workflow is the new gold standard."

While the Open Access functionality on Panther Fusion enables laboratories to implement their own customized testing solutions, it has also allowed Hologic to rapidly develop Emergency Use Authorization tests in the past to respond to emerging health threats (e.g., SARS-CoV-2), and could be similarly utilized in the future for new emerging pathogens.

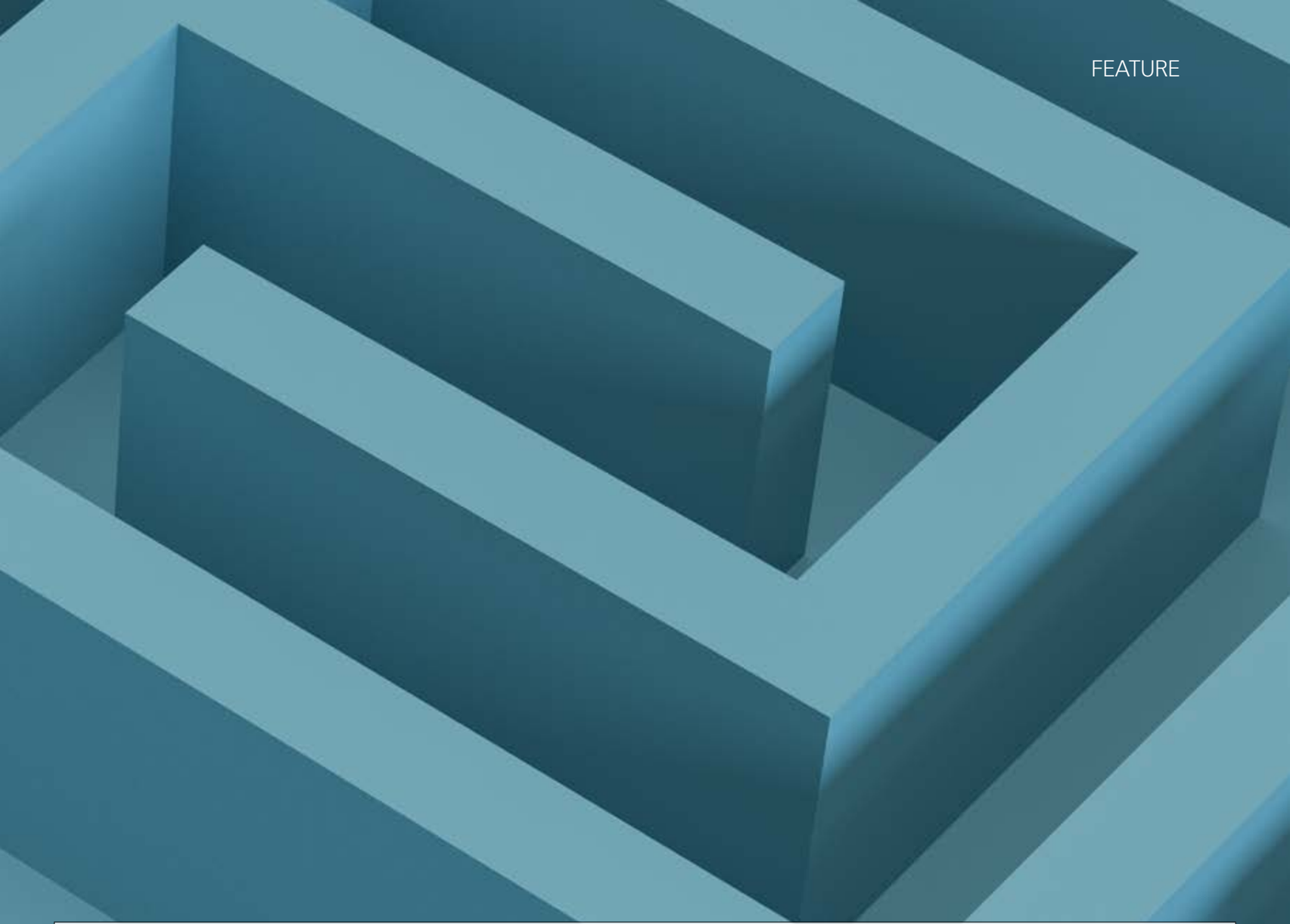
Whether it be for outbreak response or routine surveillance efforts, Panther Fusion's Open Access functionality empowers public health laboratories of all shapes and sizes to automate their testing on a sample-to-result, flexible throughput molecular testing system. ■

Hologic is an APHL Diamond Level Sustaining Member.



Laboratory-developed Tests: An Uncertain Path

By Dara Chadwick, writer



Public health laboratories have long relied on laboratory-developed tests (LDTs) to meet emerging and other public health needs. LDTs enable flexible, nimble responses to needs in large and small geographic regions and in specific populations. These tests play a critical role in disease surveillance, outbreaks, newborn screening and environmental exposures, as well as in developing disease treatment and prevention guidelines and in promoting health equity.

Yet the continued and future use of LDTs in public health laboratories is now uncertain. On May 6, 2024, the US Food and Drug Administration (FDA) published its Final Rule: Medical Devices; Laboratory Developed Tests. This rule adds FDA oversight to the creation and use of LDTs, classifying in vitro diagnostic products as medical devices under the Federal Food, Drug, and Cosmetic Act—including when the manufacturer of the IVD is a laboratory.

It's a change that promises to re-shape not only laboratory processes, but also how public health laboratories both respond and innovate.

"It's a shift in mindset and it will change approaches and which LDTs you choose to bring on," said Kara Levinson, PhD, MPH, D(ABMM), director of the Tennessee Department of Health Division of Laboratory Services.

Her laboratory uses LDTs on the clinical side for infectious disease testing and in the newborn screening program. "We're part of LRN-B and LRN-C," she said. "We have an environmental testing division and while we do use lab-developed tests in that division, they're done in accordance with ISO 17025 standards, which are different compared to where this LDT rule impacts."

Levinson stressed the critical role of LDTs in public health. "I don't want people to stop doing LDTs because we can't stay stagnant in public health," she said. "We absolutely need to continue to bring on new tests and modify tests to meet needs. We're just going to have to go about it a different way based on this LDT rule."

The Power of LDTs

Meshel Lange, MS, laboratory manager and chemical threats coordinator for the LRN-C Program at the Wisconsin State Laboratory of Hygiene (WSLH), oversees the laboratory's Chemical Emergency Response Section. "A significant percentage of clinical testing work done in our public health lab is LDTs," she said. "As the state public health lab, WSLH utilizes LDTs to meet a variety of needs to serve the people of Wisconsin."

LDTs are a powerful tool to help states, counties, and municipalities meet emerging public health threats. Lange cited a multi-state chemical threat event that occurred in 2018 as an example. Multiple individuals were exposed to brodifacoum (an anticoagulant rodenticide) via smoked synthetic marijuana products.

Healthcare professionals use vitamin K to treat brodifacoum exposure. Yet at that time, no clinical quantitative testing capability for brodifacoum exposure existed, Lange said. This left doctors without critical information to determine the appropriate vitamin K dosage for treatment.

WSLH sprang into action, standing up a new LDT in about three weeks, according to Lange.

> **"Use of LDTs lowers test cost when compared to commercially available kits... Using LDTs allows newborn screening programs to add screening for new disorders in a relatively rapid manner, thus alleviating the delay of waiting for FDA clearance."**
>
> Joseph J. Orsini, PhD

"We were the only lab in the country that had this capability at the time, and we were able to meet a multi-state need for testing to support the response," Lange said. "The high degree of technical skill and capability to stand up what's needed, when it's needed, has been and will continue to be found within state public health laboratories and the response partnerships established throughout the country."

LDTs have also helped expand testing for new disorders at a faster rate in newborn screening programs. Joseph J. Orsini, PhD, deputy director for the Newborn Screening (NBS) Program in the Wadsworth Center at the New York State Department of Health, said his laboratory has used LDTs to initiate screening for several new disorders, including Krabbe disease, Pompe disease, adrenoleukodystrophy and guanidinoacetate methyltransferase (GAMT) deficiency, among others. NBS also uses LDTs for amino acid/acylcarnitine testing, as well as for biotinidase and galactosemia. "Because we are an early adopter of new tests, we have relied on LDTs to test for conditions," Orsini said. "We have provided these data for evidence review and served on technical expert panels for the Advisory Committee on Heritable Disorders in Newborns and Children."

Both Lange and Orsini noted the cost-effectiveness of LDTs. "Use of LDTs lowers test cost when compared to commercially available kits," Orsini said. LDTs also lower programmatic costs, which Orsini said "allows us to evaluate and implement tests for other disorders, including newly approved tests and those under consideration for addition to the federally recommended uniform screening panel (RUSP). Using LDTs allows newborn screening programs to add screening for new disorders in a relatively rapid manner, thus alleviating the delay of waiting for FDA clearance."

Orsini said New York has been able to implement LDTs before some FDA-cleared kits become available. "Without the LDTs, the FDA-cleared kits may not have been developed," he said. "I believe data generated from LDTs facilitate a manufacturer's development of a test that ultimately becomes cleared by the FDA."

LDTs also enable states to meet statutory requirements for testing for conditions within a predetermined timeframe, according to Orsini. "Without LDTs, at least to start, states are at risk of violating their own laws," he said.

Lange said LDTs help ensure access to certain tests in under-served communities, such as clinical blood lead testing. Using LDTs, public health laboratories can continue to advance technology while developing cost-effective testing, she said.

A Changing Process

Developing a new LDT begins with identifying a specific need, Lange said. Proposed tests go through an approval process that includes investigation development, proof of concept, methodology validation and testing of system compliance with all regulatory standards. At WSLH, a Clinical Laboratory Improvement Amendments (CLIA)-certified and College of American

Pathologists (CAP)-accredited laboratory, a final review by the CLIA/CAP laboratory director occurs before any clinical inpatient testing.

"It's a very prescriptive process," Lange said. "We are validating a methodology in conjunction with a test system to meet a need."

After a method has been published, LDTs in Orsini's laboratory undergo rigorous testing of how well the method works, he said. LDTs are formally validated using guidelines from New York State's Clinical Laboratory Evaluation Program (CLEP).

The new FDA rule for LDTs states that a laboratory with a New York State permit, qualified director, and LDTs reviewed and approved by CLEP will not be required to have their LDTs reviewed by the FDA, according to Orsini. Yet as a whole, New York's public health reference laboratory and other clinical laboratories regulated by the CLEP system must meet other requirements as FDA's policy is phased in over the next four years, he said. "The Wadsworth Center is currently reviewing the new rule to identify areas that may be impacted," Orsini said.

Lange said she expects the new FDA rule to mean the end of some LDTs used at WSLH. Adhering to the new requirements will increase the need for resources, such as additional staffing, computer systems and legal consultation.

"Due to the financial constraints of being a state public health laboratory, this is stopping our implementation of new LDTs," she said. "In fact, we also have a timeline to take down LDTs as the ruling is limiting our ability to plan for and respond to future needs. We will have to adapt and adjust with what we have since we have no funding to support additional resources to meet these FDA requirements."

Cost is a critical part of the conversation about how the FDA rule may affect public health laboratories, according to Mandi Cosser, MPH, manager, regulatory and public policy for APHL. The cost burden is intensified in laboratories making modifications to FDA-approved tests, which then become classified as LDTs. "Public health laboratories have such limited operating budgets, and every dollar counts," she said.

> **"How we support innovation in laboratory testing may have to shift. We may become advisors to industry rather than the doers who can quickly stand up and meet the needs of the communities we serve."**
>
> Meshel Lange, MS

In addition to increasing costs, Lange said she also expects the new rule to affect innovation.

"How we support innovation in laboratory testing may have to shift," she said. "We may become advisors to industry rather than the doers who can quickly stand up and meet the needs of the communities we serve."

Lange said the rule may also have a longer-term impact on the public health laboratory workforce—one that may place public health in an uncompetitive position with industry.

"We have a lot of talented staff that want to work in emergency preparedness and response," she said. "You get to be that novel method development chemist, QA officer or response chemist that's actively helping to meet needs we see. That's a unique role. There's a potential for loss of talent, which has been a critical issue for public health laboratories across the country."

Flexibility—But How Much?

Levinson said LDTs provide her laboratories with flexibility. "We use LDTs not only to meet emerging and other public health needs, but also to tailor our testing to the needs of our state and of the population within our state," she said.

LDTs come in many flavors, she added. An LDT may be a modification to an existing FDA-approved test or a test that has been fully developed in the laboratory—or something in between. As an example, Levinson cited a test that may have been approved by FDA but not for a pediatric population. That's where the flexibility of LDTs matters, she said.

"We can bring on this test and validate it for that population," Levinson said. "It would be an LDT, but we could still meet the needs of pediatric patients. That's the kind of flexibility I see us needing to retain. If we're not able to do that and can't offer that testing, we're not meeting the needs of our clinicians and of Tennesseans."

When asked how the FDA rule could affect the flexibility to modify existing tests, Levinson said, "A lot of it is unknown, and that's causing concern and anxiety for myself and my team. Broadly speaking, in talking with colleagues, there's certainly potential for this LDT rule to slow our ability and our speed to respond to urgent or novel public health needs if we now have to submit tests for approval."

Some enforcement discretion will continue to be allowed under the FDA rule, potentially providing relief. "I consider that a huge win because that would have a drastic negative effect on laboratories if we didn't have that flexibility built in," Levinson said.

Historically, enforcement discretion and laboratory director approval allowed LDT development to move quickly in response to urgent needs. Levinson noted the inclusion of a carve-out in the final rule for immediate response.

"We've seen that come into play already with H5N1 for avian influenza," she said. "My concern is about the unknown and trying to predict how FDA will actually employ this for future emergent needs, at what scale and how much flexibility we're going to retain."

How Public Health Laboratories Are Adapting

Amid the uncertainty of some unanswered questions—particularly around LDTs involving toxicology—public health laboratories are preparing to meet the May 6, 2025, deadline for complying with the first stage of the new FDA rule.

Stage one requirements focus on medical device reporting, quality management systems, and correction and removal reporting requirements. "The good news is that we already have that structure in our laboratory," Levinson said. "We're going to lean on our quality assurance team and structures like our document control system and build them out to take us to that May 2025 deadline."

Public health laboratories are also working together to help ensure readiness to meet the rule's phased requirements. Lange said her laboratory is maintaining a catalog of resources, including what other states are doing.

Levinson encouraged colleagues to make use of all available tools. "FDA has provided a lot of information," she said. "The LDT Task Force at APHL has made sure tools and resources are there to help laboratories understand what this rule is, how it will affect them, and what they need to do to comply. If you don't have strong infrastructure in place, there are tools to help you."

According to Levinson, Southeast ColLABborators have been talking about ways they can lean on each other, including potentially regionalizing some testing. "Maybe we don't all have to reinvent the wheel," she said. "Regionalized testing may help us meet those needs at a scale that's a bit bigger than our individual jurisdictions."

Yet Levinson noted that public health laboratories may face more significant preparatory challenges as deadlines for subsequent stages of the FDA rule approach.

"Requirements are going to get further and further from the processes we have in place and require more system and process building," she said. "That's going to take time and staff that we haven't currently allocated for. My level of concern goes up as I look toward subsequent rollout of various phases. But we have time, and we'll meet those deadlines as they come."

The new LDT rule represents a "paradigm shift" in how public health laboratories approach regulation of their tests, according to Levinson. "It's a big change," she said. "At the end of the day, we all want the same thing—accurate and timely tests that meet the needs of our patients and our populations. I think that's at the heart of the FDA's goals and of all our federal partners. We all want the same thing. It's a matter of coming to agreement on how we get there. This rule is in effect and the silver lining is it's an opportunity to look at our current system for quality and make it more robust." ■

Tools and Support for Public Health Laboratories

APHL has assembled the LDT Task Force, a core team of APHL member quality and subject matter experts, to interpret and communicate the requirements of the FDA final rule, according to Mandi Cosser, MPH, manager, regulatory and public policy for APHL.

"As we look at these stage-one requirements, laboratorians are understanding that this is good laboratory science," she said. "Clarification and additional information are needed on how we implement record-keeping correction and removal reporting. APHL is working on a guide to meeting stage-one requirements."

Cosser said APHL will continue to support members with information and tools as a consolidated lawsuit against FDA by the American Clinical Laboratory Association and the Association for Molecular Pathology unfolds.

There is also some uncertainty around the rule's future with a new administration, according to Cosser. "We'll continue to update members every time we learn more information," she said. "Until then, we're here to support members as they keep moving forward."

APHL has created several resources to assist members with complying with the FDA final rule:

- A Laboratory Developed Test Regulation webpage with information, history and guidance, as well as links to FDA resources and other resources
- Email updates to members on actions taken

Members who have questions about the FDA final rule on LDTs should email LDTquestions@aphl.org.

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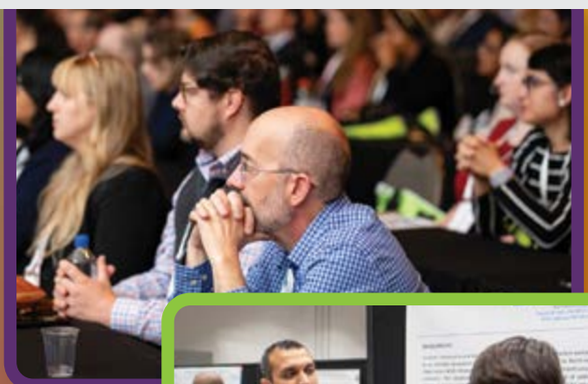
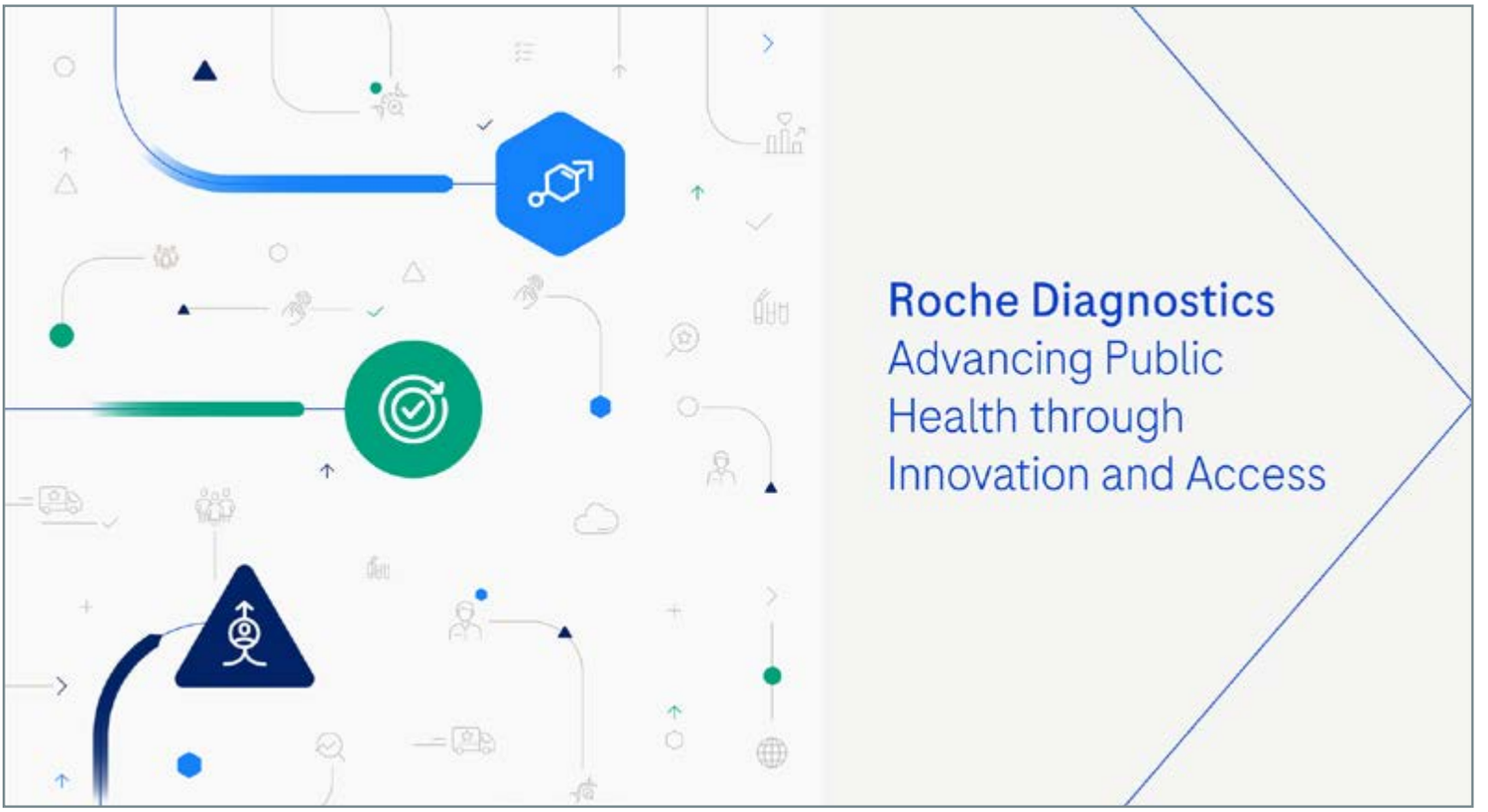


Sustaining Member Spotlight: Roche



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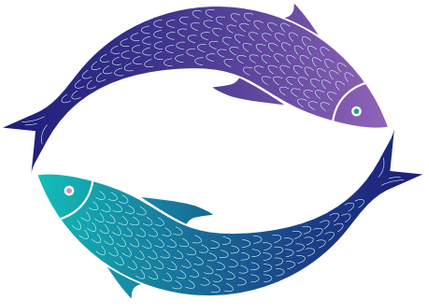
The Need to Act Now on Mercury Testing

By **Eric Bind**, program manager, New Jersey Biomonitoring and Exposure Assessment Program, New Jersey Department of Health, Environmental and Chemical Laboratory Services and **Jennifer Liebreich**, senior program manager, Environmental Health

Long-standing public health threats, such as *salmonella* and lead, as well as emerging concerns, like per- and polyfluoroalkyl substances (PFAS) and COVID-19, rightfully receive much attention. Public health laboratories play a leading role in the ongoing, successful responses to these threats. While limited resources restrict a laboratory's ability to address every threat, mercury is a global health crisis that merits attention not only due to its toxicity and prevalence, but also because of environmental concerns affecting communities disproportionately. Mercury exposure can lead to neurological, endocrine, renal and other serious disorders, with these effects more pronounced in children and developing babies. Importantly, reductions in mercury exposures may be achieved faster with fewer resources than other chemicals (e.g., lead and PFAS) by using exposure reduction strategies, such as product and fish advisories.

Mercury is a toxic metal that people may encounter in four main forms: methylmercury, ethylmercury, inorganic mercury and elemental mercury. Methylmercury is the most toxic form and is associated with fish/seafood consumption. Ethylmercury is found primarily in preservatives. Inorganic mercury is commonly found in skin lightening products (SLPs) and ayurvedic medicine. And elemental mercury is present in dental amalgam, compact fluorescent lightbulbs (CFLs), and other consumer goods. While many industrial applications have been phased out, there is continued exposure potential from residual, imported and unanticipated sources. All mercury is toxic and bioaccumulates in humans with a one- to two-month half-life in blood.



Lead	Mercury
CDC Reference Value - 3.5 µg/dL • Routinely evaluated	**No Reference Value** • Limits vary by state—not health-based
Screening Policies and Guidelines • Universal childhood lead screening recommeded • States have individual rules—mandatory tagging	**No Screening Policies or Guidelines** • No universal screening recommendations • States have limited reporting requirements
Medical Treatment Protocols • CDC guidelines based on exposure level • Well-established, consistently applied	**No Medical Treatment Protocols** • No immediate treatment protocols • No long-term monitoring protocols
Tracking and Response • State child and adult lead programs • Federal and state funding for tracking • HUD and other funding available for clean up	**Limited Tracking and Response** • Limited or no state tracking programs • Limited or no funding for tracking • Limited or no funding available for clean up
Products Limits and Bans • FDA limit for baby food • National bans on lead in products	**Limited Product Testing and Bans** • No limits for food—guidance for fish • Limited bans on products—varies by state; limit too high

Figure 1.

Building a Public Health Response Infrastructure…

Some public health laboratories are already addressing the mercury crisis. Health departments in California, Minnesota and New York City use laboratory data to eliminate mercury-added SLPs from the market. Laboratory data identify communities at higher risk of exposure, including populations that are foreign-born, minority or receiving public assistance. Such data can inform public health action. New Jersey Biomonitoring data revealed that mercury exposure is highly prevalent with more than 10% of the state's population being above New Jersey's 5 µg/L health limit and approximately 60% of pregnancies tested in the state having mercury at levels potentially causing health risks.

A comprehensive mercury public health response entails: 1) reducing consumer demand through public education; 2) reducing supply through product restrictions and enforcement; and 3) laboratory testing to identify exposed individuals and contaminated products. Public health laboratories cannot ban products but can generate the human biomonitoring and consumer product data necessary to inform policy decisions. Such data led to the dental amalgam ban in the European Union, which went into effect January 1, 2025.

…And Seeing the Effects

The United States has reduced lead exposure by 93% over the last six decades.

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Partnerships Yield New LRN-B Protocol for Testing Waterborne Pathogens

By **Sydney Comet**, associate specialist, Environmental Health; **Brigid Bollweg**, laboratory scientist, Minnesota Public Health Laboratory; **Haley Ersfeld**, laboratory scientist, Minnesota Public Health Laboratory; **Agata Figurniak**, laboratory preparedness scientist, Colorado Department of Public Health and Environment; and **Ashley Luntsford**, MLS(ASCP), laboratory preparedness scientist, Colorado Department of Public Health and Environment

Waterborne Pathogens and LRN-B

The Laboratory Response Network (LRN) was established in 1999 by a partnership between the US Centers for Disease Control and Prevention (CDC), APHL and the Federal Bureau of Investigation, with the goal of strengthening laboratory systems in public health emergency responses. The LRN works to ensure public health laboratories are ready to respond to emergency events that put the public at risk, whether it be from biological agents (LRN-B) or chemical agents (LRN-C). The first major LRN activation was in 2001, when envelopes containing anthrax spores were mailed to prominent politicians and news media offices. Since then, the LRN-B has expanded to 120 participating laboratories and has increased testing capacity to include a wide variety of matrices, including clinical specimens, food, animal and environmental samples.[1]

Waterborne pathogens have the potential to rapidly cause mass infection in large populations. Both intentional and non-intentional contamination can occur in drinking, recreational, ground and surface waters, or artificial water venues such as splash pads. Timely and efficient responses are critical when water supplies become contaminated. To ensure health departments and laboratories are properly prepared for these types of events, CDC and the US Environmental Protection Agency (EPA) developed the joint Protocol for Collection of Water Samples for Detection of Pathogens and Biothreat Agents, which provides guidance on concentrating large volumes (>100 L) of water for detection of low-concentration pathogens in large water systems.[2] In turn, CDC has recently updated the only water-related LRN protocol for processing these large-volume water samples concentrated on ultrafilters in the field. By conducting the filtration at the point of sampling, the updated LRN protocol significantly decreases the biosafety risk during transport and laboratory processing.

References:

1. CDC. About the laboratory response network. The Laboratory Response Network Partners in Preparedness. https://www.cdc.gov/laboratory-response-network/php/about/index.html
2. Gallardo, Vincent, S. Shah, M. Mattioli, AND K. Berling. Protocol for Collection of Water Samples for Detection of Pathogens and Biothreat Agents. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-21/280, 2022.

Multi-center Evaluation Study

CDC has partnered with APHL to conduct a multi-center evaluation (MCE) to test the updated protocol performance and reproducibility. Five state public health laboratories that are active members of the LRN-B volunteered to participate in the study: the State Laboratory at the Colorado Department of Public Health and Environment (CDPHE), the Florida Department of Health Bureau of Public Health Laboratories, the Idaho Bureau of Laboratories, the Minnesota Department of Health Public Health Laboratory (MDH-PHL) and the Virginia Division of Consolidated Laboratory Services. In October 2024, two members from each participating state laboratory traveled to CDC headquarters for a two-day, hands-on method training to learn specialized laboratory techniques more commonly used in environmental laboratories. In return, CDC and APHL learned more about each jurisdiction's response policies, challenges and strengths.

In response to the training, scientists from MDH-PHL remarked that "...attending hands-on training at CDC has been a great experience for us.... We are always enthusiastic about expanding our testing capabilities and collaborating with other laboratories. The comprehensive training and the support of APHL will be invaluable in the event of an outbreak situation."

During the 2024–2025 winter, the participating MCE laboratory scientists will receive spiked samples to test the water processing protocol in their BSL-3 laboratories and report this data to CDC and APHL. Their study

continued on page 22

Ten state laboratory scientists participated in the multi-center evaluation study, and one APHL staff member and two CDC staff members attended the method protocol training at CDC heaquarters. Photo: US Centers for Disease Control and Prevention.

APHL Leads Collaboration to Strengthen Data Exchange in Uganda

By **Rufus Nyaga**, informatics technical manager, APHL Kenya and **Matthew McCarroll**, MS, principal specialist, Global Health

The Central Public Health Laboratory in Kampala, Uganda.

"A little among neighbors is worth more than riches in a wilderness," goes a Welsh proverb. This proved to be true when Uganda and Kenya, two neighboring countries in East Africa, decided to work together to solve a common problem, with a little bit of help from APHL.

In April 2023, an assessment conducted by APHL revealed that Uganda's central public health laboratory (CPHL)—equivalent to a national reference laboratory—has six different laboratory information systems (LIS) collecting and storing surveillance data. This laboratory also receives, via email, sentinel surveillance data on outbreaks from hundreds of hospitals throughout the country in spreadsheet format. The collection of disparate LIS, spreadsheets and logbooks, while allowing for rapid roll out of data collection tools, can ultimately lead to an inefficient and timely process of getting quality data into the hands of health and emerging threat decision makers.

To solve this problem, APHL leveraged the digital health accomplishments realized in neighboring Kenya over the last decade. APHL worked closely with the Uganda CPHL and developed a schematic for a central laboratory data repository that would centralize all the CPHL and hospital electronic medical record (EMR) data. Following recent outbreaks of Ebola, mpox and the COVID-19 pandemic in Uganda, the Ministry of Health (MoH) had already prioritized the development of a national data warehouse that would collect and store all the health data in the country, ranging from case reports and hospital admissions to laboratory surveillance and confirmed clinical results. APHL's vision was for the data from the centralized laboratory data repository to have a single integration connection to the national data warehouse, enabling laboratory data to be used at the national level for a complete picture of emerging biological threats and subsequently lead to a more efficient threat response.

Rufus Nyaga; Matthew McCarroll; Paul Mbaka, director, Office of Information Technology and Communications, Uganda MOH; and Proscovia Nambuya, National Laboratory Systems Coordinator, Uganda CPHL, attending the Uganda Digital Conference.

APHL completed and launched the laboratory repository in May 2024 with four hospital EMR systems, and since then has added all the CPHL information systems as well as nine hospital EMR systems. At the recent Uganda National Digital Health Conference in November 2024, the Permanent Secretary (the most senior civil servant position in the MoH) officially launched Uganda's national data warehouse. APHL was present for this significant event and had an opportunity to engage in strategic discussions with the MoH on the collaboration between Uganda and Kenya and the digital health leadership demonstrated by both countries in linking laboratory and surveillance data. ■

Kakuma Ammusait Refugee Camp Laboratory Achieves ISO 15189:2022 Accreditation

By **Jully Okonji**, senior laboratory specialist, APHL Kenya; **Michael Ikuro**, medial laboratory scientist, Kakuma Ammusait Refugee Camp Laboratory; **Romeo Kithuka**, laboratory specialist, APHL Kenya; **Benson Kiptoo**, medical laboratory technologist, Kakuma Ammusait Refugee Camp Laboratory; **Peter Mundia**, Kakuma Ammusait Refugee Camp Laboratory; **Felix Shikomera**, laboratory technician, Kakuma Ammusait Refugee Camp Laboratory; **Sila Monthe**, health manager, Kakuma Ammusait Refugee Camp Laboratory; **Edwin Ochieng**, country director, APHL Kenya; and **B. Wailuba**, Kakuma Ammusait Refugee Camp Laboratory

The Kakuma Refugee Camp, the largest refugee camp in the world, was established in 1992 in northern Kenya following the civil war in Somalia and Sudan. Operated by the United Nations High Commissioner for Refugees (UNHCR), Kakuma is bordered by Uganda to the west, South Sudan to the north, and Ethiopia to the northeast. The camp hosts the Ammusait Hospital where both refugees and host communities seek healthcare services. The Ammusait Hospital is the largest referral hospital within a 300-kilometer (186 mile) radius.

In 2020, APHL, in collaboration with CDC, UNHCR and its implementing partner, the International Rescue Committee (IRC), established high-quality assured molecular testing capacity so that Ammusait Hospital could respond to the needs of refugees and local communities for SARS-CoV-2 testing during the COVID-19 pandemic. The establishment of the SARS-CoV-2 laboratory resulted in the elevation of the laboratory status and the request from the hospital's health management team to aspire for international accreditation status.

APHL trained laboratory staff in quality management systems (QMS), the ISO 15189:2022 guideline, internal audit and risk management practices. The laboratory QMS implementation used a phased approach with a facility-focused mentorship strategy based on the World Health Organization Regional Office for Africa's (WHO/AFRO's) Stepwise Laboratory Quality Improvement Process Towards Accreditation (SLIPTA). SLIPTA was established to support laboratories in the African region in improving their quality services at a time when very few laboratories were accredited in the region, and many countries did not know the best approach for implementation.

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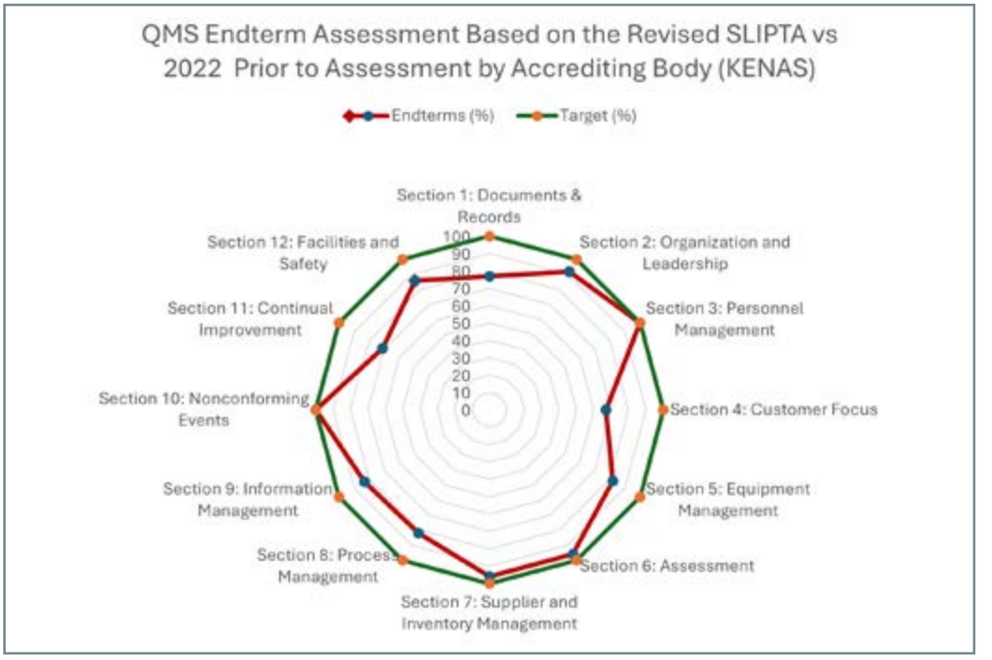

Figure 1. End-term assessments based on the WHO/AFRO-revised SLIPTA-2023. There were improvements in many of the quality essential areas resulting in a strong STAR 4 performance. This assessment was conducted prior to the KENAS accreditation assessment.

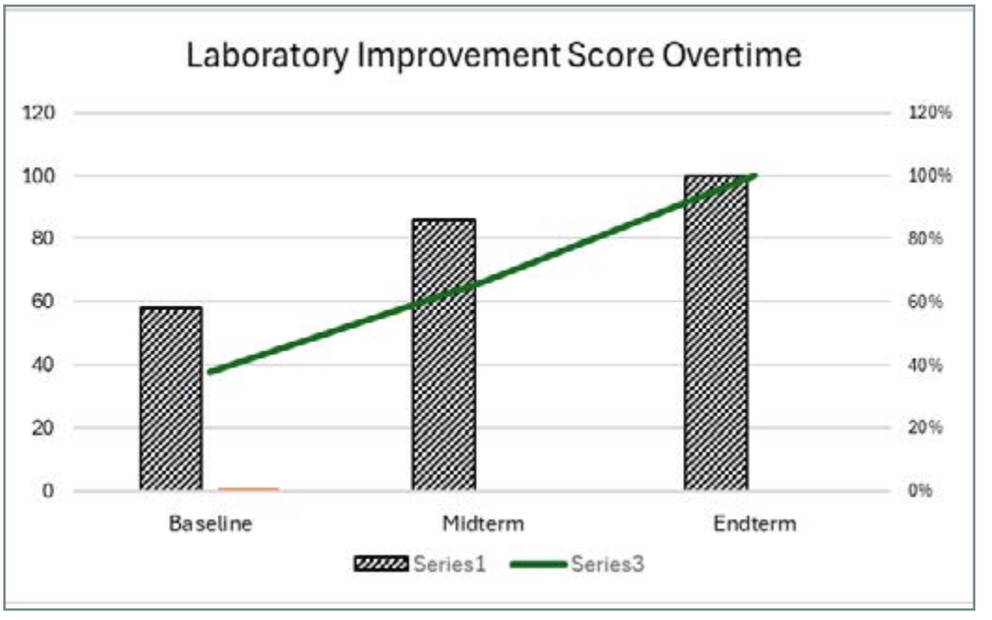

Figure 2. Percentage improvement in the laboratory score from baseline to end terms compared to the expected outcome. Results are presented in shows improvement in the laboratory scores in the implemented QSEs. An improvement from the baseline timepoint of 38% (STAR 0), Midterm of 66%, 2 STAR, and an end-term score of 88%.

Mercury Testing

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That effort provides an exemplary framework for a public health mercury response. As shown in Figure 1, policies and protocols in place for lead are lacking for mercury. Most public health laboratories currently lack the funding and response infrastructure to collect and test samples, provide environmental interventions or conduct enforcement around mercury. For example, SLPs can contaminate entire homes, from furniture to washing machines and require a complex, coordinated effort to mitigate. Further, medical knowledge and protocols are lacking for treatment of and follow-up care for mercury exposed individuals.

Behavioral change efforts can reduce personal mercury exposure, as seen in New Jersey where varying fish size consumption led to more than 90% reductions in individual exposure levels.

Encouragingly, there are short- and long-term steps that can immediately reduce mercury exposure levels. Level 1 and 2 Laboratory Response Network for Chemical Threats (LRN-C) public health laboratories can conduct mercury testing and initiate small-scale biomonitoring studies. Individuals can switch from eating large to small fish, from using CFL to LED lightbulbs, and from dental amalgam to resin. Such individual actions entail minor cost differences and lower risk and mercury levels within months. Note: SLPs present a challenge as they are targeted at minorities and there are documented societal and occupational costs associated with cessation. Public health laboratories can leverage existing programs (e.g., LRN-C, childhood lead, communications, product enforcement) to address mercury exposures and sources. Public health laboratories and health departments can assume a role in improving health outcomes in populations exposed to mercury. ■

LRN-B Protocol

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participation will further LRN's mission of ensuring emergency readiness by validating an important method that may be used in response to a variety of water contamination events. APHL hopes to support these state laboratories' diligent work in addressing critical gaps in environmental microbiology testing and will continue to support similar professional opportunities for laboratory scientists.

Scientists from CDPHE commented that their experience in the MCE study has been a very good learning experience. "It has been a great experience learning new lab techniques and being a part of something big and important. This MCE study has definitely strengthened not only my confidence in myself and my lab abilities, but also my feeling of the importance of what we do as an LRN lab."

The work benchtop laboratory scientists do every day is a critical—but sometimes removed—element of public health protection. Hands-on training and professional development opportunities such as the MCE study help to connect laboratory scientist's work to tangible public health impact, retain skilled workers and strengthen the laboratory workforce. ■

Kakuma Laboratory

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Key Outcomes

- Kakuma Ammusait became the first laboratory in a refugee setting globally to attain international accreditation status.
- Kakuma Laboratory achieved its accreditation within 15 months of active QMS implementation, significantly improving services.
- The laboratory workload increased from 56,000 patients served in 2023 to 103,000 in 2024.
- The laboratory test on accreditation scope at the time of accreditation was 75%, which is the highest among the laboratories in Kenya.
- Capacity developed for SARS-CoV-2 is currently put into use for mpox PCR testing.
- Wastages due to supply expiration have significantly dropped from 30% to less than 5%.

Lessons Learned

- It is possible to implement QMS in a hard-to-reach, refugee setting with limited infrastructure and still be able to offer quality-assured services.
- Providing quality services is essential in vulnerable states. Improving patient management and reducing the cost of operation associated with wastage laboratory improvement resulted in an increase in workload over time as seen in the previous results shared, with patients and other laboratory users showing trust and reliability in the results issues.
- Strong support and collaborative teamwork from IRC field management, Senior Management Team, and APHL teams enhanced the efforts toward accreditation.
- Regular QMS and risk management training empowered staff, ensuring they were well-prepared and engaged in the ISO 15189:2022 transition.
- Utilizing the WHO/AFRO SLIPTA checklist provided clear benchmarks, allowing for the systematic identification of gaps and monitoring of improvements.
- Leadership's active engagement fostered ownership and accountability among staff, contributing to a seamless accreditation process.

Implementation of the ISO 15189;2022 at Kakuma Laboratory resulted in improvement in service delivery and efficiency in service provision. APHL continues to support workforce development, specifically in training the IRC staff, most of whom are typically refugees themselves working in this laboratory. ■

Introducing the **Human & Animal Food Laboratory Professionals Curriculum Framework**

The Laboratory Curriculum Framework is a competency-based curriculum framework — a career-spanning, visual schematic — for human and animal food laboratory professionals. The framework is being used for:

- Training development
  courses and other learning events
- Cataloging existing training
- Career development
- Competency assessment

The goal of this framework is to foster a competent workforce trained to a consistent standard. While this framework was originally created for analysts working in human and animal food laboratories, many competencies and training materials have a broader reach.

Learn more and start using the framework and evaluation tools at **www.aphl.org/HAFL-Framework**

Framework Levels

The framework spans four professional levels (entry, mid, expert and director), and depicts the content areas in which laboratory professionals must possess competencies (i.e., knowledge, skills, abilities, behaviors and attributes) in order to successfully perform their job functions.

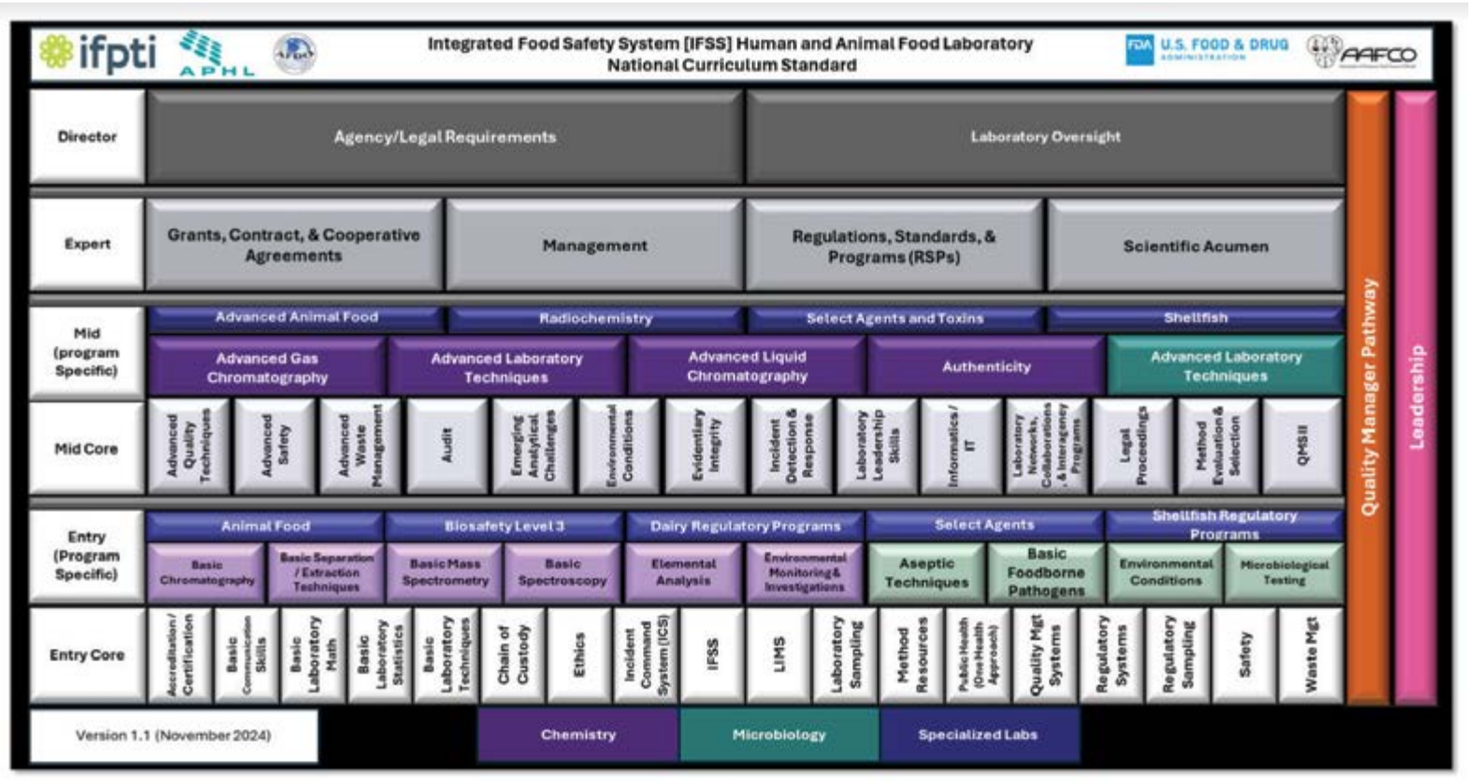
Building Analyst Competency

The framework outlines the competencies that laboratorians should possess in various stages of their career and in various disciplines (microbiology, chemistry, specialized testing). You can use these competencies to determine where you or your supervisee have knowledge gaps and identify learning resources to gain these competencies.

Competencies List: **www.ifpti.org/ncs-lab-competencies**
Interactive Framework: **www.ifpti.org/ifss-lab**

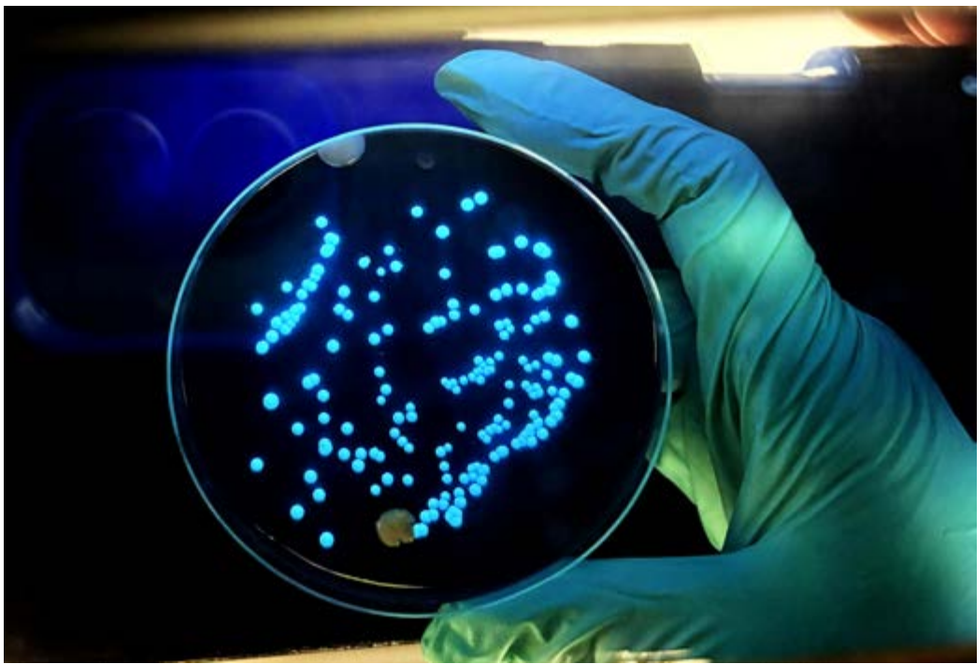
Training Available

Competency-based training courses are currently in development to complement the curriculum framework. These courses can be found on the APHL Learning Center at **learn.aphl.org/learn**.



Expanding Access to *Legionella* Testing with the *Legionella* Reference Center

By **Valérie Reeb, PhD**, assistant research scientist, State Hygienic Laboratory at the University of Iowa, and **Elizabeth Toure**, MPH, senior specialist, Infectious Diseases



Legionella anisa isolated by the LRC at the State Hygienic Laboratory fluoresce blue-white under UV light. Photo: Valérie Reeb.

>260

Specimens, samples and isolates were tested during the *Legionella* Reference Center's first year.

26

Public health laboratories have enrolled to date.

9

Legionnaires' disease public heatlh investigations have been supported.

When Oklahoma State Department of Health Communicable Disease Epidemiologist Carolyn McCrea, MS, started working on Oklahoma's first Legionnaires' disease (LD) investigation in several years, the aptly nicknamed "water queen" got right to work identifying possible sources of exposure to the potentially deadly bacteria. After a tight cluster of LD cases was reported with a history of staying at the same hotel, McCrea and her colleagues consulted with US Centers for Disease Control and Prevention (CDC) epidemiologists to develop a plan to conduct an environmental assessment at the hotel in April 2024.

Environmental samples would need to be collected and tested to confirm their suspicions; however, the Oklahoma State Public Health Laboratory does not conduct *Legionella* testing, and sending samples to a commercial laboratory would be cost-prohibitive and potentially limit the scope of the sampling. Luckily, McCrea was able to submit a request for environmental testing assistance with the *Legionella* Reference Center (LRC). McCrea and the team collected water and swab samples from the hotel and coordinated with the Oklahoma State Public Health Laboratory to package and ship the samples to the LRC. The LRC quickly turned around the results, ultimately confirming the epidemiologists' suspicions and allowing further public health actions to be taken to remediate the issue.

The *Legionella* Reference Center

APHL and CDC launched the *Legionella* Reference Center in fall 2023 at the State Hygienic Laboratory at the University of Iowa to improve access to high quality *Legionella* testing for governmental public health and environmental laboratories. The LRC provides culture and molecular testing for *Legionella* from clinical specimens, environmental samples and *Legionella* isolates submitted by laboratories. Next-generation sequencing capability will soon be available to aid with further strain characterization, providing valuable supporting evidence that, when combined with traditional epidemiologic investigation, aids in linkage of clinical cases to environmental sources.

LRC tests both clinical and environmental samples and isolates. Requests for environmental sample testing in support

State Hygenic Laboratory Environmental Laboratory Specialist Carrie Lueck filters water samples received by the LRC to prepare the samples for culture. Photo: Valérie Reeb.

Carrie Lueck plates filtered samples received by the LRC and acid washed filtrates on buffered charcoal yeast extract agar. Photo: Valérie Reeb.

of case and outbreak investigations first go through a pre-approval process to ensure that a proper sampling plan has been developed, and that the nature of the outbreak warrants the use of LRC resources. It supports LD outbreak investigations through a highly collaborative process between laboratory and epidemiology staff from the submitting laboratory, CDC and LRC. CDC and LRC can provide additional guidance on developing a sampling plan and ensuring proper sample collection, handling and shipping. Additionally, LRC offers environmental sample collection kits (available for purchase) tailored to each outbreak investigation that can be shipped to the laboratory ahead of their planned sample collection. Upon completion of testing, LRC and CDC are also available to support result interpretation and next steps.

For the State Hygienic Laboratory, serving as the LRC has been a rewarding experience. According to co-principal investigator Valérie Reeb, "Being involved in the LRC gives us the opportunity to collaborate with *Legionella* experts from across the country and to follow the entire *Legionella* investigation process from initial assessment to potential remediation, thus increasing our knowledge for solving outbreaks."

Improving Public Health Through Increased Access to *Legionella* Testing

The LRC plays an important role in the national *Legionella* testing landscape. The added capacity provided by the LRC for environmental sample testing during outbreaks enables more comprehensive investigations in jurisdictions without laboratory capacity and in those whose internal capacity is temporarily exceeded. For the Oklahoma State Department of Health, utilizing the LRC is now written into their LD outbreak investigation protocol, enabling more timely and comprehensive LD investigations and ultimately safeguarding public health statewide.

To learn more and enroll in the LRC, visit APHL's website. ■

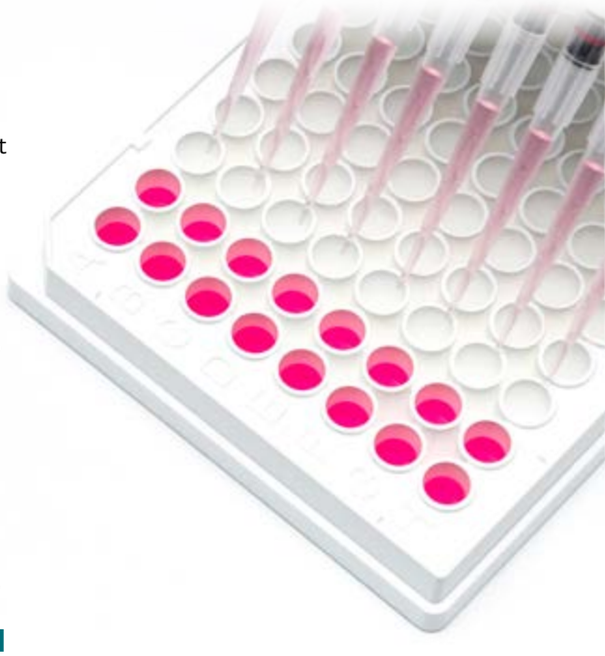
CDPHE Welcomes APHL Members to New Training Laboratory Space for MAC-ELISA Course

By **Tracy Stiles**, lead specialist, Infectious Diseases

In October 2024, the Colorado Department of Health and the Environment (CDPHE) unveiled their newly renovated training laboratory space by hosting two consecutive laboratory workshops on the US Centers for Disease Control and Prevention (CDC) MAC-ELISA assay (CDC IgM antibody capture enzyme-linked immunosorbent assay). Over the course of one week, 30 participants were trained from 27 states in one of two consecutive 2.5-day workshops.

As one of the most versatile assays for detection of arboviral infections, it is critical for laboratories to maintain MAC-ELISA competency since it is likely to be among the first developed for new or emerging pathogens. Colorado was an obvious choice to host this workshop given their proximity to CDC partners in Fort Collins. Subject matter experts from state and local public health laboratories around the country were asked to serve as faculty for the course. Staff from CDPHE and APHL worked closely with identified faculty to determine how to best utilize the new laboratory to optimize classroom and laboratory space to train a new workforce in this important assay.

The new training laboratory has a good balance of classroom and laboratory space separated by a moveable glass partition, which allowed faculty to have eyes on the participants in the laboratory, and for the participants to see notes and instructions left on the white boards in the classroom. Despite challenges, including a hurricane that impacted travel for one faculty member and two participants, the two workshops were a huge success, due in large part to the extraordinary partnership between APHL, CDPHE leadership and staff, and the skilled expertise of the selected faculty. ■



MEMBER EXCLUSIVE

The Public Health Pricing List

The Public Health Pricing List is a *members-only* listing of discounts and special offers that APHL negotiates with corporate partners.

You can get **special pricing for instruments, service agreements, equipment, testing supplies, PPE and more** from companies such as Bio-Rad, Luminex, Roche Diagnostics, QIAGEN, Promega, SCIEX and Waters.

Check out the savings!

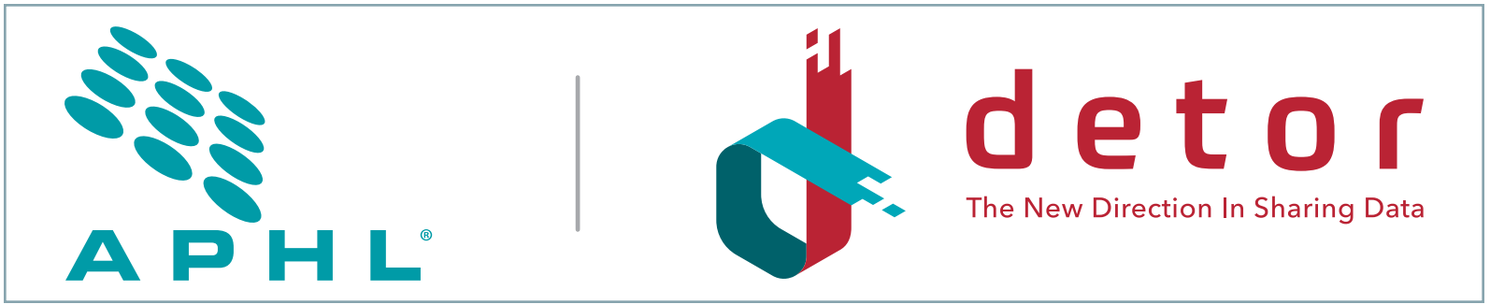
Log in to APHL.org and visit MyAPHL
Your Resources > Member Resources > My APHL

This list is only available to the APHL member representatives and member associates who have been given membership rights under your lab's APHL membership.

For more information about the public health pricing list discount offerings, please contact Camille Walker, manager, Corporate Relations, camille.walker@aphl.org.

Detor: APHL's National Public Health ETOR Solution Now in Production

By **Rachel Shepherd**, senior specialist, Informatics



In August 2024, APHL went into production with its electronic test order and results (ETOR) solution, Detor, with initial implementers Orlando Health and the Florida Department of Health. Detor is a solution hosted on the APHL Informatics Messaging System (AIMS) Platform that links a hospital's electronic health records (EHR) system with a public health laboratory's information management system. Florida was one of the early states to express interest in adopting Detor to connect with hospitals submitting newborn screening test orders. They were able to secure an ETOR partnership with their highest volume submitter, Orlando Health, encompassing four birthing hospitals.

Since going live, they have seen a nearly two-day improvement in newborn screening result availability. Additionally, it has eliminated the need for any sort of manual intervention or data entry, saving what amounts to hundreds of hours of time for hospital staff each month. The immediate sending of results directly into the hospital's EHR also means that results are available directly in a patient's chart; this new digital format creates easy accessibility and transferability for providers who may need access over the course of a baby's healthcare journey.

Detor is currently in the implementation phase with three other states slated to go into production in spring 2025. Detor is also planning larger scale expansion to more laboratories, hospitals and tests beyond newborn screening in 2025.

The Need for Detor

Healthcare depends on public health laboratories to conduct tests that help detect and prevent outbreaks and screen newborns for disorders that can be deadly or devastating without swift intervention. The ability for healthcare and public health to be able to communicate efficiently, quickly and accurately is critical.

Despite reliance on this network of laboratories to generate and communicate critical and actionable data, the laboratories themselves too often have roadblocks making this extremely difficult. Many of them rely largely on paper-based manual methods, which are time-consuming and error-prone, as the infrastructure required to make the upgrade to electronic exchange is expensive and requires long-term dedicated staff. Even when a public health laboratory and a healthcare organization can electronically exchange data, it is inherently a one-off solution—historically, each connection must be built and maintained for each and every partner, making widespread ETOR largely unachievable in public health.

Detor is a centralized, national solution that takes the onus off laboratories to develop their own disparate technical solutions, instead allowing each laboratory to plug in to existing infrastructure. This enables the leveraging and sharing of tools, resources and technical expertise to achieve ETOR nationwide. Detor substantially reduces the need for data exchange expertise at the laboratory and minimizes the burden for public health laboratories. And as the translation and mapping happens in AIMS, this solution allows providers and laboratories to submit and receive orders and results in each of their native and preferred formats. This model also comes with dedicated technical assistance from APHL to help facilitate the onboarding process.

An Award-winning Solution

Soon after its first rollout, APHL and Ruvos—a longtime informatics partner and a Diamond Level Sustaining Member of APHL—were awarded the 2024 Amazon Web Services (AWS) IMAGINE Grant: Children's Health Innovation Award for the development of Detor. This award recognizes groundbreaking efforts to advance children's health using cutting-edge cloud technology and provides a combination of funding and AWS cloud credits to winners. This support will accelerate the expansion of Detor, enabling it to scale beyond newborn screening to other high-volume, potentially life-saving tests, such as tuberculosis, HIV, hepatitis and influenza, ultimately transforming the landscape of public health data exchange.

To find out more about implementing Detor in your laboratory, visit: https://www.aphl.org/programs/informatics/Pages/DETOR.aspx. ■

Addressing Priority Training Needs for Biosafety Professionals

By **Stormy Chester**, senior specialist, Public Health Preparedness and Response

APHL Biosafety Technical Workshop instructors, Jill Power and Ed Kopp, leading biosafety professionals in a hands-on workshop exercise.

Biosafety professionals are essential to maintaining the safety and security of public health and clinical laboratories. They are faced with growing demands as they manage emerging pathogens, navigate evolving regulations and adapt to technological advancements. To better understand the needs of the public health safety workforce, APHL conducted a training needs assessment to identify gaps in knowledge and skills. The training needs assessment revealed two key training priorities relating to biosafety: risk assessments and laboratory competency assessments. These findings have further shaped APHL's efforts to develop targeted resources and training programs that empower biosafety professionals and strengthen the laboratory workforce.

To address these critical gaps, APHL, via funding from the US Centers for Disease Control and Prevention (CDC), delivered a series of technical workshops, focusing on foundational biosafety topics such as engineering controls, risk assessment and competencies. These workshops have provided biosafety professionals with the resources and knowledge they need to meet the rising demands of their roles.

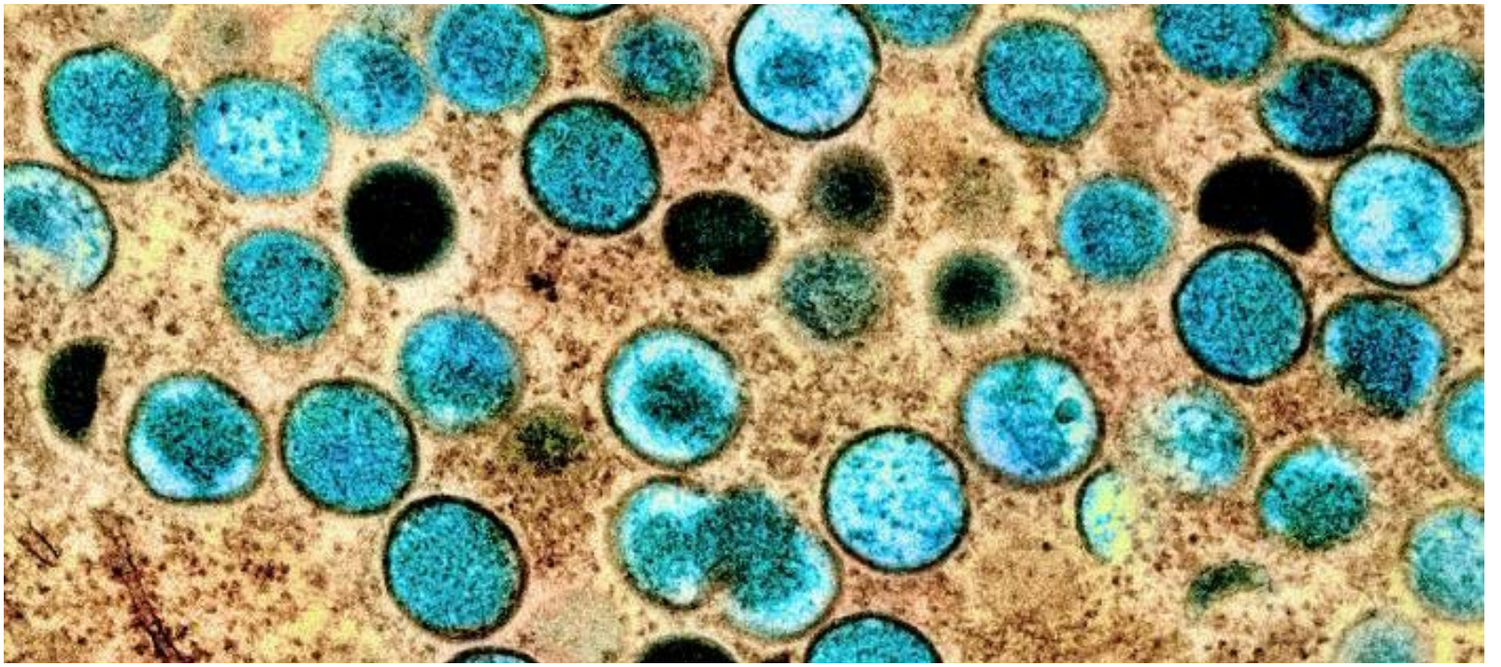
Building on insights from the training needs assessment, APHL is committed to providing ongoing resources and specialized training designed to support biosafety professionals. In addition to utilizing feedback from the training needs assessment, APHL also solicits feedback from in-person and virtual trainings to develop free resources, such as a risk assessment best practice guide, biosafety checklist, biosecurity exercise toolkit and laboratory exposure assessment, that are offered online through the APHL's Biosafety and Biosecurity Resource webpage. These resources are part of the association's ongoing efforts to provide accessible support for professionals working to strengthen biosafety and biosecurity across public health and clinical laboratories.

In addition to the online resources and in-person workshops, APHL also offers a range of online training through the APHL Learning Center (ALC). The ALC is APHL's learning management system that offers high quality educational activities. Users can search for and enroll in training, complete evaluations and manage certificates all in one place. Among its offerings is a two-part webinar series on risk assessments, The Laboratory Risk Assessment Cycle and Applying Laboratory Risk Assessments. The first webinar introduces the basics of the risk assessment process to help minimize laboratory risks, while the second focuses on the timing and methodology for performing risk assessments within their facilities. Speakers emphasized how effective risk assessments can prevent potential risks and demonstrated their application across different laboratory settings.

By leveraging insights from the training needs assessment, APHL continues to adapt its training programs and resources to address priority gaps in knowledge and skills. These efforts demonstrate APHL's commitment to empowering biosafety professionals, promoting professional growth and building a resilient public health laboratory workforce. Through targeted workshops, accessible online tools and specialized training, APHL ensures that biosafety professionals are equipped to meet the challenges of today and prepared for those tomorrow. ■

Readiness to Detect and Respond to Mpox

By **Chris N. Mangal**, MPH, senior director, Public Health Preparedness and Response



Colorized transmission electron micrograph of mpox particles (teal) found within an infected cell (brown), cultured in the laboratory. Image captured and color-enhanced at the NIAID Integrated Research Facility (IRF) in Fort Detrick, MD. Photo: NIAID

In 2022, there was a global outbreak of mpox, a viral disease related to smallpox. To date, there have been over 20,000 cases of mpox globally with approximately 4,000 cases in the United States. There are two clades of the mpox virus: clade I (with subclades Ia and Ib) and clade II (with subclades IIa and IIb). Both types spread the same way and can be prevented using the same methods. The 2022–2023 mpox global outbreak was caused by the clade IIb strain. Fast forward to 2025, and the US as well as other countries are still responding to mpox cases, with the California Department of Public Health detecting the first known case of clade I mpox in the US in November 2024.

Well in advance of the 2022 outbreak, US public health laboratories were positioned to detect viruses such as mpox with a test called non-variola *orthopoxvirus* assay. These laboratories are part of the Laboratory Response Network for Biological Threats Preparedness (LRN-B), managed by the US Centers for Disease Control and Prevention (CDC). APHL works closely with CDC to support the LRN with training, test development, testing and reporting of results, and workforce development. While the LRN-B was ready for and responded to the 2022 mpox outbreak, CDC also engaged commercial partners to support surge testing. Further, APHL quickly activated its emergency response center (EOC) with the goals to:

- Utilize an Incident Management or Command System (IMS/ICS) for a coordinated laboratory response and to ensure public health laboratories have timely diagnostics to safely perform tests
- Provide subject matter expertise and technical assistance to members, federal partners and sustaining members
- Facilitate communications among public health laboratories, epidemiologists, health officials, CDC and other partners, serving as a credible resource for the media and the public
- Promote the value of the LRN and the role of public health laboratories in this network
- Utilize APHL's voice to strengthen laboratory partnerships and coordination.

APHL worked with CDC to include automated extraction platforms in the test menu, issued biosafety guidance and encouraged member laboratories to develop new diagnostics to detect the two clades of mpox virus. These laboratories worked closely with each other, the CDC and the US Food and Drug Administration (FDA) to seek emergency use authorizations (EUAs) and/or register laboratory developed test(s) for newly developed tests that provided clade specific identification. Assay development continues among public health laboratories.

APHL has stood down its formal response to mpox but continues its work to strengthen the ability of laboratories to detect this virus. As we look ahead into 2025, mpox still proves to be a threat to the US and it is imperative to strengthen the LRN, a critical national infrastructure asset, poised to detect and respond to threats. ■

Generational Shifts in Public Health Laboratories

By **Sudaba Parnian Ahmadi**, MS, MBA, senior manager, Quality Systems and Analytics; **Hendrick Todd Ruitman**, MA, consultant, Quality Systems and Analytics; **Somaye Sarvarzade**, MA, senior specialist, Quality Systems and Analytics; and **Lorelei Kurimski**, MS, senior director, Data Science and Management, Quality Systems and Analytics

Public health laboratories are changing, driven by generational shifts that are shaping the workforce. Since 2016, APHL has been gathering insights through periodic *Workforce Profile* surveys. After the initial 2016 survey, follow-ups were conducted in 2022 and 2024. As Baby Boomers retire, Millennials have stepped in to fill the gap, with Generation X maintaining a stable presence. While Generation Z is just beginning to emerge, their numbers remain small but noteworthy. This generational evolution brings significant implications for workforce satisfaction, retention and leadership dynamics.

Who's in the Laboratory Today?

The 2016, 2022 and 2024 Workforce Profiles reveal clear generational trends (**Figure 1**). Baby Boomers now represent only 10% of the workforce, a sharp decline from 36% in 2016. Millennials have grown to 47%, up from 26%, while Generation X has remained steady, comprising around one-third of the workforce. Though Generation Z has only recently entered the workforce, their 10% representation in 2024 signals a growing presence that will shape the future.

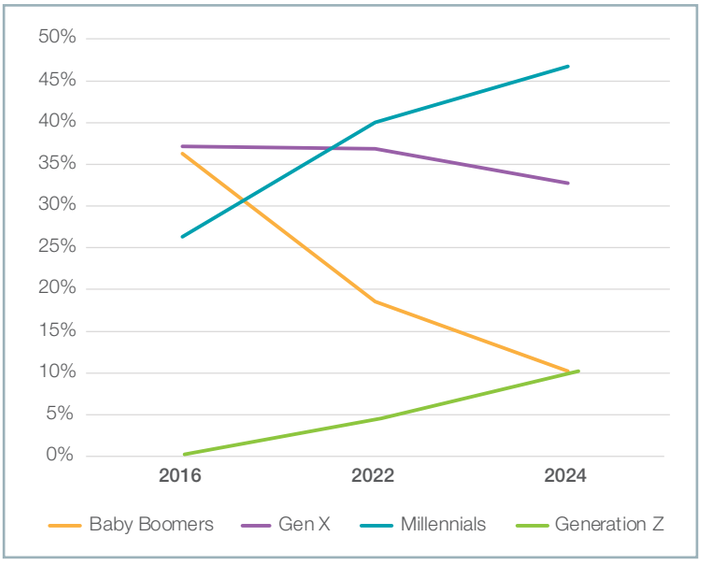
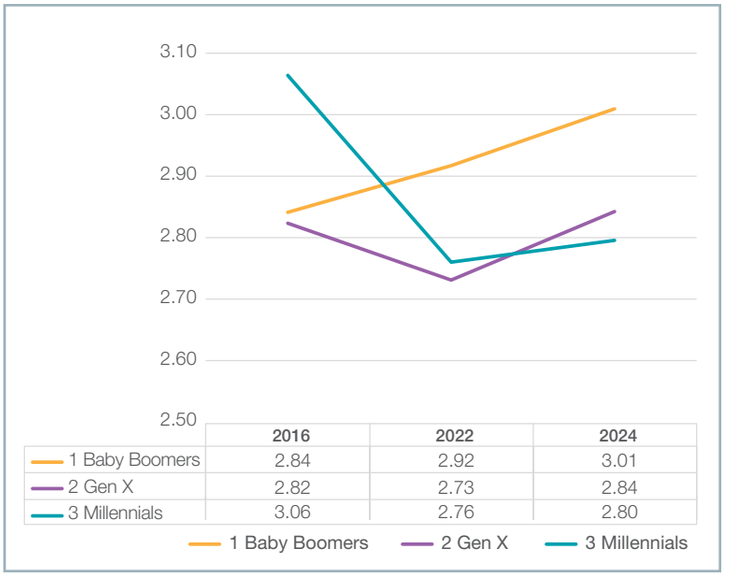


Figure 1. Trending workforce generational composition.

How Do Generations Feel About Their Jobs?

Overall job satisfaction, salary satisfaction and organizational satisfaction declined from 2016 to 2022, likely influenced by the pandemic (**Figure 2**). By 2024, satisfaction levels stabilized, yet generational nuances persisted. Baby Boomers reported increasing satisfaction across survey years, while Millennials consistently showed lower satisfaction levels than their older peers. For Generation X, satisfaction improved significantly between 2022 and 2024, highlighting potential resilience or adaptations unique to this cohort.



	2016	2022	2024
1 Baby Boomers	2.84	2.92	3.01
2 Gen X	2.82	2.73	2.84
3 Millennials	3.06	2.76	2.80

Figure 2. Rate your satisfaction with your organization (e.g. facility, work environment, etc.

What Drives Performance and Growth?

Performance indicators, such as work environment, engagement and development opportunities, reflected generational distinctions. Millennials showed different trends/levels of agreement in their responses to key items (**Table 1**).

Category	Generation	2016	2022	2024
Providing public service is an important reason why I continue to work in this career	Baby Boomers	3.37	3.53	3.43
	Gen X	3.34	3.42	3.32
	Millennials	3.33	3.3	3.32
Employees of diverse backgrounds work well with each other	Baby Boomers	3.26	3.4	3.23
	Gen X	3.28	3.39	3.16
	Millennials	3.36	3.47	3.23
I would pursue additional education with tuition support	Baby Boomers	2.98	3.03	2.94
	Gen X	2.94	2.96	2.91
	Millennials	2.98	2.96	3.19
I have sufficient training to fully utilize technology needed for my work	Baby Boomers	2.87	2.98	3.19
	Gen X	2.84	2.9	3.06
	Millennials	3.02	3.09	3.07
I feel supported in my work development	Baby Boomers	2.79	2.73	2.92
	Gen X	2.82	2.6	2.84
	Millennials	2.97	2.89	2.8

Table 1. Key performance indicators of workforce satisfaction across generations.

Baby Boomers and Generation X demonstrated relatively stable satisfaction across most indicators, while Millennials showed notable variability, particularly in areas like technological training and work development support, where their scores increased over time.

Generation Z was excluded from the analysis due to insufficient data representation.

Why Are Some in the Workforce Leaving?

Retention patterns reveal that a higher percentage of Millennials indicated their intentions to leave their current laboratory within five years than Generation X and Baby Boomers (after excluding those who were retiring in that timeframe). Additionally, Generation Z, while still a small proportion of the overall workforce (i.e., 10% in 2024), had the highest rate of intentions to leave in the 2024 questionnaire (i.e., 66%) and displayed in **Figure 3**. These patterns reveal some concerns and may create a gap in laboratory operations and knowledge retention.

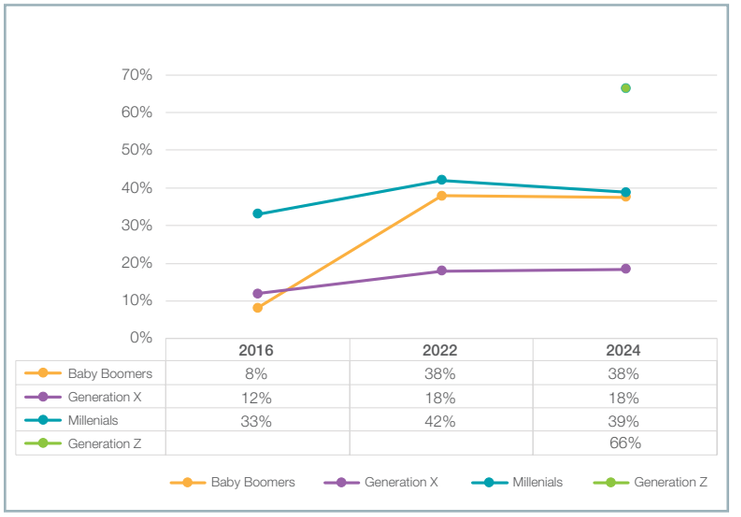


Figure 3. Percentage of respondents planning to leave their current laboratory within five years.

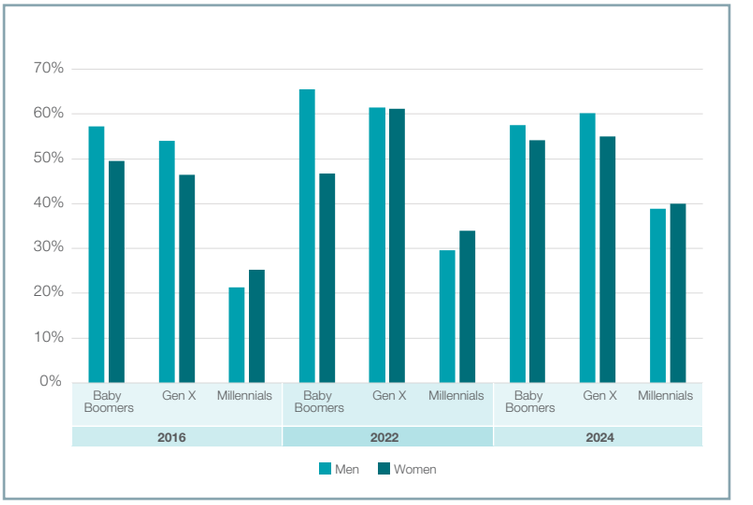


Figure 4. Trending percentage of workforce in supervisory roles by gender.

Female Workforce Leading the Way

While public health laboratories are primarily staffed by female workers, leadership roles historically skewed male, particularly among Baby Boomers and Generation X. In 2024, Millennials achieved near gender parity in supervisory roles, signaling progress in equitable leadership roles (**Figure 4**). As older generations retire, this trend suggests a more equitable future for leadership representation.

Building the Workforce of Tomorrow

These generational shifts highlight the need for targeted strategies to adapt to a changing workforce. Addressing Millennials' and Generation Z's retention challenges, fostering intergenerational collaboration and sustaining progress toward gender equity in leadership are critical priorities. Public health laboratories stand at a crossroads, where understanding and embracing generational dynamics can drive future success. ■

APHL has used generational labels in its data gathering for years, but the association realizes that these labels can reinforce negative stereotypes, emphasize class biases and oversimplify people's complex lived experiences. The association has used generational labels established by The Pew Research Center, which defines generations as spanning 15–18 years, but we understand that these labels have no scientific definition. While we realize that there is a great diversity of thought, experience and behavior within generations, these labels are used to highlight meaningful societal trends—especially where there is a surplus of data over decades—and to help us understand how our industry has changed over time. We are thinking of these terms as general reference points, and we will continue to use these terms only when our data supports the use of the generational lens.

Strengthening Public Health Laboratory Workforces: The Retention Scorecard

By **Isaac Eaves**, MS, research and evaluation analyst, Quality Systems and Analytics; **Somaye Sarvarzade**, MA, senior specialist, Quality Systems and Analytics; **Sudaba Parnian Ahmadi**, MS, MBA, senior manager, Quality Systems and Analytics; **Lorelei Kurimski**, MS, senior director, Data Science and Management, Quality Systems and Analytics; and **Abigail Raymer**, specialist, Quality Systems and Analytics

Recruitment and retention challenges are pervasive across public health laboratories. Since 2016, the periodic Public Health Laboratory Workforce Survey administered by APHL has consistently highlighted a trend—on average, 37% of respondents indicate an intention to leave their jobs within four years. This spurred efforts to create a practical tool to help laboratories assess retention practices and develop strategies for improvement.

To address these challenges, APHL, in collaboration with the Knowledge Management Committee, developed the Public Health Laboratory Workforce Retention Scorecard. This innovation assists laboratories in recognizing that retention is influenced by more than just compensation. The Scorecard provides a comprehensive assessment of organizational performance in key areas impacting retention, empowering laboratories to take actionable steps within their control. It moves the focus away from external challenges, such as state government policies on pay, and encourages the adoption or enhancement of targeted strategies to address retention effectively.

Building the Scorecard

A comprehensive literature review identified 10 critical areas influencing retention, which form the Scorecard's main categories:

1. Work-Life Balance
2. Competitive Compensation
3. Rewards and Recognition
4. Communication
5. Performance Reviews and Feedback
6. Workplace Environment
7. Health and Safety
8. Career Pathways and Development
9. Retention Planning
10. Onboarding and Offboarding

Each area includes detailed sub-themes to provide deeper insights. For example, under Workplace Environment, factors like Employee Engagement are assessed. The tool evaluates these areas using five development levels: None, Minimal, Moderate, Significant and Optimal.

To ensure accessibility and ease of use, the Scorecard was developed in Microsoft Excel, a platform widely available and familiar to laboratory staff. It includes embedded calculations to identify the most and least developed areas within an organization and provides a curated list of resources to guide improvement strategies.

The draft tool was beta-tested by committee members in late 2024 and subsequently fielded by five public health laboratories in early 2025. Feedback from these trials was incorporated into the final version, ensuring its practicality and relevance in real-world laboratory settings. This comprehensive development process ensures laboratories can readily adopt the tool to strengthen their workforce retention efforts. The Scorecard will also be regularly updated with new information to remain current and relevant.

Laboratories retain full control over their data. The Scorecard is designed for internal use only, with no external benchmarking or data collection by APHL.

How the Scorecard Can Be Used

The Scorecard is a resource for all APHL-member laboratories, designed to identify key factors influencing retention within the control or influence of management and leadership.

Laboratory management and leadership, with representation from across the organization—including operations, technical areas, support services and human resources—may complete the Scorecard collaboratively. This collective approach ensures retention strategies are informed by diverse perspectives and aligned with the needs and priorities of the entire laboratory.

Real-time scoring highlights strengths and areas for improvement, while online resources provide actionable guidance for reducing turnover.

Aligning with Ongoing Efforts

The Scorecard complements APHL's Recruitment and Retention Toolkit, Workforce Profiles and Workforce Development Programs. It aligns with APHL's strategic priorities by supporting workforce development, enhancing member value and support, and promoting data-driven decision making.

By helping laboratories assess their retention practices, the Scorecard highlights that retention is about more than keeping employees for years, it's about fostering a supportive and engaging environment where staff feel valued, motivated and empowered to grow.

Looking Ahead

APHL is planning presentations, and additional resources to support the Scorecard's adoption. Stay tuned for more information on these events and the official launch. ■

CALL FOR ARTICLES:

From The Bench

a regular feature of *Lab Matters*

Lab Matters, APHL's flagship publication, is seeking submissions from laboratorians at all levels of practice for "From the Bench," a member-driven section of its quarterly magazine.

We welcome both technical and non-technical articles covering topics across public health laboratory science, administration, careers and management. Articles may be 600-1200 words in length.

We're looking for a few key components in "From the Bench" articles –

1. **A compelling story.** Tell us about an initiative that streamlined an administrative process or fostered relationships with external communities. Describe how your lab has worked with other public health partners to stop an outbreak or respond to an environmental health threat. Or tell us how you dealt with an initiative that failed.
2. **A complete story.** Give us an article with a beginning, middle and end. The end should provide some resolution of the narrative. You don't need to have fully implemented the new algorithm, analyzed all the research data or completed the electronic laboratory reporting system discussed in your article.
3. **An insider's view.** We want articles told from the unique perspective of a laboratory scientist that will be interesting and informative for APHL members and partners.

Share your story with peers!

We can help!

We will work with you to write the article, from connecting you to a writing consultant to providing editing assistance if you wish to write the article yourself.

If you have **questions** or would like to **submit a story idea**, please contact:

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