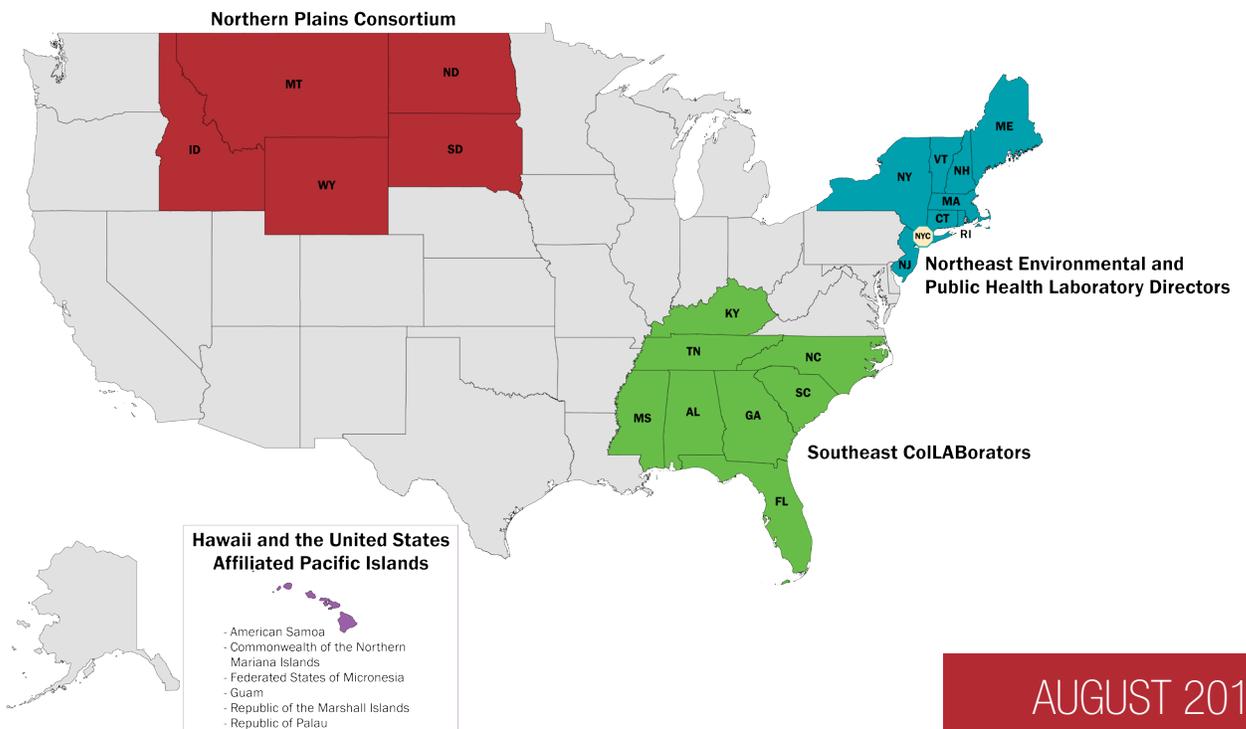


# The Status of State-Driven Regional Networks in the Public Health Laboratory Community



AUGUST 2017

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## Executive Summary

This report is a follow-up to a US Centers for Disease Control and Prevention (CDC)/APHL consultation held in November 2015 to discuss comprehensive testing services in support of public health programs. This report summarizes interviews held in the 1st quarter 2017 to determine the status of state-driven regional networks. Feedback was gathered from members of the three existing state-driven consortia—the Northeast Environmental and Public Health Laboratory Directors (NEEPHLD), the Northern Plains Consortium (NPC), and the Southeast CoLABorators (SEC)—as well as a Pacific Island network between Hawaii and the United States Affiliated Pacific Islands (USAPI).

## Results

### **Pros and Cons**

The laboratory leaders conveyed that there are many advantages to being a part of a state-driven regional network. These advantages cut across a number of areas:

1. Relationship building and collaboration — The most frequently cited advantage, to the state-driven network approach is building long term relationships leading to collaboration among peers across laboratories. A state-driven regional network makes the connection with others who have similar missions, needs, constraints and challenges, and makes it much easier to interact when emergencies arise or when a test system goes down
2. Workforce development (including trainings) — Workforce development efforts are bolstered beyond what could be accomplished alone, as network members: share ideas, technical expertise and existing trainings; produce new trainings; and work regionally to develop leadership expertise among promising staff.
3. Sharing testing services — Though not a primary factor driving state-driven networks, test sharing can provide access to a greater range of technologies and services without having to invest locally.
4. Informatics and interoperability — The ability to use electronic test orders and results (ETOR) when referring samples is a goal to increase efficiency and reduce errors. Concrete ETOR projects between consortium members are in progress.
5. Competing for funding or accomplishing CDC-funded activities — Networks share ideas and approaches, collaborate on grant writing, and are in a better position to propose collaborative work, all of which help strengthen applications and help to secure funding.

Interviewees could not identify disadvantages to participating in regional networks but did identify some challenges with forming and maintaining the networks and its activities. It was obvious, though, that all interviewees feel very strongly about the value and worth of their network.

### **Governance, Regional Interactions, and Needs**

There is variability in how the existing state-driven networks are governed and if formal charters, memorandums of agreement, or bylaws have been established or are being pursued.

Interactions between states and CDC programs and between states and clinical laboratories largely occur at the individual state level. Members of the state-driven networks will meet and discuss issues, share activities and protocols, and exchange ideas; but, to date, state-driven networks do not yet respond or interact as a network with CDC programs or with clinical laboratories.

### ***Advice and Moving Forward***

Respondents outlined various areas of need to help strengthen regional networks, including increased funding for informatics, training and workforce development, and travel. Areas where CDC or APHL could assist networks were also identified.

Existing consortia members also shared eight tips for ensuring successful and effective networks, as they believe that these collaborative partnerships need to be sustained.

To conclude, the interviews supported the idea that state-driven networks, and the deliberations and outcomes of these networks, provide a sound foundation for the evolution and continued sustainability of the public health laboratory system.

**“I would like to see a whole nation of networks, each state and local in a regional network so all could experience the value and importance of these collaborations.”**

**--Mike Pentella, former director, MA PHL**



A recent addition to the state-driven regional networks is the Southeast CoLLABorators (SEC), comprised of the states of AL, FL, GA, KY, TN, MS, NC, and SC. Additional networks are beginning deliberations so that all states will have an opportunity to be part of a state-driven consortium.

Another regional network model is the collaboration established between Hawaii and the United States Affiliated Pacific Islands (USAPI) which consists of six Pacific jurisdictions: the US territories of Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands, and the Compact of Free Association (COFA) nations that include the Republic of Palau, the Federated States of Micronesia, and the Republic of the Marshall Islands. This network was convened differently from the state-driven networks. The USAPI jurisdiction laboratories are synchronized with the Pacific Islands Health Officers Association (PIHOA) and Hawaii's support role was established in response to the 2009 H1N1 pandemic when CDC funding was provided through APHL's cooperative agreement. That funding is long gone, but CDC ELC has helped keep this fragile network viable. The network participants face similar challenges (isolation, logistics, training, transportation, etc.), and Hawaii serves in a "big brother" capacity. Despite the challenges, the network is progressing. In fact, now that Guam has established several real-time PCR capabilities, they can provide reference services such as outbreak support or test verification for other Western Pacific USPFI laboratories, and may be a better surge laboratory for Hawaii than would be a CDC lab on the US mainland.

## Report Design

This report is divided into sections based on the questions that were asked to laboratory leadership. To better understand the current status of these state-driven regional networks, questions were asked that determined 1) the impact of the network on the laboratory, both advantages and disadvantages, 2) the governance and transition of leadership within the network, 3) the status of interactions as a regional network, and 4) what is needed to strengthen the network. In addition, established networks were asked to give advice to new state-driven regional networks as they begin their collaborations, and their vision for the future.

## Impact of the Network on the Laboratory: Advantages

There are many advantages of being a part of a state-driven regional network, as all of the laboratory leadership provided numerous examples of ways their network either improved their laboratory or their work. The most common responses have been divided into the following topic areas: 1) relationship building and collaboration, 2) workforce development including trainings, 3) sharing testing services, 4) informatics and interoperability, and 5) competing for funding or accomplishing CDC-funded activities.

### Relationship Building and Collaboration

By far, the most frequently cited advantage to the state-driven network approach is building long term relationships leading to collaboration among peers. Not only do laboratory directors develop relationships, but senior leadership and technical supervisors also have the opportunity to interact with like-minded professionals in their nearby states. Although informal relationships had been forged among many states in the past, a state-driven regional network provides a more formal recognition which strengthens and builds on those relationships, providing a stronger, more cohesive, organization.

**"When I was considering the NH PHL director position, I asked to attend an upcoming NEEPHLD network meeting. After meeting leaders in other states, and knowing that I had this peer group of experts to call upon, I decided to accept the position."**

--Christine Bean, director, NH PHL

A network provides an opportunity to get to know others, not just on a professional level, but at a personal level, and develop relationships that would otherwise not be made. As one laboratory director pointed out, much of the networking occurs outside of the formal meeting, during breaks or lunches, or at the evening's dinner. Developing these relationships opens up lines of communication to share capacities and capabilities, experiences, issues, and priorities, and to learn from others. An established network makes it much easier to interact when emergencies arise or when a test system goes down or has performance problems and lengthy troubleshooting is required. For example, when the New Hampshire PHL's pipes froze and broke causing an emergency closure, knowing the capabilities of other laboratories in the network made it easy to refer and ship samples to other laboratories in the network so that public health was not compromised.

A state-driven regional network makes the connection with others who have similar needs and similar constraints, common problems and common missions, and serves as a sounding board and idea exchange for such issues as workforce needs, training development, incorporation of technological advances, informatics and interoperability, and grant applications. In states with small staff, a state-driven network offers diversity in leadership and technical expertise, providing opportunities for a small laboratory to leverage this expertise within the consortium, and flex the strength of the network.

**“Think carefully before you act, and have clear expectations. A consortium in name only won’t last.”**

--Chris Ball, director, ID PHL

When asked if being part of a state-driven network made the members more comfortable in reaching out to others for help, many responded that the network is like a family, and it is much easier to contact someone when you know them personally. It is a great peer workgroup to share strategies for handling situations, and provides an already established network for new laboratory directors and leaders. Without this ability to interact, public health laboratories may feel isolated, and directors and other leaders may not have the confidence to reach out for support. Reaching out to an established network is not as intimidating, and there are times a private discussion on a friendly telephone call is much better than writing to a list serv. This networking may be more of a benefit to new laboratory directors and leaders as it is a faster way to feel comfortable reaching out to partners with commonalities; seasoned laboratory directors have developed additional contacts through APHL.

## **Workforce Development Including Trainings**

Another advantage of the state-driven regional networks often cited was workforce development, including trainings to develop and share technical and leadership expertise. One joint project by NH and NJ was developing a training needs assessment based on published laboratory competencies. This project can be shared with others to determine training gaps in their own state or region. Networks have the potential to have significant impact on developing staff knowledge base, as participants can ask colleagues questions and bounce ideas off others. The NPC is recruiting for their second cohort of a Regional Emerging Leaders Program (ELP), which provides mentoring and training to select people in the NPC exhibiting the skills and abilities to become future public health leaders. Although APHL has a national ELP, this regional approach provides an opportunity for more promising staff to participate, and as a graduate of the first cohort stated, built confidence and provided access to a peer group of future leaders. Providing trainings through a regional network is a sound model, as evidenced by NEEPHLD providing a professional trainer for COOP plans or radiation health testing, or NPC providing an expert in quality management systems and biosafety. Plans to use both webinars and on-site trainings to develop expertise around whole genome sequencing (WGS), Bioinformatics, Informatics, and a data repository will be invaluable. Using the networks to deliver

organizational training could also be explored, such as conducting productive meetings, project management, or other management/leadership topics.

Sharing technical expertise was also cited as a positive impact on laboratories. When laboratories are implementing new technologies, regional networks provide a forum for exchanging protocols and troubleshooting. A laboratory doesn't have to start from scratch, and some laboratories have visited a peer laboratory for assistance in setting up new testing protocols, like Ebola. Another example of a technical expertise project is the NEEPHLD CDC/APHL Rabies Assessment Project. Although there was already a tool, NEEPHLD members refined the assessment checklist, and two member states are paired to audit each other's Rabies Laboratory, using the refined tool, to ensure quality testing in an area that is not regulated by CLIA.

## Test Sharing

Although there are clear opportunities surrounding test sharing, this is not a primary reason that state-driven networks exist. Many states cited difficulties surrounding test sharing, including reimbursement, regulation compliance, and legal implications. In states that have no mechanism to bill for services, performing testing for another laboratory would make it difficult to be reimbursed. Because New York State is CLIA exempt, other state laboratories performing tests on samples obtained in New York would need to hold a New York State clinical laboratory permit, which is a barrier to shared testing services. However, those states that have worked out the logistics for test sharing find the benefits to be worthwhile. For example, VT sends low volume arbovirus testing (EEE, WNV) to NH and MA, WY refers HCV RNA to ND, ND refers 16S sequencing identification to WY, ID refers low volume HIV confirmatory testing to ND, and MT sends Lyme Disease confirmations to SD. In addition to current test sharing, there are discussions around setting up one or two laboratories in the SEC to perform regional Zika plaque reduction neutralization tests (PRNT) or other esoteric tests. This would ease the burden of other reference laboratories (CDC) by developing regional capacity, and potentially reduce turn-around-time (TAT).

**"I'm a firm believer in partnerships."**

--Scott Zimmerman, director, NC PHL

Test sharing provides access to a greater array of technologies and services without having to invest locally. A laboratory must leverage existing resources, reagent costs, proficiency testing, training and other hidden costs against the potential for increased TAT. Test sharing, especially of esoteric or low volume tests, may be the best approach, especially when such decisions are supported by epidemiologists, public health departments and surveillance programs.

## Informatics and Interoperability

When specifically asked about whether a regional network impacted informatics and electronic test orders and results (ETOR), there were varying degrees of enthusiasm. In NEEPHLD four or five years ago, there was no interaction, but now many laboratories have accounts with each other, and two are directly messaging. It is widely recognized that the ability to use ETOR when referring samples to another laboratory would be efficient and reduce errors of manual entry, but if testing volumes are low, it may not be cost effective. Most laboratories within a network do not share the same laboratory information system (LIS) vendor or even if they do, customization makes them unique. The cost of interfaces and other resources can make it hard to justify. However, progress is being made. MT and ND are now in production with their ETOR project, although there was a significant cost for the few number of tests that are referred to each other. Some laboratories within the networks have web

portals, allowing for manually entry of orders, and manual download of results, which is a current stop gap solution.

## Competing for Funding or Accomplishing CDC-Funded Activities

Having an existing network with established links to other state laboratories already in place provides a foundation for applying for grants, especially those that may require regional activities. Mechanisms are already in place to streamline the administration and application process, and meet deadlines that might not be attainable if an existing regional network did not exist. Many states have limited resources and expertise for grant writing, and being part of a network helps in securing funds as collaborative work strengthens grant applications. Stronger grant applications ultimately benefits the public health community by providing opportunities to help the general public, and could result in increased funding.

One of the biggest funding sources for public health laboratories is the Epidemiology and Laboratory Capacity (ELC) cooperative agreement. When the ELC grant guidance is released, networks meet to discuss ideas and approaches, and share applications, not just for regional network funding, but for the entire ELC funding opportunity, leveraging the knowledge and thought processes of all the laboratory leadership. WY credits the existence of the NPC as a primary reason they were awarded regional WGS training funds. NEEPHLD was able identify a gap in Rabies laboratory work, and received APHL funding for the Rabies Assessment Project because of the existing relationships among the states.

Being part of a regional network helps states meet and enhance their ELC deliverables or other grant activities by sharing approaches to meet those activities. An example of accomplishing activities is the ELC funding for regional WGS training. In the NPC, because of discussions that had previously taken place, WY already knew the training needs of their region, and could immediately start plans for designing and conducting training when funding was received; there was no need for a training needs assessment which put them ahead of other regional training laboratories.

**“No laboratory is an island, even when it is. We all need to invest in relationship building and collaboration to reap a network of benefits.”**

--A. Chris Whelen, director, HI PHL

## Impact of the Network on the Laboratory: Disadvantages

When asked if there were any disadvantages to being part of a regional network, there was an almost overwhelming no. There may be some obstacles, but there can be no disadvantage to working closer together. It can be difficult to meet for face-to-face meetings due to time away from work, travel costs, travel restrictions, short staffing, and pressing priorities in a state, but networks are accommodating and allow each state to participate at the level they can. Test sharing may also present with obstacles, especially when there is the potential for territorial thinking, wanting to protect in-house testing, and the potential loss of identity and expertise when sending testing to another public health laboratory. However, as pointed out by one laboratory director, PHLs need to stop thinking competitively, and think synergy, as the collective whole is greater than the sum of its parts. Public health laboratories must balance sharing resources with outbreak response, and keep critical areas intact so that local readiness is not compromised. A key example is the need to determine late on a Friday afternoon whether a person has a case of measles or mumps, requiring an immediate public health response. Referring that specimen to another laboratory in the region would delay the response and potentially increase transmission, if the person was infected.

A potential obstacle in the network approach is the difficulty in finding joint projects that have buy-in from all the participating states. When a project for the whole network is proposed, it may not be the highest priority or in the best interests for an individual state. Care must be taken to select projects that will benefit the majority, if not all of the states, and states can participate as they are able. For example, the NPC proposed working on a joint informatics project using the APHL AIMS Hub. The expensive cost of this infrastructure project eventually outweighed the priority in some states, as the number of records that would be processed through ETOR would be minimal, and the project was been tabled.

## Governance and Transitions in Leadership

The existing state-driven networks are governed loosely, and collaboratively. Currently, neither of the existing networks, NEEPHLD or NPC, have a formal charter, memorandum of agreement, or bylaws, although there is some movement in formalizing the existing hand-shake informal agreements.

In NEEPHLD, each state has an equal vote, decisions are made by consensus, and the responsibilities for quarterly face-to-face meeting logistics, agenda development, and chair of the meetings are rotated among participating PHLs on a yearly basis. There is no real governance; everyone takes a role. Meetings are held throughout the region, providing opportunities for laboratory site visits. A standing agenda item is a report of the activities from members who sit on CDC or APHL Committees. NEEPHLD has been in existence since the 1970s, and even with transitions of leadership, has maintained its effectiveness and collaboration. Each state designates a delegate, which may or may not be the laboratory director, and NEEPHLD recognizes the importance of having several people from each state, not just the laboratory director, attend the face-to-face meetings. This allows for more people to recognize the value of the network and provides continuity to the collaboration and related activities during transitions.

In the NPC, Montana continues to take the lead for coordinating activities, grant deliverables, and meeting logistics, as they have a Laboratory Systems Improvement staff member supported by ELC funding. The NPC is currently in transition, as between 2013 and 2015 there was a change in laboratory directors in 4 of the 5 states, and by 2016, there was only one member of the original NPC still involved. Because of this transition, the leadership is more decentralized, and laboratory directors in all the states are taking a larger role in the direction of the NPC and are working to define NPC 2.0's future strategies. At first, bi-annual face-to-face meetings were held in southeast Montana, as it was centrally located for ND, SD, and WY. With the addition of ID, travel became more difficult due to the vast geography, and now meeting sites are being rotated among the states. In addition to face-to-face meetings, conference calls are held to discuss issues and progress on activities. The NPC recognizes that it is critical to develop a base of leadership, and that senior scientists need to participate, because many of the great ideas come from the scientists working together. This can be difficult in the small laboratories of the NPC where the total staff numbers are low, and people wear multiple hats. During this past year, a memorandum of agreement (MOU) was developed to formalize existing and new mutual agreements between the NPC states, enhance laboratory system improvement activities, and increase the capacity to leverage shared resources. This MOU is currently making the rounds of the states for signatures.

**“Public Health Laboratories should no longer be state centric, but have a national focus.”**

--Mike Pentella, former director, MA PHL

The newly established SEC is currently organized similar to the other state-driven networks. Tennessee received funding to organize the first meetings, and has taken the lead, but it is envisioned that project leads and meeting organizers will rotate among the states. They are

developing a charter that will provide guidance for the governance to provide continuity and consistency.

In the Hawaii-USAPI network, PIHOA supports a full time laboratory coordinator based on Guam who is the “glue” that keeps the network together. This person is constantly traveling among the member laboratories, facilitating trainings such as packaging and shipping, and maintains coordination and relationships that help labs succeed. Peer-to-peer laboratory visits funded by CDC ELC has added another dimension to the relationships that Hawaii can forge with the various jurisdictions, and early successes include Trioplex testing in Guam, influenza PCR testing on Saipan, and Leptospirosis IgM testing in American Samoa.

## Regional Interactions

### Interactions with CDC Regions

For the most part, the networks themselves do not directly work with CDC’s various network structures. CDC has defined certain networks and regions, but with the exception of PulseNet and the Antibiotic Resistance Laboratory Network (ARLN), these regional networks are more accurately characterized as referral schemes. Vaccine Preventable Disease Reference Centers, HIV NAT Reference Centers, and TB Genotyping Reference Centers are examples of referral schemes, where PHLs are assigned to a specified laboratory to refer samples for additional testing. These reference centers have had an impact on state-driven network test sharing, as tests that were once referred to a laboratory in the NPC are now shipped to the designated reference center, primarily since shipping costs were covered.

State-driven networks were established for different purposes, so were not designed to match CDC PulseNet or ARLN regions, causing differences in regional borders. In the case of NEEPHLD, there is a perfect match geographically. Both the NPC and the SEC are split among the PulseNet and ARLN regions, with NC and SC in a different region from the other states in the SEC, and ND and SD in a different region from the other states in the NPC.

However, whether the CDC region and the state-driven network be geographically similar or not, there are still differences among state capabilities and state needs, and the interactions between the state-driven networks and the CDC network structure occur independently, as an individual state to the CDC network. Members of the state-driven networks will meet and discuss issues, share activities and protocols, and exchange ideas around the topics covered by the CDC regions, but, to date, the state-driven network does not respond or interact as a network with CDC programs.

**“You can’t put a price on idea-sharing—it is priceless.”**

--Sarah Buss, director, WY PHL

When states are not in the same regions, it impacts the momentum. Because of the relationships that have been built over time, states may go outside of their CDC assigned region for assistance on certain issues. It was felt that there needs to be a broader look at how CDC develops referral schemes and regional reference centers.

### Interactions with Clinical Laboratories

Like interactions with CDC networks, the outreach to clinical laboratories that the state-driven networks perform occurs independently, on a state basis. Not all states have outreach coordinators, and the communications to clinical laboratories vary greatly from state to state. Outreach is an

opportunity to establish the value of state and local public health laboratories, and to demonstrate the knowledge base that is present in PHLs, but there has not been a concerted effort to organize these communications on a regional basis. Network members do interact around specific topic areas, such as biosafety, preparedness, trainings, or emerging diseases such as Zika and Ebola but the actual interaction with clinical laboratories is still done by the state. This could be due, in part, for the need for timely messages that may only be needed in one state. For instance, when there were two cases of Brucella which led to exposure in a clinical laboratory in CT, the laboratory director immediately reached out by e-mail to the clinical laboratory, discussing a shared experience and providing messages on ways to avoid exposure, and the steps that would be needed for follow-up.

NPC and NEEPHLD have most recently used the state-driven networks as a forum for their respective Biosafety Officers (BSOs) to meet and discuss ways to approach clinical laboratories, share documents, and develop resources such as risk assessment guidance. These subgroups of BSOs are developing strong leadership among their peers, and generating creative ideas. Hawaii-USAPI laboratories have also worked together on biosafety and risk assessments, and are doing peer-to-peer visits.

**“The NPC is an opportunity to brainstorm with a group that has similar challenges, but different perspectives.”**

--Debbie Gibson, deputy director, MT PHL

The NPC provided several examples where they have leveraged their outreach to clinical laboratories, such as a regional TB NAAT educational campaign, and providing quality management systems (QMS) and antimicrobial susceptibility training (AST) to the region. They are currently working on a preparedness on-line course for clinical laboratory professionals, and on using ID’s biorepository to develop a preparedness survey for the clinical laboratories in the region.

Although the state-driven networks rarely interact directly with clinical laboratories, bringing topics for discussion to the network, such as how to encourage clinical laboratories to submit isolates to the ARLN, provides for different perspectives which can be more creative, and more effective when reaching out to clinical laboratory partners.

## **Interactions Among Other State-Driven Networks**

Lessons can always be learned from others, and sharing both positive and negative experiences among state-driven networks was viewed as very beneficial. There is no reason to reinvent the wheel. Not all examples may be transferable, since in reality the networks are very different in size, needs, priorities and governmental structures, and what works in one region may not work in another. For example, in the NPC, approaches for interactions with Native American tribes could be an important focus, but this might not be useful in other parts of the country. However, having the ability to share ideas, discuss reasonable approaches, and develop new contacts can only strengthen existing networks.

It was suggested that an opportune time for networks to interact is during the APHL Annual Meeting, and that a time could be organized to share ideas and collaborate in a relaxed setting. It could be an opportunity to be creative, not directed, and have others talk about stumbling as well as successes. It would also be worthwhile to have examples of regional network successes outside of public health; clinical laboratories or others might share success stories.

Having a CDC presence and an APHL presence at all network face-to-face meetings has been very beneficial. These participants serve as a national liaison between the networks, and provide input

and feedback about other network activities, as well as provide information about CDC and APHL initiatives that may impact the networks.

## Needs to Strengthen the Network

If more funding was available, leaders were asked to prioritize needs that would strengthen the networks.

**Funding for Informatics:** One of most often cited responses was the need to improve informatics and the electronic test orders and results (ETOR). Everyone has different laboratory information management systems, and in order to effectively perform test sharing or reporting to CDC, some means for electronic message exchange is needed. Progress is being made in this area, and there are some instances where two states are directly messaging. However, each state's informatics is at a different stage of development, and staffing, expertise, and the cost of interfaces makes it difficult to advance this initiative quickly. To justify the high cost of resources for ETOR, the end result must be cost effective, and many times costs will exceed test volumes.

**Funding for Trainings and Workforce Development:** Another critical need was for workforce development and more coordinated technical trainings and workshops at the regional level. The model of the regional emerging leader program (ELP) started by the NPC to help with succession planning, provides a platform and curriculum to prepare staff with potential for leadership positions in their laboratories. There was interest in launching a similar program in other network to develop future leaders. Funds to continue the concept of regional trainings, such as the WGS trainings, was often mentioned, as the networks see themselves as a conduit for technical trainings. One state may have expertise in a certain area, and can provide on-line trainings or invite scientists and leaders to their laboratory for workshops to develop additional expertise. Strengthening a state's reference capabilities can complement testing performed in clinical laboratories, and when results are received in a timely manner to guide treatment and infection control practices, the value of public health laboratories is demonstrated.

**Funding for Travel:** Most leaders also cited funding travel for face-to-face meetings as a continued need to strengthen the state-driven network. Although obstacles have been previously described, the benefits of an in-person meeting still outweighs the challenges. Leaders also cited more sharing of services to improve the region's interactions, such as the rabies laboratory assessments in the NEEPHLD states. Expanding these types of experiences through peer-to-peer interactions will continue to foster the relationships and meet the needs of the states. In addition, regular meetings of quality, safety and scientific staff, where they can share common issues and problem solve would strengthen the entire network.

**“A laboratory director’s responsibility is so vast: on any given day you deal with issues from deep science to deep politics and anywhere in between.”**

--Jafar Raseq, director, CT PHL

Although state-driven regional networks provide much more than test sharing opportunities, this was still mentioned as a need. Continuing projects to determine a standard cost per test and a billable fee, or third party billing are also activities that are part of test sharing.

Other needs expressed were:

1. Set up in-house proficiency testing (PT) among the network states for those tests that do not have commercial PT materials available,

2. Implementing formal agreements (MOUs), as states can be reluctant to agree to mutual aid that is undefined, and there needs to be assurance that the states' liability is not in danger, and
3. Logistical help in organizing meetings, taking notes, tracking progress on deliverables and information exchange with other networks.

One laboratory director pointed out that funding won't erase the challenges that arise with the lack of staff and resources, and laboratory directors and leaders need to have the courage to step up and talk about critical testing, and approach sustainability with new thinking. The state-driven network model would be the forum to begin these discussions.

Leaders were asked if there were national activities or resources that could be implemented to strengthen their network, specifically videoconferencing and national trainings, or assistance from CDC or APHL.

**Videoconferencing:** Although they would prefer face-to-face meetings, leaders agreed that videoconferencing capabilities would be helpful; any enhancement of communication would strengthen the network. Videoconferencing is better than conference calls, since it is more likely that participants will be engaged, and not multi-tasking during the discussions. There was concern expressed about software restrictions in some states, and it was noted that videoconferencing cannot completely replace face-to-face meetings. However, effective videoconferencing could be used between in-person meetings for targeted, short (one or two hours) meetings, to discuss one or two issues, track project progress and keep momentum going.

**“The NPC is one thing I am involved with that I never had any problems selling to upper levels of management at the WY Department of Health, as the regional network is highly regarded and well respected. In a small laboratory, it just makes sense to collaborate.”**

--Sarah Buss, director, WY PHL

**National Trainings:** When asked if national trainings would strengthen the network, the responses were mixed. Most leaders felt that APHL does a good job in planning and delivering technical training on a variety of needed topics. Some felt that perhaps new leaders and laboratory directors could benefit from some organizational and leadership training, but the networks themselves seem to be well functioning. Some people are born facilitators, and keep the meetings on track. Topics that were mentioned as possible trainings were 1) conducting productive meetings, 2) project management, 3) crucial conversations, 4) keeping people motivated and engaged, 5) dealing with the politics of public health laboratory management (media, commissioners, legislative issues), 6) time management, and 7) documenting return on investment (ROI).

**CDC or APHL Assistance:** When asked what CDC or APHL could do to assist networks, leaders had some concrete suggestions:

1. Be a champion for state-driven networks; continue to advocate for funding, encourage expansion and coordination among programs at CDC, attend network meetings and share information.
2. Dedicate an APHL staff person to serve as a neutral liaison between the regional networks. This person would attend all in-person meetings to share information and could help with project management, overseeing priorities and keeping on a timeline.
3. Design a model MOU template that is approved by APHL or CDC, and has gone through at least one state's attorney general legal process.

4. Engage state health officers (SHOs), as many of the projects/activities need SHO involvement, and the additional buy-in and commitment from others will strengthen the network.
5. Secure contractors and facilitate trainings to provide guidance and expertise to states or regions to include funding support for travel and activities such as WGS implementation, Informatics, or the Regional Emerging Leader Program curriculum.
6. Continue to use the state-driven networks as a resource for APHL and CDC, such as when NPC and NEEPHLD members vetted the APHL Public Health Laboratory System Database (PHLSD), or to pilot certain projects.

## Advice for New Regional Networks

As new state-driven networks are stood up, existing networks had some words of advice, based on their experiences, for ensuring a successful and effective network. The advice came down to these themes:

1. Start small, be creative, and get moving. Be realistic in generating goals; only pick 1–3 goals that are meaningful to all states. Accomplish one thing, show progress and early success, and build on it. There should be a defined scope of work, and there needs to be a network lead to keep momentum.
2. Hold face-to-face meetings regularly (but no more than quarterly), as these make the difference. This is where everyone is engaged and the work gets done. As hard as it may be to commit to travel to in-person meetings, this is where team building occurs and long lasting relationships are forged. These meetings provide the opportunity to interact with others, strengthen personal and professional relationships, and allow you to get to know the people you will call on in an emergency.
3. Come in with an open mind, and open lines of communication. Establish strong communication and value the personal relationship building.
4. Involve your State Health Officer; getting buy in and interest early could help make things happen. Don't get hung up on MOUs and details—these take a lot of time.
5. Think about the size of the network making certain it isn't get too big, either geographically or in the number of states involved, to be effective.
6. Apply for funding opportunities that will help maintain the activities, including the face-to-face meetings.
7. Share as much as possible with your network colleagues and with your staff in your laboratory. Involve as many as possible from your laboratory (2–4), and keep staff informed on the importance and the value of the network.
8. Spend time thinking about what you hope to accomplish, and make certain that all network partners are on the same page. Gauge your level of commitment, determine the time and resources that can be devoted to the network, and honor it for 2–3 years. This will help you determine the true value of a state-driven regional network.

**“In Alabama, we don’t always get to drive the bus, but I’d like to change that. Being part of a state-driven network (SEC) will help.”**

--Sharon Massingale, director, AL PHL

## Vision for the Future

It was obvious that all the members of the state-driven networks interviewed feel very strongly about the value and worth of their network, and that these collaborative partnerships between state and local PHLs need to be sustained. As one laboratory director pointed out, the longevity of NEEPHLD proves that it works. Existing networks need to continue, be fertilized, and expansion of networks to all areas of the country should be encouraged. State-driven networks are so much more than a strategy for public health laboratory (PHL) service provision. Face-to-face meetings, where relationships are fostered and collaborations strengthened should be encouraged. Established projects that have demonstrated value, such as the regional emerging leaders program, regional trainings, and the informatics work in electronic data exchange, need continued support. State-driven networks, and the deliberations and outcomes of these networks, provide a sound foundation for the evolution and continued sustainability of the public health laboratory system.

## Acknowledgments

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Name	Laboratory	Position	Network
Sharon Massingale	Alabama PHL	Director	SEC
Jafar Razeq	Connecticut PHL	Director	NEEPHLD
Chris Whelen	Hawaii PHL	Director	HI-USAPI
Chris Ball	Idaho PHL	Director	NPC
Michael Stevenson	Idaho PHL	Deputy Director	NPC
Ken Pote	Maine PHL	Director	NEEPHLD
Mike Pentella	Massachusetts PHL	Director	NEEPHLD
Daphne Ware	Mississippi PHL	Director	SEC
Debbie Gibson	Montana PHL	Deputy Director	NPC
Angela Dusko	Montana PHL	Lab Systems Improvement Specialist	NPC
Christine Bean	New Hampshire PHLs	Director	NEEPHLD
Onesia Bishop	New Jersey PHL	Director	NEEPHLD
Jennifer Rakeman	New York City PHL	Director	NEEPHLD
Jill Taylor	New York State (Wadsworth) PHL	Director	NEEPHLD
Ron Limberger	New York State (Wadsworth) PHL	Division of Infectious Diseases Director	NEEPHLD
Scott Zimmerman	North Carolina PHL	Director	SEC
Christine Massen	North Dakota PHL	Acting Director	NPC
Ewa King	Rhode Island PHL	Director	NEEPHLD
Tim Southern	South Dakota PHL	Director	NPC
Rick Steece	Tennessee PHL	Director	SEC
Mary Celotti	Vermont PHL	Director	NEEPHLD
Sarah Buss	Wyoming PHL	Director	NPC

## Addendum: Non-Network Collaborations in the State Public Health Laboratory Community

### Executive Summary

Nine public health laboratory (PHL) directors were interviewed to gather insight into collaborations that are occurring among PHLs that are not part of a state-driven consortium, and to gauge interest in creating new regional networks. Questions solicited responses regarding:

- 1) collaborations with other PHLs,
- 2) level of comfort in reaching out to others,
- 3) interest in participating in a state-driven regional network and how such a network should be designed, and
- 4) how the US Centers for Disease Control and Prevention (CDC) and APHL could assist in advancing new state-driven regional networks.

Collaborations occur in PHLs regardless of whether they are part of a state-driven network, but approaches to test sharing, outreach to clinical laboratories, interoperability projects, trainings and technical assistance may differ.

Laboratory directors feel comfortable reaching out to others primarily through relationships established during opportunities afforded by APHL. However, this may not be the case for other senior staff, and regional state-driven networks may be useful in connecting these leaders.

Laboratory directors agreed that a state-driven network would provide benefits to their laboratory; however, there was some hesitancy in committing to forming a new network without more discussion. A list of potential benefits was compiled and input into the design of a new network was gathered. Geographic location was considered to be the primary factor in designing a network, although the capacity of member laboratories and their participation in existing regions, such as the Environmental Protection Agency (EPA) or PulseNet, should also factor into the design.

All of the laboratory directors interviewed felt that APHL would need to take the lead in the establishment of any new network by identifying a potential network and organizing a pilot meeting. This pilot meeting would be attended by laboratory leaders from each laboratory—not only the directors—and a set of questions would be developed to stimulate discussion on the need and benefits of a state-driven network.

It was suggested that APHL organize and facilitate the early meetings of the new networks to ensure all participants are engaged, remain involved with the process and make professional connections. In addition, APHL should designate a liaison to serve as a communication link between all state-driven networks and to ensure that the networks continue to function and address identified needs.

APHL and CDC should continue to advocate for state-driven networks and seek funding and support throughout their agencies. Funding would be needed to support travel and videoconferencing, trainings and workforce development opportunities, interoperability projects and other identified needs.

APHL and CDC have worked hard to provide avenues to foster relationships between laboratory directors and other leaders in the PHL community. The establishment of additional state-driven networks will strengthen PHLs and bring unity to a PHL system that is constantly challenged with

funding cuts, the acquisition and implementation of new and improved testing methods, and the need for outbreak response.

## Background

Currently, 30 of the 54 state and territorial PHLs (and two local PHLs) are part of five state-driven regional networks:

1. in the New England area, the Northeast Environmental and Public Health Laboratory Directors (NEEPHLD) group
2. the Northern Plains Consortium (NPC)
3. the Southeast CoLaborators (SEC)
4. one in the Pacific Islands, and
5. the Mid-Atlantic Consortium (MAC).

As a result, 24 state and territorial PHLs, and a majority of local PHLs, work independently on many of the same issues being addressed collectively within state-driven networks.

## Report Design

To gather insight into collaborations that are occurring among states that do not currently participate in a state-driven consortium and to gauge interest in creating new networks, laboratory directors from the states of Alaska, Arizona, Illinois, Indiana, Kansas, Michigan, Minnesota, Texas, and Utah were interviewed in April and May 2017. A standard set of questions solicited responses regarding 1) collaborations with other PHLs, 2) level of comfort in reaching out to others, 3) interest in a state-driven regional network and how such a network should be designed, and 4) how APHL and CDC could assist in advancing new state-driven regional networks.

## Current Status of Collaborations

Laboratory directors were asked about their collaborations with other PHLs outside of their state in the areas of test sharing, interoperability projects, outreach to clinical laboratories, trainings and technical assistance.

### **Test Sharing**

Most of the laboratory directors interviewed felt their laboratories were strong and self-sufficient, and were not looking to either outsource testing to another PHL or solicit testing from other PHLs. However, some laboratory directors already outsource low-volume environmental and clinical testing to other PHLs or to CDC or CDC-established referral centers like the Vaccine Preventable Disease (VPD) Reference centers.

Most of the interviewed laboratories have called upon others on a case-by-case basis when there was an emergent need, such as a loss of trained staff, BSL-3 facility down time, discontinued tests for newborn screening or surge testing during outbreaks. Many of these laboratories have existing Memoranda of Understanding (MOUs) with other PHLs for emergency testing and surge, such as the Four Corners states of Arizona, Colorado, New Mexico and Utah, or the northwest states of Alaska, Idaho, Oregon and Washington. Some MOUs are process-specific, such as providing botulism toxin testing services for another state; others are disease-specific, such as Zika validation of urine samples or salmonella bioinformatics analysis. Those states with local

PHLs within their jurisdiction can receive emergency assistance from these local laboratories, and commercial laboratories can reduce the testing burden on PHLs during emergencies. The majority of test sharing that occurs is driven by grants and CDC projects, such as VPD, PulseNet, CaliciNet, TB genotyping, and HIV RNA testing referral schemes. Minnesota, Wisconsin and Michigan partnered in a grant for the Great Lake Restoration Initiative and shared environmental testing based on expertise in their individual laboratories.

Although the interviewed laboratory directors were not averse to performing testing for others, they pointed out various challenges when providing testing outside of their jurisdiction. Before providing a service, the testing would need to be evaluated in terms of expected volume and estimated staff time to perform the service, potential legal issues, and how and if costs could be recouped. Financial arrangements in the states varied. Some states bill through an intergovernmental agreement, others need a contract or agreement in place that met their procurement rules, and one state has no mechanism to bill or be reimbursed. Another consideration for test sharing is the ease of sample transport. Alaska has extensive expertise in testing for foodborne botulism, but the only commercial carrier that will ship a Tier 1 select agent such as botulinum toxin does not service Alaska.

When laboratory directors were asked if they offered a niche test that could be provided as a shared testing service to other PHLs, radiochemistry testing was mentioned more than once. This is an expensive methodology, and laboratories with capacity would be willing to provide testing to improve efficiencies. The challenges of test sharing in laboratories outside of a state-driven network have many similarities to those found when interviewing laboratory leaders from existing networks.

### ***Interoperability Projects***

Another challenge in performing shared testing services is the capacity to exchange results in a timely and secure manner. Most of the laboratory directors interviewed stated that they have made little progress in addressing interoperability and the exchange of HL7 data with other states, or even within their state to their clinical partners. They all have the capacity to send data to CDC electronically, some have secure web portal capability and a few can exchange HL7 messages, primarily for newborn screening. In the past, there was some interoperability success when two PHLs shared the same Laboratory Information Management System, but this was for special projects only. Although the APHL AIMS Platform could be a valuable resource for data exchange, some of the laboratory directors cited the challenges of working with their state's centralized information technology services to achieve electronic exchange of data, in addition to obstacles like data sharing agreements and other legal and data security concerns when sharing data outside of the state's jurisdiction. These laboratories share many similarities to state-driven network laboratories in terms of informatics capabilities.

### ***Outreach to Clinical Laboratories***

None of the laboratory directors interviewed provided outreach to regional clinical laboratories in partnership with another state PHL, although Arizona and New Mexico used peer-to-peer visits funded by the CDC Epidemiology and Laboratory Capacity (ELC) cooperative agreement to collaborate on biosafety training resources and tools. All the laboratories have initiatives to engage the clinical laboratory professionals in their state, but the extent of engagement varies. Indiana and Michigan have strong established relationships, and all laboratories will be gearing up under the Antibiotic Resistance Laboratory Network (ARLN) to reach out to clinical laboratories. When Kansas lost their State Training Coordinator, they reached out to Iowa to provide the necessary faculty to provide a wet workshop to their clinical partners on the agents

of bioterrorism. To date, however, the outreach has been performed independently and reaches only those laboratories in their jurisdiction, which is similar to those states that are part of a state-driven network.

### **Trainings**

Training is a large responsibility within PHLs, both training of staff and of partners, such as clinical and environmental laboratory professionals. The majority of training offered to clinical laboratories is done within the state, not across state boundaries, such as packaging and shipping trainings. Most states work independently on providing training, although Utah partnered with the Colorado Integrated Food Safety Center of Excellence for a joint training that included epidemiologists, laboratory professionals and environmental scientists. Efforts to provide regional, multi-state trainings to PHL staff are not currently occurring in the laboratories that were interviewed, unless funded through APHL. This will likely change as CDC programs are funding regional trainings for whole genome sequencing through ELC and antibiotic resistance through the ARLN. This may be an area where being part of a state-driven network has an advantage, as workforce development, including trainings to develop and share technical and leadership expertise, is a key component of the network's shared services.

### **Technical Assistance**

All of the laboratory directors agreed that technical assistance is often provided as a service to fellow laboratory professionals, whether they are part of a state-driven network or not. These informal, case-by-case interactions occur frequently, whether it is regarding samples to validate a new test method or a new sample source, participation in a sample exchange program when commercial proficiency testing is not available, troubleshooting an assay, providing bioinformatics or other technical expertise, or sharing leadership experience.

### **Reaching Out for Assistance**

When laboratory directors were asked about reaching out to others for assistance, they all agreed that the contacts they have made through APHL make it easy to pick up the telephone or send an e-mail. Whether it is meeting people at the Annual Meeting, being part of the Board of Directors, sitting on an APHL Committee, being part of the Network of Laboratory Leadership Alumni, or participating in a special work group, PHL leaders have many opportunities to build relationships through APHL. These relationships allow leaders to interact with like-minded professionals, and to know who to go to for expertise. When other senior staff do not have access to these opportunities, it is more difficult for them to reach out to others, and a state-driven network may provide a venue to establish and nurture these safe relationships.

**“There is no need to recreate the wheel—I know I can reach out to others and not spend hours researching a topic.”**

--Victor Waddell, director, AZ PHL

### **Design and Interest in Being Part of a State-Driven Network**

All laboratory directors agreed that the concept of state-driven networks would be beneficial to PHLs, but there was some hesitancy in committing to a new network without more discussion. Because of Alaska's geography and vast distance from the lower 48 states, the logistics of travel makes it difficult to develop close interpersonal relationships among senior leaders, and to share services within a region.

Some of the potential benefits of a state-driven network mentioned include:

- Improving surge capacity and response to Continuity of Operations (COOP) situations
- Having a “sounding board” of fellow PHL professionals to talk through a broad range of problems, both technical and managerial issues
- Increasing the environmental and clinical capacity of the laboratory through shared testing
- Developing the laboratory’s workforce on a regional scale
- Sharing training materials, resources and tools
- Exchanging policies, processes and procedures
- Increasing the likelihood of face-to-face meetings, since it can be easier to have numerous staff attend regional meeting rather than a national meeting.

When looking for a laboratory to perform a certain test on a certain sample source, discussions on the APHL Laboratory Directors list serv illustrate the different capacities that are present in member laboratories, both in infectious disease and environmental testing. Through a state-driven network, laboratories can learn about the various capacities, strengths, and weaknesses of partnering laboratories. This can lead to the establishment of mutual respect, and provide mutual benefit by increasing the willingness to reach out for help, and to provide assistance to others.

Because of the benefits that could be achieved through a state-driven network, the laboratory directors were very interested in exploring the possibility of developing additional networks, and becoming active members.

When asked how these state-driven networks should be designed, laboratory directors felt that geographic location, capacity and the presence of existing regions (e.g., CDC, EPA) would all be relevant factors, but geography may have more weight.

- **Geography:** A network of neighboring states would help with the logistics of travel and routine interactions such as trainings and outreach. Sample transport is not a factor with the availability of next-day shipping, although being in vastly different time zones could be problematic. Neighboring states most likely would share the same history, demographics, disease burden and climate, and would understand the challenges of dealing with similar populations and threats.
- **Capacity:** When weighing capacity as a factor in forming a state-driven network, it may be helpful to partner with a laboratory that has more capacity, which could increase the amount of assistance provided to the network.
- **Existing Networks:** As for the existing funded networks, relationships have been built through PulseNet, Newborn Screening and EPA regions, for example, and it could be important to maintain those relationships in a new network. However, these existing regions are specialized, with the same people interacting around one topic. A state-driven regional network would need to be broader in scope and address many aspects of the PHL system.

“Geography matters in a state-driven network. Florida and Utah are not alike in terms of disease burden. Florida deals with hurricanes and Utah deals with earthquakes.”

--Robyn Atkinson-Dunn, director, UT PHL

## Ways APHL and CDC Could Advance a New State-Driven Network

Although laboratory directors were interested in exploring being part of a state-driven network, they felt that APHL needed to take the first steps, with funding from CDC, in order to get these networks started and help them gain momentum.

The first step would be to identify potential networks of states, primarily based on geographic location. Some of the states have already selected partners, such as the Four Corners states (Arizona, Colorado, New Mexico, Utah) or the northwest (Alaska, Oregon, Washington) which could be built upon. APHL then would convene a pilot face-to-face meeting of state laboratory leaders from a defined geographic area to test the state-driven network concept. This meeting should not only be attended by directors, but include other laboratory leaders such as biosafety officers, training coordinators, quality officers, informatics staff, subject matter experts in infectious disease testing and environmental testing, and laboratory management. This pilot meeting would use a set of questions to stimulate discussion on the need and benefits of a state-driven network, including:

- Identifying the current capacities of the invited states
- Identifying the needs of the network
- Identifying gaps in testing or services offered
- Identifying funding needs
- Identifying ways to form a network to ensure that the process is not negatively affected by changes in laboratory leadership
- Identifying a state to initially drive the network process

During the initial pilot meeting, plans for future face-to-face meetings or videoconferencing would be determined and meetings could be organized around training events. It was suggested that APHL organize and facilitate early meetings of the new networks to ensure all participants are engaged, involved in the process and make professional connections. Agendas would be tailored to broadly discuss all areas identified in the pilot meeting. In addition, it was recommended that APHL designate a liaison to work closely with the states, leveraging the experiences of existing networks, serving as a communication link between all state-driven networks, and ensuring that the state-driven networks continue to function and address identified needs.

**“We need a network to make sure we provide what is necessary to the public and not let the crumbs fall through.”**

--Joanne Bartkus, director, MN PHL

In order to continue the engagement and growth of these new networks, as well as existing networks, APHL and CDC must continue to advocate for the concept of state-driven networks, and to seek funding and support throughout their agencies. Funding would be needed to support travel for in-person meetings or videoconferencing, to fund electronic test order and results (ETOR) projects between states in a network, to facilitate training and workforce development opportunities, and to support other identified needs. Training opportunities may be informal one-on-one trainings to develop expertise in a certain discipline, such as parasitology from a subject matter expert in another laboratory, or could be more formal trainings such as a regional whole genome sequencing training.

APHL and CDC have worked hard to provide avenues to foster relationships between laboratory directors and other leaders in the PHL community. Continued support for open ongoing

conversations, to include the establishment of additional state-driven networks, will strengthen PHLs, and bring unity to a PHL system that is constantly challenged with funding cuts, the acquisition and implementation of new and improved testing methods, and the need for outbreak response.

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Name	Laboratory	Position
Robyn Atkinson-Dunn	Unified Utah State Laboratories: Public Health	Director
Joanne Bartkus	Minnesota Public Health Laboratory Division	Director
Matt Charles	Illinois Department of Public Health Laboratory	Director
Myron Gunsalus	Kansas Health and Environmental Laboratories	Director
Bernard Jilly	Alaska Division of Public Health Laboratory	Director
Grace Kubin	Texas Department of State Health Services	Director
Judith Lovchik	Indiana Public Health Laboratory	Director
Sandip Shah	Michigan Public Health Laboratory	Director
Victor Waddell	Arizona Bureau of State Laboratory Services	Director

## **Association of Public Health Laboratories**

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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