

LAB MATTERS

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Summer 2023 Issue 2



Leveraging the **Power of Privilege** in Public Health

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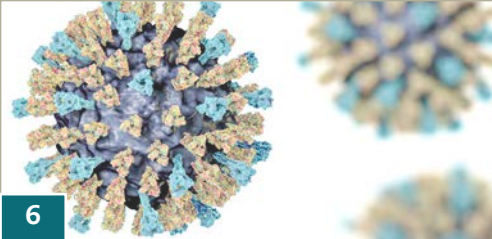


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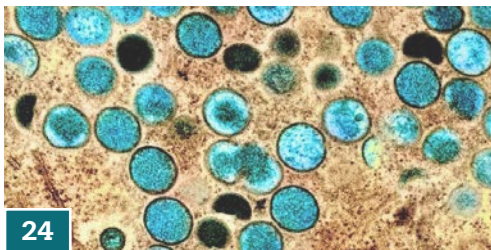
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The Association of Public Health Laboratories (APHL) works to strengthen laboratory systems serving the public's health in the US and globally. APHL's member laboratories protect the public's health by monitoring and detecting infectious and foodborne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

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Articulating APHL's DNA for the Next Generation



Daphne Ware, PhD, President, APHL and Scott Becker, MS, Chief Executive Officer, APHL

After the last two years of video meetings, virtual conferences and social distancing, 2023 got started for APHL at warp speed with lots of in-person committee and subcommittee meetings, as well as our first ID Lab Con. The association was really excited to launch the new conference—postponed from its original 2020 date—and figured we would have a modest turnout of around 300 participants or so. Instead, our members and partners jumped right into it with dynamic presentations and 500+ attendees networking and exchanging ideas. And our momentum is carrying us through, with a successful APHL 2023 in the books, the 13th National Conference on Laboratory Aspects of Tuberculosis in June, our staff-related APHL Week in July

and our Newborn Screening Symposium in October.

But we have also had the opportunity to do some critical thinking about our identity as a scientific and member-driven organization. Even though we were all stretched thin during the pandemic, the innovations came fast and furious and really made us think about not only who we are as a community, but also what we want that community to look like going forward. We are trying to see who we are after the changes wrought by COVID-19. So last year we began to seek member input about putting APHL's values into words. Not its value, which we believe is communicated every day by all

our members and staff, but its ideals and beliefs for the membership.

We received over 300 data points from our members, which helped shape a workshop in early December 2022 with the board, chairs of our committees, task forces, and strategic implementation groups, and our senior staff to model an early set of values. We then stood up a working group to complete the formulation of these values. And as announced at APHL 2023, while these values seem very simple on their face, they are encoded into the very DNA of not only the public health mission, but also who we are as an association.

Community

We actively foster meaningful connections and belonging among members and partners to promote collaboration, growth and diversity of thought that maximizes our contributions to advance public health.

Those of us who have worked in public health laboratories for a long time know how supportive our laboratory community can be. No matter where we are in the laboratory or what function we are performing, we are all supporting the mission of public health. And it can really be easy to have your head down in a grant application or in emergency testing. But you are not alone at the bench, in your laboratory or at your computer...you belong to a robust, collaborative network of like-minded people. And we are here for you.

Diversity, Equity, Inclusion and Accessibility

We embrace, promote and model a culture of diversity, equity, inclusion and accessibility (DEIA) and recognize it as essential to the work we perform and the communities we serve.

Even though we were all stretched thin during the pandemic, the innovations came fast and furious and really made us think about not only who we are as a community, but also what we want that community to look like going forward.

The public health laboratory workforce today is more diverse than it ever has been, and it will continue to grow and change. APHL members can reinforce that message of service in not only underserved and underrepresented communities, but also ensure that the people who are serving these communities have a deeper understanding of the factors and biases that make these communities the way they are. And we are not just focusing on one set of our members...everyone should complement and participate in these values.

Innovation

We meet the diverse and ever-changing public health landscape through forward-thinking and adaptive leadership.

Innovation for APHL not only involves the scientific advances, but also adapting our leaders for today's laboratories. While we have been at the bleeding-edge of technological advancements over the past few years, all the laboratory leaders that we have connected with—old and new—are also looking for new ways to build their staff experiences. And the traditional role of public health laboratories has radically changed. We've always been welcome to the table with public health officials because of the

data we provide. But that's not all that we do. During the pandemic, we had opportunities to bring together teams of people with different expertise to look over that same data and help us find ways that we can improve it and make it more robust. And it is to our advantage that those relationships that we built over the past three years continue to grow and mature; to get outside our walls and continue to engage with the communities that we serve.

Scientific and Professional Integrity

We are a trusted leader in public health, striving for continuous improvement and the highest level of ethics and honesty in laboratory science and practice.

Science is at the core function of public health laboratories. And bringing attention to good, quality science with trusted, actionable results is important. When the pandemic first rose to prominence, the association took on the role of "truth teller" to support our members and the response. Being honest about what was happening on the ground and sharing information both within our community and more broadly was essential. Even though our messages weren't perfect, they were rooted in a high degree of ethics in the science and in

the work that is done by every individual in the public health laboratory system. Because our communities are relying on us, we need to continue to build trust in these relationships and, to do that, we keep our vision set on good science, good data and quality information.

Much like when APHL staff values were first introduced over a decade ago, this is just the first iteration. We want to live in them a while and really figure out if they fit the association. Like a living organism, these member values will continue to adapt as the needs of our members change.

These values will not take the place of our mission or vision, or of our brand. Rather they are a complement. Just like an organization's brand, it isn't about the logo alone. It is a feeling, like attending an APHL conference or sitting on a committee. A feeling of belonging, of community, of mutual respect for all. By articulating and reminding ourselves of our many connections, it makes us stronger and better in so many ways. ■

Focus on Fellows: Better Together

By Rudolph Nowak, MPH, senior specialist, Marketing & Communications



Anna Sophia Gray

The New York State Department of Health, Wadsworth Center and the New York Department of Agriculture and Markets, Division of Food Laboratory (NYSAGM Food Laboratory) found an unexpected opportunity to create a unique food safety fellowship together.

“From my perspective, when I was reading the goals of the Food Safety Fellowship, it occurred to me that we do food testing, but we don’t do it all the time outside of the US Food and Drug Administration (FDA) retail food study program. Our program is outbreak-related and it’s inconsistent,” said Lisa Mingle, PhD, research scientist and fellowship mentor at Wadsworth Center.

This led to “feast or famine” periods for food safety testing at Wadsworth Center. The situation got Mingle thinking about how her laboratory could offer a more robust fellowship experience.

“We have a pretty good relationship with our partners at Agriculture and Markets. So, I thought, ‘We should reach out to them because I know they do food testing on a regular basis.’ Even if we can’t provide all those experiences all the time, the fellow would be able to get it [at NYSAGM Food Laboratory] within the program,” Mingle said.

Wadsworth Center’s Bacterial Diseases Chief Marie-Claire Rowlinson, PhD, D(ABMM) added that the partnership gives a much broader perspective on what food safety means.

“Not just the clinical side with human infections, but obviously how foodborne disease is prevented in the first place

with all the testing that NYSAGM Food Laboratory does.”

An added plus? The two laboratories are located near one another making the idea of sharing a fellow even more workable.

“The co-location allowed the individual to experience different facets of the ‘three-legged stool’ that represents the three disciplines involved in an outbreak investigation (Epidemiology, Regulatory, and Laboratory), while also training in specific microbiological and molecular laboratory techniques,” said Alyssa Dickey, PhD, food laboratory scientist and fellowship mentor at NYSAGM Food Laboratory.

A Multi-dimensional Experience

Both agencies were conducting combined interviews with fellow applicants when the idea of splitting time between Wadsworth Center and the NYSAGM Food Laboratory was presented. The fellow selected for food safety was a 2022 University of New Hampshire graduate, Anna Sophia Gray. She started her fellowship in August 2022 at Wadsworth Center performing retail food study protocols along with a rotation with the Division of Epidemiology. Maria Lucia Ishida, PhD, director of the NYSAGM Food Laboratory, said they envisioned projects that could take advantage of the resources available within the individual laboratories, with the fellow assuming the lead in the execution of the work.

Gray was unaware of the novelty of her fellowship.

“I didn’t know people did it any other way,” she said. “I came into this and thought, ‘This is great! I’ll get to see two different things.’ It wasn’t until I started talking to other fellows that this experience was unique.” Her experience was further enhanced by an opportunity to see the collaborative work of the two state laboratories during a foodborne disease outbreak.

“I had a two-week stint over at the Wadsworth Center, on their foodborne disease outbreak team. It just happened that on my first day, there was an outbreak of *Salmonella* in New York State. It ended up being 350 cases.”



As part of her fellowship, Anna Sophia Gray went shopping to purchase meat that would be tested for enteric bacteria, as part of the FDA National Antimicrobial Resistance Monitoring Systems (NARMS) Retail Meat program. Photo: NYSAGM Food Laboratory

She went on, “Since I already had background knowledge of what was happening to the clinical samples over here at Wadsworth, I went over to NYSAGM Food Laboratory and got an idea of what food sampling and food testing looked like. So, I really got this cool, multi-dimensional view of what an outbreak looks like and all the distinct roles that go into it.”

“In our minds, it’s been a success because she really loves food safety,” said Rowlinson. “And I am sure having that broad experience at NYSAGM Food Laboratory and with Wadsworth Center, in addition to going out and doing retail food shopping and coming back and testing it contributed to the success.”

Ishida and Dickey agree the partnership was a success. “Anna Sophia has been an incredible addition to our laboratory staff. She has been an excellent conduit for communication between the partner facilities,” Ishida added.

Could this unique approach become common at the two New York laboratories?

“We could certainly find other common areas where we could co-host a fellow with Wadsworth Center,” said Dickey. “The interaction has been a great experience.” ■



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Public Health Laboratory

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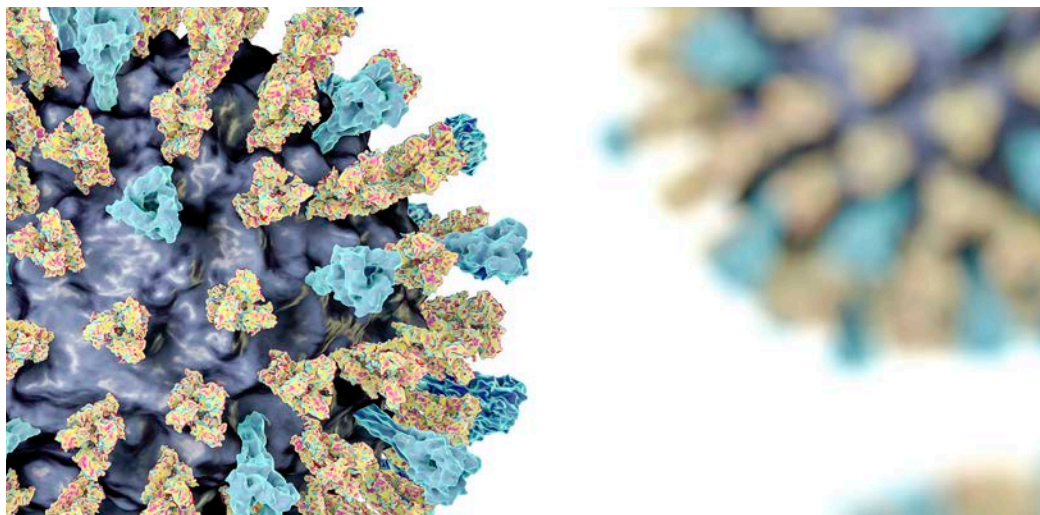
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The Public Health Laboratory Role in Response to Measles

By Michael A. Pentella, PhD, director, State Hygienic Laboratory at the University of Iowa



3D illustration showing structure of measles virus with surface glycoprotein spikes hemagglutinin-neuraminidase and fusion protein. Photo: Dr. Microbe.

Measles is a highly contagious viral disease that can have serious and even fatal consequences. According to Robert Kruse, MD, MPH, FAAFP, state medical director and division director for the Division of Public Health at **Iowa Department of Health and Human Services**, “Urgent testing for measles is critical to quickly identify and isolate infected individuals, prevent outbreaks and protect the health of our communities.” Measles is so contagious that if one person has it, up to 90% of the people close to that person who are not immune will also become infected.¹ Halting the spread of measles is a major task, which is why prompt test results and close coordination with a healthcare team are so crucial.

A Lost Opportunity

A 7-month-old baby traveled overseas and returned home to Iowa. When the signs and symptoms of measles appeared, the baby was taken to the pediatrician. While the physician suspected measles, instead of sending the sample to the public health laboratory it was sent to an out-of-state commercial laboratory as a routine

diagnostic test. By the time the result was reported to public health, it was too late to provide vaccination or immunoglobulin to anyone exposed. In addition, the parents were not advised of how contagious measles is and there was some community exposure. In this instance, early communication with the state public health laboratory and epidemiologist would have led to quicker results and additional education of the parents, which could have impacted patient care and community exposure.

Building a Better Healthcare Team

Until recently, measles RNA detection was only available in public health laboratories. However, clinical and large commercial laboratories have begun offering measles through real-time polymerase chain reaction (RT-PCR) testing. While improved access to testing is important, rapid turnaround time, robust demographic data collection and close collaboration between the laboratory and epidemiologist is critical to limiting the spread of measles. Testing outside of the public health

system has the potential to delay that important communication.

Test options outside the public health laboratory also lack characterization support. Characterization testing of measles specimens by genotyping is critical as it is the only way to distinguish between wild type virus infection and a rash caused from recent measles vaccination. Additionally, genotyping is critical for epidemiologists to understand where cases may have been imported from and to link transmission pathways in an outbreak. These two situations further demonstrate the essential role public health laboratories play in measles testing and why close coordination between public health, clinical laboratories and physicians is needed.

It is essential for public health laboratories to communicate their role in responding to measles cases to physicians and clinical laboratories. While measles virus is, fortunately, rarely seen in the United States, a suspect case is a public health emergency and requires the action of a team to respond to the event. The healthcare provider, the epidemiologist, the clinical laboratory and the public health laboratory are critical members of the team to prevent the spread of measles in our communities. ■

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1. CDC. Transmission of measles (website). Available from <https://www.cdc.gov/measles/transmission.html>.



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Adaptation and Innovation for Public Health: Sacramento County Public Health Laboratory

By Gynene Sullivan, MA, manager, Communications



Public Health Microbiologist Nicole Kahl-Purcell, Supervising Public Health Microbiologist Jean Ventura and Laboratory Technician Debra Jo check in new specimens. Photo: Sacramento PHL

When Anthony Gonzalez, PhD, became director of the **Sacramento County Public Health Laboratory** in 2007, he had no idea of the challenges that were just around the corner for him. The 2008-2009 financial crisis was an unexpected test.

"I had no idea how much of an impact that the fiscal downturn would have on us," he said. "We lost the ability for continuing education and meeting travel, as well as needed equipment purchases. But the biggest impact was staffing." As a result of budget cuts, laboratory staff was cut in half from its original 20 full-time employees (FTEs).

"There was absolutely no room for growth," Gonzalez said. But, as public health laboratories do, Sacramento adapted to its circumstances.

Location & Facility

As one of the original counties of California created in 1850, Sacramento gained prominence and wealth during California's Gold Rush. It became a

commercial center due to the numerous railways stemming from the city and its proximity to the Sacramento River. Kayakers, rafters and other outdoor enthusiasts are also drawn to the area's natural beauty.

The oldest incorporated city in California and its capital, Sacramento is an interesting mixture of historic preservation and the modern bustle of the state government. The city has over 525,000 inhabitants, although the metropolitan area numbers at approximately 2.4 million.

Located just south of downtown in an area with several county offices and close to the campus of the University of California Davis Medical Center, the Sacramento County Public Health Laboratory is on the second floor of a two-story county building, taking up 11,000+ square feet with BSL-3 facilities. Public health and primary care clinics are located on the first and second floors. The laboratory not only provides diagnostic and surveillance testing to Sacramento

County, but also to the surrounding counties of Placer, El Dorado, Nevada, Sutter and Yuba County in the foothills of the Sierra Nevadas. Even though the county building is aging, its infrastructure is constantly being evaluated and upgraded as necessary.

"Since most of our instruments now have a bidirectional interface, we've spent a lot of time upgrading our electrical grid and broadband connectivity," said Gonzalez. "Also, we're right in the heart of downtown Sacramento, which is incredibly convenient for our clients."

Testing

The laboratory is formally divided into four testing sections:

- **Mycobacteriology:** Performs specialty testing for *Mycobacterium tuberculosis* (TB). On average, the laboratory processes about 6,000 patient requests per year.
- **Bacteriology:** Handles clinical specimens such as urine, sputa, respiratory or wound samples. The section also handles the samples from foodborne or waterborne outbreaks and parasitology.
- **Serology:** Conducts QuantiFERON® testing for TB; nucleic acid amplification testing for Chlamydia/gonorrhea; and testing for syphilis and rabies. Last summer, the serology laboratory processed an average of 20 rabies tests per week—a new high for the area.
- **Bioterrorism:** With its BSL-3 rating, this part of the laboratory meets the strict federal safety requirements that allow staff to handle potentially dangerous respiratory disease agents. Laboratory staff are on call 24/7 to provide emergency testing for first responders in the community and for northern California clinical laboratories to rule out potential



Bioterrorism Coordinator and Supervising Public Health Microbiologist Jean Ventura trains new staff on how to process white powder letters. Photo: Sacramento PHL

biothreat agents. The laboratory is also a member of the **Laboratory Response Network (LRN)**.

However, Gonzalez notes, these are operational names only.

“One of the most important things that we’ve been able to establish is cross-training for all our staff. And when the pandemic hit, we were able to ramp up surge testing relatively quickly because of this practice.”

While Sacramento is not physically a large laboratory, it serves a large community including correctional health and extended care service agencies in the geographic area. And because of its BSL-3 rating, it was able to respond to the 2022 mpox outbreak, identifying the first case in California.

“In fiscal year 2021-2022, we performed over 83,000 tests for SARS-CoV-2, in addition to all our other testing. We would not have been able to do it without our new molecular platforms or our staff who are able to jump in where needed.”

Staff & Revenue

Along with its full-time public health microbiologists, the facility has a

dedicated information technology person in the laboratory.

“Since implementing bidirectional interfaces with our external public health community, our IT person has been vital,” Gonzalez said. “As microbiologists, we have nowhere near the training or sophistication required to create, implement and maintain those important interfaces.” Not only does the IT person work with laboratory staff to ensure the interfaces are working correctly, but they are also regularly communicating with the end users to ensure data accuracy.

“Even though our end users are in the same building, that doesn’t mean we’re looking at the same information, and feedback from them has been critical to maintain data quality.”

The laboratory also has a central support area that helps speed the laboratory’s work by formulating reagents and ensuring that the required supplies are available. There is also the front office staff who work with the public and clients and ensure billing procedures run smoothly. And an administrative service officer oversees the annual multimillion dollar budget comprised of a mixture of grants and county funds.

Successes & Challenges

Perhaps the laboratory’s biggest success is its response to innovations in laboratory testing, especially during the COVID-19 pandemic. But with the move to molecular platforms and more automated results reporting, there is still room for the human touch. Gonzalez tells the story of a laboratory tour he gave a colleague a few months ago. The colleague, who retired 20 years ago, commented on how different laboratories look today with sophisticated automation.

“The laboratory itself—and laboratory safety—is much different today than it was even five years ago,” notes Gonzalez. “We used to pride ourselves on knowing the biochemical reactions that identified certain species of bacteria and fungi, but today you’re going to have to be familiar with the molecular data that identifies

microbial species. And you are still going to have to start with the best specimen you can get...transport, temperature, primary culture and gram stain processes are still the same.”

Gonzalez credits his dedicated team for its successful response to the laboratory’s evolution over the years. No matter what new crisis comes along or new technology that is developed, the staff keep a critical eye on maintaining quality in all phases of their work.

“We talk about it all the time,” he said. “It’s not about turning out a lot of results as fast as you can. Our goal is to provide consistently accurate and reliable results in a timely manner.”

As a part of a sizable network of local and county public health laboratories in California, his non-scientific staff don’t have quite as much mobility within the laboratory as his microbiologists and technicians do. “We’re limited on what we can offer as far as expansion and promotions for office staff. So, if they want a promotion, it’s pretty easy for them to move within the county system to a higher position in another program or another part of the county. And we can’t do what we do without our administrative support.” Conversely, those positions are almost harder to recruit and retain.

As well as cross-training of staff on all laboratory processes and procedures, Gonzalez is focused on where the laboratory fits into the larger public health community. He is also aware that his time in the laboratory, as well as other folks who have been working for 20+ years, is likely to end soon. So not only is professional training and certification integral to his laboratorians, but leadership skills and qualities are also critical.

“We’ve done a lot of work with our workforce in letting them know not only where they fit into the grand scheme of things, but how they can thrive and adapt to new challenges. Our early adopters [of technology] are really helping to bring our new microbiologists—and some of us old timers—up to speed.” ■



Leveraging the **Power of Privilege** in Public Health

By Jill Sakai, PhD, writer



During the “Understanding Privilege” session at the APHL 2022 Annual Conference, attendees engaged in an activity to help identify some of the many sources of privilege in our society. In response to a series of questions about their personal experiences, participants added or removed beads from a string. Are your employer’s decision makers of the same race as you? Have you always been comfortable with others knowing your sexual orientation? Did you graduate from college debt-free? Add a

bead. Have you ever been followed in a store? Did you have to work as a teenager to support your family? Is it difficult to find appropriate hair products? Remove a bead.

At the end of this “privilege walk,” each person had a collection of beads that represented the overall balance of these factors in their life. Each, however, arrived at that endpoint along a path shaped by their unique life circumstances.



Audience members participating in the “privilege walk” bead exercise during the “Understanding Privilege” session at APHL 2022.

“ I think the most important message for public health laboratories is that they have a responsibility to engage their communities to determine where medically underserved populations live, and how they gain access to testing services.”

Michelle Rodemeyer, chief financial officer, Missouri State Public Health Laboratory

As this activity revealed, privilege is multifaceted and shaped by a myriad of factors: Some are innate, some chosen, some assigned by others. Some may be earned through effort and others granted through circumstances outside our control. Collectively, those facets shape the prism through which we view the world and through which others view us. But too often, we do not see the privilege that shapes our own prism. And by allowing ourselves to remain unaware, we help perpetuate the social factors that grant us advantages.

“Privilege really buffers the impact of structural, social and economic barriers and sometimes can remove them entirely,” said Ren Salerno, PhD, director of the [US Centers for Disease Control and Prevention \(CDC\) Division of Laboratory Systems \(DLS\)](#). “Those who receive privilege often overestimate, overlook or doubt the existence of barriers that they’ve never encountered. And I think that’s why it’s really important for all of us in public health, including those

who work in public health laboratories, to continually educate ourselves about privileges that we may not even know that we have and to continually expand our perspective and the perspectives of those around us.”

Due to systemic patterns of discrimination and stigma, many of the same factors that confer privilege are also social determinants of health, including race and ethnicity, socioeconomic status, gender identity, geographic region, housing status, employment status and education level. And the social, economic and structural obstacles that lead to poor health outcomes overwhelmingly affect communities that are also medically underserved, including communities of color, people with disabilities, LGBTQ+ individuals, women, people who are incarcerated, people who lack stable housing and those who live in rural settings.

Knowing that privilege underlies many of the inequities that reside within the

public health system, it is critical to ask what roles public health laboratories and their laboratorians might play in addressing some of these inequities in their workspaces and in the communities they serve. These efforts start with education—in the classroom, in the workspace and as individuals—about how to identify and acknowledge the sources and effects of privilege in public health. With a greater understanding, laboratorians can embrace allyship and start to harness the power of privilege to drive positive change.

Making Privilege Visible

Allowing privilege to remain unspoken perpetuates inequities. For this reason, recognizing and naming sources of privilege are necessary first steps toward addressing them. That starts with exploring how privilege functions within institutions.

“Privilege is operating even in places where we’re doing health equity work,”

People in positions of leadership can extend privilege to their staff through access to education and professional development. And importantly, they can create an environment where people can speak freely without a fear of retribution and with the expectation that their words will be heard and considered. As a starting place, the DEI Task Force has compiled several **resources and strategies** to help support inclusion efforts in laboratories.

said Mighty Fine, MPH, CHES, director of the **Center for Public Health Practice and Professional Development** at the **American Public Health Association (APHA)**. “And it’s important for us to acknowledge that and call it out so we can shift that paradigm.”

That will require open, honest conversations about privilege and its impacts to help make them visible to everyone. Such conversations can be hard and uncomfortable at times, “but it’s okay to be uncomfortable, as long as we’re respectful,” said Michelle Rodemeyer, chief financial officer of the **Missouri State Public Health Laboratory**.

Too often, mentions of privilege evoke shame and defensiveness, which get in the way of open communication. Much of that stigma arises from two myths, Fine said.

First, acknowledging privilege “does not mean that you didn’t work hard or that you don’t deserve what you have,” Fine said. That idea is rooted in the myth of meritocracy—that equal effort and ability will result in equal success. But in fact, social systems are built on biases and assumptions that preference and reward some identities over others.

Nor does extending privilege to others diminish one’s own. That’s the myth of the zero-sum game—by giving to or supporting others, ground is lost or something important is given up. But that is not how success works. Supporting a multitude of identities results in a stronger system that benefits everyone more fully. (For more on these myths, see the work of **Camara Jones, MD**, a social epidemiologist and physician at Morehouse School of Medicine.)

Productive conversations about privilege and its impacts will require debunking these myths and shifting the narrative toward a recognition that equitable practices work toward a collective benefit. Creating space for these conversations in the laboratory empowers individuals to ask questions, share their experiences and speak up about injustices they see or feel.

Hearing other peoples’ experiences can be a powerful way of starting to see your own privilege as well. “There’s a lot of misconceptions,” said Rodemeyer, who is also a member of the APHL Diversity, Equity and Inclusion (DEI) Task Force. “Ten years ago, I didn’t feel like I had a privileged upbringing. But as I’ve met people and heard their stories, I see how I did.”

“These open and honest conversations are so necessary because they create an opportunity to build a shared understanding of our varied experiences, which can engender empathy and are a foundation for healing,” Fine said. “My grandmother used to always say, ‘Change is on the other side of a conversation.’ I really believe that.”

Moving Toward Health Equity

As with privilege itself, addressing the resulting inequities in care first requires being able to see them. By providing services at no cost to patients, public health laboratories offer the most equitable testing possible—and often the only option for many individuals and populations who are underprivileged. In that “safety net” role, Rodemeyer sees for laboratories an unwritten mandate in health equity.

“That’s how you learn—by being uncomfortable, by being out of your comfort space,” Magaña added. “We need to expose our students to develop these other competencies.”

Laura Magaña, PhD, president and CEO of the Association of Schools and Programs of Public Health

“We level the scale a little bit.”

Public health laboratories offer a unique service to their communities, Salerno agrees. He encourages laboratorians to lean into that role.

“From my point of view,” he said, “I think the most important message for public health laboratories is that they have a responsibility to engage their communities to determine where medically underserved populations live, and how they gain access to testing services.”

That requires the willingness and the ability to really understand the community and its needs. What role does the laboratory fill in community healthcare? What services are being provided that people might not be able to access elsewhere, and are they being offered in an accessible and socially relevant way?

At the laboratory level, that might mean having programs and staff dedicated to identifying underserved communities in their jurisdictions and enhancing access to the specific testing services needed in those communities—whether it is measles or sexually transmitted infections. It might also mean developing partnerships with existing organizations, or extending services to meet people where they are. For example, during the height of the COVID-19 pandemic, many public health laboratories created mobile laboratories to bring testing services to communities that lacked access to testing locations.

Presenting clear, established policies up front can help employees feel more empowered to speak up when necessary and are a way to start shifting the culture of the workplace. Then, follow through—remember that the effects of privilege can lead individuals to view circumstances through different lenses.

Such efforts require people in-house who understand the community. Diversity of thought and experience are important in any organization, but especially so in public health, notes Kelly Winter, PhD, MPH, chief of the **Training Workforce and Development Branch** in CDC's DLS.

"When we have a public health workforce that better reflects the diversity of populations we serve," she said, "we increase the likelihood that our public health programs and initiatives will be relevant, actionable, successful and sustainable."

Dismantling Barriers

Diversifying that workforce starts with dismantling the effects of privilege in the educational pipeline, from recruitment and admissions to job placement and advancement, said Laura Magaña, PhD, president and CEO of the **Association of Schools and Programs of Public Health (ASPPH)**.

Through a close examination of academic public health programs, ASPPH has generated a set of recommendations on education, practice and research. They aim to help institutions review and redesign admissions criteria, curricula, teaching approaches and measures of student success to ensure that they reflect principles of diversity, inclusion and antiracism. "We use an equity lens for everything that we're doing," Magaña said.

The organization is also working to broaden entryways into academic public health, looking at community colleges and continuing education programs as well as bachelor's and graduate programs to make sure paths are in place to help students from underrepresented communities access educational opportunities, as well as the resources and support they need to succeed in and beyond school.

For example, some ASPPH-accredited schools and programs no longer require GRE scores from applicants. This requirement constitutes a systemic barrier for a diverse pool of applicants, Magaña said, and there is very weak evidence that GRE scores predict academic success.

"It's a barrier for some who have not had those opportunities but could, if they came to our institutions, be great public health professionals." Other efforts reflect a shift toward a broader view of what it means to be a successful public health professional. This year, ASPPH launched a workforce development center, working with laboratories and other partners to identify necessary competencies for an effective, inclusive public health workforce.

"We're living in a world that is changing so much," she said. Professionals are used to ongoing training to keep up with technical developments in their fields, she notes. It's time to take a similar approach with professional and social competencies—skills like resilience, communication, working with diverse teams, leadership and problem-solving with an inclusive perspective.

"This has to be part of curriculum," said Magaña. "These topics have to be really embedded."

Often that can be accomplished through changes in the way material is presented or evaluated, such as active learning, scenarios that include multiple viewpoints, case studies and working in unfamiliar communities. Faculty should be trained to recognize their own biases and learn to integrate cultural competencies into their teaching. And programs need to create space for students to talk about questions of privilege and discrimination. "That's how you learn—by being uncomfortable, by being out of your comfort space," Magaña added. "We need to expose our students to develop these other competencies."

That support also needs to extend beyond graduation. ASPPH is working with institutions to clarify advancement pathways for professionals from underrepresented minorities and boost equity in research support. Nationally, they are advocating for loan forgiveness programs. APHL and CDC's expanded laboratory fellowship program and new internship program are bolstering opportunities for students and early-career scientists. In collaboration with organizations that serve underrepresented groups and communities, they are working to identify and eliminate barriers to participation in and completion of laboratory training programs. And CDC's DLS has a core health equity goal of increasing diversity within the fellowship and internship programs by 40% by 2025.

"These are exactly the type of barriers that we need to eliminate," said Magaña.

A Workforce That Walks the Walk

To build an inclusive workforce, hiring, training, support and promotion should all be reframed around equity by actively looking for and rooting out effects of privilege.

It starts with how recruitment is approached, said APHA's Fine.

"It's not enough to say you welcome diverse applications and provide equal opportunities—you have to proactively seek out people with the backgrounds you want and engage with the communities where they are. Where are you seeking and sourcing your talent? [A posting on] Indeed is not enough," Fine said. He also recommends rethinking how to write position descriptions, focusing on plain-language descriptions of the duties and needed skills. Positions should sound attainable to people with varied backgrounds and help individuals see how different experiences and skillsets may be transferable to the role.



“ Privilege is operating even in places where we’re doing health equity work. And it’s important for us to acknowledge that and call it out so we can shift that paradigm.”

Mighty Fine, MPH, CHES

Laboratories can show their commitment to inclusion and employee support by being transparent about hiring, evaluation and advancement criteria and policies. Consider using orientation and onboarding to show new hires how diversity and equity principles are operationalized in the organization’s values, suggests Fine—how performance is reviewed, how promotions and opportunities are given, how to report issues and what the process entails. Presenting clear, established policies up front can help employees feel more empowered to speak up when necessary and are a way to start shifting the culture of the workplace. Then, follow through—remember that the effects of privilege can lead individuals to view circumstances through different lenses. And people notice how they are treated, Fine noted. Are microaggressions called out? Are some individuals’ work scrutinized more than others?

“You start to question if what is happening to you is because people have assigned your abilities to how you look, as opposed to your actual capability,” he said.

Above all, open and transparent communication from leadership is critical to build trust and get buy-in from staff. Nandhu Balakrishnan, PhD, director of clinical microbiology at the Georgia Public Health Laboratory and a member of the APHL DEI Task Force, emphasizes the importance of inclusive leadership for building an effective public health infrastructure. That means making space for everyone in the laboratory to share their voice, then listening with an open mind.

“To build a robust strategic plan for the laboratory, you need to know your people and understand what is working and what’s not working,” he said. “It’s all about the mindset—understanding perspectives and respecting and appreciating people’s cultures, views, ideas and thoughts.” Setting these expectations starts from the top down, Rodemeyer added, with the backing and involvement of the leadership team. But it is not enough to just say these conversations are important.

“They have to lead by example,” she said. “I think they have to talk about it ... and bring up those subjects.”

An equity-centered workplace means each employee is supported and their skills utilized, with access to resources and advancement for everyone in the organization. Mentoring and individual support can be transformative, Balakrishnan said. When he immigrated from India to the US for postdoctoral training, he had relatively few resources. He credits a series of mentors with enabling him to advance his training, find positions, learn how to succeed in the laboratory and ultimately get his green card. A good mentor should be able to help identify strengths and weakness, point out mistakes in a constructive way, and provide tools to help fill in skill or knowledge gaps, he said.

“At each and every step of my career, people have really helped bring out the best in me, even though I made errors, even though I wasn’t born a leader,” he said. “They gave me the opportunity to grow professionally and personally.” ■

Health Equity through PFAS and Wastewater Surveillance

By **Heidi Cox**, MPH, public health analyst, National Wastewater Surveillance System, US Centers for Disease Control and Prevention; **Marc Nascarella**, PhD, state toxicologist, Massachusetts Department of Public Health; and **Erin Morin**, MHS, specialist, Environmental Health



Health equity is achieved when the population has a fair opportunity to be as healthy as possible, regardless of race, ethnicity or social economic status. These social factors often play a role in the levels of exposure to environmental contaminants and infectious diseases. The foundation of addressing health inequities lies in reliable data that captures all populations regardless of social factors, which public health laboratories may have the ability to influence. This article provides a quick look into health equity considerations of two environmental testing areas, per- and polyfluoroalkyl substances (PFAS) and wastewater surveillance.

PFAS

The enormous scale of PFAS contamination provides an opportunity to consider factors of race, power and privilege to ensure the fair treatment of all exposed people. **Recently proposed federal regulations** will require monitoring for PFAS and notifying the public of the health risks. To prevent harmful levels of exposure, environmental health

systems will need to consider racial equity by prioritizing exposure reducing interventions in communities of racial and ethnic minority populations that face an increased burden of exposure to environmental pollution and experience higher rates of disease and overall poor health to achieve equitable health outcomes. New strategies are needed to engage people using culturally and linguistically appropriate approaches and to assess what systems are available to mitigate exposure in that community. It requires investment in new collaborative systems to respond to needs and questions such as:

- How can a family source enough clean water, if there are limited resources to purchase bottled water or physical ability to transport the needed supplies home?
- How can people who fish locally for tribal, cultural or economic need access safe food to eat?
- How can information be used to ensure everyone has access to the types of clinical screening and resources recommended by the National Academies of Sciences?

- What new systems must be developed to ensure all people can benefit from access to a health care provider trained in the necessary medical or public health intervention?

Tools that provide locally relevant, practical and sustainable solutions will help make progress toward equitable health outcomes for all people—and not just those who are privileged enough to have the resources and education to benefit from the interventions.

Wastewater Surveillance

Achieving health equity requires eliminating barriers to participation for population groups and expanding accessibility of public health services to reach socio-culturally diverse communities. The **National Wastewater Surveillance System (NWSS)** is one of the **US Centers for Disease Control and Prevention's (CDC's)** public health programs doing this. Wastewater surveillance addresses a gap in knowledge about where and when active infections are across communities, before confirmed cases are detected and

Achieving health equity requires eliminating barriers to participation for population groups and expanding accessibility of public health services to reach socio-culturally diverse communities.

reported. NWSS develops and sustains new and existing partnerships with wastewater utilities and state, tribal, local and territorial health agencies. The public health benefits of partner engagement help local health agencies identify outbreak trends early and direct interventions to areas with the most need.

NWSS or a similar system can be used for health equity purposes. There are a few things to consider when using wastewater surveillance. Wastewater surveillance aims to preserve anonymity,

but with growing interest in using wastewater surveillance at the facility and neighborhood level, individual anonymity could be compromised in an outbreak due to a small sample size, possibly leading to generating identifiable data. In addition, population groups identified in infectious disease outbreaks may be stigmatized, as seen with mpox and HIV. Some communities are served by decentralized waste systems like septic systems and latrines that receive waste from small or undefined populations; these populations cannot be representatively

sampled. Other populations are served by low-resource waste systems that are ineffective centralized systems with substantial decaying infrastructure or wastewater-impacted environmental waters. Compounding inequities often mean that people in these communities are at a higher risk of infection. A lack of infrastructure may put them out of NWSS' reach, but CDC and NWSS partners will be looking to address this barrier. ■



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Biomonitoring with a Health Equity Lens

By **Kelly Chen**, MSc, research scientist, California Department of Public Health; **Jessica Nelson**, PhD, MPH, epidemiologist and director, Biomonitoring Program, Minnesota Department of Health; and **Jennifer Liebreich**, manager, Environmental Health

Biomonitoring measures levels of environmental chemicals or their metabolites in a person's body fluids or tissues and is an important tool that can characterize the disproportionate burden of harmful exposures among certain communities. Public health programs and academic partners can use biomonitoring data to identify contributing risks and associated health impacts, evaluate intervention strategies, and monitor progress in reducing exposures. Combined, these efforts can lead to meaningful strategies to reduce disparities and move towards environmental health equity.

California

Biomonitoring California implemented the Asian/Pacific Islander Community Exposures (ACE) Project in 2016 and 2017 as a two-phase biomonitoring study of 200 adults in the San Francisco Bay Area. The ACE Project was conducted in collaboration with two community partners: APA Family Support Services and the Vietnamese Voluntary Foundation. These projects were motivated by prior studies across the United States, which have consistently found higher levels of heavy metals and per- and poly-fluoroalkyl substances (PFAS) among Asian/Pacific Islanders (API) compared to other race/ethnic groups.^{1,2,3} Community groups in the Bay Area were also interested in local biomonitoring data, as an evidence base to support ongoing efforts to educate constituents about safer fish consumption.

The ACE Project confirmed that Chinese Americans (ACE 1) and Vietnamese Americans (ACE 2) in California had elevated exposures to arsenic, mercury and legacy PFAS (Figure 1). In both phases of ACE, measured levels were even higher than those seen in a national cohort of API participants from National Health and Nutrition Examination Survey (NHANES). Biomonitoring California provided personal biomonitoring results

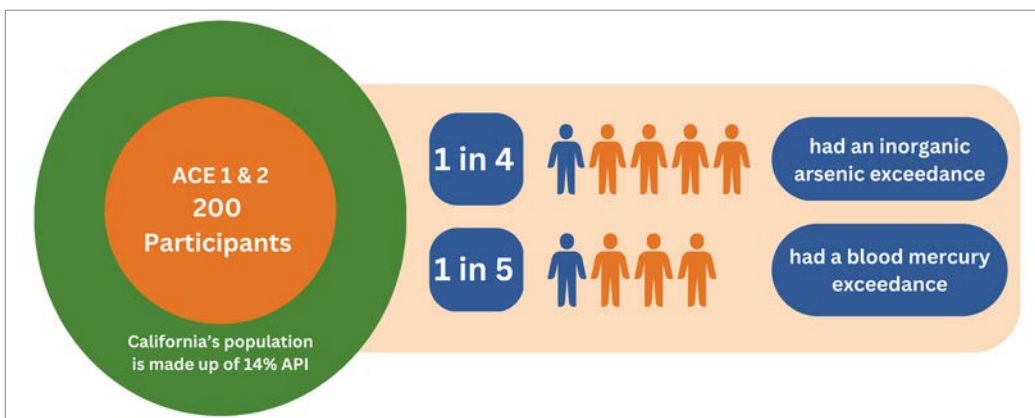


Figure 1. California's ACE Project has adopted levels of concern (LOCs) for arsenic, cadmium, lead and mercury. Participants whose levels exceeded an LOC received personalized follow-up, such as discussions to identify potential sources of their chemical exposures, and advice on ways they might reduce their exposures.

to participants, and for those with elevated levels of metals, conducted a follow-up survey to identify potential sources of exposures and provide advice on exposure reduction. The findings from the ACE Project are being used to develop health education materials on topics including arsenic in rice and safer fish consumption choices.

Minnesota

The **Minnesota Biomonitoring Program's** 2016–2018 **Minnesota Family Environmental Exposure Tracking (MN FEET)** study found that participating women from some Minnesota communities had elevated urine mercury exposures as a result of using skin lightening products. MN FEET showed that skin lightening product use may be putting some Hmong, Latina and East African women in danger of mercury exposure. Follow-up work that offered urine mercury testing as part of routine clinical screenings confirmed these results and emphasized the need for more urine mercury biomonitoring, interventions to reduce exposures, and specific cultural community outreach and engagement on the topic.

The use of skin lightening creams has deep roots in colorism and the preference for lighter skin, supporting a \$10 billion

market. However, a common ingredient in these products is mercury, which is dangerous and illegal. Consumers are generally unaware that mercury exists in these products and are therefore unaware of the risks to themselves and their families. Because of this, these risks and negative health consequences fall unequally on communities of color.

APHA's Environmental Health and Equity Collaborative created ***Achieving Environmental Health Equity: The Need and Opportunities for Public Health Action***, a brief providing background, examples, data and actionable steps environmental public health leaders and their organizations can take to move towards health equity. Actions are organized by the 10 Essential Public Health Services and include a poster and summary version.

Minnesota's multi-disciplinary intervention program utilizes biomonitoring as a key tool in its efforts to:

- Identify individuals who are exposed to mercury through urine mercury testing
- Investigate and identify the exposure source through offering free home visits
- Share information with the individuals and their communities about the dangers, including products tested and found to contain mercury
- Conduct follow-up home visits and repeat urine mercury testing to be sure that individuals' exposure has been reduced. ■



Biomonitoring California staff discuss results of the ACE projects with community partners. Photo: CA Department of Public Health

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APHL Expands to the Middle East and North Africa

By Samira Al-Mahruqi, country director, APHL Oman and Matthew McCarroll, lead specialist, Global Health



Undersecretary and the Director General of the Ministry of Health attend meetings with APHL.

In early 2021, in collaboration with the **US Centers for Disease Control and Prevention (CDC)** and the **Oman Ministry of Health (MOH)**, APHL began activities to build laboratory workforce capacity in advanced molecular detection of priority diseases in the **Oman Central Public Health Laboratory (CPHL)**. In addition, it implemented national-level activities to improve quality systems management, new laboratory design and development, and build laboratory workforce capacity in advanced molecular detection of priority diseases in CPHL. In October 2022, APHL opened an office in Muscat, Oman—the first APHL office in the Middle East/North Africa (MENA) region.

Twinning for Success in WGS and Bioinformatics

CPHL was paired with the **Oregon** and **Wyoming** State Public Health Laboratories through APHL's Twinning Program to focus on whole genome sequencing (WGS) and bioinformatic analysis. Eight staff from CPHL traveled to the United States where they were separated into two cohorts. Each cohort visited Wyoming and Oregon for two weeks to better understand the quality workflows

of advanced molecular detection, WGS, and bioinformatic data analysis. In March 2023, staff from Wyoming traveled to CPHL to assist in refining WGS wet lab workflow and to set their server for enhanced bioinformatic analysis. Staff from Oregon are scheduled to travel to CPHL in June to complete bioinformatics training. To enhance knowledge and expand experience in advanced molecular diagnostics, direct collaboration of CPHL staff with the scientists and bioinformatician from Wyoming and Oregon is in place.

In addition to working directly with CPHL, APHL is also assisting the MOH with strategic planning. MOH is in the process of building a new laboratory that will serve as a Center of Excellence in the region to provide reference testing and training. APHL designed an itinerary for MOH leaders and organized travel to the US to visit state public health laboratories, to view and discuss facility design, operations, workflows, biosafety standards, selection of the appropriate laboratory construction materials and good laboratory practices, giving them insight into how laboratories are

designed, what works, and where the challenges have been.

Looking Ahead

While APHL continues to support CPHL, it has also begun efforts to strengthen laboratory capacity throughout the MENA region. The association recently finished up a bioinformatics training on post-sequencing analysis of SARS-CoV-2 using Terra.Bio and Command Line in Jordan and will continue supporting the growth of their bioinformatics and molecular epidemiology skills through additional trainings. In Morocco, APHL plans to perform a system-level laboratory assessment in summer 2023 that will provide valuable information on the gaps and challenges to both CDC and APHL and help determine how best to address these challenges and strengthen their laboratory capacity. Additionally, APHL will also facilitate a quality management system “training of trainers” in Oman. The trainers will then be able to provide training to other laboratories in Oman or the MENA region at CPHL. ■

Twinning on Two Continents: Tanzania and South Carolina Laboratories Partner to Exchange Opportunities

By **Aika Mongi**, country director, APHL Tanzania; **Reshma Kakkar**, informatics manager, Global Health; and **Lucy Maryogo-Robinson**, director, Global Health



The Tanzania twinning delegation at SC DHEC with Dr. Nicholas Epie, SC DHEC Agency Director Edward Simmer, former MOH Permanent Secretary Abel Makubi and Dr. Ona Adair.

Establishing a long-term relationship between public health laboratories, or “twinning,” is intended to be a mutually beneficial partnership to provide ongoing learning and development opportunities for staff of both laboratories. In many cases, the different experiences and perspectives that are brought to the table through bilateral training and information exchange can benefit both parties and be a valuable learning experience.

Tanzania’s National Public Health Laboratory (NPHL) and the South Carolina Department of Health and Environmental Control Laboratory (SC DHEC) established

their relationship in February 2020 during a courtesy visit with the Director of Diagnostic Services for the **Tanzania Ministry of Health (MOH)**. MOH expressed interest in better understanding the core functions of public health laboratories and their role in public health surveillance (e.g., experience with the diagnosis of diseases rarely seen in the United States or experience with low-cost testing methods). The COVID-19 pandemic highlighted the integral role national public health laboratories play in detecting pathogens of public health significance and coordinating laboratory response.

After a pandemic pause, in-person twinning activities resumed with the MOH team visiting SC DHEC and APHL headquarters in September 2022. The team met with the agency director and division leads to learn firsthand the critical role public health laboratories have in events of public health significance. The team spent time at the laboratory learning about each team’s testing and reporting policies and determined four areas for future collaboration. Following the laboratory visit, the team traveled to APHL headquarters to gain a broader understanding of the association’s domestic and global activities.

Today, the strategic direction of NPHL is mandated by senior MOH leadership and it is in the process of becoming a semi-autonomous public health agency. In addition, NPHL and SC DHEC are finalizing a memorandum of understanding and planning their first collaborative project on non-influenza surveillance using multi-pathogen assays. APHL is excited to be supporting this important initiative through funding from the **US Centers for Disease Control and Prevention**. ■



The delegation meets with the SC DHEC agency director.

Blurred Vision, Clear Danger: Multistate Outbreak Response Launched over Contaminated Artificial Tears

By **Nikki Marchan**, senior specialist, Antimicrobial Resistance



The investigation started in Los Angeles County, California, where a doctor called one case the worst eye infection he'd ever seen.¹ Soon, there would be more.

The **US Centers for Disease Control and Prevention (CDC)**, in collaboration with state and local health departments and the **US Food and Drug Administration (FDA)**, is actively engaged in the surveillance and identification of cases in a multi-state outbreak investigation to identify patients with an extensively drug resistant bacterial infection. The infections are being caused by a strain of carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) that produces the Verona integron-encoded metallo- β -lactamase (VIM) and the Guiana-Extended Spectrum- β -Lactamase (GES). Sequenced isolates were identified as *P. aeruginosa* sequence type (ST) 1203 harboring the bla_{VIM-80} and bla_{GES-9} genes, a combination never observed in the United States. With less than one-third of US hospitals able to test for CRPA, public health laboratories are critical partners in identifying and responding to cases. As of March 14, 2023, 68 cases of the strain have been identified in 16 states, with 37 patients linked to four healthcare facility clusters. These cases came from specimens collected between May 2022 and March 2023 from both outpatient and inpatient healthcare settings.

A Difficult Proposition

The investigation to identify the source of the outbreak was complicated by differences between cases, the fact that the healthcare facility clusters were in different geographical locations, and patients were identified over a span of months. Isolates were obtained from a variety of specimen types, such as sputum, eye wash, urine, blood and rectal swabs. Patient ages ranged from less than one year to over 100, and the observed symptoms included keratitis, respiratory infection, urinary tract infection and sepsis—with severe cases leading to permanent vision loss, hospitalization and death.

One identified cluster was in an ophthalmologist's office, which allowed for the hypothesis that a single eye care product was the cause. Though the other identified infections were found in the lungs of patients in long-term care facilities, the anatomical structure of tear ducts allows for drainage into nasal cavities. This would allow for an infection to spread to the lungs and other parts of the body.

Epidemiological investigation found that most patients—including those with ocular infections—had previously used artificial tears prior to the identification

of the VIM-GES-CRPA infection. Records and interviews identified a common product as EzriCare Artificial Tears, an over-the-counter preservative-free product manufactured by Global Pharma in India, as the only common artificial tears product identified across the four healthcare facility clusters.

Laboratory testing confirmed the presence of VIM-GES-CRPA in opened EzriCare Artificial Tears bottles from multiple lots. Testing of unopened bottles of EzriCare Artificial Tears is ongoing to determine whether contamination occurred during manufacturing.

The Importance of Collaboration

Isolates associated with this outbreak are extensively drug resistant and research is ongoing to determine potential treatment options. The AR Lab Network offers carbapenem resistance mechanism testing and expanded antimicrobial susceptibility testing to aid in clinical decision making and can be utilized as a resource for clinicians looking to inform drug treatment options. Additionally, a bacteriophage with activity against the outbreak strain has been identified and is available as a potential treatment option through the University of California at **San Diego's Center for Innovative Phage Applications and Therapeutics (IPATH)**.

The investigation is still ongoing to identify current and past cases. However, the work during this complex response highlights the impressive investigation skills and coordinated efforts at work when clinical, public health laboratory and epidemiology partners engage in collaboration. The work done by each party—laboratories to detect, epidemiologists to respond and infection control experts to prevent further spread—likely kept this outbreak from becoming much larger. ■

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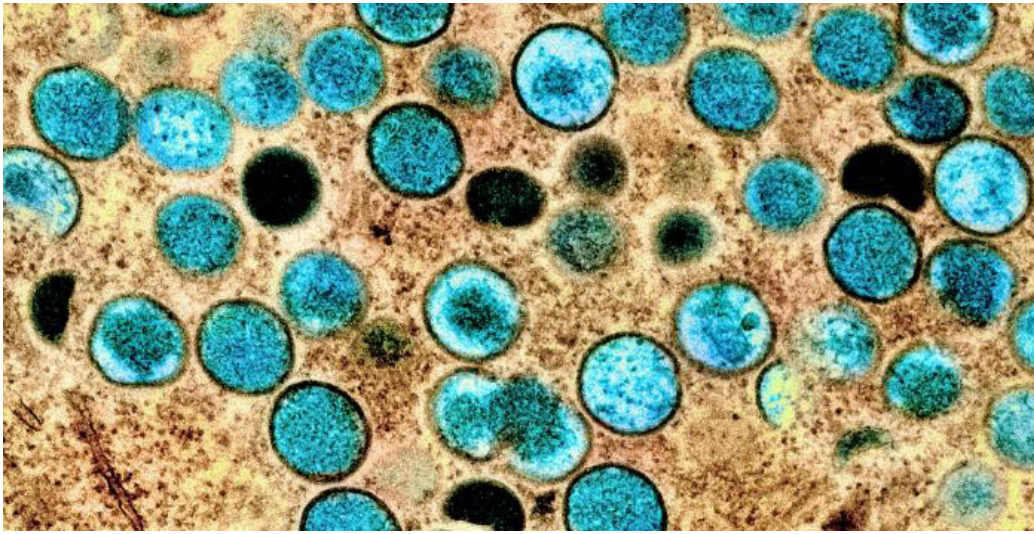


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Mpox: A Year of Partnerships

By Rana Rahmat, specialist, Laboratory Response Network



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

After more than two years of **COVID-19** pandemic response, public health laboratory scientists were exhausted and ready for even the slightest break, but it wasn't meant to be. In early May 2022, the first cases of mpox were detected in London and less than two weeks later, the **Massachusetts State Public Health Laboratory** detected the first case of mpox in the United States. What followed was an increased number of infections being reported from countries around the world, making this the first time mpox had spread widely outside of endemic areas in Western and Central Africa.

Mpox is an orthopoxvirus which is categorized into two types, Clade I and II. Clade I has a fatality rate of around 10% and is considered a Select Agent. Clade II, which is rarely fatal, has a recovery rate of around 99%. Due to the virulence of Clade I, all suspected cases of mpox sent to public health laboratories were tested by the **Laboratory Response Network for Biological Threats Preparedness (LRN-B)**. With guidance from the **US Centers for Disease Control and Prevention**

(**CDC**), LRN-B laboratories, which include federal and Department of Defense (DoD) laboratories, were able to quickly meet the testing demands.

Collaboration is Key

A key factor in the success of responding to this outbreak was the collaboration and coordination between partners. Frequent communication was quickly established between the **US Department of Health and Human Services (HHS)**, **CDC**, LRN-B laboratories and clinicians across the country. Weekly webinars and Zoom meetings ensured that guidance was being shared in a timely manner. The quick development of guidance documents for laboratories and their clinical partners was also instrumental in informing proper sample collection, sharing and shipping to avoid delays in testing.

A component of this outbreak that served as a complication and an outreach avenue for impacted populations was the way mpox spread, which was primarily

through sexual contact. Samples were received by LRN-B laboratories from submitters that had previously not worked with the network in this capacity, including sexual health clinics. To mitigate this unprecedented event, communication and testing were targeted through these same avenues to ensure that the messaging was reaching the at-risk population. Close engagement of partners and transparency in relaying information and preventative measures were major contributing factors in outbreak mitigation.

The partnerships between LRN-B laboratories and **CDC** were also instrumental in the response, particularly in the early days of the outbreak. These partnerships accelerated testing implementation and validation of new technologies, and several laboratories were involved in implementing laboratory developed tests to increase testing capacity. Other laboratories within the network were leveraged for validating the use of technologies such as automated extraction platforms to optimize testing capacity. A select number of laboratories within the network were also able to perform whole genome sequencing on their positive samples, and were able to share those data, processes and challenges with other LRN-B laboratories.

Eventually collaboration between the various parties moved beyond the response. In December 2022, **APHL** in collaboration with the **Association for Molecular Pathology (AMP)** hosted *The Science Behind Mpox* webinar, which brought together various experts to discuss the state of the response, the science behind the virus and its biosafety implications. Webinar attendees were an eclectic group including public health laboratorians, clinicians, academics and those from the commercial sector. ■



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Minimizing Risks in the Public Health Laboratory

By **Stormy Chester**, specialist, Biosafety and Biosecurity and **Michael Marsico**, manager, Biosafety and Biosecurity



Public health laboratories play a critical role in scientific research, testing and discovery, but the nature of laboratory work makes it inherently risky. To minimize risks and provide a safe working environment, a risk management process should be in place to ensure hazards are identified, analyzed and mitigated. This process includes several key steps:

1. **Identify the risks.** Risks can arise from various sources such as supply chain disruptions, environmental conditions, equipment malfunction, and chemical or biological agents. Some questions to consider during risk identification are: What may happen? How may it happen?
2. **Assess the risks.** Conduct a risk assessment to determine the relative level of risk each activity possesses. This helps guide the risk mitigation decision process. An example question to consider during risk assessment is the likelihood and consequence of an incident occurring.
3. **Mitigate the risks.** An example question to consider during risk mitigation is how the public health laboratory can reduce or eliminate the risks associated with hazards.

Here are three examples of different risks APHL member laboratories faced and the significance of implementing risk management in the laboratory.

Raven Foster Biosafety Officer, **Houston Health Department**

In 2017, Hurricane Harvey caused significant damage to the Texas Gulf Coast, forcing laboratories in its path to make risk assessments to prevent exposure and equipment loss. To mitigate these risks, the Houston Health Department implemented several measures. They stationed a contracted engineering company onsite for building maintenance needs and had two backup generators connected to major laboratory equipment in case of power outages. Select Agents were placed in an airtight container within a Ziploc bag and stored in a -80°C freezer. In the event of a flood, they also covered equipment with plastic bags. These actions were taken to ensure laboratory operations could continue with minimal disruption during the hurricane.

Ed Kopp Virology Molecular & Cell Culture Supervisor, **Florida Department of Health Bureau of Public Health Laboratories-Tampa**

During the **COVID-19** pandemic, the Florida Department of Health Bureau of Public Health Laboratories in Tampa faced shortages of various items, including personal protective equipment (PPE) and laboratory consumables. These shortages affected all aspects of laboratory work, from testing processes to employee

DIGITAL EXTRA
APHL resources on the risk management process and risk assessments.



safety. After understanding the inherent risks of these shortages and to prevent future disruptions, the laboratory ordered excess quantities of consumables and disinfectants, and established a well-stocked, maintained supply of PPE and laboratory consumables that do not expire within a set threshold of time.

Dan Hammersley Laboratory Safety Officer, **Minnesota Department of Health**

In 2014, the Minnesota Department of Health experienced a severe equipment failure when the air handling system failed during a freeze, causing substantial damage to laboratory equipment that cost millions of dollars to repair. The investigation revealed that inadequate building commissioning was the root cause of the failure. Based on the investigation and evaluating potential risks, Minnesota now employs a third shift building engineer to monitor temperature.

These examples show how laboratory incidents can be diverse and may arise from various sources. With a comprehensive risk management process in place, laboratory workers can identify, assess and control these risks to create a safe working environment and reduce laboratory accidents and potential exposures. ■

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 laboratorian that will be interesting and informative for APHL members and partners.

**Share your
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peers!**

We can help!

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

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

Gynene Sullivan, MA
Manager, Communications
gynene.sullivan@aphl.org
240.485.2750



Highlighting Member Experiences with the APHL CLIA Audit Tool

By **Tina Su, MPH**, manager, Quality Systems and Analytics



In January 2022, the APHL Clinical Laboratory Improvement Amendments (CLIA) workgroup published the *APHL Guide for CLIA Internal Audits Related to High Complexity Testing*. This guide was developed as a quality improvement tool for internal self-assessments of CLIA laboratory activities. The checklist is divided into applicable sections with the requirements succinctly stated along with examples of compliance.

There are several features of the guide designed to make it user-friendly and comprehensive:

- The State Operations Manual (SOM)/ Code of Federal Regulations (CFR) numbers are hyperlinked within the tables for a full explanation of each requirement.
- The table of contents is clickable, allowing the user to go to that specific section of the guide. There is also a button at the bottom of each page that the user can click to return to the table of contents, eliminating the need for scrolling.
- There is a column designated for user notes.

APHL has received positive feedback on member experiences utilizing the tool in their laboratories:

Lindsay Jolly, MPH, CPH, MLS(ASCP)CM
Assistant Director, **Tennessee Division of Laboratory Services**

We have used the guide quite a bit here in Tennessee. I've used the CLIA position descriptions and competency assessments for supervisors. We have also compared our existing internal audit checklist to the APHL guide and will likely fully transition to the APHL guide within the next year. It has been an extremely helpful tool for us!

Laurie Gregg, MT(ASCP)
Deputy Laboratory Director, **South Dakota Public Health Laboratory**

It has been the most thorough and useful tool I have ever used! South Dakota just had their inspection in early January 2023. We came through with zero citations! I can say that much of that had to do with the APHL Guide. The inspectors made several comments to the ease and clarity of our forms. They particularly like the personnel qualifications and delegation forms which I took directly from the APHL guide.

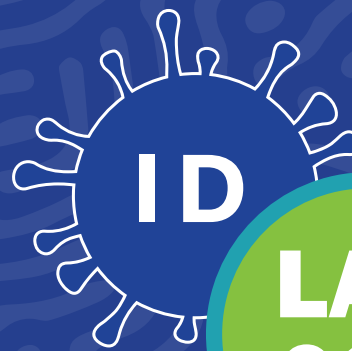
Lydia Mikhail, DrPH, HCLD, MBA, MEL
Assistant Laboratory Director, **Orange County Public Health Laboratory**

I felt it helped me study for my High-complexity Clinical Laboratory Director (HCLD) exam because I had all the CLIA requirements there in one place. Students

who are studying for the exam will find the guide helpful because it lists the information they need to know on what CLIA requires from a public health laboratory. We used the tool in the lab to prepare for our upcoming CLIA audit, by filling out all the sections as a group, including the lab director, assistant lab director and general supervisors. This effort identified gaps, areas we were doing well in and others we needed to address. It was definitely the best and most comprehensive tool to use.

While the checklist was designed for internal self-assessments, it can also be referenced when addressing corrective actions as well as serve as a resource for training new staff. APHL will continue to work with the CLIA workgroup to collect suggestions for improving the guide. If you would like to share your experience using the guide, or have any questions, please contact bertina.su@aphl.org. ■

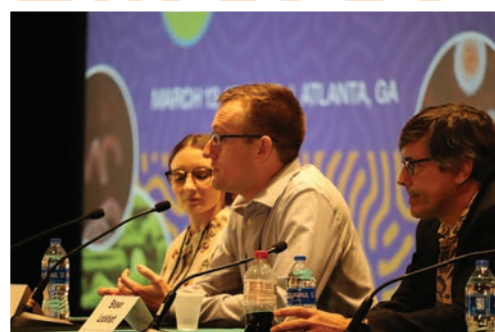
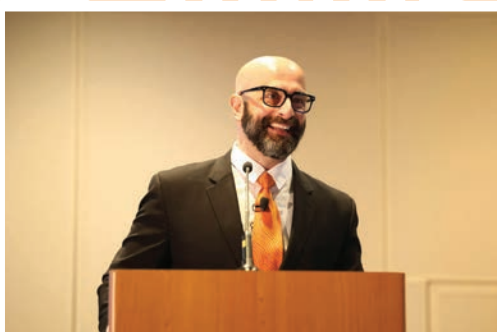
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