LAB MATTERS
analysis|answers|action
Fall 2025 Issue 3

Ensuring Quality, Safety and Efficiency in the Public Health Laboratory

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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; biological, chemical and radiological agents; genetic disorders in newborns; and other health threats.

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Making Strong Connections

Scott Shone, PhD, HCLD(ABB)
President, APHL

> **"APHL is a unique organization where the team is as committed to and passionate about public health as the members. ... The organization survives and thrives not only because of what we do as members, but also because of what each staff member is committed to delivering to members on behalf of APHL."**

As I began my term as APHL President, I had the opportunity to attend APHL Week and get to meet many association staff who I normally would not have had the chance to see, unless we were at a conference or meeting. Until my session on Day One, where I was sitting on the stage and looking out at a ballroom full of 250+ people, I did not appreciate the scale of behind-the-scenes work that happens to make our association operate so successfully.

Being able to make that connection with APHL staff and speak directly to them about how important their role is in the association was a special experience. APHL is a unique organization where the team is as committed to and passionate about public health as the members. No matter what department or program they work in, they bring much needed enthusiasm , expertise and support to each of their roles. The organization survives and thrives not only because of what we do as members, but also because of what each staff member is committed to delivering to members on behalf of APHL. Scott Becker likes to say that we are a unique association and he's right: APHL works on behalf of its members and we get stuff done.

For members, I think it remains important to keep the lines of communication and feedback open with APHL staff because, like us, they continue to weather financial uncertainty and priorities that change due to external forces. Since early 2025, APHL staff have been the epitome of resilience and "grace under pressure," and I believe it is critical for us to acknowledge their dedication, if only to let them know that yes, they are connected to our work as public health laboratories—and as public health laboratorians. The work that we do would be much harder without them, and without APHL.

North Carolina recently had the privilege of hosting the APHL Leadership in Biosafety Workshop in June, an opportunity for biosafety officers and biosafety professionals from around the country to convene and develop skills in leadership, project management, communications and building effective outreach programs. This workshop also provided a forum for biosafety officials to review case studies on failures in biosafety, ask questions in a small classroom setting and network with each other. Hosting this event was only possible with APHL's leadership and organization. From coordinating travel to recruiting faculty to planning the curriculum, APHL was integral to the success of the 2 1/2 day event.

As public health laboratories continue to do their work day in and day out, we look to APHL to provide guidance on thinking strategically about the future of public health and public health laboratory science. As you will read in this issue's feature, the association will continue to advocate for laboratory safety, quality and efficiency. It will carry on with its mission to shape national and global health outcomes by promoting the value and contributions of public health laboratories and continuously improve public health laboratory systems and practices. It is my privilege to serve as your president this term, and I'm looking forward to what we can (and will) accomplish. ■

Setting a Precedent for Unprecedented Times

Scott Becker, MS
Chief Executive Officer, APHL

"The more things change, the more they remain the same." How I wish that adage was true, especially in 2025.

The first eight months of the year have been a rollercoaster for APHL's members and for the organization. In January, we went from a staff of 300-plus strong down to a little over 200 when our entire Global Health program was halted due to stoppages in federal funding from the US Centers for Disease Control and Prevention (CDC) and reductions in force across CDC and the Department of Health and Human Services (HHS). The stoppages in the 11 countries we work in reverberated through not just our staff and country directors, but also through in-country ministries of health and our international public health partners. Fortunately, we were able to bring all staff back within a few weeks to continue our important global work.

While the shock to the public health system has been somewhat blunted by time and the tireless efforts of our Global Health team, the challenges remain.

The damage that has been the hardest to quantify, however, is in the relationships that had been built over decades of work. With the stroke of a pen, relationships with ministries of health, public health leadership and equipment vendors were shattered, and trust in APHL was eroded. We are still working to regain that trust, but to rebuild those relationships will take months if not years.

And we are adjusting, even as our world continues to change. In October, APHL will be launching its strategic planning process once again. While we will be actively soliciting participation from members, we will also be taking a deep look at the results of evaluations from our conferences, training courses and other events. APHL takes that feedback very seriously and, while we try to make improvements as we go along, having that member view during our strategic planning process is critical to our success as an organization. If we didn't have members, we would not exist.

As CEO, I'm looking forward to working with leadership at CDC to find common ground and educate new leaders about our dynamic public health laboratory community. But as the firing of the newly appointed CDC director and the resignations of top leaders from within the agency of late August showed, there is anything but stable leadership at CDC now. We will continue to "walk a fine line," or "thread the needle" or insert any phrase here that fits as we continue supporting members and educating the public about the work we do, which includes Congress. While there is some early good news coming from Capitol Hill in reference to public health laboratory funding, it's hard to predict what the final funding levels will be, especially in these unprecedented times.

One thing I know for sure, however: APHL will continue to advocate for the essential work of public health laboratories and support our members in protecting us all against health threats. ■

Lessons from Boot Camp: One Laboratorian's Journey

By **Jennifer Crew**, PhD, HCLD (ABB), public service administrator, Illinois Department of Public Health

I began working at the Illinois Department of Public Health in 2007 as a laboratory research scientist in molecular diagnostics, where I developed assays for communicable disease testing and newborn screening. I spent 10 years in this position before receiving promotions to supervisory roles in Newborn Screening and, finally, in Virology, which is my current position.

Along the way, I have been lucky enough to participate in many APHL-sponsored training programs and meetings, including conferences on tuberculosis, advanced molecular detection, and training in the use of molecular detection and tandem mass spectrometry for newborn screening.

For around five years, APHL has sponsored the Laboratory Director Board Examination Boot Camp to assist candidates interested in obtaining the High Complexity Laboratory Director (HCLD) certification. The certification can be gained by passing tests administered by the American Board of Bioanalysis (ABB) and American Board of Medical Microbiology (ABMM). I have wanted to obtain an HCLD for some time, and I was inspired by a previous director who had gone through the process when I began working at my laboratory.

After receiving an introductory email from APHL regarding Year Two of Boot Camp and receiving encouragement from management, I decided to give it a try. I found that my first round of Boot Camp was overwhelming—although I had felt sure of my knowledge of general quality assurance/quality control (QA/QC) and of molecular diagnostic testing, I realized there was more that I needed to know. I decided to independently study before applying to take the exam. This was lesson #1: Boot Camp helped me understand how much I didn't know.

I spent the next two years studying the basics as I had time between SARS-CoV-2 testing and a measles outbreak at work. I returned to Boot Camp in 2023 better prepared. By that time, Boot Camp had changed as well.

The Boot Camp's lead facilitators, who I thought of as "counselors," had incorporated Kahoot! software, which turned the weekly review session into a competition. This was a good motivator for me and boosted my confidence. Since the counselors have all passed the exams, they are good coaches in the test-taking experience. They emphasized that, "If you can rule out an answer that you know is wrong, your chances of choosing the correct answer are a lot better." Furthermore, content from the sessions was transformed into flashcards that were reviewable on Quizlet software. This approach made it easy to prepare for the exam whenever I had a spare block of time, without needing to lug around textbooks or an ABB General Knowledge binder.

Boot Camp also incorporated material pertinent to the Molecular Diagnostics specialty test from ABB, using contributions from laboratorians who had recently taken the exam. The content included good textbook resources and areas that Boot Camp participants should review. Boot Camp's resources serve as lesson #2: Concentrate study efforts on what you need to know for the exam.

Part of the Boot Camp "homework" is for participants to submit questions that can be used in the weekly review sessions. I found this to be a small, achievable task that helped keep me on track. Maintaining your focus while studying on your own is difficult, especially over the course of a year or more, and having a small community to keep you accountable never hurts! This also led to lesson#3: Keep at it!

In Spring 2024, I took both the ABB General Knowledge and the ABB Molecular Diagnostics exams. I had spent a lot of time preparing for the General Knowledge exam, and I passed it easily. However, I did not pass the Molecular Diagnostics exam on the first try. I had assumed that working in the field for 20 years would be enough preparation, but I had ignored fields of testing aside from public health, like cancer diagnostics.

Knowing what I needed to learn (and relearn), I took the ABB Molecular Diagnostics exam again in Spring 2025, and I passed it! Since I passed both exams, I achieved a High Complexity Laboratory Director certification.

I am thankful for APHL's Laboratory Director Board Examination Boot Camp and the counselors who helped me achieve my HCLD. Although there is no single way of exam preparation that works for everyone, the Boot Camp was a good tool (and community) for me. ■

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Fellows Take the Stage Presenting Their Research

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

Over the past year, fellows have not only participated at conferences as attendees but are showing up as presenters. They have presented their research at the 2024 Newborn Screening Symposium and 2025 ID Lab Con, and another has submitted an abstract for the American Association of Veterinary Laboratory Diagnosticians (AAVLD) this November.

The experience gained from the Public Health Laboratory Fellowship Program: An APHL-CDC Initiative has translated into confidence and a willingness to participate in conferences as more than attendees.

Chatting About Chatbots in Nebraska

Courtney Gauchel

Courtney Gauchel, a newborn screening fellow in the Department of Biomedical Informatics at the University of Utah, spoke during the 2024 Newborn Screening Symposium's Ignite the Night presentations in Lincoln, Nebraska.

Gauchel and her mentor, Karen Eilbeck, MSC, PhD, FACMI, thought the Ignite presentation would be a good opportunity to get their research about a chatbot that answers parents' questions about screening results in front of scientists dealing with newborn testing.

"[Dr. Eilbeck] didn't feel like we had enough research data to submit an abstract, but she sent me an e-mail saying, 'Hey, you're going to the symposium. You should really think about applying for this cool presentation. It would be great to get our research out there.' So, I did," Gauchel said.

Each Ignite presentation is a five-minute talk featuring 15–20 slides advancing automatically every 15 seconds on any topic a participant would like to share. "When I found out the format and I thought, 'Oh my gosh. Good thing I've done public speaking before and I'm not afraid of it,'" Gauchel said.

Gauchel's public speaking experience comes from having taught college students at the university's nursing school and having spoken at trade shows earlier in her career. Her mentor and other laboratory staff helped prepare her by reviewing the presentation and giving feedback. Her preparation helped her navigate another surprise.

"I didn't realize it was going to be 300-400 people. I thought we would just be in one of the smaller rooms," Gauchel said.

She credits her preparation for staying cool under pressure. In addition, the subject was something Gauchel is passionate about.

"I'm talking about my research. This is something I really love doing and so I think that came across in my speech, too." Gauchel said.

From Abstract to Panel Discussion

Dr. Majie Foster, an infectious disease fellow at the New York State Department of Health- Wadsworth Center, gave her first presentation to the laboratory community at ID Lab Con in March. Foster originally planned on presenting a poster but saw the opportunity to give a presentation.

"I wrote my own abstract, which was approved by my mentor. I took the plunge and applied," Foster said. "My abstract was accepted, and I was notified that I would be sitting in a panel discussion a few weeks prior to the conference."

The panel, featuring other bacteriologists, focused on the screening of antibiotic-resistant organisms. Foster's research focused on molecular screening and ways to improve workflows and cut costs.

Dr. Majie Foster

"Currently, there isn't a standard workflow because not all laboratories have the ability to screen quickly. Many use a culture method, and this is a molecular method showing that not only is it time efficient, but it is cost effective. So, it is an alternative for other microbiology laboratories that screen similar organisms," Foster said.

Foster believes herself lucky since she had to give presentations as part of her doctoral program. Also, as part of her fellowship at Wadsworth Center, fellows give a presentation on their research once a year. Foster also worked with her mentor, Chief of Bacterial Disease Dr. Kimberlee Musser, to refine the presentation.

"I wanted to make sure that this presentation fit that audience better. She made suggestions on how to improve it." Foster said.

More Presentations to Come

Zoe Rice, a food safety fellow at Michigan State University Veterinary Diagnostic Laboratory (MSUVDL), has submitted an abstract for consideration for the AAVLD conference. Her research, in cooperation with the US Food and Drug Administration, looks to develop and optimize a method for extracting fat-soluble vitamins from animal tissue in

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Promoting Student Exposure to Public Health Laboratory Science via MLS Programs

By **Hailey Reiss**, specialist, Academic Partnerships and **Dana Powell Baker**, EdD, MBA, MS, CPH, MLS(ASCP)CM, manager, Academic Partnerships

Medical laboratory science (MLS) programs prepare students to work as critical members of the health care team. Preparation for an MLS career involves education and training in various laboratory analysis techniques to provide information that assists with diagnosis, treatment, monitoring and prevention of diseases.[1] Some MLS programs offer students the opportunity to specialize in a public health laboratory science concentration—a valuable way of introducing students to career paths in public health laboratory science.

Through these programs, students obtain an innovative educational experience that prepares them to be successful in a clinical or public health laboratory environment. They receive education and training in advanced diagnostic testing skills and related public health topics, including key public health principles, advocacy and more. Two MLS programs have successfully integrated concentrations focused on public health laboratory science.

Virginia Commonwealth University

Master of Science in Medical Laboratory Sciences with a concentration in Public Health Laboratory Sciences

The MLS program at Virginia Commonwealth University is a graduate program intended to prepare students for roles as laboratory supervisors, educators and researchers. In addition to obtaining the core competencies of the MLS program curriculum, students in the public health laboratory sciences concentration will also obtain the fundamentals of infectious epidemiology, learn key molecular techniques and understand the application of quality management systems.

Through this program, students can expand upon their existing education to gain a deeper understanding of medical laboratory science and public health laboratory science. Graduates will be prepared for various careers, including those in public health laboratories. Thus, this program, and others like it, provide an excellent opportunity for students to gain transferable skills for clinical and public health laboratory workforces—versatility that makes these programs unique and valuable.

University of Vermont

Master of Science in Medical Laboratory Sciences with a concentration in Public Health Laboratory Science

The MLS program at the University of Vermont is an undergraduate program that seeks to prepare students to work in a clinical or public health laboratory environment. The concentration in public health laboratory science emphasizes microbiology, molecular biology, epidemiology, health status monitoring and disease prevention.

This program prepares students to directly enter the workforce upon graduation; however, interested students may also consider applying to their accelerated master's degree program while in their third year. Like the program at Virginia Commonwealth University, this one emphasizes the value of workforce readiness to prepare students for entry-level, and, eventually, leadership positions in public health laboratories. Ideally, through partnerships, students will have the opportunity to engage with professionals in health departments and related organizations before graduation, further preparing them for a career in public health laboratory science.

The Value of Partnerships

Building partnerships with MLS programs with concentrations in public health laboratory science can help to support the next generation of public health laboratory professionals.

"Partnerships are essential so that students can bridge their academic preparedness with a future career," said Kate Moreau, clinical associate professor at the University of Vermont. "We need to continue to bring visibility to laboratories and can do so by creating pathways for students to learn about the multitude of options that exist both at and beyond the bench, such as epidemiology, bioinformatics, disease surveillance, emergency preparedness, quality assurance and management."

For the best outcomes, these programs benefit from partnerships with public health departments and public health laboratories. Consider seeking out ways to partner with local MLS programs, especially those with a concentration in public health laboratory science. Partnerships today will help create graduates tomorrow who are able to protect the health and safety of their communities. ■

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The American Society for Clinical Laboratory Science. (2021). Becoming a clinical laboratory professional - ASCLS. https://ascls.org/how-do-i-become-a-laboratory-professional/

Leveraging Social Media to Promote Public Health Laboratory Science Careers

By **Ladan Ghedi**, MA, senior specialist, Academic Partnerships and **Stephanie Barahona**, MS, media specialist, Marketing and Communications

APHL strategically uses social media platforms, such as LinkedIn and Instagram, to increase awareness of career opportunities in the public health laboratory and promote public health laboratory science careers. Social media content highlights mentorship, personal stories and real-world insights from the field, reinforcing the vital role public health laboratories play across program areas like food safety, environmental health and infectious diseases.

APHL's social media strategy for the Career Pathways in Public Health Laboratory Science: an APHL-CDC Initiative builds on themes of mentorship, storytelling and career education while reinforcing the association's mission to elevate the role of public health laboratories. By featuring fellows, interns, mentors, public health laboratory ambassadors and emerging leaders, the strategy showcases the people behind the science. Through quote graphics, video testimonials and behind-the-scenes laboratory highlights, APHL brings real stories to life, illustrating the impact of careers in public health laboratory science. This content aligns with APHL's broader communications approach, which includes public health laboratory program areas like food safety, where interns and fellows are often placed. This integration helps prospective applicants envision and understand their future contributions to the field.

An example of a quote testimonial featured on APHL's social media.

Career-specific and broader public health laboratory stories are often expanded through other multimedia platforms, such as the APHL Blog and *Lab Matters* magazine, which creates several opportunities for engagement. One example is a blog post spotlighting a fellow who assisted in the investigation of one of the most severe *Listeria* outbreaks in 13 years, which was promoted across APHL social channels. The story highlighted the fellow's contributions to the laboratory and emphasized the importance of a skilled laboratory workforce. Linking career-specific content with APHL's broader public health laboratory content, and sharing stories from other platforms, such as blogs, podcasts and magazine articles on social media channels, ensures visibility for both individual stories and the importance of a larger skilled workforce.

The blog post on APHL's LinkedIn page.

In addition to leveraging social media, APHL engages students through the Handshake home feed, a customizable student-facing dashboard where organizations can share updates, events and resources directly with users. APHL uses this platform to post engaging content, such as monthly spotlights featuring APHL Public Health Laboratory Ambassadors. These spotlights highlight an ambassador's educational background, interests and personal reflections, helping to humanize the profession and foster a sense of community with our online audience.

APHL also utilizes Handshake to promote careers in public health laboratory science. By posting job opportunities on the platform, students are sought after for the Public Health Laboratory Fellowship and Internship Programs. Webinars are

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Ladan Ghedi attended the 2025 Government Social Media Conference and gained insights to help strengthen APHL communication strategies. One session, "Advanced Strategies for Using Plain Language in Social Media," emphasized the importance of simplifying language to better connect with audiences. The speaker highlighted how using plain, direct language enhances clarity and engagement, making content more accessible and relatable, especially when communicating complex topics. Applicants are able to clearly understand program goals or application steps without needing to decipher jargon. They are more likely to view the organization as transparent, reliable and supportive.

Fellows Take Stage

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Zoe Rice

the hope of eventually doing the same for livestock feeds.

"Our method isn't quite complete, but we still want to provide a progress update. We want to show them the process of method development and the challenges we've been facing and how we've been able to overcome them," Rice said.

Rice expects some pep talks and more feedback from her mentor John Buchweitz, PhD, MS, DABT, Nutrition & Toxicology Section chief at MSUVDL. While Rice awaits the decision on whether her abstract will be accepted, her preparation has raised her confidence.

"I'm a shy person and don't talk loudly, but I speak up about and defend my data. I think that's an important thing I've learned here," Rice added.

Rice, Gauchel and Foster all hoped their presentations would equate to more opportunities to further their research and open communication and collaboration among laboratories.

Foster is developing a paper about molecular screening and how it can be applied to pediatric studies. Gauchel's presentation has led to other states inquiring about the chatbot and adapting Utah's research to their own needs. ■

Social Media

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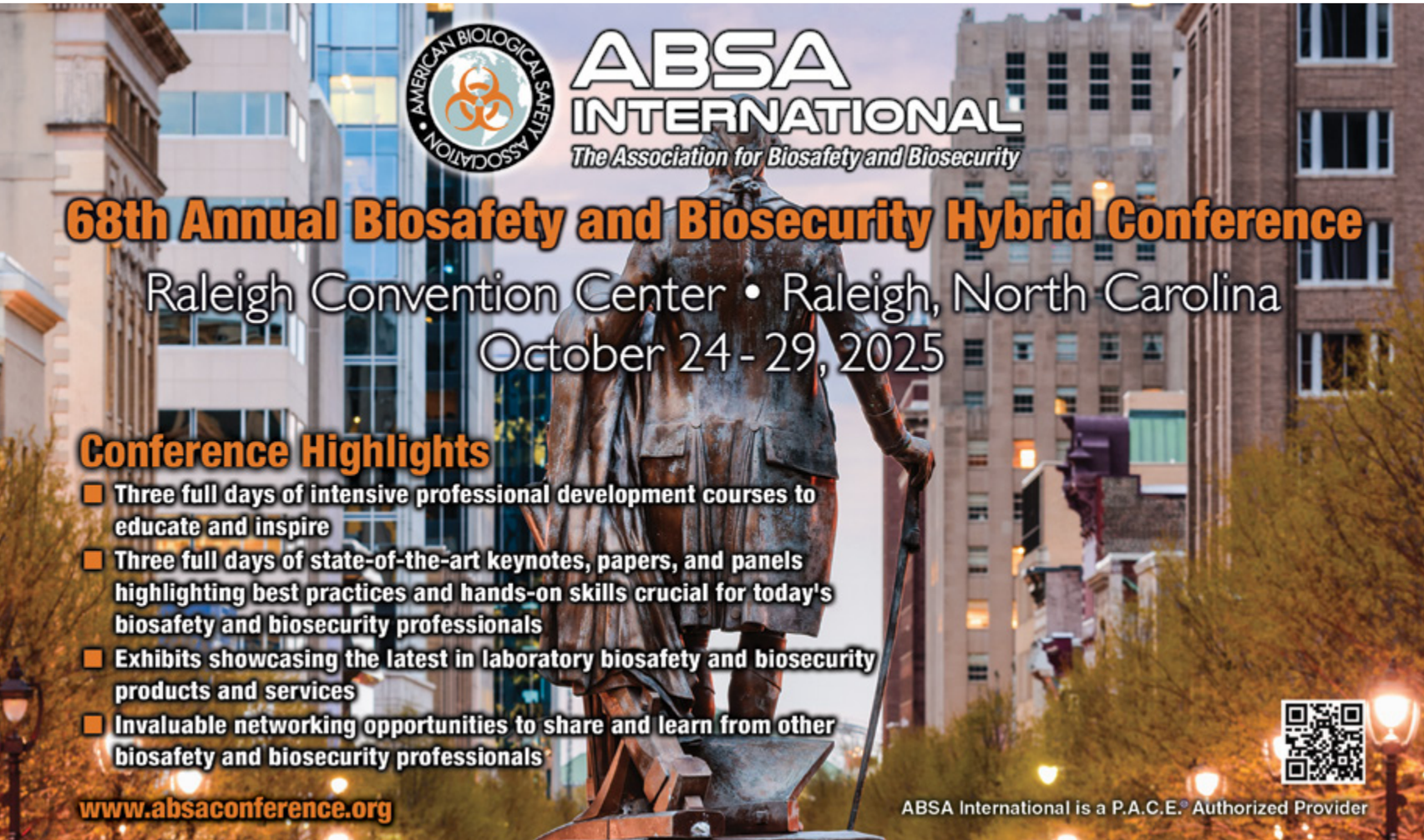
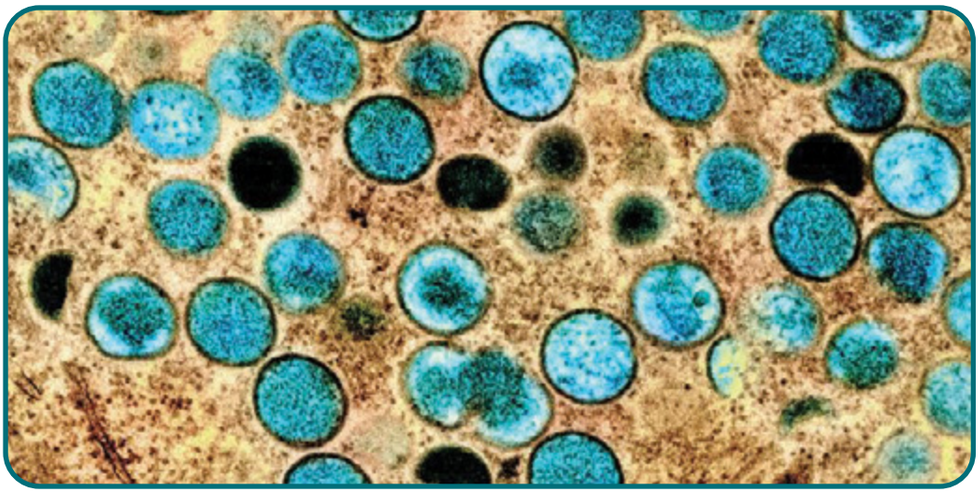
hosted by Handshake to provide students with information about career pathways in public health laboratory science. As a result of these innovative and consistent efforts to engage early career talent, APHL was named a recipient of the 2025 Handshake Early Talent Award, recognized for excellence in recruitment practices. These initiatives collectively support relationship-building with students and faculty, increase awareness of public health laboratory science careers and strengthen the pipeline of future professionals entering the public health laboratory workforce.

The Career Pathways in Public Health Laboratory Science Initiative represents how strategic, multi-platform communication can educate, inspire and connect with the next generation of laboratory professionals. Through engaging storytelling on platforms like social media and Handshake, APHL not only promotes awareness of career opportunities and the importance of public health laboratory work but also strengthens the overall public health laboratory workforce. ■



Evolution of Mpox Testing in California and the Detection of the First Clade Ib Case in the Americas

By **Jill K. Hacker**, PhD, MPH, section chief, and **William S. Probert**, PhD, research scientist, Vaccine Preventable Diseases Section, Viral and Rickettsial Disease Laboratory, Center for Laboratory Sciences, California Department of Public Health



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.

The Viral and Rickettsial Disease Laboratory (VRDL) of the Center for Laboratory Sciences in the California Department of Public Health (CDPH) has provided testing for orthopoxviruses since 2002 using molecular tests provided through the US Centers for Disease Control and Prevention (CDC) Laboratory Response Network for Biological Threats (LRN-B) that were intended to help rule out smallpox. With early 2022 reports of global spread of clade IIb mpox cases and the subsequent identification of the first clade IIb case in the United States in May 2022, VRDL recognized the need to rapidly expand its testing toolbox to include monkeypox virus (MPXV)-specific molecular diagnostic tests and whole genome sequencing (WGS) capabilities. Within one week from detection of the first clade II case in California, VRDL began work to develop and validate a laboratory-developed triplex MPXV real-time PCR (rPCR) assay. This assay was based on CDC's generic and clade-specific assays and was designed to allow detection of MPXV and discrimination between clades I and II in a single well.

Celebrating Innovation...

An early hurdle was the lack of readily available poxvirus materials for contriving clade I specimens and assessing assay specificity. This was overcome by support from CDC's Poxvirus and Rabies Branch, which generously provided VRDL with control DNA and inactivated poxviruses. By mid-June 2022, VRDL had enough specimens from suspected mpox cases to support assay validation, and by mid-July 2022, validation of the triplex MPXV rPCR had been completed. With this new test, VRDL was able to confirm MPXV in non-variola orthopoxvirus (NVO)-positive specimens, thereby providing results in a timelier manner to local health departments and other clients, supporting epidemiological investigations and alleviating some of the testing burden from CDC's workload.

The truly collaborative nature of the 2022 public health laboratory mpox response cannot be overstated. As local health jurisdictions were overwhelmed with specimens for testing, some of which did not have access to the LRN-B orthopoxvirus assay, VRDL was able to share the triplex MPXV rPCR protocol and reagents in support of other public health laboratories' efforts to add or improve mpox testing capacity. This, in turn, alleviated much of the strain on VRDL staff, who had spent several weeks of long days to bring on MPXV-specific testing, while also running the LRN orthopoxvirus assays.

...Preparing for Failure...

An ongoing challenge to the implementation of molecular tools for MPXV detection has been the potential failure of MPXV rPCR tests that target non-essential genes, as does VRDL's triplex rPCR. Poxviruses are known to delete genes that are not essential for viral survival, a phenomenon associated with the emergence of viral variants. Indeed, early in the clade IIb outbreak, VRDL was informed by colleagues at the Los Angeles County Public Health Laboratory of a MPXV variant that had deleted the generic and clade II PCR target sequences (a PCR target "dropout" mutant) and thus was not detectable with the available MPXV PCR assays that targeted these non-essential genes. While transient in spread, the emergence of this dropout mutant illustrated the risk in targeting non-essential sequences. VRDL dabbled with the idea of an assay that targeted genes within the central conserved region of the genome, but the transient nature of the clade II target dropout mutant and the lull in mpox samples coming to VRDL in 2023 put this on the back burner.

In January 2024, with the US Food and Drug Administration (FDA) laboratory-developed testing (LDT) rule looming, VRDL was approached by the LRN about collaborating to submit the triplex rPCR for an FDA Emergency Use Authorization. However, in February 2024, the clade Ib MPXV variant emerged, which was notable for deletion of the same commonly used clade I PCR target that

VRDL was fortunate to be included in an APHL MPXV WGS Working Group. In parallel with triplex rPCR assay validation efforts, VRDL investigated a metagenomic approach to MPXV WGS. While successful for samples with high viral loads, the method lacked analytical sensitivity and sample throughput capacity. Through participation in the APHL MPXV Working Group, VRDL learned about a tiled amplicon sequencing approach developed by the Grubaugh laboratory at Yale University and implemented this procedure in late July 2022. With this tool, the laboratory was able to track MPXV lineages and the emergence of new variants and, in partnership with other state and local public health laboratories and CDC, investigate the influence of VP37 mutations on resistance to the antiviral compound, Tecovirimat. VRDL's work on this initiative has also recently been published in *Frontiers*.

VRDL had chosen for its assay, also located within the variable terminal region of the MPXV genome. This clade Ib variant was the cause of a growing outbreak in Africa and raised concern over the ability to detect this more severe clade of mpox. While the generic MPXV target in VRDL's triplex assay would detect clade Ib, the clade I target (now considered clade Ia) would not. Mid-2024, an Mpox Assay Development Working Group was convened by APHL to provide a forum for interested public health laboratories to discuss clade I assay development strategies.

To minimize the risk of PCR target dropout and enable identification of both clade Ia and Ib strains, VRDL reimagined its MPXV assay to target essential genes (i.e., genes required for poxvirus propagation) located within the central conserved region of the genome. The new assay was designed as a multiplex rPCR capable of detecting four analytes: orthopoxviruses (panOPX), MPXV, clade I MPXV and clade II MPXV. While conceptually appealing, the identification of clade-specific sequences within these highly conserved regions proved to be extremely challenging, necessitating the use of a single nucleotide polymorphism (SNP) assay for the clade I target. Importantly, this SNP is conserved among both clade Ia and Ib strains. Validation of the mpox essential genes quadplex (MpoxEG4-plex) rPCR assay commenced in late October 2024, again with substantial reagent support from the CDC Poxvirus and Rabies Branch.

...and Transforming for Future Success

In late November 2024, VRDL was notified of a suspect clade I mpox case by the San Mateo County Health Department based on NVO-positive, clade II-negative PCR results obtained at a commercial laboratory, clinical signs and symptoms, and recent travel to East Africa. San Mateo County Health professionals collected additional specimens that same day and transported them to VRDL for testing. The VRDL team quickly applied tests to determine if this was indeed clade I. Within hours, specimens were concurrently confirmed to be NVO/OPX-positive using LRN assays; negative for the generic, clade Ia and clade II targets with the triplex MPXV rPCR assay; and positive for the panOPX, MPXV and clade I analytes with the MpoxEG4-plex rPCR assay. Following WGS confirmation by both VRDL and CDC, the case was deemed the first clade Ib case reported in the Americas. Investigation of 83 contacts by the CDPH clade I mpox response team and the San Mateo County Health Department identified no secondary cases, with testing provided by Santa Clara County and San Mateo County Public Health Laboratories and VRDL. VRDL completed validation of the laboratory-developed MpoxEG4-plex rPCR assay for diagnostic use in January 2025.

Describing this mpox journey gives VRDL the opportunity to highlight the collaborative nature of public health laboratory work—whether it is the can-do attitude of the amazing laboratory team, the generous contributions of hard-working CDC colleagues, or the "yes we can, tell us what you need" efforts of California's local public health laboratories and APHL. Throughout, VRDL was bolstered by colleagues at the CDC Poxvirus and Rabies Branch, and the public health laboratories of San Francisco, Santa Clara and Los Angeles counties, among others. The future of testing in public health is strongly rooted in molecular assays. Without the collective drive to advance efforts to detect emerging pathogens, this story would not be as successful. The ease of sharing knowledge, reagents and protocols between laboratories strengthens crucial scientific ties, especially as expertise in assay development and technical skills continue to be key to providing a way to stay at the forefront of pathogen diagnostics in an ever-changing microbial world. ■

Sustainability as a Catalyst for Public Health Laboratory Resilience

By **Julie Yang**, director, Applied Markets, Promega

Promega's Kornberg Center in Madison, Wisconsin, is 65% more energy efficient than comparable facilities and includes geothermal HVAC, solar panels, a double-skin façade, and rainwater harvesting systems to reduce environmental impact and operating costs. Photo: Promega.

Public health laboratories are at the forefront of protecting communities from infectious diseases, environmental hazards and emerging health threats while demonstrating remarkable resilience—adapting quickly to emerging challenges, shifting resources to meet demand and maintaining accuracy under pressure. As laboratories look toward long-term readiness, sustainability is no longer just an environmental ideal. It is a practical approach to improving efficiency, reducing waste and building stronger, more resilient operations in a constantly evolving landscape.

Increasingly, laboratory leaders are asking: *How can our operations be more sustainable and more effective at the same time?* Industry partners like Promega are asking the same question.

Reducing Operational Burden Through Energy Efficiency

Laboratories are among the most energy-intensive facilities, consuming up to 10 times more energy per square foot than traditional office buildings. Equipment runs continuously, and high-performance HVAC systems are essential to maintain controlled environments. These systems are critical—but they also carry operational and environmental costs.

That's why laboratories across the country are investing in efficiency upgrades. For example, CDC's Building 110 in Atlanta, GA reduced energy use by 23.7% through HVAC optimization and daylighting, earning LEED Gold certification. Similar gains are being made at state public health laboratories through lighting retrofits, freezer consolidation and renewable energy systems.

These efforts not only lighten the environmental footprint, but they also help save on energy costs and ease strain on systems, making it easier to maintain continuity when conditions are anything but predictable.

Promega, a trusted supplier to many public health labs, follows this same philosophy. Its Kornberg Center in Madison, Wisconsin, is 65% more energy efficient than comparable facilities, thanks to geothermal HVAC, a double-skin façade, solar panels and rainwater harvesting. The Madison campus, which consists of 13 buildings, earned ISO 14001:2015 certification in 2025, underscoring its environmental management commitment. Promega Madison had already reached 85% renewable electricity usage by early 2025 and is on track to achieve 100% by year-end.

Cutting Waste While Maintaining Laboratory Performance

Single-use plastics, cold-chain packaging and regulated waste streams continue to be substantial challenges for laboratory operations. To tackle them, public health laboratories are rethinking their materials and workflows—finding ways to cut waste without compromising quality or compliance.

Suppliers are also playing a key role and stepping up. Promega has eliminated more than 3,000 EPS coolers annually, conserved 12 tons of dry ice and

Promega employees from across departments collaborated to launch an internal plastic film recycling program that now diverts 35,000 pounds of waste annually—demonstrating how sustainability can be embedded into lab support systems from the ground up. Photo: Promega.

removed over 139,000 square meters of shrink wrap by shifting some product lines to ambient shipping. Packaging redesigns using fewer materials helps with improving shipping efficiency and minimizing carbon emissions across the product life cycle.

One standout example came from within Promega's own operations. When employees noticed plastic film from sterile packaging was being discarded, they launched a pilot program to collect and recycle it. That program grew into a full-scale effort and, in 2024, Promega installed a high-capacity baler at its logistics hub to compress and recycle plastic film. The result: 35,000 pounds of plastic diverted annually from landfills—driven entirely by internal employee collaboration.

These efforts demonstrate that impactful sustainability solutions can be driven from the ground up, proving that practical changes at the operational level can lead to meaningful and measurable results.

Procurement Strategies That Support Compliance and Impact

Procurement is proving to be one of the most effective ways to embed sustainability into laboratory operations. In late 2024, the EPA recommended the use of the ACT Environmental Impact Factor Label—developed by My Green Lab—as a tool for product selection. This labeling framework evaluates products based on emissions, energy use, packaging and end-of-life disposal, offering greater transparency into their environmental impacts.

As part of this movement, Promega is piloting ACT labeling to better assess and communicate the sustainability profile of its products. This effort aligns with broader goals of transparency and sustainability in laboratory operations. One of Promega's research facilities has also earned Platinum-level My Green Lab Certification, reflecting a strong commitment to sustainable laboratory practices. In addition, a dedicated Green Chemistry Team at Promega continually evaluates materials and processes to reduce solvent use, hazardous waste and emissions.

These measures support public health laboratories seeking to meet internal sustainability goals, comply with state procurement guidelines and improve transparency in vendor relationships.

Resilient Labs, Stronger Communities

Sustainability is not a separate initiative in public health laboratories—it is integral to how they effectively operate and deliver impact. By reducing emissions, cutting waste or making greener procurement choices, these efforts strengthen the systems laboratories rely on every day: infrastructure, workflows, supply chains and community trust.

Suppliers like Promega are committed to contributing by embedding sustainability into operations, product design and partnerships. Together with public health laboratories, we are building systems and processes that are not only more environmentally responsible—but also more efficient, adaptive and ready for the future. ■

Promega is an APHL Platinum Level Sustaining Member.

FEATURE

Ensuring Quality, Safety and Efficiency in the Public Health Laboratory

By **Gynene Sullivan**, MA, manager, Communications

More than 500,000 workers are employed in laboratories in the United States. These workers are regularly exposed to numerous potential hazards, including chemical, biological, physical and radioactive hazards, as well as musculoskeletal stresses from repetitive motions and actions. While laboratory safety itself is governed by numerous local, state and federal regulations, it has often been the responsibility of each individual laboratory to educate its staff on laboratory safety practices.

For public health laboratories, who perform testing on both human and environmental samples, keeping all staff members safe is critical. Development of a culture of safety—with accountability up and down the administrative and scientific fields—has resulted in facilities that are, in fact, safe and healthy environments in which to teach, learn and work. However, funding cuts and staffing shortages are a harsh reality on a regular basis requiring public health laboratories to use a variety of practices to ensure their readiness to respond to natural and manmade threats are available to keep staff members safe.

The Evolution of Biosafety

For much of the 20th century, there was little emphasis on laboratory safety or security. Historical accounts can produce hair-raising stories about past practices; from mouth pipetting to storing lunches in refrigerators where specimens were stored, and working on the open bench without personal protective equipment available. Biological safety cabinets were also not commonly available.

"The formation of the American Biological Safety Association (ABSA) in 1984 to promote safety as a scientific discipline and the availability of OSHA's bloodborne pathogen standards in 1992, were key events in the movement to promote biosafety practices in the laboratory," said Peter Iwen, PhD, D(ABMM), F(AAM), director and senior biosafety officer of the Nebraska Public Health Laboratory. "And then when [US Department of Health and Human Services] put out their rule on the storage and transfer of select agents, that was when the idea of biosafety and biosecurity for laboratories really started."

Into this fledgling biosafety sphere came the anthrax events of 2001, reinforcing the fact that even though laboratories had started a move towards greater safety and protection for their staff, there was still much work to do. Add in the Ebola virus outbreak of 2014–2016, and then the COVID-19 pandemic in the 2020s, and biosafety has now become a top priority for public health laboratory operations.

> **"We now recognize biosafety and biosecurity as scientific disciplines, where previously they were an afterthought. We've learned more about the importance of risk assessments and the development of biosafety guidelines with every biological event."**
>
> **— *Peter Iwen,*** *PhD, D(ABMM), F(AAM)*

"We now recognize biosafety and biosecurity as scientific disciplines, where previously they were an afterthought," said Iwen. "We've learned more about the importance of risk assessments and the development of biosafety guidelines with every biological event."

Tim Southern, PhD, D(ABMM), was a post-doctoral clinical microbiology fellow in Iwen's laboratory during the Ebola virus outbreak.

"We weren't just testing samples, we were supporting the care of individuals with an awful disease," he said. "We were bagging samples, sanitizing the bags, putting them in coolers and walking those samples between laboratories through corridors with other people and patients." Now as director of the Nevada State Public Health Laboratory, Southern knows that his experience was a career-thinking game changer.

"Pete and other team members instilled in me very quickly the importance of laboratory biosafety including critical activities like performing risk assessments that ultimately keep staff and programs safe. Quality was also a daily focus for the Nebraska team; we focused on all aspects of quality as it related to diagnostic testing and patient care."

Today's 21st century public health laboratory not only incorporates biosafety and biosecurity awareness but also sees how risk assessments and continuous training ensure data quality and quality assurance for all laboratory activities. In 1995, the US Centers for Disease Control and Prevention (CDC) created the Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases (ELC) cooperative agreement. This included funds that have been traditionally used to subsidize biosafety and biosecurity initiatives within public health laboratories. After the Ebola virus outbreak, CDC provided funds to state and local health departments via the Domestic Ebola Supplement to the ELC, which enabled 62 state, local and territorial public health laboratories to strengthen their biosafety and biosecurity activities.

> **"There are going to be impacts to our work going forward, and we have to keep telling our policymakers and anyone who will listen about the criticality of the work we do."**
>
> **— *Tim Southern,*** *PhD, D(ABMM)*

In early 2025, significant cuts were made to federal funding provided under the ELC cooperative agreement. This funding was a significant source of support for many of the nation's public health laboratories and impacted everything from replacement or maintenance contracts for essential laboratory equipment to construction or renovation of laboratory facilities. Along with these impacts, 439 full-time employees within the public health laboratory system were lost, which caused the reduction of elimination of many important testing services, as well as a decrease in personnel trained in biosafety and biosecurity.

"There are going to be impacts to our work going forward, and we have to keep telling our policymakers and anyone who will listen about the criticality of the work we do," said Southern. "But I think they are prepared to hear more from us, and I think we have to be more candid about why what we do is so important and should be funded."

Automating for the Future

Even before the COVID-19 pandemic, public health laboratories embraced testing automation to respond to emergency testing requests as well as to relieve some of the work burden from laboratory staff. With the introduction of large machines to conduct diagnostic testing, however, there came another set of concerns.

"Automation is something that laboratory directors should consider because of the current workforce constraints in public health laboratory science," Southern said. "And when you talk about machines powering science, you have to consider the safety and security profiles of the instrument, as well as the safety and security practices of the individual running the instrument before you implement a new device or method in your laboratory." With the advent of multi-use machines or testing platforms that can perform more than one type of test at a time, the procedures and processes used to stand up, perform, sterilize and then stand down the instrument take time, but is just one way that public health laboratories can ensure safety.

Laboratory automation is not a new concept. Clinical chemistry has used automation in their core laboratories for years. Because laboratories needed high throughput testing during the COVID-19 pandemic, transitioning to automated diagnostics was scrutinized in a way that incorporated the need for laboratory safety and security. Public health laboratory scientists invested in biosafety and biosecurity began to educate their communities not only about the need for automation, but about selection, use and personal protection while using this technology.

"Automation is designed to not only increase the throughput of testing, but also to enhance safety protocols and prevent human errors," said Iwen. "But that doesn't mean that automation is a panacea for laboratory personnel, especially when upfront and ongoing costs can be a burden to their laboratories."

"We are now engaging our industry partners in a meaningful way such that when they develop devices, they are thinking about the safety and security of the end user as much as they are thinking about an instrument that will bring in revenue," said Southern.

Educating the Workforce

Gone are the days when a laboratory scientist is doing antibody serology by hand, streaking plates, picking pathogen colonies from an agar plate and ensuring chemical reactions on tubes remain controlled. Southern agrees that with that loss of knowledge, there is a tendency to place undue pressure on bench scientists and administrators to move faster between testing processes and procedures.

"You need to track everything [related to a process]. You need to track training and what processes people are trained to do, even including how to break down and sterilize a machine, because if you have cross-contamination in your piece of equipment the results are junk. Quality and safety should be hand in hand."

— *Marian Downing,* *RBP, CBSP, SM(NRCM)*

"With the dependence on technology, we're losing human skills, such as reading plates," Southern said. "I think automation is setting up unrealistic expectations for laboratories, because there are still errors that occur and need human intervention." But one advantage that new laboratorians have over previous scientists is the notion that biosafety and biosecurity are essential for laboratory practice, be it clinical, commercial or public health laboratory. And not only is it the training that is critical but staying informed of new practices and techniques.

"You need to track everything [related to a process]," said Marian Downing, RBP, CBSP, SM(NRCM), biological safety consultant and American Biological Safety Association (ABSA) representative to APHL's Biosafety and Biosecurity Committee. "You need to track training and what processes people are trained to do, even including how to break down and sterilize a machine, because if you have cross-contamination in your piece of equipment the results are junk. Quality and safety should be hand in hand."

It is important to note that these safety precepts not only apply to bench-level scientists but also to laboratory administrators and facilities personnel who are invested in quality assurance, safety and security for the laboratory. There also is a critical need to continue engagement with laboratory scientists to promote career development and to assure that cross-training and other practices are being utilized.

"As laboratory personnel, you need to have an understanding of not only how the equipment functions and what the features are, but also how waste will be removed by your custodians and where the venting from that biosafety cabinet hood goes," said Downing. "A basic understanding of laboratory design goes a long way to ensuring fewer accidental exposures." Southern agrees.

"I believe the most effective scientist-leader is someone who can do the job from beginning to end, regardless of automation," he said. "I want my laboratory scientists to learn how to make media, perform testing with all the appropriate controls, and thoughtfully evaluate all results. I even want my scientists to know how to take the trash out and run the autoclave. I believe by focusing on the end-to-end processes, including safety and security that accompanies those workflows, you are building a better foundation for your laboratory program."

"We continue to be in the early stages of establishing professional biosafety and

biosecurity training programs," said Iwen. "Public health is somewhat behind the curve in the development of these training programs, as are clinical, commercial and manufacturing laboratories. Although we are more attuned to biosafety practices in the laboratory, there are still opportunities available to improve the work environment."

Assessing the Burden of Risk in Laboratories

Major strides to improve laboratory biosafety have occurred in recent years, but ongoing reports of exposures to biological agents indicate that there are still laboratories in the US with inadequate biosafety practices in place. Funding from CDC has allowed collaborations with state and local public health agencies to strengthen healthcare infection control practices and enhance laboratory biosafety and biosecurity practices; however, gaps in funding have impacted ongoing efforts to maintain safe working environments.

A critical step to enhance biosafety practices is an accurate measurement of laboratory exposures and laboratory-acquired infections (LAIs). The lack of reporting requirements and mechanisms likely has resulted in an underestimation of incidents, so the actual number of exposures and LAIs is unknown.

While the Federal Select Agent Program requires reporting of exposure events involving select agents, there is no way to ensure compliance for non-select agents. Thus, there is no mechanism available to capture exposures or LAIs in laboratories that do not work with or encounter select agents. Alternatively, a national publicly accessible, non-punitive mechanism to report exposure events and LAIs would allow a more accurate number of incidents to be documented and analyzed.

Current biosafety standards of practice followed by laboratory professionals are subject to interpretation, as they do not define mechanical, physical and operational standards. Additionally, there is a lack of mechanisms available to objectively and consistently apply the standards. Many of the guidelines and recommendations are not data driven science-based conclusions.

Consequently, while laboratories in the US adhere to biosafety guidelines, there is extreme variability in the physical and mechanical plans and the operational procedures that support them. Laboratory staff and laboratory leadership compliance with plans and procedures is also inconsistent, with turnover in the laboratory requiring additional diligence to maintain these competencies.

APHL strongly supports the expansion of efforts to improve and enhance biosafety and biosecurity practices in all US laboratories to include those that support private clinical practices, public health laboratories to include agricultural and food testing laboratories, and research and academic laboratories through education, training, guidelines and incorporation of quality management practices. Read more in the position statement, Improving Biosafety in Our Nation's Laboratories and visit the APHL website for more information.

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:

Gynene Sullivan, MA
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240.485.2750

Safety and Quality: Key Components of a Laboratory System

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

"A successful laboratory is built on a strong foundation of safety and quality."

— *Scott Shone, PhD, HCLD(ABB), Laboratory Director, North Carolina State Laboratory of Public Health*

Safety and quality are key components of a laboratory system. While these areas are often managed separately, there is a benefit to bringing them together. When safety and quality work in tandem, it can lead to smoother operations, stronger communication and a laboratory culture where staff feel supported. Today's laboratory professionals are finding practical ways to merge safety and quality in their daily work. The following professionals show what is possible when safety and quality are no longer siloed. Their efforts serve as inspiration for others looking to create a more connected and impactful laboratory environment.

Kayle Cirrincione
Health, Safety and Preparedness Manager
Dallas County Health and Human Services

It has been made a priority to work closely with our Quality Team to ensure safety and quality are fully integrated. It started with incorporating biosafety risk assessments into the onboarding of new tests, and it grew into a strong, ongoing partnership. Together, we conduct annual internal audits that give us a well-rounded view of lab operations and help drive meaningful improvements. With our new lab opening later this year, this collaboration has become even more critical—keeping us aligned, strengthening our lab culture and supporting stronger outcomes for both our team and public health.

Kate Fitzpatrick, MPH, MBA, MB(ASCP)CM
Deputy Bureau Chief
Arizona Department of Health Services

In January 2024, our Quality Assurance (QA) department enhanced internal audits to include method witness observations, using a detailed checklist to assess compliance with standard operating procedures, good laboratory practices and safety policies. Identified safety concerns are shared with management and the Biosafety Officer, strengthening collaboration. This process led to improvements, including harmonizing personal protective equipment protocols across our open microbiology floor after inconsistencies with safety glasses were noted. It also clarified clean glove usage through staff engagement, observations and updated signage.

To further integrate safety and quality, a QA representative now serves on both the Biosafety Subcommittee and Safety Committee. This collaboration has helped create a more consistent and proactive laboratory environment.

Jill Power, MS
Retired Deputy Director
New Hampshire Public Health Laboratories

By introducing the Biorisk Management Standard ISO 35001: Biorisk Management for Laboratories, it formalized our safety program, ensured procedures were relevant to staff, improved how issues were addressed and established continuous monitoring of safety practices. Following the ISO standard guidelines, we also developed a process to communicate quality and safety findings and made them available to all management and staff using different communication methods—bulletin board, committee minutes, email, staff meetings, trainings and management review reports.

Using quality principles also allows the safety program to become more robust by implementing metrics that are monitored over time. Safety metrics enhance the quality program by having measures and monitors to ensure safety infractions are mitigated in a timely manner and to eliminate future safety problems.

Ninecia Scott, PhD
Quality Assurance and Safety Group Manager
Virginia Division of Consolidated Laboratory Services

Our organization consolidates various testing (e.g., clinical, environmental, emergency response, and consumer protections) and services. Through quality assurance and safety (QAS), we ensure compliance with federal, state and local standards and regulations and promote a safe workplace protecting personnel who provide these services.

Our team's joint goals are to continuously improve and implement current best practices essential to mitigating risks

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Improving Safety and Quality through Biorisk Management

By **Michael Marsico**, program manager, Public Health Preparedness and Response

The International Organization for Standardization (ISO) 35001 Standard: *Biorisk management for laboratories and other related organisations* defines a process to identify, assess, control and monitor risks associated with biological threats. ISO 35001 is built on the concept of continual improvement, following the Plan-Do-Check-Act Cycle (PDCA) (**Figure 1**). This approach provides a system to identify problems, implement solutions, evaluate results and make changes for ongoing improvement of the laboratory system specifically around the quality of laboratory operations and the safe handling of potential threats.

APHL and the US Centers for Disease Control and Prevention (CDC) are working to pilot the implementation of the ISO 35001 standard at multiple pilot public health laboratories.

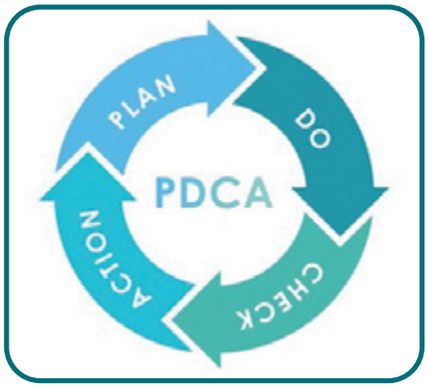

Figure 1. A visual representation of the Plan-Do-Check-Act Cycle.

Michael Stevenson, PhD
Deputy Laboratory Director
New Hampshire Public Health Laboratories

The ISO 35001 standard has helped the New Hampshire Public Health Laboratories to:

- Include a safety assessment component to the annual Clinical Laboratory Improvement Amendments (CLIA) competency assessment requirements.
- Consolidate documentation of all quality events, including non-conforming events and safety incidents, into a single electronic workflow process using Ideagen Quality Management (aka, Qualtrax).
- Implement an Excel safety risk assessment template for identifying biological, chemical and radiological hazard risks and mitigation steps, across all New Hampshire Public Health Laboratories testing units.
- Mentor an APHL Fellow in Biosecurity and Biosafety—now in his second year with us!
- Validate our autoclave biowaste sterilization cycles and have consistent quality controls in the cycle runs.
- Provide justification for and ultimately hire a dedicated laboratory safety officer.

Michael A. Pentella, PhD, director, and Andrea Morris, MPH, biological threat coordinator/biological safety officer
State Hygienic Laboratory at the University of Iowa (SHL)

Participating in the ISO 35001 pilot program provided SHL with the opportunity to evaluate our current biosafety program, identifying both strengths and areas for improvement. In preparation for the audit, SHL conducted a review of the program and initiated some changes. The preparation for the audit and the review by the auditors supplied us a fresh perspective and helped us see improvements that could be made.

For example, post-audit we implemented comprehensive documentation of all biological safety cabinets and fume hoods within our Quality Management System (QMS), including task reminders for necessary maintenance. Additionally, we have begun recording safety findings and conducting drills within our QMS. We have also revised our onboarding process to ensure consistent provision of recommended vaccinations and are incorporating a dedicated safety section into our annual management review.

By promoting safety with a focus on quality improvement, SHL continues to strengthen our culture of safety, address areas needing improvement and ensure the sustainability of a robust biosafety program.

Having an international standard that blends both quality and safety is imperative to support all laboratory operations. APHL is eager to continue to collaborate with these pilots to implement this standard and promote the value of ISO 35001 with other public health laboratories in the future. ■

Safety and Quality

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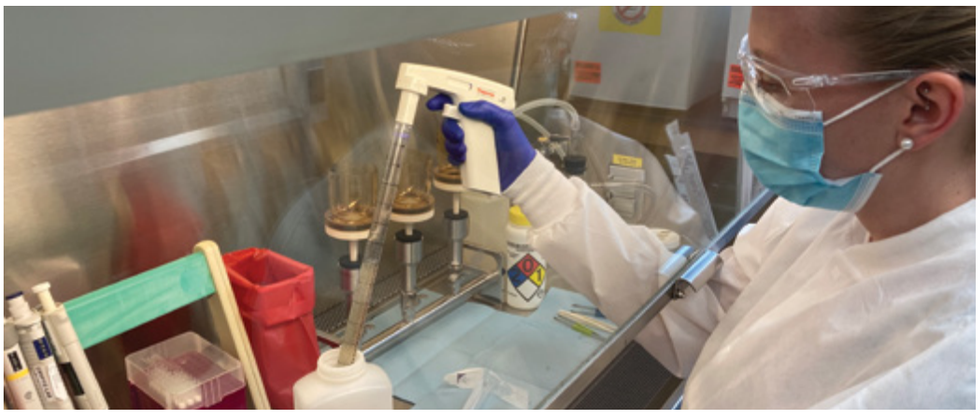
and producing reliable results. Two of our initiatives—a lab-wide continuous temperature and humidity monitoring system and streamlining training processes—are rooted in process standardization, training/competency, risk management and process improvement; thereby demonstrating intersectionality. When QAS works together, these actions result in improved commitment, employee support, accountability and credibility with our customers. ■

Wastewater Surveillance: Signs of Success for a New System

By **Erin Morin**, MHS, specialist, Environmental Health



Kayley Janssen from the Wisconsin State Laboratory of Hygiene pipettes sewage samples . Photo: Wisconsin State Laboratory of Hygiene.

During the COVID-19 pandemic, wastewater surveillance emerged as a useful public health tool to understand the presence of pathogens and their trends, as well as variants of diseases by analyzing samples of a community's wastewater. Agnostic of healthcare-seeking behavior and symptom presentation, wastewater surveillance can fill gaps in existing clinical surveillance systems, provide early warnings for healthcare facilities, help determine resource prioritization, and offer insight into the next public health threat.

Since 2021, the US Centers for Disease Control and Prevention's (CDC's) National Wastewater Surveillance System (NWSS) has funded 50 states, five cities, two territories and one county to develop wastewater surveillance programs. These jurisdictions have built capacity from the ground up to cover 45% of the US population and have used wastewater surveillance to detect targets such as SARS-CoV-2, influenza A/B, RSV, mpox and even polio. While wastewater surveillance is not a silver bullet and might not be effective for every pathogen, many jurisdictions have successfully used the data to implement routine and outbreak response public health interventions in their communities. These actions would not have been possible without NWSS funding and technical assistance.

Success Stories in the West…

The Houston Health Department (HHD) and their academic partner, Rice University, had been testing weekly wastewater samples for measles for about a year before they detected the virus in wastewater. The positive detection was in a sample collected before a clinical case was reported. In a parallel investigation, two cases of measles were confirmed in unvaccinated adults who had recently traveled internationally and resided within the sewershed of the positive detection. There have not been any subsequent positive wastewater detections in the Houston area—although they still test—and the method developed on collaboration with Rice was used in the West Texas outbreak and successfully identified measles in New Mexico's wastewater, per their statewide HAN.

Within a month of the first diagnosed US mpox case in May 2022, WastewaterSCAN validated an existing clade II mpox virus-specific assay that was then deployed in routine wastewater testing. Mpox was detected in multiple communities' wastewater throughout California within days of the assay implementation. Those detections helped inform public health understanding of the state and community burden of disease as clinical testing began to scale up and intersected with increasing awareness of the disease in at-risk populations. The California Department of Public Health (CDPH) worked closely with WastewaterSCAN to notify local health departments, who then alerted health care systems and local medical providers. With this information, they were able to allocate resources (vaccine, therapeutic and testing resources) and enhance community outreach. CDPH has since added the mpox clade II assay to their own routine wastewater testing. As the initial outbreak waned, wastewater surveillance for mpox has continued to prove useful, identifying mpox in the wastewater prior to case ascertainment, enabling scaled-up outreach and communication to mitigate further spread. Wastewater surveillance was again able to be leveraged in 2024 in response to the clade I mpox public health emergency of international concern.

…and the East

The Virginia Division of Consolidated Laboratory Services (DCLS) recently expanded its testing capacity to include SARS-CoV-2, influenza A/B, RSV, and mpox clade I and II. By bringing these assays in-house, DCLS improved turnaround times and reduced the reliance on external reference laboratories. This supports faster, more integrated public health responses and strengthens Virginia's overall preparedness for respiratory and emerging infectious disease outbreaks by providing more accurate, timely and complete data.

While all eyes were on the 2025 NFL Draft, the Wisconsin State Laboratory of Hygiene (WSLH) was looking at wastewater from treatment facilities in the area. As a part of their large events monitoring, they tested the wastewater for 13 pathogens of public health concern over an 8 1/2-week sampling period (six weeks before the event, three event days and the following 2 1/2 weeks) using a combination of digital PCR

Can't Get Enough Wastewater Surveillance?

Check out some other resources!

ASTHO

- Framework for Addressing Ethical Considerations in Infectious Diseases Public Health Wastewater Surveillance

CSTE:

- Public Health Impact Stories (can search by state or filter by wastewater surveillance)

APHL Publications

- National Trends in Wastewater Surveillance: 2023 Survey Report
- SARS-CoV-2 Wastewater Surveillance Testing Guide for Public Health Laboratories

APHL *Lab Matters*

- CDC and NCBI Coordinate Wastewater-based Genomic Surveillance Data
- Wastewater Surveillance for More Than SARS-CoV-2
- Environmental Health Laboratory Fellows Make a Difference
- Supporting Polio and Mpox Population Surveillance through Wastewater Testing
- Health Equity Through PFAS and Wastewater Surveillance
- Considerations for Implementing Wastewater Surveillance in Rural Communities
- NWSS Centers of Excellence Live Up to Their Names
- Metagenomics May Offer Value Across Many Areas of Public Health

APHL Blog Posts

- Wastewater surveillance gained prominence during the pandemic. Where is it now?
- Waste Not: Building a Wastewater Surveillance System in Zambia
- Testing the Waters: Ethiopia Pilots a Wastewater Surveillance Program
- How Kenya Built a Wastewater-based Surveillance System: Six Questions Answered
- Eyes Below the Surface: Wastewater Surveillance Pilot Program in Uganda Shows Potential for Future Pandemic Monitoring

(dPCR) and GeneXpert. Using dPCR, they detected hepatitis A during the draft and were able to report the detection within 24 hours. After discussing with the local health department, hepatitis awareness communication went out to the county via social media, reminding the community of symptoms and how to minimize their risk. After the draft, wastewater levels returned to normal, although a hepatitis A signal has returned along with an ongoing outbreak investigation in the area.

In 2021, the North Carolina Department of Health and Human Services (NCDHHS) began displaying wastewater surveillance data on a public dashboard. Since then, they have received positive feedback about the public value of the data. The health director for Asheville said wastewater surveillance is a valuable tool to track illnesses like flu and COVID-19, inform health messaging and encourage public health actions like vaccination or notifications to local healthcare providers. Additionally, one immunocompromised resident stated she uses this data to determine when to schedule non-urgent doctors' appointments or attend group activities. She said wastewater surveillance was a "trusted bright light" in North Carolina and uses this data to arm herself with "correct and current information" for her daily life.

While there is still much to learn about how to optimize wastewater surveillance as a public health decision making tool in the US, these jurisdictions have demonstrated their current utility and future potential to strategically manage community diseases. ■

Confronting Workforce Challenges in Environmental Health

By **Nicholas Arguelles,** associate specialist, Environmental Health and **Jennifer Liebreich**, MPH, senior program manager, Environmental Health

Nationwide, environmental public health laboratories face a workforce crisis: fewer applicants are entering the field, student-loan burdens weigh heavily on skilled professionals and government laboratory salaries struggle to keep pace with other sectors. These pressures erode institutional knowledge and make it difficult to recruit and retain staff. Recognizing these challenges, APHL's Environmental Health Committee (EHC) prioritized workforce development during the past year, and its Chemical Threat Collaborative Workgroup (CTCWG) developed resources to assist the chemical threat preparedness workforce within the Laboratory Response Network for Chemical Threats (LRN-C) programs in public health laboratories.

A History of Collaboration

The CTCWG is rooted in a decades-old effort by the US Centers for Disease Control and Prevention (CDC) to bolster workforce training. APHL adapted that original concept into the Chemical Threat Special Interest Group in 2008, which evolved into a collaborative workgroup when the CTCWG was formally chartered. In 2021, it became a topical workgroup of the EHC, whose priority is maximizing the value of the LRN-C, and during all iterations, its membership consisted of public health laboratory staff focused on LRN-C outreach efforts. The CTCWG continues to collaborate across APHL to innovate and deliver hands-on tools to support and strengthen the chemical threat workforce.

Innovative Resource Development

This year, the CTCWG introduced three flagship tools designed to guide, equip and connect CT Coordinators from their first day of work through ongoing peer collaborations. Day One in the LRN-C is an onboarding document that offers a two-week roadmap for newly hired CT coordinators. It weaves together introductions to laboratory colleagues, essential quality system requirements, CT-specific training milestones and strategies for engaging external partners, such as emergency responders and regulatory agencies, all in a single, easy-to-follow guide. By integrating training and outreach in one document, it directly advances the CTCWG's mission to provide current, comprehensive chemical threat preparedness practices.

To ensure that newly hired staff can find helpful resources, CTCWG rolled out a magnet to be placed prominently in all LRN-C laboratories. The four-inch circle magnet features a QR code linking to APHL's LRN-C emergency response resource page. From their mobile phones, staff can instantly access the onboarding guide, key standard operating procedures, quick-reference materials and contact lists for regional and national CT experts. The magnet's convenience allows quick, direct access to resources for new hires, and encourages frequent resource utilization by existing staff in the laboratory.

A scannable magnet appears on equipment in the Massachusetts laboratory. Photo: APHL.

Acknowledging the risk of knowledge loss during staff turnover, APHL compiled the Knowledge Retention Toolkit. The toolkit contains both general and position-specific questions, meant to capture the knowledge gained by employees through their hands-on experience and practice in the field.

A peer-to-peer exchange visit between Massachusetts and Wisconsin. Photo: APHL.

This year the toolkit gained a dedicated CT Coordinator tab. This new section provides onboarding questionnaires tailored to CT workflows, SOP checklists, documentation templates and best practice guidance for capturing institutional knowledge before retirements or transfers. By standardizing how laboratories preserve critical processes and insights, it helps build a sustainable knowledge infrastructure that aligns with broader outreach and preparedness goals.

Launch of the Chemical Threat Peer-to-Peer Exchange Program

Building upon many years of success by APHL's Biosafety Peer Network, the CTCWG developed a similarly modeled chemical threat peer exchange program. Utilizing application responses, CT coordinators from LRN-C laboratories were matched, based on complementary strengths and growth areas. In spring 2025, 16 LRN-C laboratories participated in site visits. Peer exchanges enable LRN-C scientists to share best practices for method development, refine outreach strategies and strengthen response approaches. Beyond boosting technical readiness, the program fosters lasting professional relationships that strengthen the network itself and the nation's preparedness overall.

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Strengthening Surveillance: A Training Model for the Next Generation of PulseNet Laboratory Experts

By **Amy Bryant**, MPH, specialist, Food Safety

Training participants for the PulseNet Laboratory and Data Analysis Workshop for Whole Genome Sequencing using Illumina Sequencing Instruments and the PulseNet 2.0 Analysis Platform. Photo: APHL.

Food safety professionals at the state, local and federal levels work in close collaboration every day to protect the public's health. Scientists collaborate with epidemiologists, food inspectors, state regulators, associations and federal partners to share information, recall dangerous food products and communicate with the public. If one of the components of this intricate system fails, then the risk to the public from unsafe food increases.

Sweeping cuts in federal funds have had a direct impact on public health professionals resulting in lost jobs, the elimination of programs and the erosion of institutional knowledge across government. Public health laboratories have been impacted particularly hard. While still recovering from the Great Resignation fueled by the COVID-19 pandemic, laboratories are desperately attempting to fill empty positions only to be met with a lack of training opportunities for the incoming workforce.

Public Health Training Gap Must be Filled

Newly hired laboratorians need access to technical information, hands-on laboratory workshops and training on data analysis to bridge knowledge gaps and benefit public health response.

Unfortunately, limited space for training participants, the inability of trainers to travel and shrinking budgets further restrict access to already limited training opportunities. To sustain high-quality surveillance and outbreak detection programs, we must have a robust, well-trained laboratory workforce. This means continual investment in the professional and scientific development of public health laboratory staff.

Nationally, the need for laboratory training is growing faster than courses can be offered. Therefore, innovative solutions are essential to close existing training gaps with minimal impact on resource-constrained state and local agencies. To accomplish this, we must leverage the expertise and technology that currently exists in the public health community relying on the technical expertise of those who routinely plan and develop rigorous training for public health laboratories.

A New Model for PulseNet Training

In summer 2025, the Michigan Department of Health and Human Services (MDHHS), APHL and the US Centers for Disease Control and Prevention (CDC) co-hosted a week-long training on PulseNet standardized procedures for whole genome sequencing on Illumina instruments and PulseNet 2.0 data analysis. This training was designed for state, local and federal public health laboratory technologists for testing enteric bacterial pathogens. MDHHS generously provided the venue, subject matter expertise and logistical assistance. Trainers from MDHHS, Colorado, Tennessee and CDC provided expert instruction through a combination of live and remote presentations. The use of Microsoft Teams enabled participants to receive the same high-quality instruction provided at CDC-hosted workshops. Working with sustaining member Illumina, APHL was able to facilitate Illumina's generous donation of reagents and supplies to support the training. Additionally, resources provided to MDHHS through CDC's Epidemiology and Laboratory Capacity grants were used to build out an expanded and well-designed training space. As a result of these investments and collaborations, a high-quality training was successfully delivered to 21 participants—nearly double the number typically invited to the course hosted at the CDC campus. Feedback from participants was overwhelmingly positive, as evidenced by one response: "Thank you so much for allowing me to be a part of this amazing training! I learned so much valuable information that I will absolutely be using and bringing back to my laboratory to share with my coworkers."

By leveraging the existing expertise of our members at the state and local levels and APHL's resources and relationships, we can begin to fill the training gap at a time of national need. MDHHS's first-rate contribution to fulfilling PulseNet training needs can serve as the model for future training activities. ■

The Culture Club: Inside the NERLC

By **Allison Gennety**, specialist, Food Safety

> "The APHL NERLC group and calls have been extremely beneficial for our laboratory… and I hope that the NERLC continues to provide support to public health laboratories."
>
> ***— NERLC Member***

The National Enteric Reference Laboratory Community (NERLC), established by APHL and the US Centers for Disease Control and Prevention's (CDC's) Enteric Disease Laboratory Branch (EDLB), was created to foster collaboration, communication and consistency across public health laboratories working with enteric pathogens. As enteric diagnostics evolve, the need for a connected community to support isolation, identification and subtyping has grown.

The NERLC was created to meet that need. By bringing together laboratorians across the country, the community offers space for real-time discussions about challenges, results and best practices at the enteric bench. Members work in laboratories of all sizes and capacities, but all share a commitment to accurate testing and a unified public health response. One of the primary goals of the NERLC is to empower public health laboratories to speak up and share experiences and help guide future priorities. It's not just about updates; it's about building a peer-led environment where laboratories can learn from one another and shape the conversation together. There are scheduled calls that discuss current outbreaks, interesting findings and updates to best practices. So far, the NERLC has hosted speakers from public health laboratories on topics such as Shiga toxin-producing *E. coli* (STEC) and Enteroinvasive *E. coli* (EIEC), as well as review of STEC, *Shigella* and *Salmonella* workflow documents aimed at improving efficiency and saving costs in public health laboratories. The community also keeps members up to date on the latest changes within EDLB and EQA testing results.

Whether you are a new staff member looking for support or a seasoned microbiologist with knowledge to share, your voice is welcome! We encourage all members to participate in calls, present interesting topics and cases, ask questions and provide feedback to help shape the group. To join the community, reach out to the APHL staff liaison Allison Gennety. Feel free to contact APHL and the CDC EDLB team with any interesting ideas to present on one of our next calls. The NERLC is built on the idea that no laboratory works alone, so join the culture club and be a part of the conversation. ■

Save the date for the next NERLC Call!

Scan the QR code to add the meeting to your calendar:

Join Us!

APHL Newborn Screening Symposium 2025

October 5–9, 2025 • Providence, RI

Early registration rate expires September 19.

www.aphl.org/NBS2025

#APHLNBS

Assessing Workforce Competencies in Kenya and Zambia

By **Natalie Martinez**, specialist, Global Health; **Reshma Kakkar**, senior manager, Global Health; **Hewan Moges**, specialist, Global Health; **Matthew McCarroll**, principal specialist, Global Health; **Kasimona Sichela**, senior informatics technical manager, Zambia; **Elias Munshya**, senior specialist, Informatics, Zambia; **Nelson Akenga**, senior specialist, Informatics, Kenya; and **Rufus Nyaga**, deputy country director, Kenya

Senior Informatics Specialist Nelson Akenga provides technical assistance to Zambian participants. Photo: APHL.

Workforce competency assessments are integral for ensuring the quality, safety and efficiency of laboratory testing. A competent workforce, as measured by international standards such as ISO 15189, is the foundation of a high-performing public health laboratory. However, a significant challenge in measuring the competency of laboratorians has been the lack of structured online digital assessment tools. Historically, managers and staff have often relied on cumbersome and time-consuming paper-based evaluations. To address this, APHL developed an online Laboratory Workforce Competencies Assessment Tool, aiming to enhance accessibility and functionality in competency evaluations. This tool enables users to conduct workforce competency assessments and visualize results within and across facilities in each jurisdiction. It also allows for one-time assessments, comparisons or repeat assessments over time.

A key feature of the tool is its ability to facilitate both self-assessments and supervisor-led assessments across various essential laboratory workforce competency domains. Currently, the Laboratory Informatics domain is the only one incorporated into the tool, however, future plans are to include Quality Management Systems, Emergency Management Response, Communications, Security, Management & Leadership and Ethics. The assessment results are designed to inform supervisors and interviewees of their strengths and knowledge gaps, thereby providing a foundation for developing personalized professional development plans.

This past April, APHL hosted in-person workshops to introduce and pilot this new assessment tool in Kenya and Zambia. These workshops brought together Ministry of Health representatives, APHL staff and laboratory personnel from selected pilot sites. Participants included 20 individuals in Kenya and 21 in Zambia.

During the workshops, the tool was subjected to several use-case scenarios, and feedback and recommendations were gathered for improvement of the tool. Attendees confirmed that the online tool was more accessible and easier to administer than previous methods. They also noted its effectiveness in highlighting areas needing improvement. The tool summary reports were also reported to be useful for supervisors to more aptly plan professional development activities for their staff.

The next phase of the Laboratory Workforce Competency Assessment Tool's development will focus on incorporating additional domains from the Laboratory Workforce Competency Framework and implementing other enhancements based on the recommendations gathered during the workshops, all aimed at providing a robust user experience and improved quality standards for laboratory accreditation.

For more information on the Laboratory Workforce Competency Assessment Tool please contact Hewan Moges specialist, Global Health. ■

The Rapid Closure—and Reinstatement—of Two CDC Laboratories

By **Sarah Buss**, PhD, D(ABMM), program manager, HIV, Viral Hepatitis, STD and TB Programs

Laboratories are essential to public health. Laboratorians work to generate data and provide results that inform public health action and treatment decisions. When laboratories are running smoothly, their work can be underappreciated. However, when laboratory work is abruptly stopped, people quickly take notice.

On April 1, two US Centers for Disease Control and Prevention (CDC) laboratories—the Division of STD Prevention's (DSTDP) Laboratory Reference and Research Branch and the Division of Viral Hepatitis's (DVH) Laboratory Branch—were suddenly closed and all employees were subject to a reduction in force. The closures were part of broader federal staffing cuts that were rationalized as elimination of tasks "identified as either unnecessary or virtually identical to duties being performed elsewhere in the agency." In reality, these laboratories performed essential functions that were not available elsewhere, and their absence was swiftly felt.

By April 2, the public health community was scrambling to find a laboratory that could complete molecular surveillance testing related to an ongoing hepatitis C virus (HCV) outbreak linked to a pain clinic in Florida. The DVH laboratory had been performing this work using an in-house-developed protocol and system designed specifically for hepatitis outbreak detection and transmission mapping—the Global Hepatitis Outbreak and Surveillance Technology (GHOST). The DVH laboratory had deployed the protocol to state and local public health laboratories, but data analysis was dependent upon GHOST system maintenance that the DVH laboratory routinely performed. With GHOST shut down, unmet HCV surveillance needs were reported in additional states and requests for hepatitis A surveillance testing, also previously completed by the DVH laboratory, surfaced. National surveillance for hepatitis viruses had been halted without a contingency plan.

Similarly, questions quickly arose about the ability of the United States to continue the vital work conducted by the DSTDP laboratory. Public health laboratories providing regional antimicrobial susceptibility testing and sequencing-based surveillance for drug-resistant *Neisseria gonorrhoeae* wondered who would provide the external performance evaluation panels, quality control strains, media and antibiotic powders, data analysis and technical consultation that they relied upon. Surveillance work conducted by the DSTDP laboratory, related to an uptick of disseminated gonococcal infection cases, abruptly stopped and there was no plan in place to move it forward.

Fortunately, on June 11, following widespread concern and mobilization by the public health community, CDC announced a policy reversal with over 400 positions reinstated, including all staff from the DVH and DSTDP laboratories. The announcement brought relief, but also questions: Would all employees return or was there a loss of institutional knowledge and expertise? Would the reinstatement of critical services survive a CDC-wide reorganization? How long would it take to bring specialized testing back online? While some questions remain unanswered, employees of both laboratories worked rapidly to bring their testing and consultative services back online, understanding that more damage would be done the longer that systems remained down.

This episode should serve as a reminder: laboratories are not optional infrastructure and skilled laboratorians are indispensable. Moreover, the functions of national reference laboratories cannot be quickly outsourced or recreated. While private laboratories can provide diagnostic testing for many diseases and conditions, surveillance testing that links cases and helps find the source of outbreaks is usually not available in the private sector.

State and local public health laboratories are highly capable and increasingly equipped with molecular surveillance tools of their own. However, working across jurisdictional boundaries presents challenges, such as facilitating payment across state lines, assuring reporting capability and establishing a common understanding of methodologies. These challenges must be mitigated before services are needed. National laboratories help bring coherence to the system, providing consistent methods, ensuring quality standards and linking data across the country. Without their central coordination and expertise, the national laboratory network begins to fragment, weakening the collective response to emerging threats.

Looking ahead, the laboratory community must advocate for sustainable investments, clear contingency planning and policies that recognize the irreplaceable role of federal public health laboratories in a functioning public health laboratory system. Because when the system shuts down, the consequences are immediate—and the recovery is never instant. ■

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.

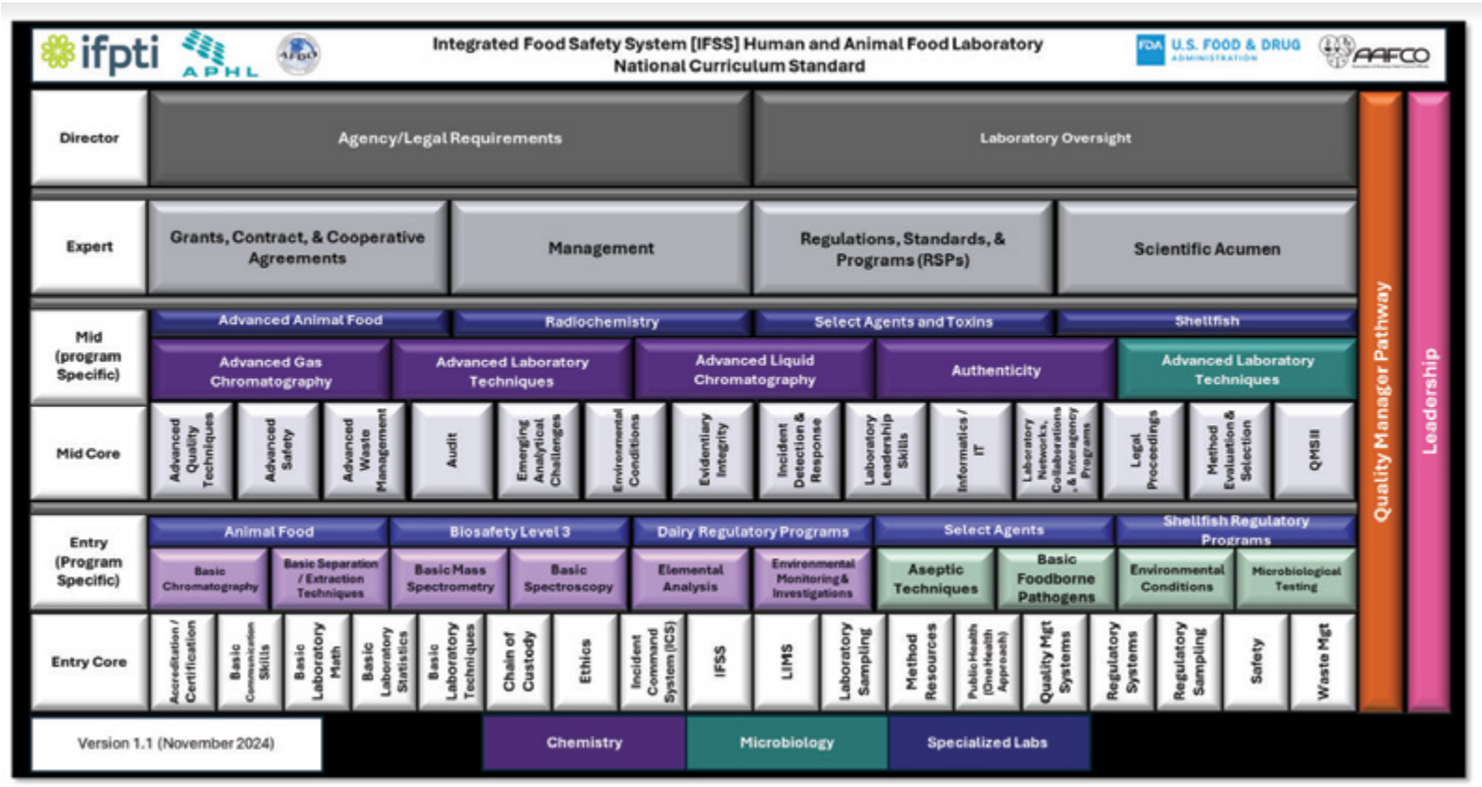
Building Analyst Competency

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 APHL's Learning Portal at **learn.aphl.org/learn**.



Building the Foundation for Public Health Data Modernization

By **Melanie Kourbage**, MA, PMP, lead specialist, Informatics

Microbiologist Oliva Welsh at work in the UDHHS laboratory. Photo: UDHHS

As public health agencies face increasing funding uncertainty, the need for a flexible, forward-looking data modernization strategy has never been clearer. For many, the first critical step is conducting a thorough internal assessment to pinpoint the biggest gaps and highest priorities that must be addressed.

Lessons from Utah

In fall 2024, the Utah Department of Health and Human Services (UDHHS) launched an ambitious, enterprise-wide evaluation of its data systems. Using focus groups, the process brought together programs across the agency to ensure a balanced, insightful understanding of systemic needs. Key areas investigated included:

- Data access and sharing
- Data sources and quality
- Data processes and workflows
- Infrastructure readiness
- Governance and policy alignment
- Workforce capacity and training

The result was a clear, actionable summary of challenges, opportunities and strategic recommendations. UDHHS also created a dynamic list of proposed data modernization projects—a "living" roadmap to guide future action. The findings and recommendations from UDHHS's listening and learning sessions with the laboratory reflect issues common across many public health laboratories nationwide, which include:

- Limited data access and internal sharing
- Heavy dependence on outdated and unsupported systems
- Policy and governance hurdles
- Skill gaps and lack of specialized training

The recommendations in the final report were a combination of immediate actions and longer-term goals. Over the long term, the report recommended that the laboratory focus on—as resources and funding allow—upgrading legacy systems, adopting cloud-based solutions, expanding instrument integration with the LIMS and replacing outdated sequencers. Even if full implementation is not yet feasible, these modernization goals are now documented and prioritized for future investment.

More immediately, UDHHS will implement several of the report's recommendations. For example, UDHHS intends to improve data literacy and strengthen its sequencing program by hiring a genomic epidemiologist to train individuals on genomic data and its utilization. Also, UDHHS is in the process of creating standardized data-sharing agreements to break down interdepartmental data silos and, in order to strengthen the connection between the laboratory and UDHHS data modernization efforts, a member of public health laboratory leadership has joined the data modernization core team.

Fostering Member Success Through Shared Experience

Ensuring that the laboratory is a part of an organization's data modernization conversation is one of the key goals of the APHL Data Modernization Subcommittee. Using knowledge acquired by APHL member laboratories during their modernization journeys, this subcommittee, launched in early 2025,

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Learn More

- **Want to learn more about the Subcommittee or share your laboratory's priorities?** Reach out to Melanie Kourbage.
- **Just getting started?** Check out the Public Health Institute's Data Modernization Initiative Planning Toolkit for practical guidance.
- **Coming soon:** Keep an eye out for the public health laboratory data modernization survey to make your voice heard!
- **Want the full story?** UDHHS's journey is featured in the *CSTE Stories from the Field* series.

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.

learn.aphl.org

AIMS: Keeping Pace with a Changing Digital Health Ecosystem

By **Melanie Kourbage**, MA, PMP, lead specialist, Informatics

"What do you think the future of the health technology ecosystem should look like?"

This was the question recently posed by the Centers for Medicare and Medicaid Services (CMS) and the Assistant Secretary for Technology and Policy (ASTP) through a request for information (RFI) released in May. CMS and ASTP sought input from various perspectives on health information technology (IT) and solicited ideas for how to shape the future direction of health technology.

The RFI specifically requested feedback from patients, providers, payers and technology developers, but notably not that of the public health community. This omission of public health voices is telling—and risky. Public health data inform population-level decisions that save lives during crises like pandemics or outbreaks and supports campaigns to combat chronic disease. In many cases, public health laboratory testing plays a key role in individual patient care as well as treatment. A more future-forward health IT ecosystem should make public health not just a recipient of data but a key architect in how systems are built and governed.

Making Public Health a Priority

The omission of public health from the list of parties utilizing health IT underscores a deeper reality: public health data are often not a priority for health IT developers. Their primary focus is, understandably, on enabling clinical care, supporting payer workflows and ensuring patient data flow smoothly across care settings. But public health data play a different yet equally critical role, which is why a dedicated intermediary—one designed specifically to support the interoperable movement of public health data—is needed.

The APHL Informatics Messaging Services (AIMS) Platform has been securely transporting millions of messages daily for use cases that span the full spectrum of public health data exchange for over two decades. But AIMS continues to evolve with the digital health ecosystem and is helping jurisdictions meet new interoperability and data exchange challenges. AIMS is ahead of the curve on the Trusted Exchange Framework and Common Agreement (TEFCA), helping public health agencies become early adopters. While hospitals are still onboarding to qualified health information networks (QHINs), AIMS has already established connections to 70+ state, local and territorial public health agencies and currently supports 55 agencies in receiving electronic case reporting (eCR) via the eHealth Exchange QHIN, one of the first examples of public health data in production through TEFCA. AIMS processes 2.25 million eCR documents via TEFCA each month.

Crucially, through APHL's collaboration with eHealth Exchange, as TEFCA finalizes sub-exchange purposes for other use cases, AIMS is positioned to seamlessly transition additional data feeds, such as electronic laboratory report (ELR), syndromic surveillance, electronic laboratory surveillance messages (ELSM), case notification messages, cancer reporting, vital records, immunization data and electronic test orders and results (ETOR) to TEFCA for its data exchange partners.

AIMS is also building its fast healthcare interoperability resources (FHIR) capabilities and has partnered with Deloitte and the Florida Department of Health to conduct a pilot project to run a FHIR query to retrieve missing patient demographic data from an electronic health record.

A Robust Solution with a Strong Foundation

Despite current uncertainties surrounding public health, there is a strong foundation being built for the future. AIMS can support a streamlined public health system with consolidated and centralized services. For example, the CDC Data Integration Building Blocks (DIBBs) team is working with APHL to launch its eCR Refiner tool as a centralized service on AIMS to "refine" eCR messages and surface the relevant data before they are received by public health. Hosting,

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Workforce Challenges

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Looking Ahead

The CTCWG continues to explore new ways to connect with APHL programs to support the chemical threat workforce. The group intends to refine its suite of practical resources to enhance mechanisms for sharing knowledge and foster collaborative opportunities. Maintaining a focus on user-centered tools, flexible training approaches and sustained peer engagement strengthens workforce development, outreach efforts and preparedness. In this manner, APHL fulfills its commitment to ensuring that public health laboratories are equipped—both in expertise and networks—to address chemical threats with confidence.

Data Modernization

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will help identify and develop tools, best practices and position statements to help laboratories assess their technological capabilities and infrastructure needs, identify areas for improvement and plan a modernization strategy.

The subcommittee is excited to amplify the story of the UDHHS enterprise assessment and their collaboration with their public health laboratory. UDHHS did the assessment internally, and their methodologies can be a model for other organizations. The UDHHS assessment process—conducted in-house and informed by real-time insights of agency staff—offers a replicable, cost-conscious roadmap that other public health agencies can use to launch their own modernization journeys. And the findings and recommendations in UDHHS's report are useful starting points for any public health laboratory. The subcommittee hopes to share stories like this across member laboratories and to support them on their modernization journeys.

Health Ecosystem

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development and processing will take place on AIMS instead of in 65 different jurisdictions, thus cutting costs and overhead. Similarly, AIMS has multiple pilot laboratories and healthcare organizations in production with ETOR and is positioned to scale this service nationally. These shared services benefit the entire digital health ecosystem, improve public health outcomes and allow healthcare to focus on patient care rather than reporting requirements.

APHL is also expanding public/private partnerships with clinical laboratories to help them meet public health reporting requirements with minimal effort and overhead using AIMS; and APHL is exploring creative approaches to automated reporting on performance-based metrics like data quality and completeness for ELR and eCR. In the past six months, optimization efforts have led to a 30% decrease in monthly AWS infrastructure costs, with further process improvements in the works.

Through AIMS, the infrastructure is available to scale these solutions and to collaborate with TEFCA partners like eHealth Exchange to enrich and broaden the public health data that is flowing, and to take advantage of new interoperability and technology. The future is not just about keeping up; it is about shaping what's next. APHL and AIMS are leading public health data exchange into the future, and public health should be a key TEFCA partner, with representation in governance, standard setting and infrastructure strategy.

APHL's comments in response to the CMS/ASTP RFI can be found on our Policy Engagement space on Confluence.

Association of Public Health Laboratories
7700 Wisconsin Avenue
Suite 1000
Bethesda, MD 20814

APHL Sustaining Member Program

The following corporations partner with APHL to support the nation's public health laboratory system.

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