LAB MATTERS

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Spring 2026 Issue 1

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ASSOCIATION OF PUBLIC HEALTH LABORATORIES

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where laboratory science and public health meet

May 4–7, 2026 | Baltimore, MD
Baltimore Convention Center

The APHL Annual Conference, an event for the public health laboratory community, brings together more than 1,000 leaders, scientists, influencers and partners to share issues, trends and best practices driving laboratory science and public health today.

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

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Reflections on a Milestone

> "It is these connections, participating in APHL's leadership and watching APHL's membership grow and change every year that reflect that it is never too late to become a leader in public health."

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

As a ninth grader in Mr. Solomon's honors biology class, I knew right away that I wanted to do science. The first day we were able to look into a microscope was a watershed moment in my life that dictated my career and cemented my passion for scientific rigor. Throughout my undergraduate and graduate experiences, I realized that I really wanted to do public health science, but at the time, the definition of a "public health laboratory" was not in the academic lexicon. APHL was the organization that not only crystallized it for me but also offered me the opportunity to investigate it further as an Emerging Infectious Disease Fellow.

So now, 22 years into my public health journey, I am a laboratory director who has begun looking at the next generation of leaders. Just as a director has an obligation to train their replacement, the legacy of an association is also generational. When APHL first began in 1951 as the Association of State and Territorial Public Health Laboratory Directors, its overarching mission was to be the voice of those laboratory directors to federal and state public health partners. As the association grew and extended its membership to other public health laboratories, we showed that there is a different way to approach public health. In one instance, the microbiologist may take center stage during an Ebola outbreak. In another instance, the food safety fellow may be instrumental in detecting an outbreak of *Listeria*. While from the outside it may look like one person, team or department is providing the answers, thanks to APHL, we know we are all a part of the same system.

It is also very thought-provoking to educate new laboratorians about the cyclical nature of public health. We are confronted with a public health emergency, we do the work with little to no recognition, and then the emergency goes away. We may receive funding related to the emergency, so we build systems, innovate laboratory practices and hire and train staff to respond. But once the emergency funding goes away, we have to change and adapt to continue to deliver core services to our communities. As public health laboratories find themselves again on the downswing of the funding cycle, our most important duty is to train and coach the next generation on how to navigate these challenges.

While my foray into public health laboratories was very intentional, there are many career paths that can lead to public health. Nowhere is that more evident than the fellows and interns that have come through APHL's Fellowship and Internship programs over the years. Indeed, within my own laboratory in North Carolina, I am always delighted to hear the stories of how my colleagues found public health and, in turn, public health laboratories.

It is these connections, participating in APHL's leadership and watching APHL's membership grow and change every year that reflect that it is never too late to become a leader in public health. No matter your position in the laboratory, no matter when you join our community, your contributions will improve the lives of more people than you know. ■

The Nature of Partnerships

> "Our public health and laboratory partnerships are at the heart of everything we do."

Scott Becker, MS
Chief Executive Officer, APHL

"Tell me again. Are we primarily a laboratory organization or are we primarily a public health organization?"

This was a question I asked our leadership frequently in my first decade at APHL. I needed to define that difference so I could define it for our partners, funders and colleagues. What I discovered at the time was that we are one of many voices in the laboratory space, but APHL is the only laboratory voice in the public health community. And that voice, now more than ever, is vital to creating new partnerships and sustaining existing ones.

While our association was formally founded in 1951 as the Association of State and Territorial Public Health Laboratory Directors, our roots were established long before as a variety of different groups: the Society of American Bacteriologists, the American Public Health Association Laboratory Section, the Southern Public Health Laboratory Association and the Conference of State and Provincial Public Health Laboratory Directors. Our first formal partnership was with the then-Communicable Disease Center, today's US Centers for Disease Control and Prevention. As the complexity and depth of public health laboratories has changed, so has the complexity and depth of our partnerships.

Our public health and laboratory partnerships are at the heart of everything we do. Across the public health ecosystem, we work closely with federal partners, such as CDC, EPA, FDA, HRSA and others. Just as important are our relationships with the "Big Five": ASTHO, CSTE, NACCHO, the Big Cities Health Coalition and APHL—together, we are the Big Five.

For me personally, the Big Five has been a true rock over the past six years—from the earliest days of COVID through today. The collaboration, trust and shared commitment during some of the most challenging moments in public health have made a real difference.

Beyond the Big Five, we partner with a wide range of organizations, including the American Public Health Association, Trust for America's Health, ACLA, CLSI, NEHA and many more. These partnerships bring us together to advocate, deliver programs and support one another as we advance public health.

The corporate partnerships that we have built and sustained have been integral to APHL's growth. Some companies are partners, providing our members with the opportunity to enhance the dialogue about public health laboratory practice. Other companies are active APHL members, not only supporting members at APHL events, but also allowing our members to help shape their work. From tracking supply shortages to weighing in on new innovations and technologies, we are incredibly proud to be able to nurture these relationships.

Our international partners are also essential to public health success because those relationships allow us to understand what is really going on outside of our borders. They allow us to share early information—and not just within the public health laboratory space. From organizations as large as the WHO to smaller organizations such as the Canadian Public Health Laboratory Network, our members and partners benefit from the association's interactions with these organizations on both a macro and micro level.

Even after 27 years of leading APHL, I find that our partnerships are still about finding relationships that contain a mutual spark of inspiration, of collaboration and of wanting to change things for the better. Our partnerships are also about mutual dependence and reliance—whether through policy, advocacy or technical innovations—and providing our members with the most helpful information as soon as possible. They are also about hosting those spaces for connecting, sharing and gathering.

APHL has a long history of evolution and a long history of change, but it still comes down to the people you work with. And as we look forward to the next 25 years of evolution, it will be a privilege to continue to convene our members, to continue to sustain those partnerships and to continue to bring like-minded people together who share the same goals. We will continue to be the leading voice for public health laboratories, providing analysis, answers and action. ■

75 Years of Membe

The 1951 formation of the Association of State and Territorial Public Health Laboratory Directors (ASTPHLD) from the old Conference of Southern Public Health Laboratory Directors was a sign that the emerging field of public health laboratory science had gained a national, if not international, focus.

ASTPHLD brought together laboratory directors from 48 states and US territories in a collegial atmosphere, allowing the executives to share scientific, administrative and financial expertise at annual meetings and in refereed publications. Until the association changed its name in the late 1990s, ASTPHLD represented the interests of public health laboratories nationwide.

In August 1997, Scott Becker attended his first National Laboratory Training Network (NLTN) meeting in Edmonds, Washington. Becker and Carol Clark flew to Portland, Oregon prior to the meeting to brief Dr. Mike Skeels, the head of the Oregon public health laboratories and then ASTPHLD president, on the association's dire financial straits.

"I needed him to understand, face-to-face," Becker said, "that we would do everything we possibly could, but that the organization needed to be transformed, and that was going to take resources. I wasn't quite sure how or what we were going to do, but I knew it needed to be done. He did not really like hearing about the resource challenges, but he listened intently and heard it."

> **"I needed [Dr. Skeels] to understand, face-to-face, that we would do everything we possibly could, but that the organization needed to be transformed, and that was going to take resources. I wasn't quite sure how or what we were going to do, but I knew it needed to be done."**
>
> ***— Scott Becker, MS***

Becker and Clark left Skeels and took a four-hour train ride from Portland to Seattle for the NLTN meeting. During the ride, the two staffers methodically listed everything that needed to be changed in the association: a new name, a more inclusive membership, tools for increasing the association's public image, budgets, and importantly, increasing federal government financial support for the organization's mission. At the top of the list was the need to change the association's name.

The name change also implied a more inclusive organization with new membership categories. Mike Skeels chaired a January 1998 board meeting that began to examine Becker's proposed changes. At that organizational meeting, opponents to the changes were numerous and vocal. They argued that county, local and private laboratory staffers could belong to any number of scientific organizations, and that ASTPHLD's very exclusivity made it an elite organization in the public health community.

But supporters of the proposed changes made the case with equal passion that the organization was stretched too thin with its 56 members. "We had been talking for many years about bringing more people in," Dr. Carl Blank said. "We were talking about a broader perspective that was not restricted to state laboratories. The board needed to represent laboratories. It couldn't restrict membership."

"The idea of expanding the membership preceded the name change," Dr. Burt Wilcke said, adding that the suggestion had first been made and voted down at the 1993 annual meeting in Minneapolis. "But it was obvious that we had to have the name change to attract new members."

The vote, as Becker recalled it, "was very close. It was a real challenge. They kept voting-up, down, up again-and it was one of these emotional, passion-filled type of things." ■

— Excerpted from *APHL 50th Anniversary: Looking Back, Looking Forward*

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Membership by the Numbers:

December 2011	December 2025
768	**1,696**
members in six categories	*members in seven categories*

APHL brings together institutions and individuals who recognize the value public health laboratories provide to their communities and jurisdictions. Since the early 2000s, we have added membership categories to reflect the breadth and depth of knowledge that public health laboratories bring to any public health conversation:

Public Health Institutional - State: Any of the public health laboratories of the states, territories, and commonwealths, including the District of Columbia, of the United States are eligible for membership in this category.

Public Health Institutional - Local: Any of the public health laboratories of the counties, parishes, municipalities, cities, townships, boroughs or other localities within the US, as well as any US-associated Pacific Islands, are eligible for membership in this category.

Public Health Associate Institutional (PHAI): Environmental laboratories, agricultural laboratories, state chemical laboratories, and other laboratories of the states, territories, and commonwealths, including the District of Columbia, of the United States, as well as any US-associated Pacific Islands, who are interested in public health issues are eligible for membership in this category.

Individual: Persons who have an interest in public health and are not otherwise eligible for membership can join us in this category.

Student: Those individuals that are currently enrolled in an undergraduate or graduate program related to public health laboratory science (e.g. microbiology, chemistry, public health, environmental health, etc.), or are a fellow or intern at a public health laboratory are eligible for membership in this category.

Sustaining-Corporate Colleague: Added in 2013, this membership category recognizes industry or corporate entities that have an interest in public health or environmental laboratories.

Our members are also very active in not only the governance of APHL, but also the forward-thinking work of public health. Over 5,000+ members of committees, subcommittees and workgroups advance public health laboratory science, educate future public health leaders, make connections across industries and power technology innovations across the public health community.

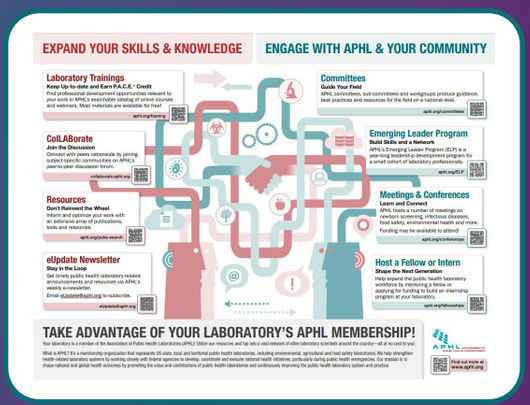
For more on APHL's membership, and becoming a member, please visit APHL.org.

Your laboratory's membership gives you access to:

- Laboratory trainings
- CoILABorate communities
- Technical publications, tools and resources
- *eUpdate* newsletter

SCAN ME

For a full-sized version of this poster! It contains QR codes to APHL's various member resources, such as publications, toolkits, newsletters, laboratory trainings and more!



Member Profile: Georgia Department of Agriculture Laboratory

By **Carrie Crabtree**, PhD, laboratory division director and state chemist

Staff from the Atlanta laboratory (photo on left) and the Tifton laboratory (photo on right). Photo: Georgia Department of Agriculture.

Year established: Our agency was established in 1874, and the laboratory followed in 1880. We started out in the main office in Atlanta as a Fertilizer and Soil laboratory, but it quickly expanded into food adulteration and other areas.

Location: We have eight sections across two locations. One is in Atlanta, Georgia and the other is in Tifton, Georgia (they are ~200 miles apart) and sometimes they share samples.

Facility: Our Atlanta laboratory is an approximately 11,000-square-foot facility that houses our State Grade A Dairy Laboratory and our Food Safety Microbiology Laboratory. Our Tifton location is a 75,000-square-foot facility that houses the other six laboratory sections, which include our Pesticide, Animal Feed, Fertilizer, State Seed, Metrology and State Fuel & Oil laboratories.

Number of staff: I have 55 staff members (56, including me—I manage the entire division).

Distinguishing characteristics: We are one standalone laboratory division with eight unique sections in two locations that cover all 159 counties in our state. We are under Operations within the Georgia Department of Agriculture, specifically in the Consumer Protection Divisions, where we serve as an internal partner to six of the other consumer protection divisions. We are one of a few departments of agriculture laboratories that are not part of a university. We do have external customers for some of our sections, but we also assist our Georgia Department of Public Health (DPH), Georgia Department of Natural Resources (DNR) and Georgia Bureau of Investigation (GBI). Our laboratories vary in accreditation from ISO/IEC 17025, NIST, Association of Seed Analysts (AOSA) and FDA Grade A program. Our samples range from human food, animal feed, pesticides, seed and fertilizer, to all petroleum products, and weight and volume provers. We are a unique mix of biology, microbiology, horticulture, physics and chemistry.

Highest volume testing: Our Seed laboratory has the highest level of testing at approximately 19,000 samples per year. Specifically, they perform germination and purity of peanut seed for all of Georgia and most of the southeastern US. Our Fuel laboratory comes in second at approximately 12,000 samples per year. The Food Safety laboratory would be our third highest.

Notable success story: Our Food Safety Microbiology laboratory has been part of several peer-reviewed articles concerning leafy greens and pathogen testing. They were most recently part of a case where the same strain of Listeria monocytogenes was found to persist on a lettuce harvester for many more years than thought possible, with samples that were positive many years apart.

Biggest challenge: Our biggest challenge is funding, specifically for salaries. This is especially difficult in laboratory sections where external funding may not be available to supplement salaries or even to purchase equipment. ■

Member Profile: Maryland Department of Health Laboratories Administration

By **Robert Myers**, PhD, director

Laboratory staff photo taken in fall of 2023 commemorating Maryland's 125th anniversary. Photo: MDH Laboratories Administration.

Year established: Our roots can be traced to our founding in 1898 when, at the recommendation of the Maryland Board of Health, the legislature appropriated $2,500 to hire a State Biologist (Bacteriologist), Dr. William R. Stokes. His mandate was to provide free testing to physicians to establish a more rigorous scientific basis for the diagnosis of communicable diseases, and to examine drinking water and food for bacterial contamination to guide public health officials in implementing more effective sanitation measures. To this day, we continue to be a science-based organization providing sound, actionable, objective and unaffiliated information to medical professionals, public health partners and others to implement appropriate prevention and control measures by providing accurate and timely laboratory test results. We are considered to be the oldest continuous operating unit in the Maryland Department of Health (MDH).

Location: Our central laboratory is physically located in east Baltimore, adjacent to the Johns Hopkins University Medical campus. We also operate two smaller regional environmental testing laboratories, one in western Maryland in Cumberland and the other in Salisbury on Maryland's eastern shore.

Facility: Construction of our central laboratory was completed in spring 2015. The approximately 237,000-square-foot energy efficient building is LEED Silver certified and includes energy saving features such as HVAC heat recovering enthalpy wheels, case work made from renewable materials, such as bamboo, and a green roof. Our laboratories are housed on six floors of the building, which features an open-plan design with mobile case work that allows for more flexible use and efficient use of space, allowing us to expand our testing capabilities and adapt to emerging threats, enhancing our overall preparedness efforts to better respond to outbreaks and environmental hazards. Our facility also contains over 17,000-square-feet of BSL-3 laboratories so our staff can safely work with high-consequence pathogens that are regularly encountered in public health laboratory practice. Additionally, the complex mechanical systems needed to operate our building are housed in a two-story penthouse with two rooftop 2.0-megawatt diesel generators that can completely power the facility for up to 72 hours when disconnected from the power grid.

The building infrastructure is organized around five scientific divisions—Environmental Sciences, Newborn Screening, Molecular Biology, Virology/Immunology and Public Health Microbiology—based on the diversity of scientific disciplines that are practiced in the facility to address a variety of public health problems. Our scientists are continuously improving our test systems by adapting and applying advanced technologies for better solutions to detect and characterize newly emerging and reemerging infectious diseases; respond to the growing threat of antimicrobial drug resistance; identify existing and novel chemical, radiological and microbiological contamination of our food and water supplies; and develop effective newborn screening tests for treatable heritable disorders. Approximately 9.8 million tests were performed by the Laboratories Administration in fiscal year 2025 (July 01, 2024 to June 30, 2025). We contribute not only to the mission of the Health Department, but to many other state federal and local government partners and to communities across the state.

Number of staff: We are staffed by approximately 220 full-time and contractual employees, most of which are based in our Baltimore laboratory. Our diverse workforce is highly educated, with approximately 75% of employees having a scientific or technical background. We also have a hard-working, dedicated cohort of support staff that are vitally important to sustain the success of our laboratory operations.

Distinguishing characteristics: We celebrated our laboratory's 125th anniversary in the fall of 2023.

Highest volume testing: Our highest testing volume is performed by our

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Vermont Laboratory Discovers What a Difference a Fellow Can Make

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

The Vermont Department of Health Public Health Laboratory is hosting its first Career Pathways in Public Health Laboratory Science fellow and things have gone better than they could have hoped.

"Lauren has jumped in with both feet and is making a huge impact on our rabies testing program," said her mentor Kathy Seiler, PhD. Lauren Berkley, a University of Vermont graduate with a bachelor's in wildlife biology and a master's in biology, has a background that includes wildlife rescue and rehabilitation.

Seiler, Program Chief of Microbiology at the Vermont Department of Health Public Health Laboratory, explained that her laboratory does not have a dedicated microbiology staff for rabies testing. Fifteen people, including Berkley, rotate to complete the testing. That is where the fellowship, and Berkley in particular, proved so valuable.

"She has really taken her passion for what she is here for—rabies and arbovirus—and made a significant, positive impact on the laboratory," Seiler said.

Berkley wanted her focus to be on zoonotic and vector-borne pathogen-related projects. She helps with testing animals for rabies and with doing polymerase chain reaction (PCR) for arbovirus surveillance work. It is work that aligns with her deep interest in wildlife health and desire to work on rabies-related projects.

Targeted Impact

"The rest of my time, I work on various projects related to those two areas," Berkley said. Those other "various projects" understate what Berkley has undertaken at the laboratory.

"She's conducted a survey of the rabies testing team to see where our pain points are and where we can improve our processes. And this has led to the creation of a project called the Rabies Refresh Project here at the laboratory," Seiler said. "This has been just pivotal, firming up our testing procedures and really addressing how staff feel about doing it."

Vermont Fellow Lauren Berkley.

Seiler added that Berkley takes feedback to heart and integrates all the information into how she shows up every day. One example was getting left-handed tools for the three lefties who worked in the rabies laboratory.

"It's almost an accessibility issue for individuals who are left-handed to work with right-handed tools when working with a deadly disease," Seiler said. "So that is going to make an immense difference in their ability to properly do necropsies on rabid and non-rabid animal testing, increasing not only staff safety but also staff satisfaction daily."

Seiler added that Berkley hit the ground running and credited her for bringing some structure and focus to the laboratory's rabies testing.

"I think there was an opportunity to incorporate One Health perspectives and One Health trainings and bringing in different perspectives from the US Department of Agriculture or from veterinary medicine and different areas of expertise to see if we could improve testing efficiency, safety, job satisfaction," Berkley said.

More Work to Do

Berkley isn't done yet, either. Part of her fellowship includes researching and making recommendations for equipment that may be useful to the laboratory.

"We're excited about getting a microscope camera and a tablet in the rabies laboratory so that we can develop more diverse training materials," Berkley said. "We can take pictures because the test for rabies is a fluorescent antibody test. So having pictures of what different slides look like, what some of the non-specific fluorescence can look like; different things that might be a little bit tricky while you're training."

The impact on the rabies laboratory has been significant, according to Seiler.

"I do not think that we would have had the bandwidth among our staff to be able to bring these changes forward and with the speed with which she was able to," Seiler said.

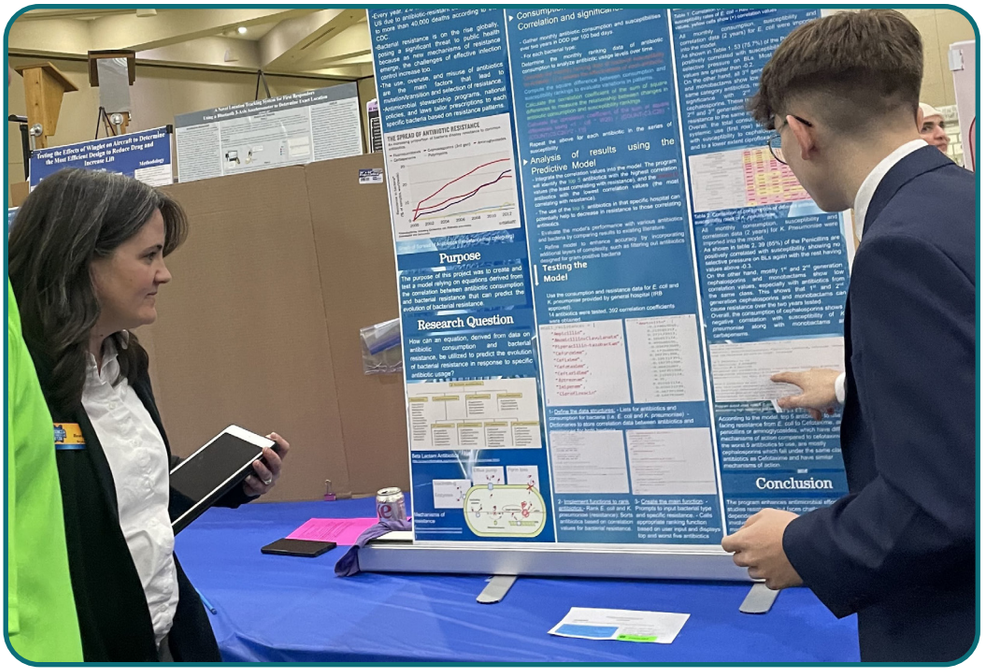
Seiler added that Berkley has worked with their rabies subject matter expert to help obtain new tools and develop new techniques and studies for necropsy testing.

Berkley's ambition doesn't end with her work in the rabies laboratory.

"I want to be a veterinarian, so I'm taking some prerequisites online." Berkley said. "I'll apply and hopefully the second year of my fellowship will work out and then I can go to vet school shortly after that and then return to the public health sphere someday with maybe a little more clinical training." ■

Public Health Laboratory Ambassadors Engage Students Across the Country in 2025

By **Hailey Reiss**, specialist, Academic Partnerships



Public Health Laboratory Ambassador Heather Seymour attends an outreach event at a science fair. Photo: Flint Regional Science and Engineering Fair.

The APHL Public Health Laboratory Ambassadors Program has sought to connect public health laboratory professionals with students and local community members to share the value of public health laboratory careers. The program is volunteer-based and has been in operation since May 2023. In 2025, the program continued to grow and positively impact more communities across the United States.

As of November 30, 2025, there were 194 Public Health Laboratory Ambassadors in the program. Eighty-seven ambassadors joined the program in 2025 and now represent 32 US states, the District of Columbia and one US territory.

"I'm glad the Public Health Laboratory Ambassadors program is growing, and people are promoting careers in public health," said Jayme Parker, PhD, chief and CLIA director at the Alaska State Public Health Laboratories. "It may seem like a challenging time in public health to do this outreach work, but the students remain very open to this career field and excited that we are still here promoting public health."

Public Health Laboratory Ambassadors planned or participated in 121 outreach or recruitment events in 2025, varying from career fairs to classroom visits to guest lectures and more in 22 US states. Through these events, ambassadors connected with up to 6,382 participants, many of whom were high school and collegiate students. These events allowed ambassadors to speak to students and other members of the public about their careers in public health laboratory science and illustrated the value of public health laboratories in the community.

"Participating in an outreach event was incredibly rewarding," said Linh Al Chalabi, research scientist I at the California Department of Toxic Substances Control. "I enjoyed sharing my knowledge and career journey while helping students gain confidence in a laboratory setting. The experience also reminded me of the impact we can have through mentorship and community outreach. I would absolutely volunteer again and highly recommend this program to others."

In 2026, APHL expects to see more Public Health Laboratory Ambassadors engage with members of their communities through outreach events. Several ambassadors are also collaborating to develop a four-part webinar series on how to prepare for a public health laboratory career intended for high school, undergraduate and graduate students. Ambassadors will also be able to continue collaborating in monthly Ambassadors Connect calls, which first launched during 2025 to foster community and cooperation among program volunteers in a virtual setting. ■

The Public Health Laboratory Ambassadors program is always looking for more public health laboratory scientists and professionals interested in participating in outreach and recruitment events designed to spread greater awareness of public health laboratory science and provide exposure to public health laboratory careers to support workforce development. Learn more at https://www.aphl.org/Career-Pathways/Academic-Partnerships/Pages/PHL-Ambassadors.aspx.

Equity, Accuracy and Stewardship: Rethinking Vaginitis Diagnosis for Women Everywhere

By **Amanda Suchanek**, PhD, medical advisor, bioMérieux US Medical Affairs

Vaginitis remains a leading cause of gynecologic-related primary care visits in the United States, yet the approach to diagnosis and treatment continues to present significant challenges for clinicians and public health professionals. Recent studies underscore persistent gaps in diagnostic testing and highlight the consequences for antimicrobial stewardship and patient outcomes.

Analysis of healthcare resource utilization revealed that among more than 4 million patients presenting with vaginitis symptoms between 2018 and 2022, only about a quarter of non-pregnant women and half of pregnant women received any diagnostic testing at their initial visit.[1] The majority were treated empirically without laboratory confirmation of the underlying cause. Advanced molecular diagnostics, such as nucleic acid amplification tests (NAATs), were used in less than 10% of cases, despite their superior sensitivity and specificity. This underutilization persists despite updated guidelines from the Infectious Diseases Society of America (IDSA) and the American Society for Microbiology (ASM) recommending multiplex NAATs for vaginitis diagnosis.[2]

This diagnostic gap has far-reaching implications. When treatment is based solely on symptoms, the risk of misdiagnosis and inappropriate therapy increases. A 2021 study found that nearly half of women with laboratory-confirmed vaginitis received inappropriate prescriptions, and a third of women without any infectious cause were still given antibiotics or antifungals.[3] Those treated empirically without confirmation were much more likely to return with persistent symptoms within three months, contributing to increased healthcare utilization and patient frustration. Access to advanced diagnostics may be restricted by cost, availability, and insurance coverage, particularly in resource-limited settings.

Several factors contribute to these gaps. Clinical practice often favors traditional methods—wet mount microscopy, pH testing or visual inspection—because they are quick, familiar and usually easily available. However, these methods lack the sensitivity and specificity of molecular diagnostics. Practical barriers also play a role: NAATs may not be available in every clinic; turnaround times can be slow; and insurance coverage varies. Furthermore, billing and reimbursement issues further complicate the picture, as some low-cost or point-of-care tests may not be billed or captured in claims data, leading to underreporting and possibly underuse.[4]

From an antimicrobial stewardship perspective, these findings are concerning. Prescribing antibiotics or antifungals without confirming the diagnosis contributes to the growing problem of antimicrobial resistance. Organisms associated with vaginitis are not immune to this trend, and overuse of empiric therapy risks making future infections more difficult to treat. Recent data showed that concurrent treatment of male partners—using both oral and topical antimicrobials—alongside standard therapy for women with bacterial vaginosis (BV) significantly reduces BV recurrence rates compared to treating women alone.[5] By targeting both partners, the cycle of reinfection is interrupted, thereby decreasing the overall need for repeated antimicrobial courses in women. Such a strategy not only improves clinical outcomes but also aligns with antimicrobial stewardship principles by minimizing unnecessary antibiotic exposure, reducing the risk of development of resistance, and preserving the efficacy of available therapies.

The path forward involves broader adoption of molecular diagnostics, especially multiplex NAATs, which are now recommended by society guidelines. Stewardship efforts must focus on ensuring that every patient receives the right treatment, at the right time, for the right reason. Provider education is also critical; clinicians must be aware of the limitations of traditional methods and the benefits of targeted diagnostics. Policy initiatives should support stewardship, reduce disparities and improve outcomes for women nationwide. Investment in rapid, accurate point-of-care testing and equitable access across all patient populations will be essential to improving the standard of care for vaginitis nationwide. ■

bioMérieux is an APHL Platinum Level Sustaining Member.

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Rapid Detection and Sequencing of Influenza A in Agricultural Samples: Lessons From Cambodia and Why It Matters for US Food Security

By **Kaylinnette Pinet**, PhD, development scientist II, Applications & Product Development, New England Biolabs and **Betsy Young**, PhD, senior product marketing manager, Next Generation Sequencing, New England Biolabs

Highly pathogenic avian influenza (HPAI) A virus continues to evolve across animal reservoirs. While zoonotic transmission to humans in the United States has been limited, recent epidemiological trends in Cambodia underscore how quickly zoonotic risks can escalate. After nearly a decade without human cases, Cambodia has seen a resurgence of H5N1 infections, highlighting dynamic viral evolution across poultry and humans. According to the World Health Organization (WHO), Cambodia saw a total of 27 H5N1 cases from 2023 to July 2025, with 12 associated deaths. Across 25 countries, during the same time frame, WHO reported an H5N1 fatality ratio of 48%, reinforcing the need for vigilant surveillance.

Over the years, the international movement of infected animal products or contaminated materials has dramatically increased due to trade and shipping route expansions. Protecting the international food supply, for US consumers and others, will involve improving rapid agricultural sample sequencing capacity. This is particularly relevant to poultry and dairy farmers and processors.

A new correspondence in the *New England Journal of Medicine* from Institut Pasteur du Cambodge demonstrated that rapid and routine sequencing of poultry swabs (e.g., cloacal, oropharyngeal) can quickly detect influenza A genome reassortment events and identify markers linked to increased virulence and transmissibility. These types of data could help guide interventions before viruses break through into wider supply chains, putting the US food supply and human health in jeopardy.

A Purpose-Built Workflow for Influenza A Surveillance

The workflow (**Figure 1**) was inspired by the need for prompt agricultural sample surveillance and is supported by reagents from New England Biolabs. It pairs inhibitor-tolerant extraction with an easy, one-step RT-PCR and indexed influenza A primers for whole-genome amplification and library preparation. Ultimately, this workflow transforms these samples into data in hours rather than days.

- **Monarch® Mag Viral DNA/RNA Extraction Kit (NEB #T4010)**
  This magnetic bead-based system is optimized for complex matrices. It efficiently extracts and purifies nucleic acids from fats, proteins, and PCR inhibitors while preserving viral RNA integrity. The result is high-quality RNA suitable for sensitive RT-PCR, qPCR, LAMP and sequencing applications.
- **LunaScript®Multiplex One-Step RT-PCR Kit (NEB #E1555)**
  Following extraction, LunaScript enables robust reverse transcription and amplification of Influenza A gRNA in a single step. Its optimized chemistry supports multiplexed amplification, reducing hands-on time and improving sensitivity for low-abundance targets.
- **NEBNext® Flu A Integrated Indexing Primer Module (NEB #E3436)**
  This module enables amplification of all eight influenza A genome segments and incorporates indexing in a single step. This design reduces workflow complexity, minimizes errors and promotes comprehensive sequencing with Oxford Nanopore Technologies® Ligation Sequencing Kit V14/XLV14 (or Illumina® sequencing).

Finding Flu A, Closer to Home

The US has most recently seen HPAI transmission to humans via milk products, raising concerns about consumer safety, warranting additional safety screening. However, milk is a notoriously difficult matrix for viral detection due to its constituent fats, proteins and enzymatic inhibitors that can suppress extraction efficiency and impede downstream assays, leading

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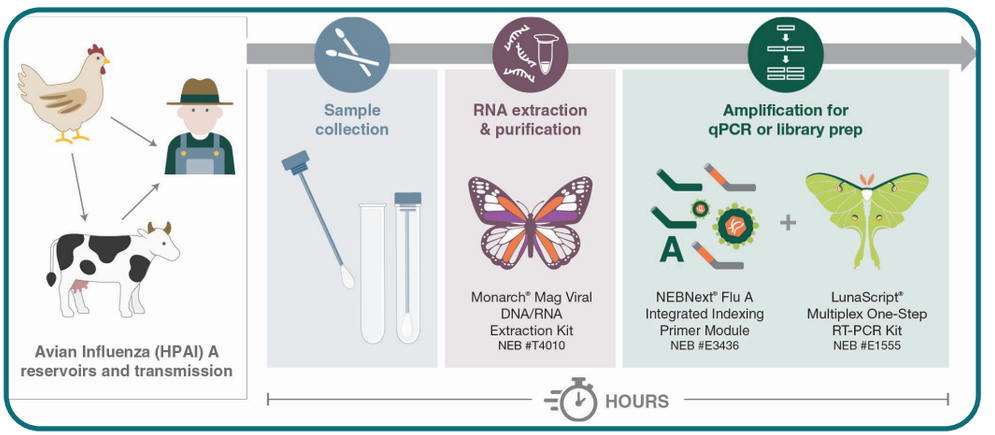


Figure 1. Finding Flu A, Faster. The complete NEB workflow for influenza A identification begins with RNA extraction and purification, followed closely by reverse transcription and amplification. With optional library prep for influenza A sequencing, these solutions are fast and reliable.

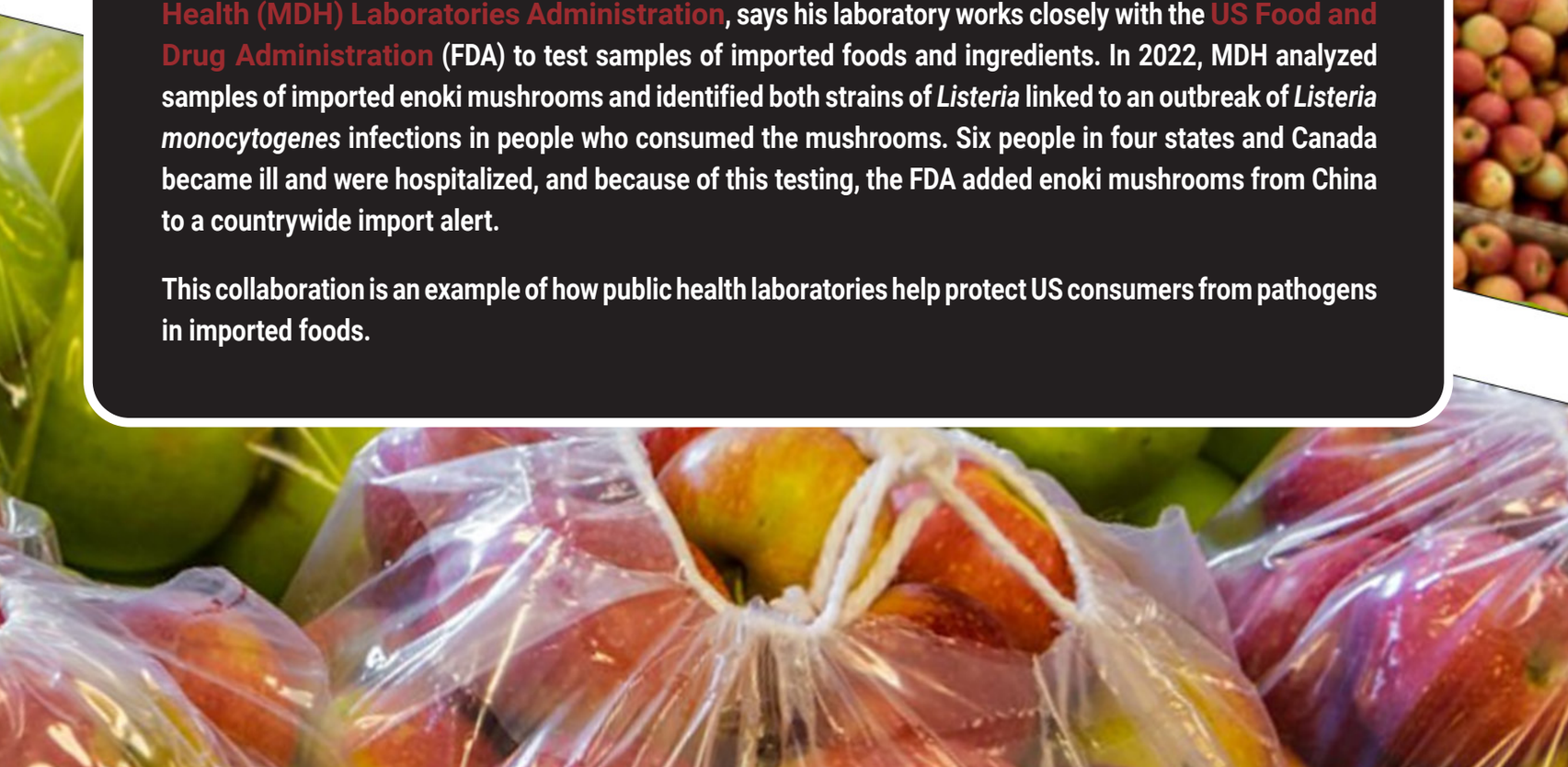
Quality, Safety, Traceability: Protecting the Food Supply for US Consumers

By **Dara Chadwick**, writer

Protecting the United States food supply from pathogens and contaminants that cause foodborne illness has long been a multiagency effort at the federal level, with state and local health departments contributing to the investigation of, and response to, foodborne outbreaks. Today, as more human and animal foods are made with globally sourced ingredients, public health laboratories play an increasingly critical role in protecting food safety through testing innovations and collaborations that can help detect foodborne threats to US consumers and stop outbreaks before they start.

Sinisa "Sin" Urban, PhD, chief of the Division of Environmental Sciences at the Maryland Department of Health (MDH) Laboratories Administration, says his laboratory works closely with the US Food and Drug Administration (FDA) to test samples of imported foods and ingredients. In 2022, MDH analyzed samples of imported enoki mushrooms and identified both strains of *Listeria* linked to an outbreak of *Listeria monocytogenes* infections in people who consumed the mushrooms. Six people in four states and Canada became ill and were hospitalized, and because of this testing, the FDA added enoki mushrooms from China to a countrywide import alert.

This collaboration is an example of how public health laboratories help protect US consumers from pathogens in imported foods.



"FDA requested ongoing sampling of these imported enoki mushrooms for *Listeria*, which never would have occurred to us because no one in Maryland was sick," Urban said. "We isolated two strains from products on Maryland stores shelves that were part of this outbreak. The producers were then put on import alerts so they could not just freely import products into the US—they had to prove their products were safe. This is prevention. This is exactly the kind of work we're trying to do."

Critical Partnerships

All food products, whether produced domestically or imported, must meet US food safety requirements. According to Donald A. Prater, DVM, principal deputy director of the Human Foods Program at the FDA, the agency regulates about 80% of the food supply, with the remainder—including meat, poultry and processed egg products—regulated by the US Department of Agriculture.

As part of its Food Traceability Rule, FDA uses a risk-ranking tool to determine which foods must meet additional tracing requirements. Across the nearly 400 ports of entry where food enters the US, food products are screened using a tool called Predictive Risk-based Evaluation for Dynamic Import Compliance Targeting (PREDICT). This risk-based analytics tool electronically reviews prior notice entries, flagging risky products and entries with incomplete or inaccurate data. Using PREDICT, FDA can make quick admissibility decisions when a food is offered for import—including whether to physically examine the product or take a product sample.

Collecting and testing samples is a resource-intensive process that requires locating the product in a warehouse, inspecting the labeling, using a specific methodology to collect and process a sample, and sending it to a laboratory. FDA relies on its own laboratories and on state public health laboratories for sampling and testing. Broadly, this work includes routine surveillance testing, targeted assignments based on specific findings or historical trends, and testing for chemical hazards or pathogens that occur in new geographic locations or due to outbreaks.

Eight FDA laboratories primarily conduct regulatory surveillance of imported foods. Seven of those laboratories have microbiology capabilities, and all eight can perform various chemical analyses. Four additional laboratories are engaged in applied science activities, including method development, validation, and platform and matrix extensions, according to Prater. The Food Emergency Response Network (FERN), a 170-member network of federal, state, local, Tribal and territorial laboratories, also conducts regulatory testing when needed.

"We rely on our collective efforts with other public health laboratories," Prater said. "We have great cooperation and we're always looking to share what we've learned and how we can improve and work more efficiently and effectively to protect consumers. The value of working together as a food system is immeasurable in terms of protecting public health."

Angela Poates, lead specialist for global health next generation sequencing and bioinformatics for APHL, said public health laboratories are the "boots on the ground" in defending the US food supply. As APHL's lead for PulseNet International, a network focused on surveillance and detection of foodborne outbreaks caused by bacterial enteric pathogens, Poates and her colleagues work to help public health laboratories in eight global regions increase their foodborne pathogen, enteric and antimicrobial pathogen surveillance capacities.

"We're helping to build food safety globally, which protects the US because we have many ingredients and food items coming into our country," she said. "A coordinated outbreak response among public health laboratories, regulatory bodies, and industry suppliers is important for a fast outbreak response. Everybody has a part to play."

Evolutions in Testing

Foodborne disease testing has evolved rapidly during the past two decades. Public health laboratories have moved from primarily using methods such as pulsed-field gel electrophoresis to whole genome sequencing (WGS). Standardizing the use of WGS has improved the precision of pathogen identification, as well as the speed and efficiency with which public health and regulatory agencies can respond to foodborne outbreaks.

With FDA funding, Urban's laboratory modernized its methods. "We brought

Demonstrating results—and telling the stories of the critical work done by public health laboratories—is a key component of the funding puzzle.

on sophisticated screening tools, so we don't have to test every food item with cumbersome, laborious and tedious methods," he said. "Our partnership with FDA has been critical. Most states, including Maryland, don't have the funding or infrastructure to throw money at a problem and build capacity at a moment's notice."

As an example, Urban cites the use of high-resolution mass spectrometry techniques to identify what made a Maryland woman sick after she ingested Nut Diet Max brand Nuez de la India seeds—marketed as India nuts, commonly known as candlenuts—in 2023.

"She ended up in the hospital with bradycardia," Urban said. "We tested the food and, like whole genome sequencing where you get the genetic fingerprint, we applied a chemical fingerprint. Through analysis, we learned these were yellow oleander seeds, which are highly toxic. High-resolution mass spectrometry is a relatively new technology for identifying unknowns."

WGS is a critical tool in connecting the dots of foodborne illness, especially those that stretch beyond state or national borders.

"All public health labs in the nation now use next-generation sequencing as their primary testing methodology for foodborne illness and disease surveillance on the clinical side," said Kelly Oakeson, PhD, chief scientist, Next Generation Sequencing and Bioinformatics at the Utah Public Health Laboratory, noting that every laboratory has at least one next generation sequencer for surveillance work as part of the US Centers for Disease Control and Prevention's (CDC's) PulseNet.

"That same foundation of technology, training and technique means that if I get a result here in Utah, I can directly compare that result to my neighbor's results in Idaho or New York or anywhere across the nation," he said.

Through FDA's GenomeTrakr network, public health and university laboratories collect and share genomic data for foodborne and other pathogens that could affect the nation's food supply. With access to these data, public health officials compare and analyze pathogens in real time to enable rapid response.

No single technology has been as transformational in protecting the nation's food safety as WGS.

"Access to genomic profiles of pathogens has been instrumental in solving outbreaks and protecting the public, especially in situations where there are few cases or where cases have occurred over a period of years," said Prater. "The ability to link and have confidence in the attribution to a particular outbreak or case has meant we can solve outbreaks we hadn't been able to before."

Domestically, PulseNet has focused on validating protocols and decentralizing training of all laboratories on these protocols, according to Poates. "That made it easy to make sure all laboratories are using the same methods to detect outbreaks using whole-genome sequencing and that results are seamless. That doesn't work on a global scale for many reasons," she said. "You have countries with vast differences in financial resources, human resources and capabilities. The important thing is to have methods that are validated so the results are reliable. That's the work we've been doing recently with PulseNet International."

Still, some variability isn't always a bad thing, Poates said. "We're working on validating different full genome sequencing methods," she says. "Having the ability to use more than one technology provides flexibility for labs. Since some methods are more cost effective than others, we need this variability globally. But we want to make sure results are comparable so we can analyze them in a similar way for cluster detection and outbreaks."

An Emerging Workforce

Investing in sophisticated technologies to test for foodborne pathogens also requires investing in a trained laboratory workforce. Poates said most international laboratories she has worked with now have a sequencer.

"The difficulty is that they may not have the infrastructure to support data that comes off the instrument or the epidemiological experts to analyze and interpret data," she says. PulseNet International trains international laboratories on sequencing instrumentation and on equipment that may have been purchased for respiratory virus surveillance that can also be leveraged for enteric surveillance.

Domestically, Oakeson has seen a workforce divide between bioinformatics experts and wet lab scientists. "I think you can do both," he said. "That's a bridge we're trying to build on the workforce development side. It's our job to take wet lab scientists and train them on how to do bioinformatics. Now, we're adding the genomic epidemiology component too."

Urban says the Public Health Laboratory Fellowship Program: an APHL-CDC Initiative has helped him meet emerging workforce needs in his laboratory.

"I've mentored 12 different fellows each for two-year appointments over the last three years," he said. "I have people at the bench who are amazing and love what they do. Seven out of the 70 scientists I have here are APHL fellows. The program is an excellent way to increase workforce when funding decreases and to bring new laboratorians into public health."

Another benefit of developing a food safety workforce is that these laboratory

skills are broadly useful, according to Poates.

"One of the reasons this work is so important is because the wet laboratory, bioinformatics and epidemiology skills laboratories are trained in for food safety are transferrable to other pathogens," she said. "This enhances overall pandemic preparedness greatly and encourages lab-epi communication, which is important in all forms of outbreak response. Even though we might be focused on foodborne pathogen capacity-building efforts, we're building global pandemic preparedness and global health security."

Funding Food Safety

The laboratory results critical to maintaining a robust food safety system require significant resources. Yet federal and state agencies often face spending constraints that affect these resources. FDA's Laboratory Flexible Funding Model (LFFM)—first announced in 2020—has allowed some public health laboratories like MDH to further invest in protecting food safety. "In our case, there were 14 possible projects across microbiology, chemistry and radiochemistry," Urban said. "We were funded for all but one of them. Now, all the disciplines we use in environmental testing, we can apply to food safety."

Urban says LFFM funding for MDH continues. "We couldn't do what we do without this grant; even with shrinking budgets, my view is we should be doing more, not less, because public health demands it," he said. "I feel my role as one of the recipients of this grant is to hand wins to FDA, so they can go to Congress and get more funding. I come from academia, where you almost never get a grant without showing preliminary data. That's the model I've adopted in public health. We are always doing more."

As an environmental sciences laboratory, most of Urban's work is testing air, water and food samples. His lab responds to outbreaks and illnesses, but "what we really want to do is prevent harmful exposures before they happen. We do surveillance testing of products already on store shelves for a variety of threats that could be present," he said. "We went from testing a few hundred samples per year to testing about 2,000 samples."

> **"The ability to link and have confidence in the attribution to a particular outbreak or case has meant we can solve outbreaks we hadn't been able to before."**
>
> ***— Donald A. Prater**, DVM*

Testing products before isolates from ill people are sequenced is a shift from approaches that test products only after people become ill. "We have the funding and the mandate to do it," Urban said. "If we can find pathogens before people get sick, that's worthwhile and it's what we should be doing. You can quantify how much we're saving in emergency room costs and show that this is a good investment. But you can only do that if you have data."

Demonstrating results—and telling the stories of the critical work done by public health laboratories—is a key component of the funding puzzle.

"We saw a reduction in the amount of funding we usually get for food safety activities in our most recent award from CDC," Oakeson said. "We had to scramble to find ways to make up for those shortcomings because we don't get a lot of support from state tax dollars. We used different funding mechanisms to fill in and make sure we can keep doing what we do to keep the food supply safe."

Oakeson and his colleagues have also implemented strategies to help stretch laboratory resources. "In Utah, we've validated the ability to use a quarter of the volume of reagents needed for sequencing," he said. "Previously, a reagent kit would be good for about 96 samples, but we now use that same kit and test 384 samples. We've been able to get more bang for our buck by using innovative techniques. We've shared those procedures and protocols with other public health labs across the nation so they can see those same cost savings."

Sharing results and methodologies, and training together, has helped refine how state, federal and international laboratories work together.

"We're getting better at what we do," said Prater. "It doesn't mean we don't have a need for additional resources. We're always advocating to make sure we have sufficient resources, not only for FDA laboratories but for our state partners as well."

Oakeson says he's constantly looking to improve the efficiency of laboratory processes. Consolidating workflows is one area of focus. "If I can do one set of workflows in the laboratory to get my sequence data generated and prevent the need for additional workflows on the data analysis side, that helps my data scientists do that work as simply and as streamlined as possible," he said. The update of CDC's PulseNet to PulseNet 2.0, with its cloud-based solution for data analysis, has also improved efficiency, according to Oakeson.

Process improvements have helped public health laboratories meet the ever-growing demands of protecting the US food supply, even as available resources dwindle. "There's always a new pathogen or virus that we need to address, but funding rarely increases," he said.

That's because public health works well in the background. "We need to keep public health and food safety at the forefront of people's minds," Oakeson says. "It's important that people know what we're doing and how we're protecting them." ■

Maryland

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newborn screening (NBS) laboratory. MDH NBS Laboratory is tasked by state statute to perform NBS testing and screen every baby born in Maryland (approximately 65,000 births/year) for the conditions defined by the Recommended Uniform Screening Panel (RUSP). Maryland is one of 12 states that continues to perform a second screen. Prompt medical interventions based on the results of these fast and accurate screening tests prevent infant long-term morbidity and mortality. In fiscal year 2025. the MDH NBS Laboratories performed over 8.8 million tests. Under Maryland law, when conditions are added to the RUSP tests, they must be added to the Maryland NBS panel in a timely manner. Since December 2023, the MDH NBS Laboratory has validated and implemented four new tests to screen for additional heritable conditions* for virtually every baby born in Maryland, adding hundreds of thousands of additional NBS tests performed annually.

**New conditions screened for since December 2023:(1) X-ALD (X-linked adrenoleukodystrophy, (2) MPS-II) Mucopolysaccharidosis type II, also known as Hunter syndrome, -(GAMT) Guanidinoacetate methyltransferase (Creatine deficiency) and Krabbe Disease (globoid cell leukodystrophy).*

Notable success story: In Summer 2024, test results generated by several MDH testing laboratories were instrumental in support of an investigation by the MDH epidemiologists and food protection regulators into a cluster of Listeria monocytogenes infections in Maryland that were ultimately linked to the consumption of contaminated processed sliced deli meats, which led to a national recall of contaminated products. *Listeria* infections are reportable conditions in Maryland and by statute, *L. monocytogenes* bacterial isolates recovered from these infections must also be submitted to the MDH Laboratory for confirmation of the identification of the isolate and further genetic characterization using national standardized whole genome sequencing (WGS) subtyping procedures. The results of these genetic subtyping procedures are uploaded to national databases managed by CDC and/or FDA. These data sets are constantly analyzed to find clusters of genetically related *Listeria* bacteria that might be linked to a common exposure to a contaminated food product. Through case interviews, MDH epidemiologists linked the consumption of a common food product—precooked Boar's Head deli meats—purchased at a local market to a local cluster of *Listeria* infections. Through PulseNet, Maryland made the initial link between a cluster of genetically related *Listeria* infections with the consumption of contaminated deli meat products collected from a local food store by isolating genetically indistinguishable genotypes of *L. monocytogenes* from unopened packages of deli meats. As of October 1, 2024, testing at the MDH Laboratory identified eight of the 59 infections reported in 13 states that were associated with this outbreak.

Biggest challenge: Historically, our biggest challenge has been the recruitment and retention of scientific talent. MDH laboratory scientists who possess specialized skills and advanced training, such as proficiency in performing mass spectrometry or WGS, are in high demand by biotechnology firms, commercial and federal government laboratories in the highly competitive Baltimore-Washington corridor job market. State salaries are substantially lower in comparison to comparable positions in the biotech industry, federal government laboratories or federal contractor positions, and Laboratories Administration frequently loses highly skilled fully trained laboratory scientists to attrition often because they cannot be adequately compensated by our organization. However, in light of recent events and the uncertainty of continued federal support for public health, our biggest challenge will be to find innovative alternatives to sustain some of these mission-critical programs if federal funding that now supports them is discontinued or drastically reduced. ■

Rapid Detection

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to false negatives and poor sensitivity. Thus, purpose-built workflows, like the one highlighted above, are needed to overcome these challenges. Thus far, New England Biolabs has supported rapid influenza A purification and detection from milk with qPCR and LAMP workflows.

Impact on Research and Surveillance

By overcoming matrix-related inhibition, streamlining RT-PCR and simplifying library preparation, these modular workflows empower teams to generate accurate genomic data from agricultural samples. This capability supports critical applications, including:

- Food contamination and safety monitoring
- Outbreak preparedness and strain tracking
- Zoonotic transmission studies

Robust and rapid influenza A sequencing capacity, from poultry sheds to milk tanks, can improve the US's ability to safeguard its food supply and consumers, detect novel variants before they cascade through trade networks and act decisively. Learn more about NEB's solutions for infectious disease surveillance and sequencing. ■

APHL Committee Instrumental in Enhancements to FDA Food Chemistry Data Review Protocols

By **Robyn Randolph**, MS, program manager, Food Safety and **Maria Ishida**, PhD, laboratory director, New York State Department of Agriculture and Markets

APHL advisory committees are a powerful conduit for change. This was recently illustrated through the Human and Animal Food Committee's (HAFC) successful effort to streamline processes for state food chemistry data.

Protecting the nation's food supply from harmful contaminants is a hallmark of human and animal food testing programs. State laboratories produce valuable analytical results that should be utilized for regulatory purposes at the federal level. The process for assessing food contaminants varies depending on the type (biological or chemical) and the associated health risks. For biological foodborne pathogens or toxins posing an immediate health risk, the US Food and Drug Administration (FDA) conducts a quick and straightforward review. However, removing food with chemical contaminants from commerce can be hampered by bottlenecks in the FDA review process for state food chemistry data. The primary health risk is exposing people to chemicals that aren't immediately harmful but can cause long-term health effects.

At a December 2023 HAFC meeting, members noted FDA's internal review of food chemistry data packages can take from three to 12 months. Others noted FDA's request for dense data packages (often 100+ pages) within three days as a major resource burden. Inconsistent or unclear data requirements caused confusion, and requests for additional data, sometimes weeks or months later, disrupted workflows and required unanticipated resources.

HAFC members expressed frustration that their data was slow to be acted upon and heavily scrutinized. Most state regulatory food testing laboratories are accredited to ISO/IEC 17025, which attests to strong quality systems and defensible data. FDA's ability to act on state data was a key driver for its investment in state laboratories becoming ISO/IEC 17025 accredited. Members were perplexed by resistance when using test methods different from FDA's, despite their accredited status and demonstrated capability to deliver comparable results with proficiency samples.

Recognizing this as a broader concern, HAFC appealed to federal partners. In August 2024, APHL sent FDA a letter and issue brief outlining key issues and recommended actions to improve efficiency and effectiveness of FDA's chemical data package review. FDA's Human Foods Program (HFP) listened and took major strides towards improvements. One year later, HFP leaders presented, to the HAFC, process changes and metrics showing marked improvements in food chemistry data package review.

Streamlining Data Package Requests

APHL Concern: A three-day turnaround for submitting data packages to FDA was too demanding.

HFP response:

- **More Targeted Requests:** HFP began requesting data packages only when a product action was likely, reducing data package requests by 17% from 2023– 2025.
- **Improved Review Rates:** During the same period, the percentage of data packages that received technical reviews increased by 14%.
- **Extended Submission Window:** Deadline for data packages was extended to within five business days, except for critical risk cases.

Reducing Delays in Data Package Reviews

APHL Concern: Long delays—ranging from three to 12 months—in FDA's review of food chemistry data packages.

HFP response:

- **Review Timeliness:** Samples receiving a review determination within two months improved by 80% from 2023–2025.
- **Product Action Recommendations:** The percentage of samples receiving a product action recommendation rose from 5% in 2023 to 100% in 2025—a 95% improvement.

HAFC members value their strong relationships with FDA and the ability to have honest conversations about difficult topics. FDA has committed to working with APHL to identify additional opportunities for improvement. This collaboration will continue through a HAFC work group addressing an unresolved concern about inconsistent data review feedback. The work group will develop method-specific checklists based on state laboratory experiences to accompany food chemistry data packages. Through continuous dialogue with HFP partners, HAFC efforts to improve food chemistry data review processes will continue. ■

Strengthening Foodborne Outbreak Response With CIFOR in Kentucky

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

Kentucky Workshop participants, TN CoE staff and APHL staff in Frankfort, KY during the CIFOR workshop.

> **“I was grateful to have members of TN COE present as they helped explain portions of the worksheets.”**
>
> *— Workshop participant*

APHL recently partnered with the Kentucky Department for Public Health (KDPH) and the Tennessee Integrated Food Safety Center of Excellence (TN CoE) to host a CIFOR Toolkit workshop designed to refine foodborne outbreak response across multiple KDPH program areas. The event brought together epidemiology, environmental health and laboratory staff to examine existing workflows and align practices with CIFOR recommendations.

The Council to Improve Foodborne Outbreak Response (CIFOR) is a multidisciplinary collaboration of national associations and local, state and federal agencies representing epidemiology programs, environmental health programs, public health laboratories and regulatory agencies. CIFOR identifies barriers to rapid detection and response to foodborne disease outbreaks and develops products that address these barriers. CIFOR has many resources to assist public health laboratories and other agencies involved in foodborne outbreak response to enhance collaboration among interested parties, identify model practices for foodborne disease investigations and promote the value of molecular surveillance of foodborne illnesses.

Before the workshop, APHL and TN CoE worked with KDPH to complete some preliminary tools that help clarify decision-making roles and priority areas for improvement. KDPH chose to focus on Communication and Relationships with Relevant Agencies. During the session, KDPH organized participants into groups to help foster discussion between the different disciplines present. Using the CIFOR Toolkit, participants compared actual workflows with recommended practices, looked for inconsistencies and pinch points and rated the implementation of needed changes.

> **“I really appreciated this training and the opportunity discuss programs and make solutions for the streamlining processes.”**
>
> *— Workshop participant*

The workshop produced a clear action plan that outlined tasks, identified responsible staff and developed timelines for implementation. For Communication, the team committed to establishing formal communication processes, updating contact lists for partners and tracking communication indicators during outbreaks. For Relationships, key tasks included revising outbreak response protocols and conducting stakeholder tabletop exercises.

This workshop demonstrated how the importance of partnerships between organizations and the TN CoE played a critical role in assisting with workshop preparation and facilitation. APHL is happy to help support public health laboratories who hope to host their own CIFOR workshops and can assist with all aspects of workshop preparation and delivery. Kentucky’s progress demonstrates how a targeted, collaborative in-person workshop can translate national guidance into tangible improvements that other states can replicate. ■

From Training to Trust: How PulseNet International Is Strengthening Foodborne Disease Surveillance

By **Angela Poates**, lead specialist, Global Health

Svetlana Colac, of Moldova's National Agency for Public Health, demonstrates dilution of sequencing libraries during a PulseNet Eastern Europe Central Asia training workshop.

Because our world is so interconnected, foods—and any pathogens they may harbor—routinely cross borders, making foodborne safety a global concern. Foodborne disease and antimicrobial resistant (AR) enteric pathogens endanger food security, economic stability and global health. PulseNet International (PNI), headquartered at the US Centers for Disease Control and Prevention, plays a crucial role in strengthening global capacity for genomic surveillance of enteric pathogens and AR.

Over the past three years, APHL-supported PulseNet International activities have advanced global capacity for enteric pathogen genomic surveillance through a robust program of training and collaboration activities. These activities target challenges many countries face when implementing genomic surveillance: wet lab and bioinformatic capabilities, quality assurance and challenges with data sharing.

Six regional trainings covering two different sequencing chemistry types equipped dozens of scientists with laboratory and bioinformatics skills across Africa, the Middle East, Asia-Pacific and Eastern Europe/Central Asia (EECA). Trainees participated in week-long trainings that included hands-on library preparation, sequencing and data analysis. Despite the explosion of next generation sequencing (NGS) capacity post-COVID-19, many countries still lack trained bioinformaticians or sufficient IT infrastructure for processing large amounts of sequencing data. PulseNet International trainings provided an accessible, cloud-based platform which does not require high power computing power and provided scientists with the ability to analyze their sequencing data without specialized bioinformatics skills.

Complementing these efforts, two regions have participated in feasibility studies designed to demonstrate the laboratories' ability to generate and analyze quality sequence data from foodborne pathogens. Participating sites sequenced and analyzed 100 isolates of enteric pathogens of concern for their region. This provided PNI members an opportunity to demonstrate their ability to utilize sequencing for public health impact in their respective countries. In addition to participating in the feasibility studies, sites that received Illumina training also piloted and launched the newly developed PNI certification program. To date, 22 scientists across three regions have passed certification, proving their ability to produce sequence data which passes PNI quality benchmarks.

To foster collaboration and knowledge exchange among and across the regions, PNI has also convened five regional meetings over the last three years. It has also expanded its governance framework by establishing a new region (PNI EECA) and electing new regional coordinators and steering committees for PN Africa and PN Middle East. Not only do these efforts collectively aim to standardize practices and enhance outbreak detection and response capacity across regions, but they also establish trust among PNI members, which is the first step to successful data-sharing initiatives.

Looking ahead, PNI will focus on disseminating findings from its feasibility studies, expanding certification programs and launching a community-of-practice to sustain collaboration, communication and trust. Additional priorities include developing a data-sharing dashboard, providing tools to PNI partners for harmonized global cluster detection and finalizing overarching and regional governance documents. Together, these initiatives will strengthen global genomic surveillance networks, provide regional self-sufficiency in outbreak detection and response, and foster a culture that is supportive of data sharing for enhanced global food safety. ■

PulseNet Asia Pacific members with their certificates after completing a MiSeq training course in Melbourne, Australia in February 2024.

Beyond the Smoke: Emergency Coordination and Environmental Testing Response to the 2025 Los Angeles Fires

By **Jeff Wagner**, PhD, chief, Environmental Laboratory Branch, California Department of Public Health Center for Laboratory Sciences and **Emily Potter**, DrPH, fellow, Environmental Health

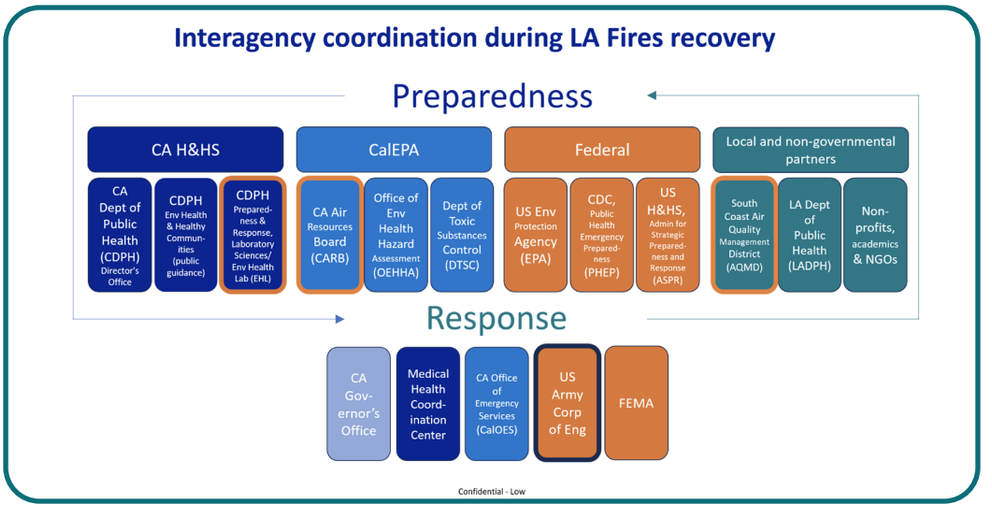

Figure 1. Interagency coordination during the LA fires recovery.

Major United States disasters in the first half of 2025 marked the costliest six-month period on record, causing more than $100 billion in damages. Among these events were the devastating wildfires that swept through Los Angeles, California, in early January 2025. Impacts included fatalities from both direct fire-related losses and indirect impacts on the region's health and emergency response systems.

The role of interagency environmental testing during one of the worst disasters in the state's history was paramount. Coordinated measurements demonstrated an optimized model for public health laboratory response. In the immediate post-fire response, standardized testing from various agencies enabled rapid assessment of potential exposure risks, guided emergency cleanup and informed protective public communications. Exploratory testing helped increase understanding of what substances were left after the fire to inform future planning.

A Multi-hazard Environment

The Los Angeles wildfires created overlapping risks, combining fire devastation with potential environmental and public health threats across air, water, soil and indoor dust. The fires released soot and burned building materials, degraded air quality with increased airborne particulate matter (PM) and metals, and potentially impacted soil, drinking and recreational waters with fire-related runoff.

The defining challenge was to rapidly prioritize and test diverse, time-sensitive samples under pressure. As such, the California response exemplified adaptive, high-impact public health response.

Coordinated Laboratory Response

Several task forces were formed by local, state and federal partners to assess these risks. Environmental and public health teams provided technical expertise on a range of measurements, including air, soil and water quality, vector control, worker safety, toxicology and hazardous materials cleanup. This collaboration underscored the critical connection between scientific analysis, laboratory capacity and public health guidance, particularly in the immediate aftermath of the fires.

California agencies (**Figure 1**) conducted analysis of air samples, ash and indoor dust to assess chemical risks and unique fire signatures. This included standardized testing to monitor for PM and airborne metals by the South Coast Air Quality Management District, the California Air Resources Board and the US Army Corp of Engineers, as well as exploratory methods to better understand potential additional pollutants conducted by the California Department of Public Health Environmental Health Laboratory. Some smoke and ash chemical risks can be determined by comparing to established standards like outdoor

What is $PM_{2.5}$?

$PM_{2.5}$ (fine particulate matter) refers to airborne particles smaller than 2.5 micrometers in diameter—about 30 times thinner than a human hair. Wildfire smoke is a major source of $PM_{2.5}$, which can penetrate deep into the lungs and enter the bloodstream, increasing the risk of respiratory and cardiovascular health effects, especially for sensitive populations.

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Training Yields Readiness: Lessons Learned from a North Dakota Radiation Response

By **Meghan Melnick**, MPH, specialist, Environmental Health and **Jennifer Liebreich**, MPH, senior program manager, Environmental Health

The Laboratory Response Network for Chemical Threats (LRN-C) provides analytical testing and surge capacity for emergency response, assisting in exposure monitoring and sample triage for chemical emergencies. This network connects partners at the local, state and federal level, enhancing flexible and resilient inter-agency collaboration. As a member of the LRN-C, the North Dakota Public Health Laboratory has a strong operational foundation for emergency response. All 54 LRN-C laboratories have the capacity to monitor chemical exposures at their onset and pack and ship specimens to the US Centers for Disease Control and Prevention (CDC). North Dakota, like all LRN-C laboratories, conducts outreach activities to public health partners year-round, and these relationships were invaluable during a recent radiation exposure incident.

North Dakota Public Health Laboratory staff use a handheld radiation detector to scan over-pack packaging for radiation during a drill to be ready for incidents that may include radioactive material. Photo: ND PHL.

A Situation Arises

On a Thursday evening in June 2025, an oil field employee was exposed to radiation from environmental samples in northern North Dakota. The employee was exposed to Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) when a series of safety mechanisms failed. The employee's safety system alarmed after they got a face full of dust from the product with which they were working. The employee went home, showered, then traveled more than an hour to the Emergency Department in a large city. The Emergency Department notified Poison Control in neighboring Minnesota, according to North Dakota's contract, and Poison Control notified the Radiation Emergency Assistance Center/Training Site (REAC/TS) at the US Department of Energy. REAC/TS advised on treatment options, proposed collecting a 24-hour urine specimen, and recommended contacting the health department. REAC/TS advocated for a nasal swab to check for inhalation, a standard precaution during suspected exposures. Providers also anticipated that commercial radiobioassay testing might face delays, so REAC/TS notified CDC to identify a timely, no-cost option suitable for ruling out a harmful intake.

> **"The rapid, coordinated response of North Dakota's Public Health Laboratory underscores the need for all states to maintain a continuous laboratory readiness posture for radiological and chemical emergencies."**
>
> ***— Amy Watson Hardnett, PhD, LRN-C program lead, Division of Laboratory Sciences, National Center for Environmental Health, CDC***

The state laboratory, state epidemiologist and state Emergency Preparedness and Response (EPR) section coordinated a call to begin response activities. The state laboratory relied on longstanding relationships and capacity-enhancing exercises to successfully respond to the incident. The laboratory contacted CDC scientists, who provided expertise on types of radiation, how they worked and what to expect from handheld radiation detection readings. CDC also provided guidance on receiving the specimen safely, specimen storage, specimen handling and additional safety considerations to support response efforts. In this incident, CDC testing involved radiobioassay of a urine specimen to rule out internal contamination with radium-226 (Ra-226). CDC's involvement was integral to the success of the response, providing technical expertise in an incident that exceeded routine operational experience. The sample was safely transported to and secured by the laboratory on Monday, shipped to CDC on Tuesday and delivered on Wednesday.

North Dakota's readiness was a product of ongoing drills and exercises to enhance its emergency capacity. The laboratory holds annual Specimen Packaging and Shipping exercises (SPaSE) and broader capabilities drills within the laboratory and with EPR and the Civil Support Team (CST) to ensure all partners understand emergency protocols and so they can continuously improve procedures and methods. These exercises created familiarity, built trust and strengthened relationships, securing a prompt, nimble and effective response.

Lessons Learned

An after-action call identified multiple opportunities for growth. Coordinating contact with the patient to obtain the specimen, determining proper radiological screening procedures, identifying relevant tests and deidentifying the specimen were challenges during the emergency. In this incident, REAC/TS advised a 24-hour urine specimen collection (~2 L) before public health laboratory involvement. This is a common occupational approach to radiation evaluation. However, CDC has a rapid radiobioassay for emergency response requiring only a single spot

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Mapping a Path to Laboratory Surveillance in Bangladesh

By **Dr. Mohammad Kamrul Islam**, MBBS, MPH, program coordinator, Bangladesh; **Natalie Martinez**, specialist, Global Health; and **Sarah Young**, MPH, senior specialist, Global Health

In 2024, APHL began working with the US Centers for Disease Control and Prevention (CDC) and the Bangladesh Ministry of Health and Family Welfare to implement a laboratory mapping initiative in Bangladesh. This project focused on designing, developing and implementing a mapping tool to obtain data on the Bangladesh national public health laboratory system. The resulting analysis, summarized in the Bangladesh Health Facility Laboratory Capacity Mapping Report, offers strategic recommendations for the Directorate General of Health Services (DGHS) to utilize in their national strategic plan. The data gathered from 26 laboratory sites across four administrative tiers—National, Division, District and Upazila—revealed that overall network maturity is moderate, defined by significant technical expertise constrained by systemic fragmentation.

Tiered System of Contrasts

The mapping identified a "dual system" operational model: structured programmatic workflows (e.g., tuberculosis, polio/measles surveillance) operate efficiently, while routine clinical diagnostics often rely on informal manual processes. National laboratories (e.g. Institute of Epidemiology Disease Control and Research (IEDCR), National Tuberculosis Reference Laboratory (NTRL), and Institute of Public Health (IPH)) demonstrate good analytical and procedural standardization. Standardization of testing methods and platforms is high, confirmed by 86% of laboratories across the national list of priority diseases. However, systemic integration is lacking. Sample tracking systems are often informal or limited to specific vertical programs, and the lack of a unified laboratory information system (LIS) increases reliance on manual data transcription. Sub-national tiers (Division, District, Upazila) mapped showed systemic weaknesses in core management areas, such as:

- **Quality Management (QM) and the Validation Gap.** The mapping found an absence of dedicated full-time QM personnel at any sub-national site. This lack of needed QM personnel forces clinical results of validation onto medical technologists, creating a

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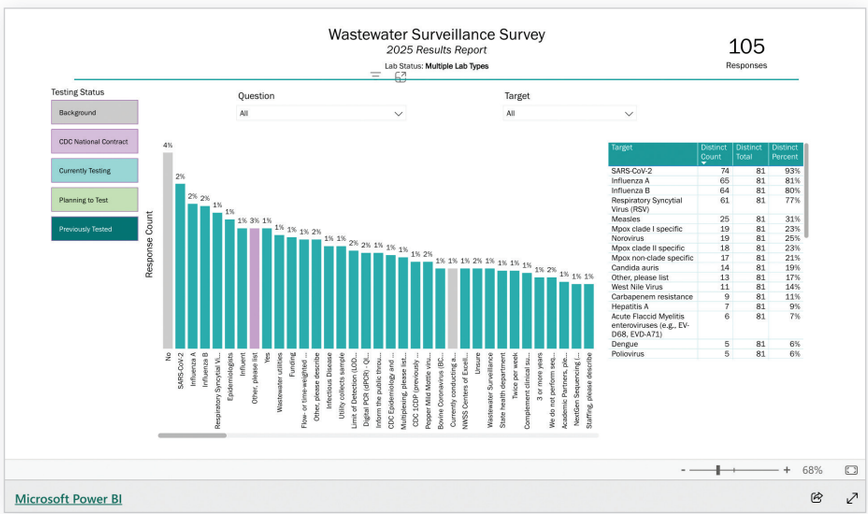
NEW RESOURCE

A Collaborative Tool to Turn Wastewater Data Into Action:

Wastewater Surveillance Dashboard

A new resource from APHL, the **Wastewater Surveillance Dashboard** uses data from the 2025 Wastewater Surveillance Survey to provide a metric laboratories can use to gauge progress as they continue to grow and hone their methods. This dashboard can also be used by National Wastewater Surveillance System (NWSS) and APHL's NWSS Laboratory Community of Practice to understand the overall wastewater surveillance landscape and to identify successes, challenges and resource needs.



Learn more and explore the dashboard: www.aphl.org/WWS

The NGS Quality Initiative Peer Network: Improving Sequencing Quality through Information Sharing and Collaboration

By **Shannon Mahoney**, senior specialist, Infectious Diseases

Over the last decade, public health laboratories have expanded their use of next generation sequencing (NGS) technologies and workflows. As laboratories have increased NGS use, they have also needed to develop new approaches for quality management. To promote further knowledge sharing and collaboration between public health organizations, the APHL-CDC NGS Quality Initiative (NGS QI) established a peer network program. The peer network seeks to improve sequencing quality management activities and promote greater collaboration and expansion of sequencing capabilities in public health laboratories.

Facilitating Connection

Following a successful pilot program with Florida and Michigan in 2024, APHL opened applications for laboratories to participate in the peer network program in 2025. Nine public health laboratories were selected and matched with one another, which included public health laboratories in the District of Columbia, Florida, Iowa, Michigan, Minnesota, Rhode Island, South Carolina, Tennessee and Virginia. Partnered organizations, with support from APHL, developed agendas for two-day site visits based on current needs and interests. Common agenda topics covered a wide array of sequencing quality considerations, including management of sequencing data, development of sequencing-specific standard operating procedures, validation of sequencing assays and improving communications with information technology (IT) personnel and epidemiologists.

Each laboratory hosted a site visit, which gave participants a chance to observe the host laboratory's sequencing workflows and quality procedures. On-site discussions, held between dozens of wet laboratory sequencing staff, bioinformaticians, quality managers and laboratory leadership, provided participants with a unique opportunity to gain exposure to new ideas and protocols for sequencing quality management. These visits gave laboratories the rare opportunity to see how another public health laboratory operates and ample time for collaboration and information sharing.

Future Opportunities

After seeing the types of interactions between epidemiologists and laboratorians in Iowa, Kristin Carpenter-Azevedo, MLS, supervisor for the Sequencing Core Laboratory in the Rhode Island Public Health Laboratory said, "We have already begun communicating with our epidemiologists and have really embraced inviting as many people [as possible] to the table to seek input." Additionally, Rhode Island has adopted a series of automated tools developed by the Iowa laboratory, streamlining time-consuming tasks in their current sequencing workflow processes.

Reflecting on their peer network engagement with the District of Columbia Public Health Laboratory Division and Virginia Department of Consolidated Laboratory Services, South Carolina Public Health Laboratory Microbiologist III Gregory Goodwin, MS, observed that their laboratory will be working to revise documentation on sequencing quality control metrics, adapting their standard operating procedures to better reflect individual sequencing assays, and will redevelop their data storage and retention procedures based on knowledge gained from their peer network engagement.

While the primary purpose of this program was to provide the opportunity for laboratories to visit and learn from one another, these interactions provided a springboard for long-lasting relationships and collaborations. APHL continues to support and foster the collaborative relationships developed during this program and track and monitor the long-term impact. The peer network provided APHL and its federal partners with added insight into the needs of APHL members and how ongoing work can be better tailored to enhance advanced molecular detection activities in the field of public health. ■

In 2019, APHL and the US Centers for Disease Control and Prevention (CDC) launched the APHL/CDC NGS Quality Initiative, a joint effort to assist laboratories in developing improved laboratory practices and national health efforts around NGS-focused quality management systems. The Initiative has published more than a hundred customizable tools and resources for NGS quality management that encompass the Clinical Laboratory Standards Institute's 12 Quality System Essentials.

Managing Sustainable Public Health Data Exchange at the National Level

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

The pandemic taught many lessons about public health infrastructure. Among them, that rapid scale-up in response to emergencies is only sustainable when paired with a platform that can agilely connect public health systems and healthcare providers across the country. And this national network generates massive volumes of data, which translates into substantial operational costs.

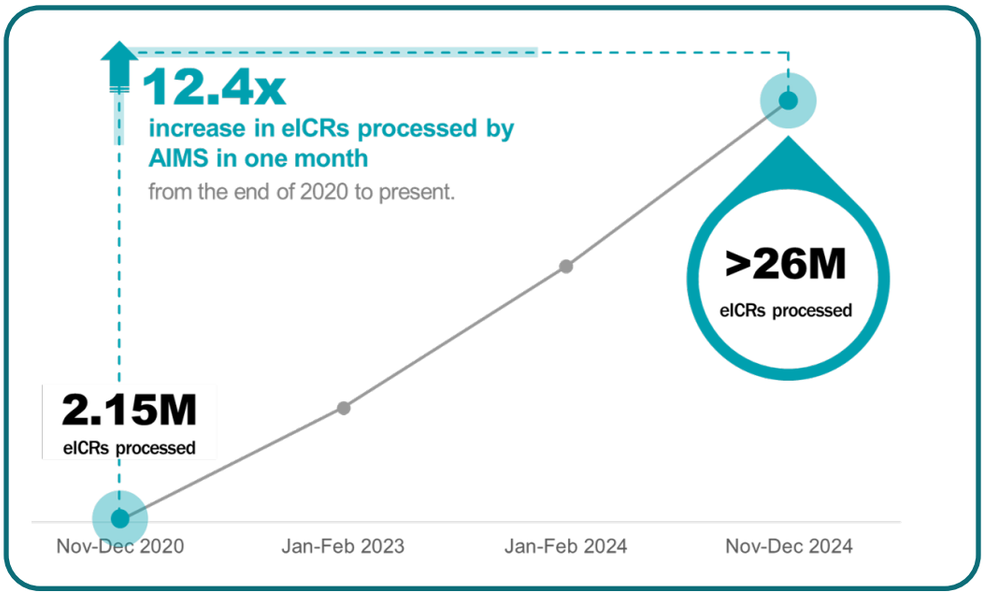
A Robust Foundation

The APHL Informatics Messaging Services (AIMS) Platform has long served as the backbone of national public health data exchange, processing more than 40 million messages per month across laboratories, federal partners, hospitals, and other public health collaborators. Think of it as a high-speed interstate transporting critical information—surveillance messages, electronic case reporting (eCR), immunization data, vital statistics, electronic laboratory results (ELR), electronic test orders and results (ETOR), and other public health reporting—from one point to another. By centralizing these intermediary services into a single platform instead of replicating efforts across every public health jurisdiction, AIMS saves money, time and lives.

But with great success comes great operational complexity. When COVID-19 hit, the platform scaled dramatically to meet demand. For example, in late 2020 AIMS processed about 2.15 million initial electronic case reports (eICR) per month. But by the end of 2024, AIMS was processing more than 26 million eICR per month, with numbers continuing to increase. Other use cases saw similar increases in activity during the same period. That exponential increase in message volume brought a corresponding spike in operational costs in the form of monthly bills from Amazon Web Services (AWS).

After the emergency ended, the volume of data continued to increase as more

Growth in Monthly eICR Volume Processed on AIMS (2020–2024)



conditions and healthcare organizations onboard and as AIMS evolved to handle more use cases. For example, the platform recently assumed responsibility for reporting ELR to jurisdictions from the US Centers for Disease Control and Prevention's (CDC's) ReportStream and SimpleReport. CDC also commissioned APHL to build and operate Detor, a centralized, fast and secure system to transmit ETOR between healthcare systems and public health collaborators. Already, more than 100,000 newborn screening, sexually transmitted infection (STI) and tuberculosis (TB) orders and results have been exchanged through Detor since the service went live in August 2024, saving hundreds of hours for both hospitals and laboratories, reducing turnaround time by days and potentially saving lives. These expansions to AIMS demonstrate its versatility and CDC's continued reliance on and trust in the platform.

AIMS gets the job done, but at a cost. As funding tightens across public health, APHL is trying to find ways to reduce expenses. This public health intermediary will only be sustainable if it can streamline its operations and make the investment more cost-effective.

The Stabilization Initiative

This past year, APHL focused on stabilizing and streamlining operations across the AIMS Platform. The association overhauled how messages are processed and routed without disrupting services to users—no small feat when the platform is handling 480 million annual messages that healthcare organizations, laboratories and agencies depend on at the local, state and federal level. Through careful process improvement efforts, the platform achieved considerable reductions in operating costs while maintaining the same level of service reliability.

The work began with comprehensive analysis. The team leveraged AWS tools including Cost Explorer, Compute Optimizer and Trusted Advisor to generate data-driven insights about where resources were being consumed. They established a semi-permanent governance structure to continue process

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The Results Are In! Data Modernization at Public Health Laboratories Is a Work in Progress

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

Data modernization has been the key focus of public health departments since the US Centers for Disease Control and Prevention (CDC) launched the Data Modernization Initiative in 2019. But that focus has been on areas of public health outside of the laboratory. Therefore, when the APHL Data Modernization Subcommittee launched in January 2025, its first order of business was to understand where public health laboratories stand in their data modernization journeys. The resulting nationwide survey of chief informatics officers, interoperability coordinators and informatics program managers revealed a landscape of both persistent challenges and emerging opportunities and a clear path forward for collaborative action.

The key finding? You are not alone. Public health laboratories across the nation face similar challenges and share remarkably similar priorities. Top priorities centered on integration and interoperability: developing fully integrated public health data ecosystems connecting sequencing and analytical activities, creating interoperable networks for laboratory instruments and laboratory information management systems (LIMS), and establishing robust electronic test order and results (ETOR) intermediaries.

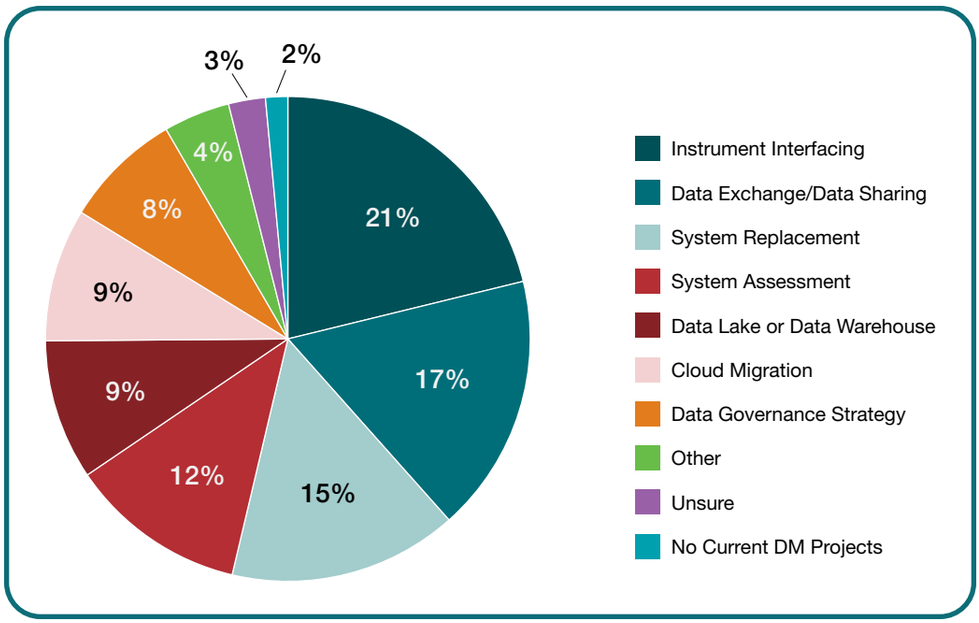

Figure 1. Roadblocks Impeding Data Modernization Goals.

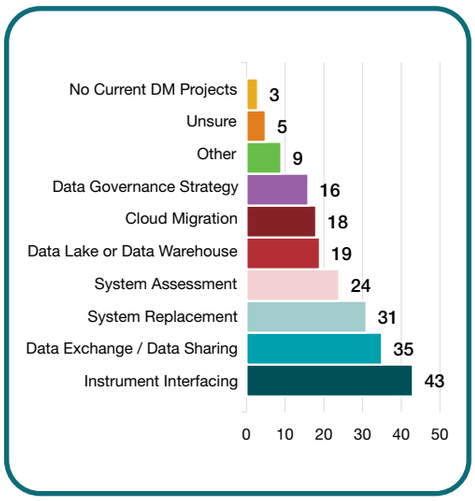

Figure 2. Data Modernization Projects in Progress at Public Health Laboratories.

Similar Priorities...and Challenges

While 73% of laboratories report being at least somewhat on track to meet their data modernization goals, the roadblocks they face are substantial (**Figure 1**). Unsurprisingly, laboratories reported that workforce capacity and funding concerns are their main challenges, followed by the limitations of legacy systems. Data modernization isn't simply a technical upgrade; it is an evolution requiring sustained investment in both technology and people.

Despite these hurdles, public health laboratories are moving forward with remarkable consistency (**Figure 2**). The most common data modernization projects include instrument interfacing, data exchange and interoperability initiatives, and LIMS assessment and replacement, with most laboratories managing multiple projects simultaneously. Instrument interfacing is an ongoing effort, with laboratories interfacing one device at a time and often juggling multiple solutions to integrate the dozens of instruments in their networks. Many laboratories are working with LIMS that are outdated and unable to meet the demands of emerging interoperability and data sharing standards. Yet replacing these systems represents a multimillion-dollar investment that can span years, with significant implementation risks if not approached strategically.

Many laboratories are also building new data management architectures in the cloud—data lakes and data warehouses paired with robust data governance frameworks. These initiatives are often enterprise-wide efforts led by and integrated with other programs across the broader public health agency.

Facilitating Solutions

The survey revealed significant commonalities, both in what laboratories are tackling and in what they are not ready to tackle. Few laboratories feel prepared for emerging technologies like the HL7 Fast Healthcare Interoperability Resources specification (FHIR), artificial

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When Systems Fail: Building Resilient Laboratory Informatics Through Comprehensive COOP Planning

By **Christina Egan**, PhD, deputy director, Division of Infectious Diseases and chief, Biodefense and Mycology laboratories, New York State Department of Health-Wadsworth Center; **Hugh Peeples**, MLS(ASCP), clinical application coordinator, Tennessee Department of Health Division of Laboratory Services; and **Sean Hannigan**, specialist, Informatics

When the network goes down, how will your laboratory's informatics systems keep running? This question took on urgent importance for Tennessee Department of Health Division of Laboratory Services' newborn screening program on Christmas Day 2020, when a car bomb devastated downtown Nashville's AT&T service building, bringing down communications and network access across the region.

The explosion rendered the state laboratory's internet infrastructure nonfunctional, creating an unprecedented crisis. Without connectivity, the laboratory information management systems (LIMS) became inoperable, preventing laboratory staff from processing or analyzing any newborn screening samples. For a program that detects potentially life-threatening conditions requiring immediate intervention, the network outage created an urgent public health emergency.

The Single Point of Failure

Tennessee's experience revealed a critical vulnerability: AT&T served as both the primary and backup internet provider for the state laboratory, creating a single point of failure. When the service went down, there was no redundancy to fall back on. Initial attempts to restore connectivity through portable Wi-Fi hotspots, point-to-point Wi-Fi connections and emergency internet service provider (ISP) contracts all proved too slow or uncertain for immediate need.

As the outage continued, laboratory leadership recognized that temporary connectivity solutions would not be sufficient. This prompted activation of their continuity of operations plan (COOP), involving an interstate partnership with the Florida Department of Health Bureau of Public Health Laboratories.

Interstate Collaboration in Action

Hugh Peeples, clinical application coordinator from the Tennessee Department of Health Division of Lab Services, advised the laboratory's response to the crisis. The COOP

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Beyond the Smoke

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PM and lead, while others are not as well understood, especially indoors. These results were discussed by diverse partner teams, including the California Office of Environmental Health Hazard Assessment, the US Environmental Protection Agency and the Los Angeles Department of Public Health to determine their potential impact on public health. The standardized testing supported wildfire recovery efforts and public guidance, while continued exploratory testing will inform future public health planning and environmental monitoring. Such exploratory testing adds to the collective knowledge of what exposures may be present as the science evolves on what such exposures may mean for health.

Optimizing Future Emergency Response

Timely response in the Los Angeles fires was only possible through prior strategic interagency collaboration. The Public Health Assessment Unit within the Incident Command Structure successfully integrated the various agencies into the response and ensured that sampling methodologies and action levels were appropriate to inform public health decisions. These complementary partnerships were fostered by effective capability recognition of the various entities. Local expertise and leadership was essential.

With wildfires transitioning from seasonal threats to year-round public health emergencies, the coordinated response by the California environmental and public health teams provides a vital blueprint for how laboratories can adapt to this new reality. Through standardized testing, timely data interpretation, continued development of testing methods and close interagency collaboration, laboratories helped protect communities from potential risks and strengthened the foundation for future emergency response. Public health laboratories nationwide should build upon these lessons to strengthen preparedness infrastructure and deepen cross-sector partnerships, ensuring that scientific expertise remains at the center of emergency response.

The findings and conclusions in this article are those of the authors and do not necessarily represent the views or opinions of the California Department of Public Health or the California Health and Human Services Agency. ■

Oregon's SensOR™ Module

By **Matthew Shrensel**, air quality monitoring manager, Laboratory and Environmental Assessment Division, Oregon Department of Environmental Quality

Each year, Oregonians face increasing risks from wildfire smoke. To improve geographic data coverage and provide the public critical and timely information, Oregon Department of Environmental Quality (DEQ) developed the SensOR™ module, a low-cost monitoring solution. Many commercially available, compact low-cost sensor solutions have advantages, but don't necessarily serve Oregon DEQ's requirements for air monitoring. To solve these problems, DEQ developed the SensOR™ module for measuring $PM_{2.5}$ based on DEQ's expertise with monitoring wildfire smoke and historical data. SensOR™ distinguishes itself from most commercial products by integrating with commercial data acquisition software, providing active airflow, controlling humidity to reduce measurement artifacts, and it is adjusted by DEQ for regional wood smoke measurement artifacts. These features enabled DEQ to double the size of its monitoring network and provide data to the public for decision making.

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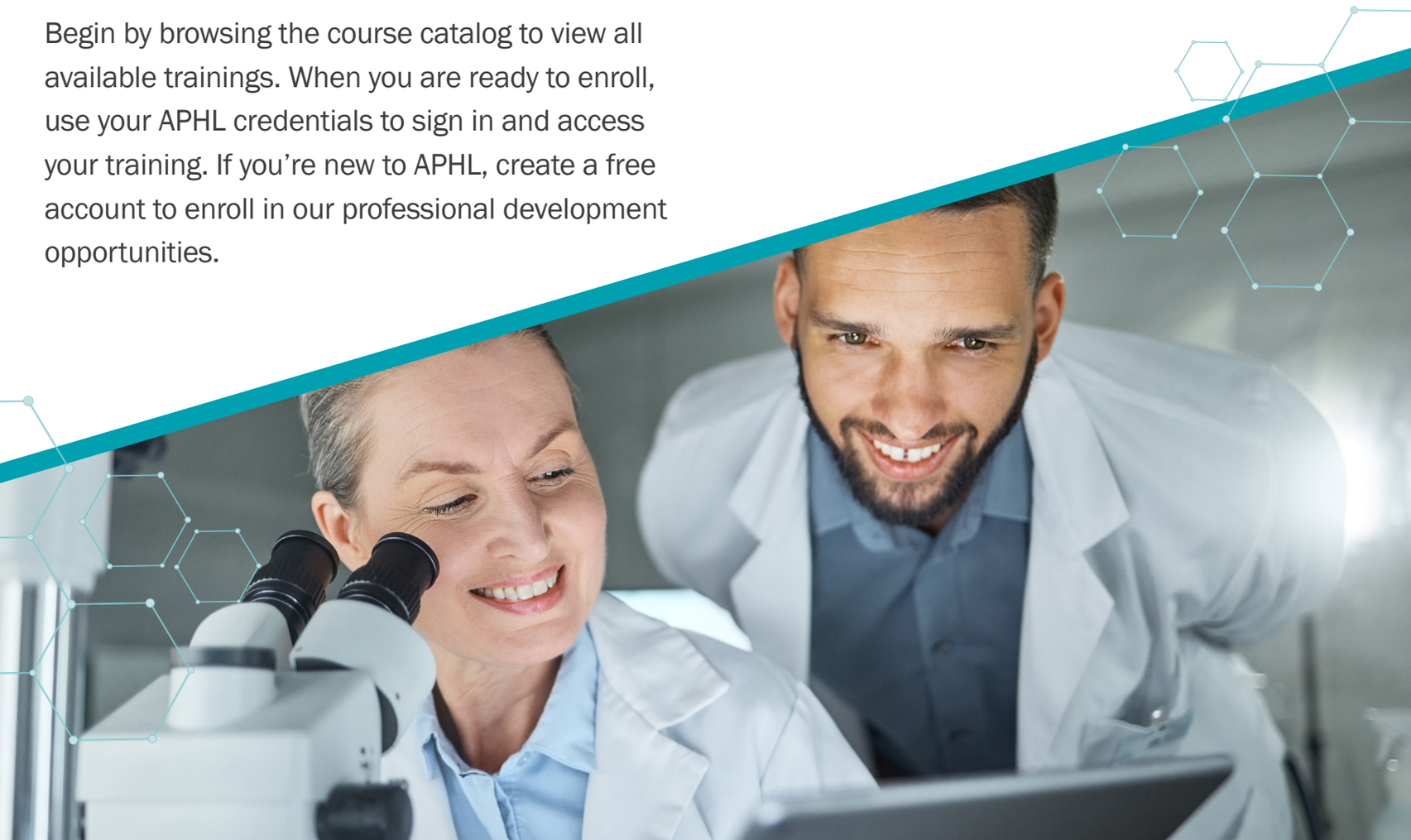
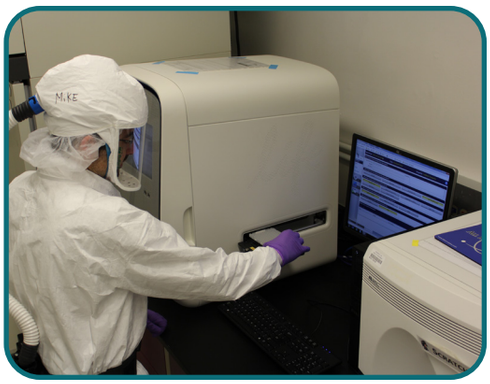


Why Public Health Emergency Preparedness Funding Matters for Public Health Laboratories

By **Tyler Wolford**, MS, senior program manager, Public Health Preparedness and Response



Michael J. Perry, DrPH, MEd, Director of the Biodefense Laboratory at the New York State Department of Health Wadsworth Center, loads a polymerase chain reaction (PCR) plate into a QuantStudio™ Dx instrument in preparation for Laboratory Response Network for Biological Threats Preparedness testing. These activities are supported through PHEP funding to strengthen public health laboratory response capabilities.

Public health laboratories are a foundational component of the nation's public health emergency preparedness and response system. From detecting emerging infectious diseases to supporting responses to chemical, radiological and biological threats, laboratories provide timely, high-quality data that inform life-saving decisions. US Centers for Disease Control and Prevention Public Health Emergency Preparedness (PHEP) cooperative agreement funding plays a critical role in sustaining and strengthening this capacity, ensuring that public health laboratories remain ready to respond to both known and unforeseen threats.

On an annual basis, PHEP provides approximately 90% of the funding that supports public health preparedness and response activities. In the wake of the 2001 anthrax attacks, total PHEP funding to public health agencies peaked in 2003 at $970 million, including $167.7 million dedicated to public health laboratory biological and chemical preparedness. Since that time, funding levels have declined substantially. In fiscal year 2023 (July 1, 2023, to June 30, 2024), total PHEP funding decreased to $661.9 million, with $92.5 million allocated to public health laboratories.

PHEP funding enables laboratories to maintain core preparedness capabilities that are difficult to sustain through routine funding streams alone. Emergency preparedness requires surge capacity, redundancy and specialized expertise—capabilities that may not be fully utilized during routine operations but are essential during crises. PHEP

resources support the acquisition and maintenance of critical laboratory instruments, reagents and consumables; ensure access to secure and resilient information systems; and help laboratories maintain validated methods for high-consequence pathogens and hazardous agents. Without PHEP funding, many laboratories would struggle to maintain these readiness capabilities between emergencies.

Key Values of PHEP Funding

Workforce Development and Retention. Preparedness is only as strong as the people implementing it. PHEP investments support training, exercises and competency development for laboratory scientists, biosafety professionals, data analysts and laboratory leadership. These funds enable cross-training to ensure continuity of operations, support participation in national laboratory networks and help build leadership and response coordination skills. In an era of workforce shortages and increasing technical complexity, PHEP funding helps laboratories recruit, retain and sustain a skilled workforce capable of responding under pressure.

Laboratory Integration Within Broader Emergency Response Systems. Public health emergencies require coordinated action across epidemiology, emergency management, healthcare and federal partners. PHEP resources support planning, communication systems and exercises that ensure laboratories are fully integrated into incident command structures and emergency operations centers. This coordination allows laboratory data to be rapidly translated into actionable public health decisions, supporting timely risk assessments, resource allocation and public messaging.

Innovation and Adaptability in Laboratory Preparedness. Recent emergencies from COVID-19 to mpox to novel influenza strains have demonstrated that threats evolve quickly and often unpredictably. PHEP investments allow laboratories to pilot innovative technologies, such as advanced molecular diagnostics, genomic sequencing and data modernization tools, and to adapt workflows to emerging needs. This flexibility enables laboratories to pivot rapidly during emergencies while maintaining quality and safety standards.

Mitigates Health, Economic and Societal Impacts of Public Health Emergencies. Early detection, rapid testing and reliable laboratory data reduce delays in response, limit disease spread and support more targeted interventions. By strengthening preparedness before an emergency occurs, PHEP funding helps avoid far greater costs associated with uncontrolled outbreaks, prolonged response efforts and loss of public trust.

In an increasingly complex threat landscape, sustained PHEP funding is not optional—it is essential. Continued investment ensures that public health laboratories remain resilient, adaptable and ready to protect communities when emergencies arise. Strengthening laboratory preparedness through PHEP funding ultimately strengthens the entire public health system and safeguards the health and security of the nation. ■

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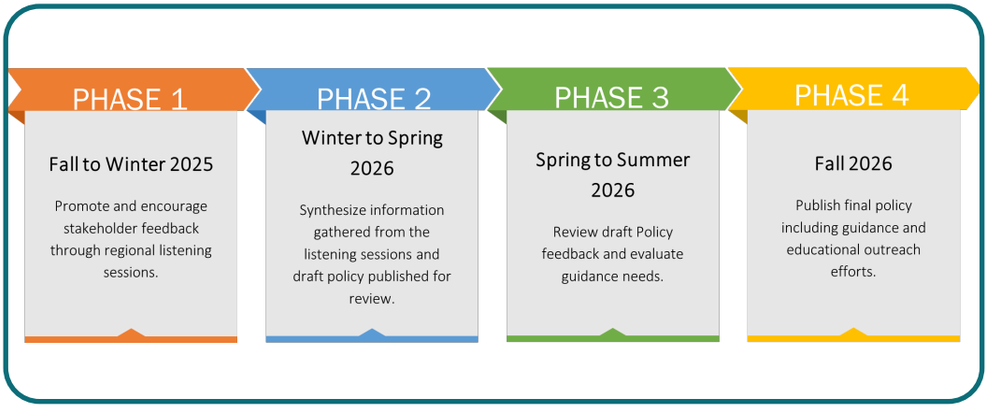
National Institute of Health Launches Biosafety Modernization Initiative

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

In September 2025, the National Institutes of Health (NIH) launched the Biosafety Modernization Initiative, a comprehensive effort to modernize and strengthen biosafety policies and practices. This effort aims to ensure that NIH's biosafety framework keeps pace with evolving biological risks posed by advances in science and technology since the creation of the original NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines) in 1976.



Throughout this initiative, NIH is seeking input from across the biosafety community, including academic and research institutions, biosafety professionals, policymakers and members of the public. Their goal across 2025–2026 is to collaborate across the community to create a revised biosafety framework addressing current risks.

APHL Biosafety and Biosecurity Committee members share their perspectives on how the initiative can affect state and local public health laboratories:

Peter Iwen, MS, PhD, D(ABMM), F(AAM)

Director, Nebraska Public Health Laboratory

The announcement of a new Biosafety Modernization Institute by the federal government is designed to strengthen biosafety practices with an apparent goal to update the NIH Guidelines. The main function of this document is to provide regulatory control for institutes that engage in NIH-sponsored research. Although most public health laboratories do not participate in NIH-sponsored research, they do handle high consequence pathogens that fall under the oversight of the Federal Select Agent Program (FSAP). Since FSAP uses the NIH Guidelines as one means for regulatory guidance, PHLs will subsequently need to be prepared to address any changes that are made to modernize biosafety practices in the laboratory.

Marian Downing, RBP, CBSP, SM(NRCM)

Biosafety Consultant

There are many questions about how the NIH Biosafety Modernization Initiative may affect biological research, the oversight/funding of Institutional Biosafety Committees (IBCs) and its relevance to private industry and non-research entities such as public health and clinical laboratories. Hopefully, any new guidelines will harmonize with current biosafety standards including the Biosafety in Microbiological and Biomedical Laboratories (BMBL), employ biosafety best practices, protect proprietary information, and utilize peer-reviewed research for policy decisions.

David Hill, MEM, CIH

Director of Safety, New York State Department of Health

For any public health laboratories currently conducting federally funded research activities that require oversight by Institutional Biosafety Committees (IBCs), there is likely to be both a change in the scope of biosafety oversight for existing recombinant and synthetic nucleic acid research technologies, as well as an expansion of oversight to include certain wild-type pathogens. However, it will be important for APHL and its members to monitor the progress of this initiative to determine if the proposed future scope will remain limited to federally funded research activities, or if they will look to expand their biosafety oversight beyond that previous boundary to include any biological risks associated with public health laboratory settings.

While not all public health laboratories fall under NIH guidelines, APHL still encourages public health laboratory professionals to participate throughout this process. The APHL Biosafety and Biosecurity Committee will continue to collaborate with NIH and public health partners on the creation of updated guidelines. For more information and announcements, visit the NIH website.

APHL and FDA Partner on *Cronobacter* Detection Training

By **Katie Hislop**, senior specialist, Instructional Design; **Kenya Neal Copeland**, senior specialist, Instructional Design; **Robyn Randolph**, program manager, Food Safety; and **Aalok Mehta**, specialist, Food Safety

In September 2025, APHL partnered with the US Food and Drug Administration's (FDA's) Office of Training, Education and Development (OTED) and the Office of Laboratory Operations and Applied Science (OLOAS) within the Human Foods Program (HFP) to deliver a first of its kind, in-person laboratory training on detecting *Cronobacter* spp. in powdered infant formula (PIF). *Cronobacter* spp. is an emerging opportunistic pathogen capable of surviving in dry environments such as PIF and causing rare, severe and sometimes fatal illness in neonates and infants. Through multidisciplinary collaboration, *FD430* Cronobacter *spp. Laboratory Training: Detection in Powdered Infant Formula* translated a complex, technical topic into practical, hands-on learning. While APHL has collaborated with FDA on training initiatives for more than a decade, this effort marked the first time APHL developed and delivered an FDA in-person course from concept through execution.

> **"This class was extremely well done. The in-person time with the subject matter experts (SMEs) is invaluable to my learning & what I will take back to my lab for implementing the method...APHL did an amazing job coordinating the class & with the class materials"**
>
> ***— Course Participant***

A Critical Training Need

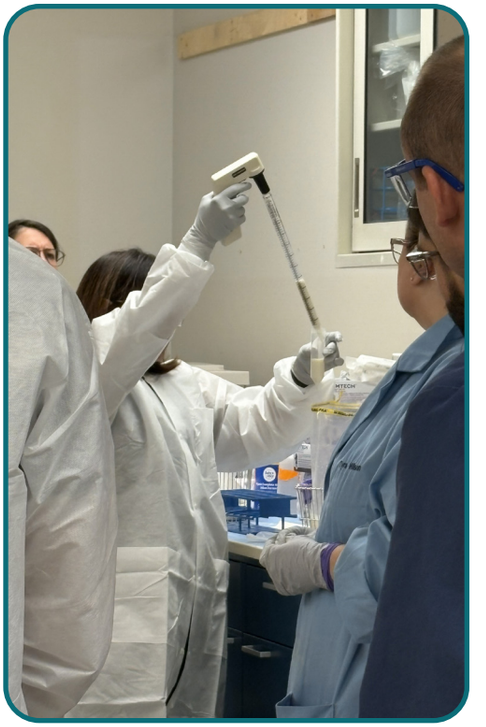
Several events elevated this training to a top priority. In 2022, an investigation of *Cronobacter sakazakii* linked to PIF from a major manufacturer resulted in serious illnesses, a nationwide recall and significant formula shortages—revealed critical gaps in state and federal laboratory testing capacity. In response, FDA and key collaborators launched a *Cronobacter* Prevention Strategy and prioritized strengthening testing capabilities through standardized methods and targeted training. As improved testing procedures were developed, the need for comprehensive training across federal and state laboratories became urgent, positioning the FD430 *Cronobacter* spp. Laboratory Training as a high FDA priority.

Creators Behind the Course

The success of the course reflects extensive collaboration among FDA, APHL and state laboratories. The FD430 Course Advisory Group (CAG) included leading FDA microbiologists at the forefront of *Cronobacter* testing. Among them were the current authors of the FDA *Bacteriological Analytical Manual (BAM) Chapter 29—Cronobacter*, including Yi Chen, Nancy E. Miranda, Kun C. Liu and Jeremi S. Mullins.

In addition to these subject matter experts, FDA provided essential training coordination and project management support, while APHL contributed expertise in on-site logistics and instructional design. Guided by the BAM and the expertise of the CAG, APHL created materials grounded in cognitive science and adult learning principles to improve engagement and retention.

The CAG evaluated delivery modality (in-person, virtual or online), training location, target participants and engagement strategies to ensure the course addressed real-world laboratory needs. This multi-organizational, cross-functional collaboration paired FDA's scientific leadership with APHL's learning design expertise to create a course that was both technically rigorous and learner-centered.



An instructor demonstrates how to remove supernatants from a PIF enrichment.

Training Delivery

Hosted at FDA's Seattle Human and Animal Food Laboratory (SEAHAF), the training combined classroom instruction with hands-on laboratory practice. The 14 trainees represented both state and FDA food laboratories. Blending technical instruction with real-time practice and discussion proved invaluable. Learners exchanged insights with experts, built connections between state and federal partners and learned directly from one another.

Participants praised the course as well-planned and highly relevant, highlighting the usefulness of interactive materials such as the participant workbook and the expertise of FDA and APHL staff. The

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The Intersection of Public Health and One Health

By **Julie E. Breher**, DVM MPVM, veterinarian, San Diego County Public Health Laboratory; **Ashley Smith**, MS, lead specialist, Fellowships and Internships; and **Rob Nickla**, M(ASCP)^{CM} QLSCM, RBP(ABSA)^{CM}, CBSP(ABSA)^{CM}, manager, Training Program Management

"One Health" is a relatively recent term that refers to an ancient concept thousands of years old. Both the World Health Organization and the US Centers for Disease Control and Prevention define One Health as an approach that integrates multiple sectors, disciplines and communities with the goal of achieving optimal health outcomes for humans, animals, plants and the environment. Recently, a relational One Health theoretical model has been proposed, in which human health is nested within animal health, which is nested within ecosystem health, and this entire framework shares a common environment with various social, cultural, economic, biophysical, political and historical dimensions.[1]

From a public health perspective, One Health infuses the majority, if not all, of what laboratories do. From zoonotic pathogen management to beach water testing to foodborne outbreaks to chemical contamination analysis, public health jurisdictions at all levels strive to manage complex problems that require a collaborative, multisectoral and transdisciplinary approach. Therefore, considering the magnitude of this broad concept, one must wonder: What is *NOT* One Health?

Breaking Down Silos

Public health and One Health are deeply interconnected frameworks that share a common mission: protecting and promoting health across human, animal and environmental domains. While public health traditionally focuses on human populations, One Health is a broader, integrative approach that recognizes the interdependence of human, animal and ecosystem health. In essence, public health is One Health.

One Health is not a discipline but a way of working. It is a collaborative, multisectoral and transdisciplinary approach that is already embedded in many public health laboratory activities. Public health laboratories routinely engage in One Health work, often without labeling it as such. Examples include monitoring environmental contaminants, detecting zoonotic diseases like rabies and highly pathogenic avian influenza, responding to foodborne outbreaks, and using tools such as MALDI-TOF mass spectrometry and *Candida* species identification.

Many One Health partnerships already exist but may be overlooked or unrecognized due to professional silos. Veterinarians, environmental scientists, agricultural experts, epidemiologists, clinical microbiologists and others share common missions and are therefore all One Health collaborators. Breaking silos and drawing on cross-sector expertise may aid PHL professionals in building a collaborative One Health approach to monitoring and detecting health threats.

Leveraging Existing Information to Embrace One Health Concepts

A pre-conference workshop held at APHL 2025 was designed to elevate awareness of One Health, provide tools to strengthen public health laboratory capacity, foster cross-sector collaboration and highlight the value of One Health in public health laboratory settings. Examples showcased fellowship projects spanning clinical microbiology, veterinary diagnostics and agricultural surveillance demonstrating how One Health principles are embedded in today's laboratory work.

The Laboratory System Improvement Program (L-SIP) also emerged as a key resource for partnership building within the pre-conference workshop as many laboratories have already utilized this tool in fellowship projects. Public health laboratories can use L-SIP to develop communication strategies and convene partners around shared One Health goals. Workforce pipelines such as the Career Pathways in Public Health Laboratory Science: an APHL-CDC Initiative helps cultivate a new generation of scientists who may view public health through a One Health lens. This workforce development strategy fosters strategic, interconnected collaboration to support public health initiatives often through a One Health approach.

Ultimately, One Health is not a separate initiative from public health; it is a foundational approach that permeates all aspects of public health. By embracing One Health, public health laboratories strengthen their collective ability to sustain resilient health systems, respond to complex health threats and build a more integrated One Health future. ■

Reference:

Meisner J, McLeland-Wieser H, Traylor EE, Hermesh B, Berg T, Roess A, Van Patter L, Rosenthal A, Davidovitch N, Rabinowitz PM. Relational One Health: A more-than-biomedical framework for more-than-human health, and lessons learned from Brazil, Ethiopia, and Israel. One Health. 2024 Jan 9;18:100676. doi: 10.1016/j.onehlt.2024.100676. PMID: 39010955; PMCID: PMC11247262.

Radiation Readiness

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urine sample (>= 30 mL) to screen for internal contamination with Ra-226. This mismatch created an unnecessary burden for the patient and introduced unnecessary complexity to sample storage and handling for the public health laboratory. However, when a 24-hour collection is already obtained, laboratories can reduce handling complexity by aliquoting into an appropriate container before shipment.

Identifying procedural gaps, like the specimen collection and handling methods, provided meaningful opportunities for system improvement. Moving forward, regular exercises and drills will create operational muscle memory to reduce hesitation and confusion in response events. The exercises will reinforce the notification pathways to reduce communications confusion. Early coordination between clinicians, laboratories and federal partners on sampling requirements before specimen collection can be highlighted during drills to minimize procedural issues. By strengthening clarity about roles, refining specimen-handling protocols and formalizing communication pathways, North Dakota expands an already strong foundation.

The 2025 radiation incident demonstrates that preparedness is not a static achievement but an ongoing process. It benefits from practice, partnership and continual reassessment. The event serves as a powerful reminder that preparedness and drills are not merely exercises—they are essential components of real-world readiness. ■

Bangladesh

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critical quality assurance risk (the "validation gap").

- **Capacity and Logistics.** Procurement systems rely on rigid annual cycles, frequently resulting in stockouts during high-volume testing. This is compounded by the widespread presence of the "one-person lab" model in Upazilas, where a single medical technologist manages the entire complex diagnostic workflow. Sample tracking is informal or non-existent outside vertical disease programs, hindering outbreak investigations and reliable chain-of-custody. For sample transport procedures, 79% of national departments have completely standardized protocols, but three laboratories rely on transport arrangements on an “as needed” basis, and others report non-applicability due to their non-infectious specimen focus (e.g., food samples).
- **Communication.** Post-analytical communication for clinical results remains largely informal (e.g., phone calls), undermining the formal dissemination pathways necessary for integrated public health action.

Strategic Imperatives

The data collected provides DGHS with insights into capacity and communication between the different laboratory tiers. To build a cohesive and resilient network, targeted investments must prioritize: digital integration via a national LIS, creating dedicated full-time quality manager roles and implementing real-time resource planning to ensure sustainable operations at all tiers.

By addressing these, Bangladesh can successfully move toward establishing a truly integrated and responsive national public health laboratory network. ■

Data Exchange

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improvements and identify additional savings opportunities. Every system component came under scrutiny.

One way that APHL has reduced costs and overhead is by leveraging cloud native services where possible. For example, a fully managed, scalable service is now used (AWS Transfer Family) that reduces the maintenance burden, and cloud governance solutions and rules are being implemented to reduce overhead on APHL

Another major milestone was completing the Mirth Resilience project. While the primary goal was improving performance, resource utilization, and scalability within the electronic case reporting architecture, an additional benefit emerged: message processing and storage efficiencies that correlated to significant AWS cost reductions. Even after only one month in production, these cost savings were apparent in the monthly invoices.

The results speak for themselves. Current cost-saving efforts have resulted in approximately $258,000 per month in reductions. It is important to note that savings don't always show up as a direct one-to-one drop in monthly invoices—sometimes unused resources are removed only to add resources for another workload. But the net effect remains a positive reduction.

Looking Ahead: The Volume Challenge

Cost stabilization doesn't mean the work is done. APHL is already exploring the next frontier: reducing the volume of eCR messages themselves. A significant portion of what healthcare organizations currently send to AIMS cannot be used by public health agencies. These non-reportable eICRs still require processing and routing, which drive costs.

Several enhancement strategies are under consideration. One straightforward approach would remove high-volume conditions that produce substantial electronic case reporting loads but have minimal or no Reportable Condition Knowledge Management System (RCKMS) authoring by public health agencies. Malignant neoplastic disease represents one such condition. The impact could be substantial: filtering these non-reportable cases could result in an estimated 25 to 30 percent volume reduction, with corresponding operational savings from reduced ingestion, processing and routing.

A Platform for the Future

This stabilization work positions AIMS to support public health through funding uncertainties while preparing for the platform's next evolution. APHL is constantly looking ahead, seeking partners throughout the health IT ecosystem to develop and pilot new use cases for TEFCA, FHIR and the CMS Interoperability Framework. Through this innovation, AIMS will be ready when public health needs reliable data exchange solutions.

The pandemic proved that public health infrastructure can scale rapidly to meet unprecedented challenges. The AIMS stabilization initiative proves something equally important: that careful stewardship and strategic thinking can ensure those systems remain sustainable for the long haul. As public health faces an uncertain funding landscape, this kind of financial discipline will be essential to maintaining the critical services the nation depends on. ■

Data Modernization

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intelligence (AI) or new data sharing models like the Trusted Exchange Framework and Common Agreement (TEFCA). Without adequate preparation, public health laboratories risk falling behind as these innovations reshape the field.

These challenges and opportunities create an opening for collaborative solutions that the Data Modernization Subcommittee was designed to facilitate. Rather than each laboratory developing solutions in isolation, public health laboratories expressed strong interest in collective approaches, whether through shared software platforms, common data standards or hands-on technical assistance. By fostering this collaboration and promoting innovative technologies, the subcommittee aims to help laboratories leverage advanced analytics to safeguard the public and improve patient outcomes. In an interconnected health ecosystem, no laboratory modernizes alone—and the Data Modernization Subcommittee stands ready to facilitate collective progress.

For more information about APHL's Data Modernization Subcommittee or to access resources for your laboratory's modernization efforts, visit aphl.org or contact the APHL Informatics team. ■

COOP Planning

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implementation involved several critical steps: samples were assigned accession numbers and demographic entry sections were scanned for follow-up; prepared samples were securely packaged and shipped to Florida for testing under emergency arrangements; and Florida conducted available tests according to their capabilities before returning samples to Tennessee for additional screening not available in Florida.

However, the collaborative arrangement revealed significant interoperability challenges. Florida's LIMS system could not properly process Tennessee's sample control numbers because they were not long enough to meet Florida's data format requirements. This incompatibility required manual workarounds and highlighted the need for standardized identifiers across state systems.

Results Management Without LIMS

The collaborative testing arrangement with Florida produced results that needed efficient management outside the normal LIMS system. Tennessee's informatics team developed a manual procedure involving four key steps:

1. Hard copies of test results arrived from Florida with Tennessee's sample identifiers and Florida's testing data.
2. Results were physically sorted by Tennessee accession number to create a retrievable filing system.
3. Documents were scanned and filenames standardized to match accession numbers creating a searchable digital archive.
4. A special mnemonic was created to alert providers that results came from Florida and required special attention.

Lessons Learned and System Improvements

Following the 2020 network disaster, Tennessee conducted a comprehensive review of their emergency procedures, leading to several technological and procedural improvements. The laboratory worked with the state information technology department to implement truly redundant internet solutions using different service providers and separate physical routes. They collaborated with their sample puncher vendor to develop capabilities for processing blood spot cards even when internet connectivity is unavailable. Tennessee also revised their sample numbering system to ensure interoperability with partner laboratories during emergency operations.

Building a Comprehensive Framework

The Wadsworth Center's own experience with a 2018 server interruption caused by a car accident demonstrated the importance of preparation. The incident resulted in an inability to perform testing due to lack of accessioning capabilities, leading the laboratory to create a standard operating procedure for COOP labels. They now print a set of COOP labels at the start of each year and review and update the procedure regularly.

Dr. Christina Egan, deputy director of the Division of Infectious Diseases and chief of biodefense and mycology laboratories at the Wadsworth Center, outlined best practices for information technology preparedness at the forum. These include having an individual within the laboratory with sole responsibility focused on information technology, documenting all IT systems and identifying critical assets, developing IT systems COOP plans, reviewing the COOP every few years to account for changes such as paperless test requests, keeping COOP and disaster planning on IT meeting agendas, and regularly exercising the plan.

A Holistic Approach to Resilience

The experiences of Tennessee and New York demonstrate that effective disaster recovery for public health laboratories requires planning beyond traditional IT concerns. Critical considerations include equipment inventory for minimum required emergency operations, alternate location planning with necessary utilities and security, multi-provider network redundancy through different ISPs with separate physical infrastructure, interstate collaboration agreements with multiple neighboring states using standardized protocols, and offline capabilities that can function without network connectivity or access to primary facilities.

Regular testing of emergency protocols through simulated disaster scenarios is essential to ensure staff familiarity with procedures and identify potential weaknesses before they impact actual operations during a crisis. As public health laboratories become increasingly dependent on digital infrastructure, comprehensive COOP planning has evolved from a recommended practice to an essential requirement for maintaining critical public health services when systems go silent. ■

Cronobacter Detection

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knowledge gained will enable attendees to train others in their laboratories, helping address critical gaps in state and federal laboratory capacity to detect *Cronobacter* in PIF. This training demonstrated how blending scientific expertise with instructional design—and engaging teams across organizations—can produce learner-centered programs driven by a shared mission to protect public health.

Future Training Initiatives

FD430 reinforced the urgency of strengthening *Cronobacter* testing for food safety, particularly for vulnerable populations. Beyond technical skills, the course showcased the power of partnership: APHL, FDA and state agencies aligning science and learning design toward a common goal. APHL intends to apply this collaborative approach to future training initiatives that advance food safety testing capabilities. ■

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