LAB MATTERS
analysis|answers|action
Fall 2026 Issue 3

75 years APHL

Building a Resilient Newborn Screening System

INSIDE:

6 The Impact of the LRN-C Outreach Investment
20 Saving Days, Saving Lives: How Detor is Modernizing Nationwide Newborn Screening Data Exchange
32 Measuring the Impact of Emergencies on Public Health Laboratory Operations and Workforce Dynamics

ASSOCIATION OF PUBLIC HEALTH LABORATORIES

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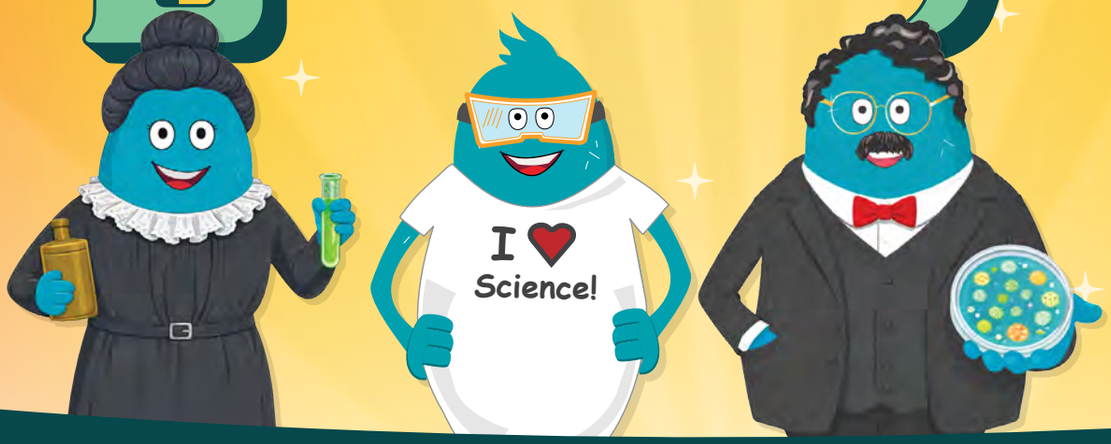

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LAB MATTERS FALL 2026 | CONTENTS

COLUMNS

2 President's Message

3 CEO's Message

4 Inside the Emerging Leader Program Coaching Experience

5 Accomplishments, Expansion, Jobs: The Career Pathways Evolution

FROM THE BENCH

6 The Impact of the LRN-C Outreach Investment

MEMBERSHIP

10 Member Profile: Napa-Solano-Yolo-Marin Public Health Laboratory

12 APHL's 75th Anniversary: Innovation

FEATURE

14 Building a Resilient Newborn Screening System

FEATURE SPOTLIGHT

INFORMATICS

20 Saving Days, Saving Lives: How Detor Is Modernizing Nationwide Newborn Screening Data Exchange

APHL PROGRAMS

ENVIRONMENTAL HEALTH

22 From Elimination to Uncertainty: Enhancing Measles Detection Through Wastewater Surveillance

23 Poison Centers and Public Health Laboratories Partner to Protect

GLOBAL HEALTH

24 Strengthening Sepsis Surveillance Through Digital Health Innovation in Thailand

INFORMATICS

26 Celebrating 20 Years of the Public Health Laboratory Interoperability Project

27 The Backbone You Don't See: How AIMS Powers Public Health Every Day

PUBLIC HEALTH PREPAREDNESS AND RESPONSE

28 Strengthening Laboratory Resilience Through Biorisk Management

29 Behind the Scenes: How Public Health Laboratories Prepare for Major Events

30 The Laboratory Response Network Responds to the 2026 Ebola Outbreak

QUALITY SYSTEMS AND ANALYTICS

32 Measuring the Impact of Emergencies on Public Health Laboratory Operations and Workforce Dynamics

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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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Leaning Into the Power of Regionalization

Sharon Massingale, PhD, HCLD/CC(ABB)
President, APHL

> "It is an exciting time for me to begin my term as president of APHL. ... I am very excited to give back to the organization that has given me so much during my public health laboratory career."

Very early in my career as a public health laboratorian, I was introduced to the concept of laboratory systems and standards by APHL. In fact, one of my first encounters with the association was as a member of the Laboratory Systems and Standards committee. When APHL rolled out the Laboratory Systems Improvement Program (L-SIP) in 2007, it was a great opportunity for our members to assess and reassess their systems on an ongoing basis. In fact, it was the first program of its kind specifically tailored to public health laboratories.

Fast forward to 2026 and the time has come for L-SIP to evolve. Even before I became president-elect, I was thinking about how our members could use systems like L-SIP to further strengthen their activities. L-SIP itself was created specifically for state laboratories, and now APHL has a more diverse laboratory membership which now includes environmental, agricultural, chemical and veterinary laboratories. In addition, we have robust representation from local jurisdictions and from public health partners.

The concept of developing regional consortia within the public health laboratory community started with the New England states in the 1970s and then in 2006 with the Northern Plains states. From 2015 to 2019, growing discussions about the need for a unified approach to workforce development and continuity of operations, along with recognition of region-specific challenges, increased interest in creating additional consortia, resulting in the creation of the Southeast ColLABorators, Mid-Atlantic Consortium, Midwest Consortium, Pacific Rim Consortium, and the Four Corners and Central Plains Consortium. Currently, the Regional Consortia comprises seven regions representing 49 states and the District of Columbia, some US territories and other municipalities, 68 unique public health laboratories and over 300 laboratory professionals.

My priority for the year is to revitalize L-SIP to be more inclusive and to be more adaptable to the many regions where our public health laboratorians live and work. The new Regional Consortia System Improvement Program will reinforce linkages that already exist between public and private partners in each consortium, as well as create new linkages and resources for those who had not typically been the benefactor of those partnerships. For example, within my home regional consortium of the Southeast ColLABorators, we are examining ways to set productive limits on projects that might prove challenging or might stress the political environment within our jurisdictions. Our aim is to not only streamline functions, such as procurement, courier services, information sharing and other laboratory services, but to also remain cognizant of each member's challenges—whether geographical or political. By partnering within our consortia, we can not only educate our fellow consortia members, but also work with other well-established external consortia to adapt their best practices and lessons learned to our unique circumstances.

It is an exciting time for me to begin my term as president of APHL. While there will be challenges and unexpected events for us to respond to, I am very excited to give back to the organization that has given me so much during my public health laboratory career. I look forward to our year together, and I encourage you to reach out to your colleagues and make those connections that are so vital to public health laboratory science. ■

Good Science Is More Than a Line Item

Scott Becker, MS
Chief Executive Officer, APHL

> "Good science is more than just a line item on a budget—it is people, it is expertise, it is storytelling and it is partnerships."

This past June, I had the pleasure of attending the Global Health Security Conference in Kuala Lumpur, Malaysia. It is a biannual gathering of global health security experts and practitioners from around the world. The first time APHL attended the conference eight years ago, there were very few laboratory-oriented sessions. Even two years ago, there was a dearth of public health laboratory-related discussions or sessions.

This year, APHL's team gave 11 oral presentations and one poster, and we hosted 10 bilateral meetings with other organizations, including the US Centers for Disease Control and Prevention (CDC) and Mérieux Foundation USA, among others. We also had the opportunity to co-host a side event to talk about APHL's work globally in collaboration with Village Reach, a partner organization that works with low-resource communities in sub-Saharan Africa to improve the capacity and reach of health care delivery services. These important face-to-face meetings, especially in times of uncertainty, are an important way for the association, our members and our staff to reinforce our deep commitment to global health security to both our partners and the countries and communities we serve.

In the past few months, our members have been responding to numerous outbreaks. While the hantavirus outbreak has been resolved, the fact that our members in Nebraska were able to respond quickly is a testament to the gold-standard laboratory practices that enabled them to develop a test for the quarantined passengers, which could only occur through the lessons learned from previous outbreaks. The ability to rapidly respond to global events, such as mpox, Ebola or hantavirus, is a critical aspect of domestic public health laboratory safety and security.

Our members and staff have always been aware that responding to biological, chemical, radiological or emerging pathogen events is always a resource issue, but it's so much more. It is the ability to coordinate with partners and first responders. It is the ability to reach out and engage with other public health laboratories and learn what they are doing in real-time. It is the ability to do good science with the latest technology, and the ability to innovate and adjust as the situation changes. Our members have been rockstars about telling the story after the fact, but as response events become increasingly more regular, all of the work our members are doing needs to be told as it happens. And this is what APHL is built for.

Right before this issue went to print, the Health Resources and Services Administration announced that APHL will serve as a convening body for newborn screening programs across the country. When we gather in New Orleans, LA, for the 2026 APHL Newborn Screening Symposium October 11–15, we will be celebrating that new partnership, as well as the people who make these partnerships possible.

Good science is more than just a line item on a budget—it is people, it is expertise, it is storytelling and it is partnerships. APHL may be an association that is known for our work on domestic issues, but our public health expertise and our engagement both here and around the world continue to shine through. ■

Inside the Emerging Leader Program Coaching Experience

By **Kenlie Fite**, DrPH, MPH, CPCLC, lead specialist, Leadership Development, **Danielle Chatelain**, MPH, senior specialist, Leadership Development and **Holly St. John**, MFA, senior specialist, Leadership Development

Leadership development does not happen through training alone; it is shaped through reflection, feedback and opportunities to navigate challenges with support. Within APHL's Emerging Leader Program (ELP), coaching is an optional component of the participant experience, providing emerging leaders with individualized, meaningful conversations as they develop their leadership skills and advance their careers. Through one-on-one coaching, participants dedicate time and space to explore their goals, reflect on their experiences and identify strategies for continued growth. Coaching complements the program's curriculum and other learning opportunities by encouraging participants to apply what they learn to real-world workplace situations.

> *"My mindset has shifted a lot through the coaching program. I know that my overall outlook of my work environment, stressors and leadership conflicts has improved drastically."*
>
> **— Participant, 2025**

What Coaching Looks Like in the ELP

Unlike mentoring, which often focuses on sharing advice and experiences, coaching prompts participants to develop their own insights and solutions. Coaches guide participants through thoughtful conversations that help them better understand their strengths, challenges and leadership styles. These conversations often center on communication, relationship building, decision-making, conflict management and career development. Because coaching is tailored to each participant's needs and goals, no two coaching experiences are exactly alike.

Participants are matched with experienced volunteer coaches from the Emerging Leader Alumni Network (ELAN) and Laboratory Leaders of Today Alumni (LLOTA). Coaching engagements begin in January and continue through June, with a structured three-month coaching period and an optional three-month extension. Coaches and ELP participants typically meet for three to six one-hour coaching sessions, providing space for reflection, goal setting and leadership development. APHL also provides coaches and ELP participants with resources and tools to support meaningful conversations throughout the engagement.

Supporting Leadership Growth and Development

For many participants, coaching becomes a catalyst for greater self-awareness and confidence. Through structured reflection and goal setting, participants gain a deeper understanding of how they lead, communicate with others and continue to develop as professionals. Coaching also provides a supportive environment for discussing challenges and opportunities, allowing participants to explore different perspectives and approaches.

The Impact of Coaching

Since 2023, APHL has facilitated 50 coaching partnerships across three ELP cohorts. These one-on-one partnerships pair emerging leaders with experienced volunteer coaches from across the public health laboratory community to support leadership development, professional growth and career exploration. The coaching component provides participants with a dedicated space to discuss workplace challenges, explore new perspectives and develop strategies to achieve their professional goals.

Coaches also benefit from the experience. By partnering with participants in the ELP from across the public health laboratory community, they support workforce development while contributing to the growth of future leaders. These relationships foster meaningful professional connections, encourage the exchange of diverse perspectives and experiences, and provide coaches with an opportunity to reflect on and strengthen their own leadership practices while helping others navigate challenges and achieve their professional goals.

Investing in the Future Public Health Laboratory Workforce

As public health laboratories continue to face evolving challenges and workforce needs, developing strong leaders remains essential. The optional coaching component of the ELP helps participants build the skills, confidence and self-awareness needed to lead effectively within their organizations and communities. By investing in individualized leadership development through coaching, APHL strengthens the current and future public health laboratory workforce, ensuring that emerging leaders are prepared to navigate challenges, inspire others and contribute to the continued success of public health laboratories nationwide.

Coaching is one part of APHL's broader commitment to leadership development. To explore additional programs and opportunities, visit the Leadership Development Programs webpage. ■

Accomplishments, Expansion, Jobs: The Career Pathways Evolution

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

APHL Fellows at the APHL 2026 Annual Conference.

Born from funding from the 2021 American Rescue Plan (ARP), the Career Pathways in Public Health Laboratory Science: An APHL-CDC Initiative aimed to increase the public health laboratory workforce and improve the training and workforce development of scientists working at laboratories. The program also expanded to grow partnerships with academic and private institutions that deal with public health laboratory science.

Career Pathways enters its fifth and final year of ARP funding with its largest number of active fellows (287) and mentors (279) in 83 host laboratories.

The Internship Program currently has 105 participants. Over 200 fellows and seven interns took part in this year's APHL Annual Conference.

Academic Partnerships has 1,242 participating academic institutions and has recruited 216 Public Health Laboratory Ambassadors.

The Leadership Development Program graduated 19 participants in May from the Emerging Leader Program (ELP) and there are 24 individuals currently in Laboratory Leaders of Today (LLOT).

But those are only numbers. There are accomplishments, challenges, highlights and hundreds of stories behind those numbers. Each program has grown since 2021 and continues to mature.

"The program touches so many people, not only the next generation of participants moving from a fellowship or an internship to a position at a public health laboratory, but also supporting everybody that's already there," said Josh Rowland, director of Experiential Learning. APHL Chief Learning Officer Christine Bean, PhD, MBA, MLS(ASCP), oversaw the development of the Career Pathways programs from the beginning. She cites the infusion of the ARP funds as a spark to workforce opportunities.

"The sky was the limit of what we could build, what we could create and what we could expand on, and that was exactly what we did," said Bean.

The expansion included the fellowship and leadership programs while internships and academic partnerships are two new programs to APHL.

Fellowships and Internships

(Read more in *Lab Culture News*)

"APHL has had fellowship programs for years, but never of this scale. What it needed was systems to be built here at APHL to manage application systems, matching systems, communication with laboratories and the recruiting of mentors," said Bean. Rowland credits the fellowship and internship staff for making all the moving parts work and meeting the expectations of the member and host laboratories.

"The laboratories saw the value of fellowships," said Bean. One of the real benefits to the fellowship program was that it's a one-year fellowship with the possibility to extend to a second year. And the laboratories see a lot of value in that. They've got someone for enough time to really train them and work a meaningful project."

APHL's internships were created as an introduction into public health laboratory science.

"I saw many of these students come into public health laboratories and say, 'I never knew this field existed,'" said Bean. She added that exposing students to the wide scope of opportunities available in the public health field has been invaluable.

"One of the things I was excited to see is students coming from a wide scope of degree programs to do internships, which is very valuable," she said.

Bean guided the internship program from an idea to a proven program. Examples of interns finishing their programs and becoming fellows or employees at their host laboratories are common. Rowland said it is gratifying to know that the participants will come out of their programs with a foundational knowledge about public health laboratories.

"Whether they are going to be a physician or going to work in public health, they have a great body of knowledge," he said. Rowland also appreciates the positive feedback about their mentor and host laboratory and what they've provided.

"When I first started, the program was building. Internships were building. And now they are mature programs," Rowland said.

continued on page 7

The Impact of the LRN-C Outreach Investment

By **Jocelyn Hover**, MPH, LRN CT coordinator, Texas Department of State Health Services Public Health Laboratory Division

Nerve agent exercise with 6th CST. Photo: Texas Department of State Health Services Public Health Laboratory Division.

Investment in outreach pays dividends. Financial resources injected into the Laboratory Response Network for Chemical Threats (LRN-C) do not merely maintain facilities. They fundamentally cultivate partnerships, strengthen regional emergency preparedness and drive overall operational readiness. Because public health threats do not happen in isolation, the primary return-on-investment metric is an LRN-C's level of emergency responsiveness—translating public health dollars into saved lives and averted economic catastrophes. Investing in targeted outreach yields a ready-to-act community framework long before a crisis occurs.

Partnerships

A critical return on LRN-C funding is the mitigation of systemic fragmentation across responding agencies. Effective chemical threat response cannot rely on a single entity. The LRN-C assets serve as a common core linking diverse public and hidden networks. These partners include:

- First responders, including civil support teams, hazmat teams, fire and police
- Federal entities, including the Federal Bureau of Investigation, BioWatch, the US Postal Inspection Service, Health and Human Services' Administration for Strategic Preparedness and Response, the US Department of Homeland Security and the Drug Enforcement Administration
- Clinical experts and countermeasures, including public health laboratories, toxicologists, epidemiologists, CHEMPAKs and poison control centers

A localized approach is needed because a "one size fits all" strategy fails to meet the needs of all jurisdictions. Chemical threat laboratories and municipal hazmat teams vary drastically in their equipment and regional needs. Programs are strengthened by partnerships from an expansive web of disciplines. Coordination reduces operational friction because relationships are built-in blue-sky days with training and exercises.

Outreach Efforts

The Texas LRN-C program, along with the Texas LRN-B programs, has an outreach model that has evolved over the last 12 years. In the early days, it was centered exclusively at the public health laboratory in Austin and offered one-way knowledge sharing encompassing lectures and demonstration of analytical testing. Today, the program is dynamic and far-reaching, expanding into the Texas Laboratory Response Network across the state. Across the major metropolitan centers, scientists are out of the laboratory conducting training and participating in exercises. Innovations over the years resulted in bidirectional learning, hands-on practicing and multi-jurisdictional cooperation. Continued outreach investments ensure relationships and relevance remain as position turnover impacts agencies.

Texas Laboratory Response Network. Photo: Texas Department of State Health Services Public Health Laboratory Division.

Metrics of Success by the Numbers

Data tracking the program from 2014 to the present highlights its massive systemic value and tangible output across the state. Value cannot be determined by sample numbers alone but by reach-backs and technical assistance requests of first responders throughout the major metropolitan centers. The Texas LRN-C program has participated in more than 100 training sessions and six multi-agency emergency exercises, involving more than 1,000 emergency responders and members of the Texas LRN Network. These outreach efforts have led to more than 150 official reach-backs and technical assistance requests, alongside the processing of both environmental and clinical samples as part of responses. This program has been made stronger by offering continuing education units for EMS and trauma systems when appropriate.

Real-world Impacts

The practical success of these outreach efforts can be highlighted by hazmat teams in Harris County reaching out for assistance with elemental mercury in a local residence involving children, or Dallas County in the wake of a server room fire where there were heavy metal exposures and first responder hospitalizations. With monetary investments in updated equipment and technologies into the Texas LRN-C program, response capabilities were increased. This is best highlighted

First responder training with Texas LRN-C in Austin. Photo: Texas Department of State Health Services Public Health Laboratory Division.

by a response involving an unknown substance later confirmed to be cocaine.

Through continuous planning, organizing, training, evaluating and innovating, LRN-C outreach in Texas, along with the LRN-B members of the Texas LRN Network, ensure that first responders never have to meet the laboratory for the first time during an active emergency, no matter where they are located in the Lone Star State. ■

Career Pathways Evolution

continued from page 5

Leadership Development Program

(Read more in *Lab Culture News*)

After the COVID-19 pandemic, laboratory leadership was an opportunity to address a lapse in available training. Bean said the US Centers for Disease Control and Prevention (CDC) previously had offered a New Laboratory Director Orientation, adding that she attended the orientation when she became a director in New Hampshire.

"I immediately thought we need more than that. We started the first cohort of [LLOT] in January of 2022," Bean said. That first cohort had 65 people, and the program continues annually, although with smaller groups of 30 people. They work on a project and create their agenda, with guidance from the Leadership Development Program staff.

The ELP has seen a lot of growth as well. The program now offers two models: the traditional hybrid model where participants join remotely and meet in-person during the year, and a completely virtual model.

"We will be able to host 50 people in ELP next year, which is double what we were previously able to do, which is amazing," Bean said.

"We're already seeing LLOT alumni being very active. They want to continue to be part of this, which is amazing and helpful because we have them help create agendas and work with the next cohorts," Bean said.

Another new feature to the program is their Quarterly Networking Event, which is a virtual networking opportunity for connecting peers in similar roles. The event features a skill-building session followed by discussions for attendees.

continued on page 8

Career Pathways Evolution

continued from page 7

Academic Partnerships

(Read more in *Lab Culture News*)

Another program that was new to APHL was Academic Partnerships. Charged with reaching out to academic institutions and other partners by attending career fairs and conferences, it aims to introduce and connect students to public health laboratory science and the related career opportunities.

"Academic Partnerships has led the way to a lot of our success getting potential candidates in place to become selected (into the program)," Rowland said. Part of the Academic Partnerships Team is the Public Health Ambassadors program, which was developed by ELP Cohort 16.

"They have over 200 ambassadors nationwide now," said Bean. " When the Academic Partnership Team goes out to career fairs, it's not unusual that ambassadors in that area will join them at the event because it's helpful for students to hear from somebody currently working at a public health laboratory."

The Challenge Ahead

Challenges can overshadow even the most impressive of accomplishments. And the Career Pathways programs are facing adversity now.

"We're in a position where we've showcased our ability to have these top-notch and successful programs that satisfy the needs in these public health laboratories," Bean said. She wants to continue that success, but also prepare the laboratories and mentors for changes.

"What we know today is that APHL's scientific programs will pay for the fellowships," said Rowland. "What that might mean for our program is we need to have more transparency as to what's going on with those fellows in terms of their quarterly reports and project status. Our money will be more year-to-year versus the seven-year period we have had. We are thinking about all options to continue the programs."

Both Rowland and Bean acknowledge that the future of the programs is all about funding. Rowland said that there will be an announcement about the future of the program around October 1.

"We might not have all the answers, but we will announce when the application opens and when the first onboarding will be," Rowland said. ■

Make a Milestone Gift

Invest in the Future of Public Health Laboratories

75 years APHL

Celebrate 75 years of public health impact by making a tax-deductible $75 anniversary gift to APHL today!

CALL FOR ARTICLES:

From The Bench

a regular feature of *Lab Matters*

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

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

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

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

Share your story with peers!

We can help!

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

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

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240.485.2750

Member Profile: Napa-Solano-Yolo-Marin Public Health Laboratory

By **Beatrix Kapusinszky**, PhD, laboratory director, Napa-Solano-Yolo-Marin Public Health Laboratory

Staff of the Napa-Solano-Yolo-Marin Public Health Laboratory in December 2025. Photo: B. Kapusinszky.

Year built: 2009

Location: City of Fairfield, County of Solano, California

Facility: The Solano County Public Health Laboratory was founded more than 50 years ago and was first located in a former canning factory on Tuolumne and Tennessee Streets in Vallejo. The laboratory moved to its current location in November 2009. The Napa-Solano-Yolo-Marin Public Health Laboratory (NSYM PHL) is a specialized, regional public health facility serving healthcare professionals, law enforcement and residents across four California counties. Managed through Solano County Health and Social Services, it performs crucial functions in outbreak monitoring, infectious disease control and environmental testing.

Number of staff: 14

Distinguishing characteristics: NSYM PHL primarily performs diagnostic, reference and environmental testing focused on infectious diseases to four counties in California with a total population of over 1 million people. It offers a variety of testing:

- Clinical and infectious disease testing, encompassing bacteriology, mycobacteriology, virology and molecular PCR, immunology and serology, mycology and parasitology
- Vector-borne diseases and wildlife safety, including tick identification and testing, rabies testing
- Environmental health testing, including bacteriological water testing and chemical water testing
- It is a sentinel laboratory for select biothreat (BT) agents.

Highest volume testing: Mycobacteriology, using acid-fast bacilli (AFB) smears and cultures, QuantiFERON Gold-Plus (TB testing) and MTB/Rif GeneXpert molecular testing.

Notable success story: The laboratory won the prestigious Healthiest Laboratory Award from APHL in 2026, specifically recognizing its excellence in environmental sustainability and workforce safety, such as:

- Workplace wellness programs, ergonomic workstations, supportive break policies and staff-led team walk activities
- Regular training, ongoing education and standard operating procedures for safe laboratory practices, including the proper handling, segregation and disposal of chemical and biological materials
- Required use of personal protective equipment to reduce risk and exposure
- Dedicated personnel responsible for biosafety, hazardous materials and quality assurance
- Routine health screening and vaccinations for laboratory personnel
- Opportunities for professional development, like the public health microbiologist training program

Biggest challenge: Workforce training and staff retention with rising cost of living. ■

MALDI Bio

13
CAUTION
SAFETY GLASSES
REQUIRED

75 Years of Innovation

In 2000, APHL developed a white paper entitled Core Functions and Capabilities of State Public Health Laboratories. In the years since its publication, the Core Functions document has been revised to describe the core functions of all public health laboratories irrespective of their identity as state, regional, county, city or local. Public health laboratories, and the systems in which they operate, face continuing challenges and uncertainties. Yet the 10 essential public health services and the 11 core functions of public health laboratories remain unchanged. APHL continues to support the work of public health laboratories in eight key areas:

ENVIRONMENTAL HEALTH

Environmental health laboratories are often the first to identify hazardous contaminants in people and the environment. APHL works to strengthen their ability to detect and respond to environmental threats and inform public health practice and policy. APHL supports environmental health laboratories through technical assistance, training, guidance and integration with public health partners.

FOOD SAFETY

APHL advances food safety by increasing the competence of scientists, improving the capabilities of member laboratories and strengthening the credibility of results generated by food testing laboratories for public health action. We promote the role of state and local public health laboratories and agricultural laboratories in the detection and characterization of foodborne hazards and work with member laboratories to ensure robust surveillance and outbreak detection and prevention activities. APHL also increases the competence of laboratory staff, improving the capabilities of member laboratories and strengthening the defensibility of results.

GLOBAL HEALTH

At the start of the 21st century, APHL's Global Health Program had one staff member. Now in 2026, the program has a robust domestic and international presence across the globe that facilitates activities such as public health laboratory twinning partnerships, leadership and technical training, quality standards/systems training and program implementation, among others. These activities result in a strengthening of public health laboratory surveillance systems in numerous countries and the development of several guides and materials to be used by other countries in the future.

INFECTIOUS DISEASES

Since their creation in the late 1800s, public health laboratories have always been prepared and equipped to protect communities from known and emerging diseases. From diagnosis and reporting of venereal disease testing during World War II to testing for the HIV virus and other emerging pathogens, APHL ensures that member laboratories remain on the cutting edge of technology and testing innovations. As laboratories adapt new technologies such as metagenomics and bioinformatics, APHL regularly uses its convening power and its elevated voice to advocate and facilitate policies and procedures.

INFORMATICS

In 2008, APHL launched the APHL Informatics Messaging Services (AIMS) Platform in partnership with CDC to monitor and respond rapidly to health threats, strengthen laboratories with shared resources and expedite delivery of time-sensitive health information to consumers. Originally developed as a mechanism for states to report influenza data, AIMS has since expanded to serve as the nation's public health data exchange platform. AIMS provides the critical infrastructure for public health laboratories, federal partners, healthcare organizations, private sector laboratories and other public health entities to safely and quickly share disease and other health data so outbreaks can be identified and contained as they are happening.

NEWBORN SCREENING AND GENETICS

For over six decades, public health laboratories have sustained a life-saving program while managing rapid growth in test menus, follow-up expectations, data needs and access considerations. APHL's convening power has supported shared practice, rapid dissemination of lessons learned, and alignment across laboratories, clinicians and federal partners as newborn screening (NBS) evolved. It is leading the discussions about transitioning to whole genome sequencing and expansion of NBS services and staff, improving the capabilities of member laboratories and strengthening the defensibility of results.

PUBLIC HEALTH PREPAREDNESS AND RESPONSE

In 1999, APHL turned its focus to bioterrorism and preparing for threats. With the establishment of the Laboratory Response Network in partnership with CDC and the FBI, and after the white powder incidents of 2001, public health laboratories found their preparedness efforts entering a new phase. APHL strengthens public health laboratories' ability to respond to such threats by supporting partnerships and outreach activities, developing trainings and tools, and providing crisis management assistance. APHL also assists in coordinating laboratory responses during public health emergencies.

QUALITY SYSTEMS AND ANALYTICS

Public health laboratories use data and quality practices to inform decisions, guide continuous improvement activities to strengthen laboratory services and systems, and foster partnerships, collaborations and knowledge sharing. APHL supports the work of public health laboratories by collecting and translating data into actionable information for our members and partners. We produce survey reports, guidance documents, toolkits, dashboards and more, which public health laboratories can use to inform decisions, guide continuous improvement activities to strengthen laboratory services and systems, and enhance efficiency to advance public health.

Building a Resilient Newborn Screening System

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

Testing every newborn for heritable diseases in the United States is one of the most lauded—and most unseen—success stories of public health laboratories. But with the lack of federal oversight as well as the aging of the newborn screening (NBS) program workforce, NBS programs need to continue to build resilience into their laboratories.

With staffing cuts and funding limitations at the Health Resources and Services Administration (HRSA), there is a gap in recognizing holes in newborn screening. Those gaps and holes mean diagnoses are going to be missed.

Joe Orsini, PhD, deputy director of the Newborn Screening Program at the New York State Department of Health—Wadsworth Center, said that while newborn screening aims to eliminate false negatives, genetic testing introduces the possibility of false negatives.

> *"Without [HRSA] sending out grants, grant requests, looking for people that may have ideas for developing biochemical screens or developing second-tier biochemical screens, we are missing where holes are forming in newborn screening."*
>
> — **Joe Orsini**, PhD

"How we do that is still up in the air and maybe open for discussion," Orsini said. "Without that group [HRSA] sending out grants, grant requests, looking for people that may have ideas for developing biochemical screens or developing second-tier biochemical screens, we are missing where holes are forming in newborn screening," Orsini said.

The biggest hole is that there is no longer the Advisory Committee on Heritable Disorders in Newborns and Children that reviews requests to add new disorders to the Recommended Uniform Screening Panel. This means that screening tests that are available for new diseases cannot be added, so newborns with these diseases will be missed.

Technology continues to advance as does the cost, whereas laboratories' budgets may not keep up with those costs. Genetic screening costs are still prohibitive and currently do not meet all the objectives of biochemical testing.

"I can see there being a good overlap with the two. I think the newborn screening programs are keeping their ear close to the ground and trying to embrace genetic screening as a way of improving the screening, especially in cases where there aren't biochemical tests," Orsini said.

Laboratories must balance the demand for additional screenings with the cost of new technology. They also must measure how the new technology impacts existing testing.

"I think a lot of us have thought at least for the next five or so years biochemical screening isn't going to go away, just because of the nature of the speed and cost associated with doing genetic testing," Orsini said.

Susan Tanksley, PhD, deputy laboratory director, Texas Department of State Health Services, thinks that improving existing processes is one way to continue to build resiliency in the NBS program.

"We want to have the best possible assays. If there's a better technology, can that be incorporated into the program?" Tanksley said. "Looking at the cost of things, is there a less expensive way to do something and not cut into that quality?"

Orsini said picking up 80%–90% of individuals with disease through a genetic screening like the BRIDGES study is great if that is the only way to do it. He believes there ought to be mechanisms put in place to push researchers to develop more screening approaches.

"In Texas, we're typically not one of the first programs to implement something. We really lean on the learnings of other programs who are early adopters and making those connections," Tanksley said.

Greg Bonn, newborn screening operations manager at the Colorado Department of Public Health and Environment, said with COVID-19, their laboratory spun up several platforms and tests, and leadership wanted to keep the knowledge in-house. Then there is the reality that as newborn screening gets more complex, the number of specimens goes down while the cost of each specimen rises.

"What do we do to make that second-tier testing that's normally required for new disorders to limit false positives, false negatives on the front end? Is that looking at a regional model or something in-house?" Bonn said.

Colorado runs a lean laboratory, according to Bonn, meaning funds are limited as are samples and they

> *"What do we do to make that second-tier testing that's normally required for new disorders to limit false positives, false negatives on the front end? Is that looking at a regional model or something in-house?*
>
> — **Greg Bonn**

currently reach out to other newborn screening programs for assistance.

"It is looking around, seeing what else is happening in your building. If you're part of a health department or if you're part of a larger university it becomes what can you work and leverage together," Bonn said.

Tanksley adds that it is fortunate that newborn screening is such a sharing, collaborative community because the laboratories can make those connections and ask questions.

The Wadsworth Center is one of those laboratories that helps with providing screening oversight and expertise to laboratories who request assistance, Orsini said.

Bonn emphasized that another challenge is the assumption that because the birth rate has gone down and leveled off, newborn screening is doing less work than it has in the past.

"There's a lot more that we test for and report out and share. We may have lost 3,000 kids a year, but we've added 70,000 tests when we add a new condition," Bonn said.

Bonn, Tanksley and Orsini agree that second-tier testing may be an important part of newborn screening's future.

"If there are good genetic approaches that have poor first-tier screening approaches, more difficult or slower second-tier biochemical testing could be done. I think that's something that needs to be looked at," Orsini said.

The push for higher tier testing requires staffing and expertise that not all laboratory programs have.

Recruiting and Retention

Technology is only as effective as the laboratory staff administering the testing. Current newborn screening staff are aging, meaning recruitment and retention are also a key to ensuring resiliency within NBS programs.

Technology is only as effective as the laboratory staff administering the testing. Current newborn screening staff are aging, meaning recruitment and retention are also a key to ensuring resiliency within NBS programs.

"You can do more with people that are already knowledgeable rather than having to retrain people constantly. You want them to advance so that the program can continue to grow and advance," Tanksley said. "It can be considered an investment and not just a cost."

Retention is the biggest challenge at the Colorado laboratory. Bonn says the Colorado laboratory is an entry-level job on the laboratory technologist side. He added that it is expensive to live in the Denver area but he believes that their pay makes up for the higher cost of living.

"We've developed a pay plan to try to keep those techs as long as we can, but it's the idea that a lot of times we're hiring a biology or chemistry degree fairly recently out of college, if not right out of college, and training them. And once they get three to five years' experience, they leave," Bonn said.

Bonn added that openness and honesty about pay and promotions are part of Colorado's plan. In their first year, a technologist learns to operate every platform in the laboratory. After two to three years, they can begin to specialize.

"We still need weekend coverage, so people need certain competencies. But then they can specialize and learn more. We've outlined a pathway so they know what their salary is within the first year, two years and then five years," Bonn said.

The situation in Colorado shows that knowledge and experience come at a price.

"I think that all states are facing how do we pay people so that we are competitive with the private sector, because having job security isn't something that younger people are as concerned with. They need to pay their bills; they want to buy a house," Orsini said.

Tanksley cited the COVID-19 pandemic as a period where she felt that her laboratory was a training ground for anybody who wanted to perform a polymerase chain reaction (PCR) test for the virus.

"We lost a lot of people because the money was much better in the private sector. As those companies shut down, we've benefited from some of the staff who left those companies who needed a stable job," Tanksley said.

Over the past few years, the Texas laboratory has built up their compensation package due to high turnover. Colorado gives their staff a pathway that shows what happens to their salary and position opportunities if they stay.

"It's costly to lose a position because some of these (positions) may require a year or two of training before they're fully competent. If you lose somebody after two years, you've lost all that training as well," Tanksley added.

The flip side is what Orsini described as job inflation.

"You have to hire people at a higher grade level, just to get them in the door. And they're kind of minimally meeting those job requirements," Orsini said. "I feel like we've been somewhat

The [Texas Department of State Health Services] laboratory has also let high school and college students come to tour the facility. The hope is that early exposure to the laboratory, the testing they do and the careers that are available might entice students to consider public health laboratory science as a career option.

fortunate that the Wadsworth Center is just an exceptional place and New York State's salaries are fairly competitive."

Orsini believes in giving people "promotion ammunition."

"We try to give people who have the talent, the interest and the drive a position where they're going to be able to do the kind of work that will get them a promotion down the road," Orsini said.

Orsini added that while they have been able to fill empty positions, it has been a challenge to add new positions.

Opportunities for growth and professional development are also tools Tanksley hopes to use to attract and retain staff. Texas will be implementing a mentoring program for staff and new managers along with a "buddy system" for new employees.

"We're hoping those things will help because it'll give exposure to people they're normally not in contact with, and someone to really encourage professional growth and development," Tanksley said.

The Wadsworth Center also believes mentoring can help with retention.

"There's also a professional growth group that was put together in the past two or three years where we're doing actual mentorship with new supervisors, trying to give them direction as to what they can improve on with communications or whatever knowledge they may need," Orsini said.

Remote work is one area that can be both innovative and a recruiting and retention tool.

"We've also allowed for more remote working possibilities. I think the lab has taken advantage of being able to remotely monitor data and do data work from home. We've tried to accommodate people allowing them to do that where it makes sense," Orsini said.

Outreach and the Future

Tanksley admits she did not know about public health until she started working at a public health laboratory. She believes early exposure is key to bringing up the next generation of newborn screeners.

"We offer tours. Some are educational for genetic counselors. Some are for future nurses or doctors where we teach them about the things we do in the laboratory, and newborn screening is part of that," Tanksley said.

The laboratory has also let high school and college students come to tour the facility. The hope is that early exposure to the laboratory, the testing they do and the careers that are available might entice students to consider public health laboratory science as a career option.

Orsini said that Wadsworth does presentations to communities explaining that newborn screening is

much more than just a newborn's heel prick. He added the outreach extends to colleges as well.

"We're trying to reach out to biology, chemistry majors—people with the appropriate background—to fill the need in settings where they'll be able to explore what their career options are," Orsini said.

Innovation

The Texas laboratory is working on a way to improve efficiencies in testing. Tanksley explained that the laboratory has assays for lysosomal diseases and Krabbe disease. Currently, they require an 18-hour incubation period because of the Krabbe assay. The US Centers for Disease Control and Prevention has developed a method that requires only a three-hour incubation.

"We are now adding metachromatic leukodystrophy (MLD) to the same assay. It may or may not work, but we are also looking at adding two other tests that are done by different methods onto that assay," Tanksley said.

Multiplexing these assays could be an improvement to the process that would reduce costs and reduce the amount of staff time needed to conduct the tests. Orsini said that his laboratory reduced the number of testing methods to do more multiplex testing.

Orsini believes the laboratories themselves are what will keep newborn screening resilient.

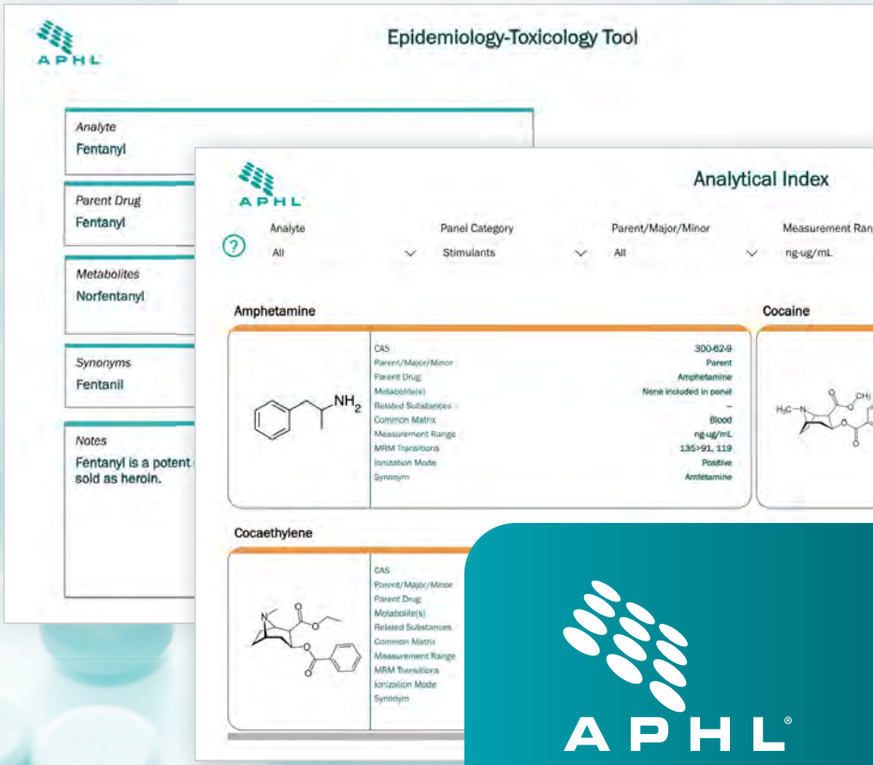
"Futureproofing still comes back to us. I think programs are trying to be involved and see where we can use the new technology to enhance and not necessarily replace what we are already doing," Orsini said. ■

NEW RESOURCE

Simplify Method Development and Results Interpretation:

Overdose Biosurveillance Dashboard

A new resource from APHL, the **Overdose Biosurveillance Dashboard,** was developed to assist non-fatal overdose biosurveillance programs testing for substances included in the *Expanded Strategy* Recommended Panel. This interactive resource assists with epidemiological interpretation of laboratory toxicology results and provides key analytical information for laboratory method development.



Learn more and explore the dashboard:

www.aphl.org/OD-Biosurveillance

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Saving Days, Saving Lives: How Detor Is Modernizing Nationwide Newborn Screening Data Exchange

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

Detor gives time back to those that conduct the tests, those that need the results to provide care and patients who can use that time to heal.

Each year, 99.9% of the 3.6 million babies born in the Unites States receive a newborn screening test conducted by a public health laboratory. Approximately 12,500 of those babies receive a positive result that can lead to a potentially serious or fatal condition if not detected and treated early. For many of the conditions screened, the time between birth and the onset of irreversible damage is only a few days. And thus, the speed of information matters: When test results are available faster, a simple intervention can shift a baby's trajectory from chronic disability or early death to one of normal growth and development.

Immediate intervention requires access to immediate information, and despite living in an increasingly digital world, many public health laboratories still rely on cumbersome manual data entry and slower paper-based solutions for sending and receiving test orders and results due to constraints in funding, resources and time. To solve this longstanding challenge and to ensure that critical information is shared in time to provide critical care, APHL—in partnership with the US Centers for Disease Control and Prevention (CDC)—developed Detor.

What Is Detor?

Detor bridges the gap between public health and clinical care, ensuring that life-saving data moves at the speed of modern medicine. Detor is a national public health intermediary that sits between a public health laboratory's laboratory information management system (LIMS) and a healthcare organization's (HCO's) electronic health records (EHRs). Instead of connecting to one another directly, each organization builds a single interface to Detor, which eliminates the need for multiple custom interfaces and replaces slower, error-prone manual processes. Detor allows public health laboratories and healthcare facilities to plug into existing infrastructure and take advantage of shared resources, expertise and technology across the public health landscape. In other words, APHL builds and shares messaging routes centrally for its members as opposed to every public health laboratory and HCO having to build and maintain them independently and repeatedly.

The speed of information matters: when test results are available faster, a simple intervention can shift a baby's trajectory from chronic disability or early death to one of normal growth and development.

Nationwide Impact

Since going live in August 2024, Detor has demonstrated great success nationwide. The eight public health laboratories and 73 HCOs that are currently live on Detor have exchanged more than 200,000 orders and results—with 94% of those being for newborn screening—and have seen significant improvements in data exchange efficiency, result turnaround time and data quality.

Result Turnaround Time

Result Availability Improvement: 42%, or an average of 4.5 days faster.

With Detor, results are triggered to be sent electronically to the patient's chart as soon as available, meaning the process no longer relies on manual intervention (e.g., uploading PDFs, intercepting/copying a fax). By eliminating those human steps of the workflow, Detor has allowed for results to be received by the provider and the patient's family an average of 4.5 days faster.

In some cases, the impact is even more pronounced. Detor replaced a lengthy and highly manual newborn screening process between Alaska's Fairbanks Memorial Hospital and the State Hygienic Laboratory at the University of Iowa. Detor now automates the flow of data and delivers critical results six days faster, ensuring that vulnerable newborns in even the most remote areas of Alaska can receive life-saving interventions as quickly as possible.

Time Savings

Data Entry Time Saved at Public Health Laboratory: 80%, or an average of 11+ minutes saved per test.

Data Entry Time Saved at HCO: 90%, or an average of 10+ minutes saved per test.

Without Detor, healthcare staff request tests by manually entering information from the patient's chart into a different portal or by handwriting that same duplicative information on the bloodspot card. In turn, the public health laboratory needs to manually transfer the received information into their own LIMS and follow up on orders with typos, missing fields or ineligible writing. With Detor, both healthcare and public health laboratory staff are saved time by eliminating the need for duplicative data entry—the order is pre-populated with information from the patient's EHR and then made directly available in the public health laboratory's LIMS. This has led to significant time savings for public health laboratories and HCOs, allowing them to focus their time on what truly matters: conducting testing and providing care.

And the higher the volume, the greater the impact; for instance, in Florida, where 10% of the state's 2025 babies had their newborn screening orders and results exchanged via Detor, Orlando Health saved more than 1,180 hours (or the full time equivalent of nine weeks per year) by eliminating their manual resulting process.

Detor has enabled HCOs and public health laboratories to exchange test orders and results faster and more efficiently than ever before. As a national solution, Detor is able to centralize, share technical solutions and reduce the burden on public health laboratories and their partners who would otherwise have to implement multiple redundant interfaces. Most importantly, Detor gives time back to those that conduct the tests, those that need the results to provide care and patients who can use that time to heal.

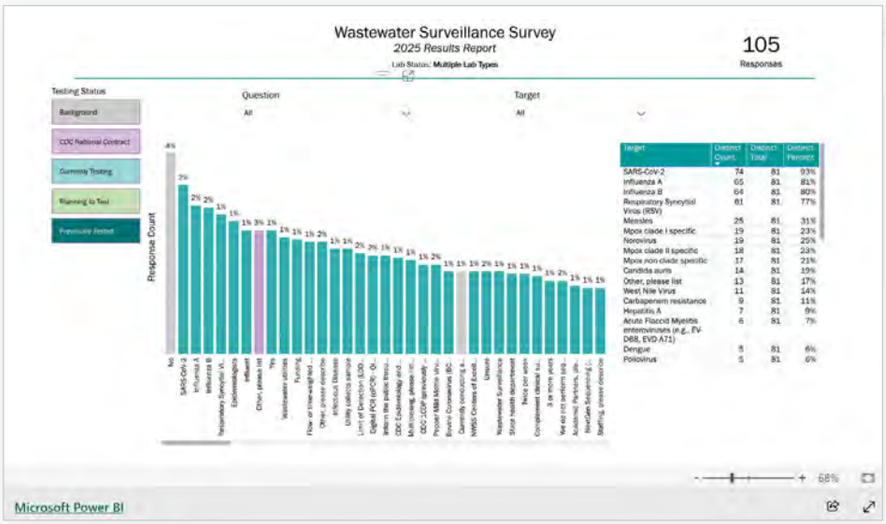
To learn more about Detor visit the Detor Resource Center. If your laboratory is interested in implementing, e-mail detor@aphl.org to schedule a discovery call. ■

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

APHL

From Elimination to Uncertainty: Enhancing Measles Detection Through Wastewater Surveillance

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

Wastewater is collected from a Texas treatment plant to test for measles. Photo: Texas Department of State and Health Services.

Laboratory scientist from Hawaii testing wastewater samples for measles. Photo: Hawai'i State Department of Health.

Due to the success of the measles, mumps and rubella (MMR) vaccine and strong public health infrastructure, measles was declared eliminated in the United States in 2000. However, more than two decades later with sustained outbreaks and nearly a year of continuous transmission, the US faces the possibility of losing its elimination status. More frequent outbreaks and increased case counts could be expected, potentially placing additional strain on public health systems. Wastewater surveillance offers a cost-effective, scalable and efficient way to strengthen disease monitoring. By providing an additional layer of data that complements clinical reporting, it can help identify emerging clusters earlier, track ongoing outbreaks and inform resource allocation.

Early Detection Is Key...

One of the key advantages of wastewater surveillance is its ability to detect viral activity even when clinical testing is delayed, limited or incomplete—an important consideration for the previously eradicated measles. Wastewater can fill this gap by providing early, community-level signals of transmission. For a highly infectious disease like measles, even a few days' advance notice can significantly reduce infections, as early detection enables public health agencies to issue alerts, increase public awareness of symptoms and prevention strategies and notify healthcare providers to prioritize testing and treatment prior to further spread of disease.

Public health laboratories leveraged existing technologies established during the COVID-19 pandemic to test composite influent samples for measles by concentrating the virus using nanoparticles and performing molecular detection using quantitative or digital polymerase chain reaction (PCR) testing. Any positive detections are confirmed using next generation sequencing to identify specific viral strains. Once confirmed, results are shared with local and state health authorities, allowing for timely communication, targeted interventions and healthcare system preparedness.

When this technology was applied to the 2025 measles outbreak in Texas, wastewater surveillance provided a one- to three-week lead over clinical case confirmation, influenced by viral shedding levels, sampling frequency and access to healthcare. In the same year in Hawaii, measles was detected in wastewater before any clinical cases were reported, which prompted immediate coordination among epidemiologists, immunization programs and communications teams. Actions included alerting healthcare providers, conducting syndromic surveillance to identify potential cases, issuing public health advisories and reinforcing vaccination recommendations.

...and Provides Much-needed Data

Retrospective analysis of wastewater surveillance samples can identify when measles spread first began, prior to clinical detections. In 2025, Oregon analyzed wastewater samples from a 2024 measles outbreak and found evidence indicating community spread of measles

continued on page 31

Poison Centers and Public Health Laboratories Partner to Protect

By **Kelsey Granger**, MHS, senior specialist, Environmental Health

Evolving drug use patterns and the consistent emergence of new substances present complex challenges for clinicians, poison centers and public health. Dr. Travis Olives, medical director of the Minnesota Regional Poison Center (MRPC) and emergency medicine physician at Hennepin County Medical Center (HCMC), has witnessed this evolution firsthand.

Serving Minnesota, North Dakota and South Dakota, MRPC manages approximately 50,000–60,000 calls annually across a large region with densely populated urban centers and highly rural communities. Often associated with unintentional childhood exposures, poison centers also receive many calls from adult individuals following intentional or unintentional substance exposure. Poison centers provide expert guidance on clinical management of acutely ill patients, including individuals experiencing severe toxic exposures, intentional self-harm or overdose, or substance use-related medical complications.

Looking for the Obvious...

Poison centers continuously monitor poisoning associated with new and emerging substances, including many that are commercially available. Kratom alkaloids like 7-hydroxymitragynine have increased in both potency and availability in smoke shops. Simultaneously, poison centers observed a dramatic increase in reports of kratom exposure from 258 in 2015 to 3,434 in 2025. Mushroom-infused chocolates, syrups and other products sold in smoke shops or through online retailers present concerns due to their uncertain ingredient composition, variable dosing and resulting toxicity that can be difficult to diagnose. Adult and pediatric consumption of both regulated and unregulated cannabis edibles and drinks are another frequent contributor to poison center calls and consultation requests. Children experience severe effects of THC intoxication at much lower doses than adults, presenting elevated concern to poison centers.

Opioids like fentanyl continue to rightfully receive substantial attention due to their enduring role in overdose morbidity and mortality. However, Olives also identified methamphetamine as a substance of primary concern due to its major contribution to morbidity and healthcare utilization. Methamphetamine is one of many substances associated with the national shift from a focus on opioids towards polysubstance use, which challenges traditional diagnosis and treatment guidelines due to the complex clinical presentations produced by varying substance combinations. Polysubstance use is further influenced by drug adulterants, like xylazine and medetomidine within the illicit opioid supply, which can produce clinical effects that substantially differ from those of more familiar drugs and often require different treatment approaches.

...Through a New Lens

Partnerships between poison centers, clinicians and public health laboratories have a particularly significant impact in responding to overdoses. The Minnesota Drug Overdose and Substance Use Surveillance Activity (MNDOSA) provides actionable toxicological information about non-fatal overdoses, identifying that three or more substances were detected in nearly 40% of all biosurveillance specimens collected from submitting hospitals in Minnesota in Q2 of 2024, confirming the growing shift towards polysubstance use.

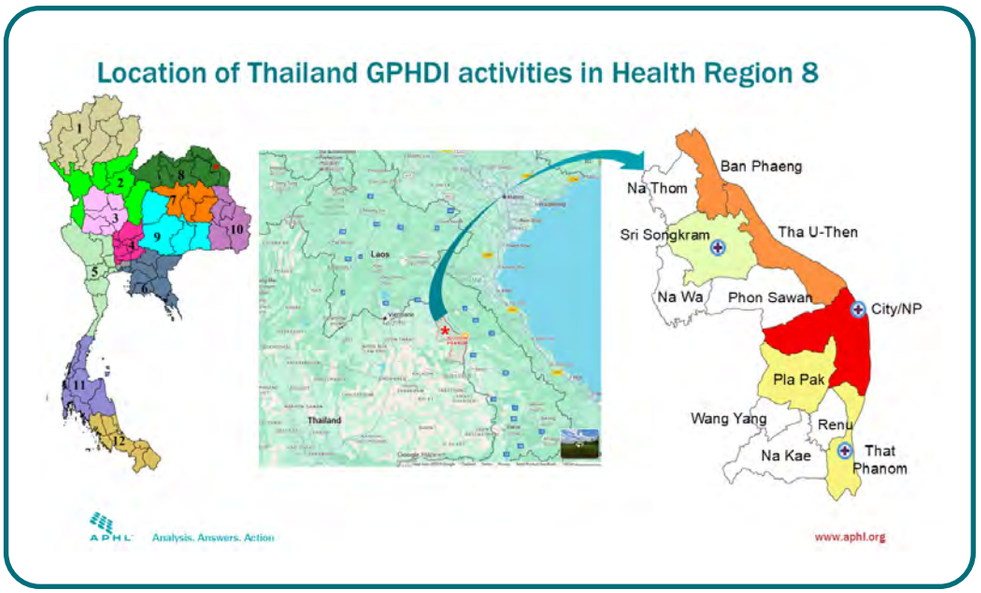
Data from MNDOSA has also assisted with informing treatment decisions and improving patient care. After MNDOSA identified the presence of medetomidine within patient populations across Minnesota, including HCMC, HCMC was able to tailor treatment for patients suffering from severe withdrawal associated with medetomidine use by utilizing dexmedetomidine. This partnership also provides the public health laboratory with a rich resource. Because clinicians and poison center personnel have direct patient contact, their knowledge of the patient population can provide perspective on underlying contexts of substance use and overdose, like socioeconomic status, personal support systems, resource availability, housing stability and other individual factors.

Collaboration between poison centers and public health laboratories also plays a critical role in responding to rare but potentially high-consequence exposures. A longstanding partnership with Minnesota's Laboratory Response Network for Chemical Threats program facilitates rapid sample collection, testing and consultation when unusual chemical exposures like thallium or ricin poisoning are suspected, significantly improving clinical decision-making and patient outcomes.

As the toxicological landscape continues to change, the integration of poison center expertise, clinical practice and public health laboratory surveillance is increasingly important. For Olives, these partnerships are successful because they simply make sense: "All of that's come together organically because we have been working over many years across silos, just because it's the right thing to do." ■

Strengthening Sepsis Surveillance Through Digital Health Innovation in Thailand

By **Reshma Kakkar**, senior manager, Global Health; **Barameht Piralam**, project manager, Nakhon Phanom Public Health Office; **Apisit Khamgonluechar**, IT technician, Nakhon Phanom Public Health Office; **Thuwan Simmali**, project administrator, Nakhon Phanom Public Health Office; and **Dr. Supphachoke Khemla**, infectious disease physician, Nakhon Phanom Provincial Hospital



APHL, in collaboration with the US Centers for Disease Control and Prevention (CDC), supported Thailand through the Global Public Health Data Innovation (GPHDI) initiative to strengthen digital health systems that improve laboratory and clinical data availability for public health decision-making. GPHDI advances global data modernization by automating data exchange, strengthening interoperability, building digital health capacity and improving governance for timely detection and response.

APHL partnered with Nakhon Phanom Hospital and Nakhon Phanom Public Health Office in Northeastern Thailand to implement an interoperable digital platform to improve sepsis detection, monitoring and clinical management. As a leading cause of hospital mortality, sepsis has been a national priority for the Thai Ministry of Public Health since 2018 as early recognition and treatment are essential to reducing deaths.

Despite investments in hospital information systems, sepsis management was hindered by inconsistent clinical definitions, variable reporting, incomplete documentation and continued reliance on paper-based workflows. These challenges affected data quality, delayed clinical decision making and reduced effective surveillance and evaluation of interventions.

To address these challenges, APHL implemented a digital transformation strategy based on four interconnected pillars: **People, Processes, Technology and Data**.

People. Success depended on strong leadership and multidisciplinary collaboration. Hospital leadership prioritized reducing sepsis mortality, while emergency department clinicians and nurses, infectious disease specialists, laboratory and information technology staff and dedicated project personnel served as champions for implementation, workflow redesign and ongoing system support.

Processes. Clinical workflows were redesigned to improve coordination across the patient journey, including emergency department triage, laboratory testing and pharmacy services. Standardized electronic workflows reduced variability and supported faster recognition and treatment of suspected sepsis cases.

Technology. Rather than introducing a new hospital information system, APHL enhanced existing digital infrastructure by configuring a digital Nursing Assessment Form and an integrated Sepsis Alert Platform within the hospital information system. The platform communicates with laboratory and pharmacy systems, enabling electronic test ordering, rapid laboratory reporting and timely medication dispensing. Additional clinical decision support features, including drug allergy and antimicrobial resistance alerts, were incorporated to improve patient safety.

Recognizing the importance of continuity of care, APHL also developed the NKP Sepsis Sync Program, enabling secure electronic exchange of patient information between 11 community hospitals and Nakhon Phanom Provincial Hospital, improving situational awareness across facilities and supporting coordinated clinical management of severe infections.

Data. Routine analysis of clinical and operational data informed continuous quality improvement, identifying workforce training needs, optimizing emergency department workflows and guiding enhancements to the digital

Project status review with Dr. Barameht Piralam, project manager, Nakhon Phanom Provincial Health Office; Dr. Supphachoke Khemla, infectious disease physician, Nakhon Phanom Provincial Hospital; and Reshma Kakkar, senior manager, Global Health. Photo: Mr. Apisit Khomgonluechar.

From left to right: Dr. Siriluk Jaichuang, deputy of provincial chief medical officer; Dr. Kittichet Teerakulphongvej, deputy of provincial chief medical officer; Dr. Preeda Worahan, provincial chief medical officer; Sherrie Staley, senior director, Global Health; and Reshma Kakkar, senior manager, Global Health. Photo: Mr. Apisit Khomgonluechar.

platforms, creating an iterative cycle of system improvement.

Through this strategy, APHL implemented a robust, interconnected digital health platform that improves the availability of standardized, high-quality clinical data for surveillance and patient care. Replacing fragmented, paper-based documentation with centralized electronic data capture supports earlier identification of patients at risk of sepsis. As Dr. Preeda Worahan provincial chief medical officer, noted, "It has been a positive experience to implement this platform as it is a transition from paper to digital and supports the Thai government's policy to move to a paperless system."

Although the platform is designed to improve patient outcomes and reduce mortality, continued adoption, workforce training and change management remain essential to maximize system use and generate sufficient data to measure clinical impact. The platform has been recognized during health region inspection visits, with discussions underway to position Nakhon Phanom Hospital as a model for expanding these innovations and best practices to additional provincial hospitals.

What began as a hospital-level intervention is emerging as a regional model for data-driven, paperless health systems, demonstrating that improvement in sepsis surveillance can be achieved through smarter use of existing digital infrastructure. In an era of increasingly strained global health resources, such locally driven, sustainably embedded innovations may offer the clearest path forward. ■

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Celebrating 20 Years of the Public Health Laboratory Interoperability Project

By **Samuel Abrams**, MPH, PMP, manager, Informatics

This year marks the 20th anniversary of the Public Health Laboratory Interoperability Project (PHLIP). PHLIP launched in 2006 to improve information sharing between public health laboratories and the US Centers for Disease Control and Prevention (CDC). PHLIP's mission was to establish a mechanism to communicate near real-time, specimen-level public health information utilizing standardized methods that were laboratory information management system (LIMS)-agnostic, ensuring a solution that all public health laboratories could utilize through their existing technology. With laboratory, epidemiology and technology experts working collaboratively to develop and pilot these standards, PHLIP has persisted as a reliable reporting mechanism that continues to evolve in supporting public health.

The Origins of PHLIP

PHLIP was created from the need to modernize how laboratory data flows from public health laboratories to CDC. Most laboratory data was sent by manual, non-standardized reporting methods. APHL, CDC and laboratory and IT subject matter experts from six public health laboratories created PHLIP message and vocabulary standards in an effort to demonstrate interoperability and effective electronic data exchange for public health laboratory surveillance. Using influenza data as its first-use case, two public health laboratories piloted the HL7 message with constrained vocabulary via a route-not-read hub that would later become the APHL Informatics Messaging Services (AIMS) Platform. This hub ensured data could be securely sent in a manner that reduced the technical burden on both sender and recipient.

APHL established two technical assistance (TA) teams in 2010 to help public health laboratories onboard to PHLIP. These teams provided project management, terminology, business analysis and technical architecture support. This ensured technical capability and workforce limitations would not hinder a public health laboratory's ability to participate in PHLIP. This approach resulted in over 30 public health laboratories successfully sending HL7 data through PHLIP within the first four years of creation. Adoption of the platform resulted in an increase in interoperability for public health laboratories across the country, ensuring CDC received high-quality data through faster methods to help inform national influenza surveillance efforts.

Meeting Current Needs

Since establishing itself as a reliable data sharing method between public health laboratories and CDC, the PHLIP infrastructure has expanded its utility beyond influenza. In the past few years, an increasing number of public health laboratories have worked with APHL TA teams to send data for the National Respiratory and Enteric Virus Surveillance System (NREVSS), which include respiratory syncytial virus and adenovirus, among others. The breadth of the PHLIP message has grown to include specimen information, additional assay results, patient demographics and epidemiological data.

APHL continues to ensure PHLIP keeps pace with changing standards and that laboratory feeds utilize modern HL7 standards. Recent efforts by PHLIP TA have transitioned public health laboratories to HL7 v2.5.1, which can send

continued on page 31

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The Backbone You Don't See: How AIMS Powers Public Health Every Day

By **Sean Hannigan**, specialist, Informatics

Timely laboratory results can be the difference between life and death. Behind nearly every disease report, newborn screening result and outbreak investigation runs a piece of infrastructure most people never see. It's called the APHL Informatics Messaging Services (AIMS) Platform.

So, what is it, and why should it matter to the person at the bench or the person running a laboratory?

One Connection, Any Direction, Any Data

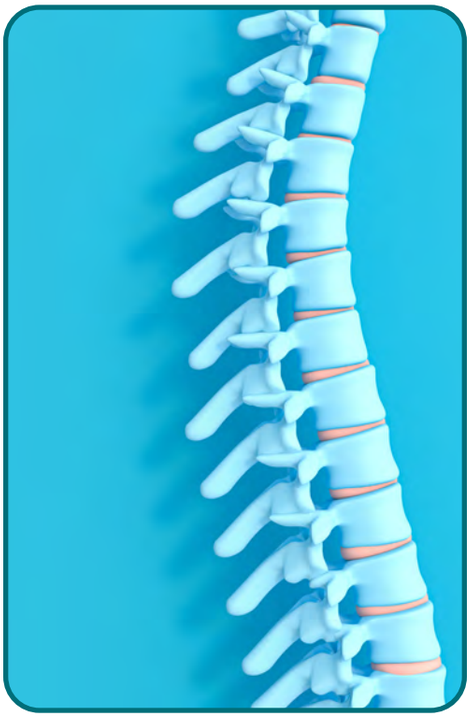
AIMS is a secure, cloud-based platform that acts as a hub for exchanging vital public health data. APHL launched it with the US Centers for Disease Control and Prevention (CDC) in 2008, and the first Public Health Laboratory Interoperability Project (PHLIP) influenza surveillance message went to CDC that year. The first senders were public health laboratories. Influenza was the first disease tracked on the system.

It has grown a great deal since then. AIMS is now the foundational infrastructure for the nation's public health system, moving more than 50 million records a month across roughly 74 public health agencies and laboratories and more than 60,000 connected healthcare organizations.

Here's a way to picture it: AIMS is a high-speed interstate for critical health information, carrying healthcare records, birth and death records, laboratory test orders and results, and more from one point to another. APHL's Michelle Meigs, managing director, Informatics, has offered another version: What FedEx is to package delivery, AIMS is to health data—a way to get information where it needs to go fast, secure and intact.

Why It Matters

Before AIMS, sharing health data often meant mail or a fax machine. That was slow, less secure and easy to get wrong. A rushed sender might shorten a patient's



name to save a few seconds, or a number got transposed somewhere along the way, and then someone had to catch the incomplete or incorrect report and fix it. That's more time lost. With all 50 states feeding data to CDC, the old way didn't scale.

Speed is only part of the value. The bigger part is reusability. Every service runs on the same infrastructure, so public health can stand up new use cases without building new connections. When COVID-19 hit in early 2020 and CDC needed to move testing data from the states, APHL didn't have to spend millions on a new transport system. AIMS was already there. That "do once, apply at scale" design is why one connection can replace hundreds of point-to-point interfaces, and why adding capacity means adding services rather than infrastructure.

AIMS also translates. It transforms data into the format each partner needs, so systems that otherwise couldn't talk to each other can. A JPEG attached to an email is useless to a provider's system. A message delivered straight into the health record is not. That interoperability is what gives providers, epidemiologists and the public a full picture to act on.

Supporting the Youngest Patients

Newborn screening is one of the clearest examples. Within hours of birth, nearly every baby in the United States is screened for serious but treatable conditions, and doctors need those results fast to start treatment that can save a life. Detor, the electronic test order and result service on AIMS, connects the public health laboratory directly with the birth hospital, sometimes before the baby even has a name. AIMS can also report the birth to the state's vital records registry through STEVE, or the State and Territorial Exchange of Vital Events, which opens the door to things like insurance enrollment and a Social Security number.

Built for What Comes Next

AIMS is FISMA- and HIPAA-certified, hardened by more than 18 years in production, and named one of the nation's public health intermediaries. New priorities keep arriving, from TEFCA-based exchange to AI-assisted workflows, and the platform is built to carry them on the same trusted foundation instead of starting from zero each time.

A newborn screening result in Alaska. A foodborne illness report in Texas. A cancer pathology record headed to a registry. AIMS gets that data where it needs to go, so people get treated and lives get saved. ■

Strengthening Laboratory Resilience Through Biorisk Management

By **Stormy Chester**, senior specialist, Public Health Preparedness and Response and **Michael Marsico**, program manager, Public Health Preparedness and Response

Biosafety professionals from 25 public health laboratories across the country gathered at the Utah Public Health Laboratory in Taylorsville, Utah, for APHL's Biorisk Management Workshop, May 19-21. Supported with funding from the US Centers for Disease Control and Prevention (CDC), this three-day workshop provided biosafety professionals with training on the principles of biorisk management, highlighting the integration of quality, biosafety and biosecurity through interactive exercises, real-world case studies and peer learning.

> *"APHL continues to be an invaluable leader in strengthening biosafety and biosecurity across public health laboratories. Attending the recent Biorisk Management Workshop was an inspiring experience that left me motivated, connected with colleagues and excited to implement meaningful improvements at my home laboratory. The practical resources, expert guidance and collaborative environment were truly exceptional."*
>
> — **Olivera Marjanovic-Peyron**, PhD, PHM, RBP(ABSA)
> California Department of Public Health

The workshop agenda was built around the findings and lessons learned through the APHL/CDC ISO 35001: Biorisk Management for Laboratories implementation project. The insights gained from working with public health laboratories implementing the standard helped shape agenda topics that addressed common challenges and provided practical strategies, tools and examples that participants could apply within their own organizations.

Sessions focused on leadership engagement, risk assessment, workforce competency, biosecurity, performance evaluation and continual improvement while emphasizing how quality management principles can strengthen biosafety and biosecurity programs. Participants also explored topics such as artificial intelligence, automation and cybersecurity, while discussing how these evolving technologies influence modern laboratory risk management.

One of four interactive rotational exercises during the APHL Biorisk Management Workshop.

The workshop emphasized active learning through case studies, small-group discussions and hands-on exercises. Participants shared challenges, evaluated solutions and learned from one another's experiences. This collaborative setting allowed attendees to connect with peers dealing with similar challenges and exchange approaches to overcome them.

At the conclusion of the workshop, participants provided their feedback through exit tickets, highlighting their commitment to begin discussions with leadership about implementing ISO 35001 principles or strengthening their existing biorisk management programs. Participants also identified a need to improve risk assessments, enhance incident reporting, review emergency drills, expand biosecurity practices and incorporate APHL biosafety resources into their programs.

This feedback highlights participant dedication to making continual improvements within their biorisk management programs, further emphasizing the importance of ongoing education and training initiatives.

continued on page 31

Behind the Scenes: How Public Health Laboratories Prepare for Major Events

By **Courtney Demontigny**, MPH, senior specialist, Public Health Preparedness and Response

When a city hosts a major event, such as a championship sporting event, an international summit, political convention or large-scale festival, the logistical preparations are immense and highly visible. Security personnel, traffic management, emergency medical services and crowd control preparations all ramp up in advance. However, what the public rarely sees is an equally critical layer of preparation happening in public health laboratories that are working hard to be ready to detect and respond to any potential infectious disease threats, chemical exposures and radiological incidents. Public health laboratories face unique challenges that go far beyond routine operations when getting ready to respond to major events in their jurisdiction. The sudden influx of travelers from around the world, combined with mass gatherings and increased security concerns, creates conditions at a heightened risk for infectious disease introduction, rapid transmission and potential chemical or radiological incidents.

To support laboratories in building and maintaining this readiness, APHL has developed the Public Health Laboratory Readiness Checklist for Major Events. This practical resource is designed to guide laboratories in strengthening readiness, sustaining quality operations under surge conditions and enhancing coordination with local, state and federal partners before, during and after major events.

Why Preparation Matters

Major domestic and international events bring together large populations in concentrated areas, including travelers who may carry pathogens not commonly seen in the host region. This convergence dramatically increases the risk of disease introduction and rapid spread. A single undetected case can quickly become a widespread outbreak when thousands of people are sharing venues, transportation and accommodations.

Beyond infectious disease, laboratories must also be prepared for chemical and radiological incidents. Large events are potential targets for intentional acts, and accidents involving hazardous materials become more likely with increased activity and infrastructure strain. Laboratories need protocols in place for all-hazards response, not just biological threats.

Perhaps most critically, the time to build relationships with key partners is before an event, not during one. Emergency response depends on seamless coordination between public health laboratories, clinical facilities, law enforcement, emergency management agencies and other state and federal partners. Establishing these connections in advance and understanding partner capabilities, agreeing on communication protocols and practicing joint response can mean the difference between a controlled situation and a crisis.

Building Lasting Readiness

The Public Health Laboratory Readiness Checklist for Major Events is not just about preparing for a single event; it is about building awareness and partnerships that strengthen overall laboratory and community preparedness. The connections established and protocols that are reviewed and tested during major event planning continue to strengthen the system long after the event concludes, improving response to routine emergencies as well as future large-scale situations. Access the *Public Health Laboratory Readiness Checklist for Major Events* through the APHL Preparedness Planning and Training Resources website to begin strengthening your laboratory's readiness today. ■

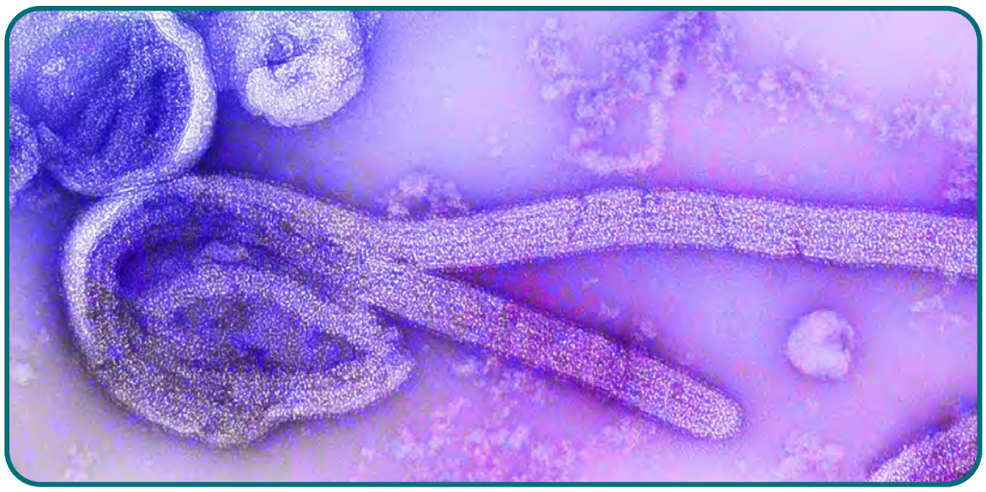
Inside the Checklist

The checklist covers seven essential domains:

- Preparedness and Risk Assessment
- Sample Collection, Transport and Chain of Custody
- Laboratory Testing and Staffing Strategy
- Data Management and Reporting
- Quality Management and Performance Metrics
- Communication, Coordination and Public Messaging
- Post-event Review and Legacy Planning

The Laboratory Response Network Responds to the 2026 Ebola Outbreak

By **Rana Rahmat**, MPH, senior specialist, Public Health Preparedness and Response



Twenty-five years after the 2001 anthrax attacks demonstrated the importance of a coordinated national laboratory response system, the Laboratory Response Network (LRN) continues to serve as one of the nation's most critical public health preparedness assets. The recent Ebola outbreak in Central Africa underscores why this capacity remains essential.

In May 2026, the Democratic Republic of the Congo (DRC) declared an outbreak of Ebola disease caused by the rare Bundibugyo virus. Since the outbreak was first identified, cases have increased rapidly, with over 4,000 cases of suspected infections and over 2,000 deaths reported across the DRC and neighboring Uganda as of mid-June. The outbreak's spread into densely populated urban centers and conflict-affected regions has complicated surveillance and response efforts. Recognizing the potential for regional and international spread, the World Health Organization declared the event a Public Health Emergency of International Concern (PHEIC).

The emergence of the Bundibugyo virus is particularly concerning because no approved vaccines or targeted treatments currently exist for this strain of Ebola disease. In response, the US Centers for Disease Control and Prevention (CDC) issued a Health Alert Network (HAN) advisory on May 19, notifying healthcare providers, laboratories and public health agencies of the outbreak and the need for heightened vigilance.

While the outbreak is occurring thousands of miles from US borders, it highlights the importance of maintaining domestic laboratory readiness. Through the LRN for Biological Threats (LRN-B), 45 laboratories across 36 states currently possess the capability to detect the Bundibugyo virus. This nationwide testing capacity enables rapid identification of suspected cases, supports public health investigations and provides confidence that the United States can quickly recognize and respond to imported infections.

Today's LRN-B laboratories rely on advanced diagnostic technologies to maintain this readiness. Many laboratories capable of detecting the Bundibugyo virus have adopted BioFire testing platforms, primarily the Global Fever Special Pathogens Panel, while others utilize the Next Generation Diagnostic System (NGDS) Warrior Panel. These tools provide laboratories with the ability to rapidly screen for high-consequence pathogens and support timely public health decision-making.

As emerging infectious diseases continue to challenge global health security, the LRN remains a cornerstone of preparedness. Whether responding to bioterrorism, novel pathogens or international outbreaks with the potential to reach US communities, the network's strength lies in its ability to connect laboratories across jurisdictions, provide advanced diagnostic capabilities and ensure that public health officials have the information needed to act quickly.

The 2026 Bundibugyo Ebola outbreak serves as a reminder that preparedness is not built during a crisis, but sustained through ongoing investment in the systems, partnerships and laboratory capacity that protect public health every day. ■

Established in 1999 through a partnership between CDC, the Federal Bureau of Investigation and APHL, the LRN was originally designed to strengthen the nation's ability to detect and respond to bioterrorism. Its value became evident during the anthrax attacks of 2001, when LRN laboratories collaborated to identify the source of infections and support the public health response. Since then, the network has evolved into an integrated system of public health, hospital, veterinary, environmental, food-testing and federal laboratories capable of responding to a wide range of biological and chemical threats.

Measles Detection

continued from page 22

10 weeks before the first case was detected. This study showed the necessity of maintaining infrastructure for measles wastewater surveillance to proactively identify future outbreaks.

Wastewater surveillance can also help determine when outbreaks are concluding. While the absence of viral detection does not guarantee a disease is no longer present, consistent negative results can support evidence of declining transmission when combined with clinical data. During South Carolina's 2025–2026 measles outbreak, ongoing wastewater monitoring helped public health officials assess disease spread and allocate resources more effectively. This work inspired Republican Sen. Tim Scott of South Carolina to advocate for more funding, earning the Secretary of Health's approval.

As measles re-emerges as a public health concern, wastewater surveillance is proving to be a valuable complement to traditional methods. APHL's 2025 Wastewater Surveillance Survey showed 17 jurisdictions testing for measles. Since then, the National Wastewater Surveillance System (NWSS) has added measles to the list of suggested targets for Epidemiology and Laboratory Capacity (ELC) for Prevention and Control of Emerging Infectious Diseases Cooperative Agreement grantee laboratories, increasing this number to 28 laboratories submitting data to NWSS. Between ELC grantee laboratories and the CDC national contract, wastewater surveillance for measles is almost nationwide. By offering early warnings, broader population coverage and actionable insights, it strengthens the ability of public health systems to respond quickly and effectively. ■

20 Years of PHLIP

continued from page 26

enterovirus sequencing data—a capability not available with the older HL7 standard.

Widespread adoption of PHLIP has proven invaluable in implementing a quick response to timely detection of emerging infectious diseases. APHL TA teams were able to onboard 58 public health laboratories to send SARS-CoV-2 data within the first few months of the COVID-19 pandemic. As the 2022 mpox outbreak emerged, APHL worked quickly with public health laboratories to add new capability for PHLIP to support sending mpox laboratory-developed test (LDT) data to CDC. Both efforts utilized the PHLIP feed as a rapid response data sharing method to provide valuable information to CDC.

Approximately 60 state and local public health laboratories are in production to send PHLIP data to CDC. APHL TA teams continue to work with new and existing public health laboratories to expand the type and quality of data sent through PHLIP.

The Future of PHLIP

APHL and CDC continue to support PHLIP to ensure it can meet future public health needs. APHL is enhancing the AIMS Dashboard to support public health laboratories with updating data feeds as new tests are brought online and public health laboratory LIMS undergo upgrades and changes. The dashboard provides an interactive environment for public health laboratories to monitor PHLIP and other data streams to ensure their messages are sent to trading partners.

Upcoming enhancements for PHLIP include enabling the APHL TA team to quickly review messages, and for senders to view validation errors while receiving real-time notifications of message failures. With errors impacting messaging, these enhancements will provide faster opportunities to identify and correct issues.

These improvements will empower both public health laboratories and APHL to take faster action to resolve issues impacting data feeds, while ensuring CDC continues to receive high-quality data. Furthermore, they secure PHLIP's place as a robust platform capable of meeting future public health data needs.

For more information on PHLIP or the AIMS Dashboard, contact APHL at support@aimsplatform.com. ■

Biorisk Management

continued from page 28

Participants from the APHL Biorisk Management Workshop in Taylorsville, Utah.

While participants valued the resources and discussions, they also identified opportunities for additional training. Requests included additional guidance on implementing ISO 35001, peer network opportunities and advanced training on topics such as biosecurity risk assessments, leadership engagement and integrating quality and safety into a unified system. These recommendations will help shape future APHL biosafety training opportunities and resources.

As public health laboratories continue to navigate complex challenges, building resilient biorisk management systems has never been more important. By translating lessons learned from the APHL/CDC ISO 35001 implementation project into practical training and peer-to-peer learning, APHL's Biorisk Management Workshop equipped biosafety professionals with strategies to strengthen laboratory resilience, improve risk mitigation and foster a culture where biosafety and biosecurity are integrated into everyday laboratory operations.

Contact biosafety@aphl.org for more information on the APHL/CDC ISO 35001 Implementation Project or other biorisk management trainings. ■

Measuring the Impact of Emergencies on Public Health Laboratory Operations and Workforce Dynamics

By **Isaac Eaves**, fellow, Quality Systems and Analytics

From 2016 to 2024, public health reports—including APHL's Workforce Profile Survey and PH WINS—identified alarming workforce trends, such as increases in intent to leave and declines in overall job satisfaction among the public health laboratory workforce in the United States. Globally, ongoing public health emergencies and budget constraints have further strained laboratory systems, contributing to stress, burnout and workforce attrition. These workforces play a crucial role in disease detection, outbreak investigation and emergency response and—despite documented operational challenges—limited comparative analysis exists on how these pressures affect domestic and international laboratory workforces.

With the continued threat of public health emergencies and the rising uncertainty of the public health budget, APHL wanted to investigate and compare how public health laboratories in the US and globally prepare for and respond to emergencies, and how such emergencies impact laboratory operations and workforce dynamics across both contexts.

Approach

Interviews were conducted with US state public health laboratory directors across three regions[1] to gather perspectives on operations, workforce capacity and emergency response. Directors represented laboratories of varying sizes and system structures, reflecting the diversity of the national public health laboratory system. To understand global laboratory experiences, we reviewed APHL Global Health program materials, including reflections and testimonials from APHL staff and laboratory leaders across multiple regions.[2]

Through thematic data analysis and using the constant comparative method, APHL identified four key themes, highlighting similarities and differences across US and global settings.

Insights

The four themes—laboratory operations; system structure and governance; policies and strategies; and partnerships and funding—highlight persistent challenges alongside opportunities for sustainable operations through workforce investment and collaboration. Laboratory leaders across both contexts cited operational challenges due to funding instability, limited workforce capacity and poor interagency coordination. Staff flexibility—such as cross-training and extended hours—helped offset these pressures but was not sustainable, underscoring the need for long-term workforce investment.

Laboratory system structures and governance varied across contexts, from coordinated networks to decentralized, independent laboratories, each with strengths and limitations. Global system structures rely on regional collaboration for support, while in the US, laboratories foster support through inter-agency collaboration. While current structures meet routine needs, emerging threats and resource constraints require more adaptable, connected and resilient systems. Both US and international laboratory leaders emphasized the need for integrated systems to support surveillance and outbreak response.

Laboratory leaders across both settings provided examples of effective policies and strategic planning that strengthened operations. For example, the COVID-19 pandemic prompted adoption of automation, electronic reporting and improved data systems in US laboratories. Similarly, global laboratories advanced preparedness planning models and data modernization during the pandemic.

Multilateral partnerships and funding support have become essential to laboratory operations and outbreak response in both settings. International agencies such as the US Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) support laboratory operations through training and policy development, funding and guidance for best practices. In global contexts, the World Bank is a major supporter of laboratory infrastructure. Regional agencies, such as Africa CDC, the Intergovernmental Authority on Development in East Africa and Right to Care Zambia, support surveillance, policy initiatives and disease prevention and treatment. In the US, federal agencies continue to provide regulatory support while laboratories build relationships with epidemiologists, state health departments, academic institutions and laboratories in the same region to support operations. These partnerships enable rapid response, including case confirmation and containment, through coordinated communication. In some cases, they have also elevated laboratory leaders into decision-making roles, helping ensure science informs policy and response.

Recommendations to Support Public Health

- Prioritize workforce development strategies, including surge staffing, cross-training and ongoing competency development to reduce strain.
- Train laboratory personnel in incident command systems and emergency management to support timely activation.
- Strengthen communication among laboratories, epidemiology units and emergency agencies to improve coordination.

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- Embed laboratory expertise within emergency operations to ensure representation in planning and policy development.
- Modernize laboratory infrastructure and data systems to support advanced diagnostics and real-time surveillance.

Conclusion

Public health emergencies and funding constraints continue to expose systemic challenges, including workforce shortages, resource limitations and planning gaps that cut across continental lines and emergency contexts. Building resilient laboratory systems will require integrated surveillance, modern diagnostics and sustained workforce investment. Laboratory leaders' experiences demonstrate that progress depends on strong governance, partnerships and long-term investment to prepare for future public health threats. ■

Strengths, Challenges and Needs in Public Health Laboratories

Insights from APHL Programmatic Data and US Qualitative Interviews

THEME	APHL GLOBAL PROGRAMMATIC DATA	US QUALITATIVE INTERVIEW DATA
CHALLENGES	**Operational:** staffing shortages; training gaps; deployment delays; resource constraints; reliance on external funding **Emergency preparedness/response:** budget constraints; gaps in policy frameworks	**Operational:** funding instability; limited workforce capacity; weak interagency coordination **Emergency preparedness/response:** political pressures and conflicting directives; inconsistent or unclear communication from national authorities
SYSTEM STRUCTURE AND GOVERNANCE	**Operational:** decentralized or multi-tiered laboratory networks **Emergency preparedness/response:** Regional testing capacity supports outbreak response **Need:** stronger integrated systems for outbreak surveillance and response	**Operational:** ranges from coordinated networks to decentralized, independent laboratories **Emergency preparedness/response:** supports collaboration, information sharing, diagnostics and surveillance **Limitations:** redundancy, limited regulation and connectivity issues hinder emergency response
POLICIES AND STRATEGIES	**Operational:** data modernization; national networks to strengthen laboratory capacity **Emergency preparedness/response:** repurposed HIV, malaria and tuberculosis (TB) equipment during COVID-19	**Operational:** laboratory leaders included in plans for construction of new laboratories **Emergency preparedness/response:** developed testing systems
PARTNERSHIPS AND FUNDING SUPPORT	**Operational:** CDC and WHO support infrastructure, training and workforce development; World Bank supports infrastructure; Africa CDC supports bioinformatics, metagenomics and water surveillance; IGAD supports migration, data and training policy initiatives. **Emergency preparedness/response:** Academic institutions and international collaborators provide technical and financial assistance during outbreaks; countries establish in-country CDC chapters; Right to Care supports infectious disease prevention and treatment, health systems strengthening and community-based interventions.	**Operational:** CDC and WHO provide funding and best-practice guidance; FDA, EPA and USDA provide regulatory support; laboratories maintain close relationships with epidemiologists and state health departments. **Emergency preparedness/response:** Public health scientists are included in policy decision-making; laboratories collaborate with other state agencies and sentinel clinical laboratories; the Laboratory Response Forum supports collaboration among laboratory directors.

KEY TAKEAWAYS			
	1 Shared capacity gaps: Both data sources identify workforce capacity, sustainable funding and coordination as core constraints affecting routine operations and emergency response.	2 Governance shapes readiness: Integrated laboratory networks, clear policies and reliable communication channels strengthen surveillance and outbreak response, while fragmented systems create redundancy and delays.	3 Partnerships are essential but create dependency risks: External, technical and financial support expand laboratory capacity, but long-term resilience depends on institutionalizing those gains within national and state public health systems.

Abbreviations: *APHL, Association of Public Health Laboratories; CDC, US Centers for Disease Control and Prevention; WHO, World Health Organization; FDA, Food and Drug Administration; EPA, Environmental Protection Agency; USDA, US Department of Agriculture*

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