MISSION
Shape national and global health outcomes by promoting the value and contributions of public health laboratories and continuously improving the public health laboratory system and practice.

VISION
A healthier world through quality laboratory systems.
Anyone who knows APHL’s leadership knows that food is near and dear to our hearts. So, it’s particularly fitting that the association’s 2013 annual report is organized around this theme.

No matter what type of cuisine you favor, it’s important to keep foodborne pathogens off the menu. With new funding from the US Food and Drug Administration (FDA), the association expanded its efforts last year to do just that. Among other things, APHL and partners joined with FDA to map the genomes of organisms implicated in foodborne disease outbreaks and began a multi-pronged effort to help US food and feed laboratories attain International Organization for Standardization (ISO) accreditation—a hard-earned seal-of-approval signifying that laboratories have state-of-the-art quality management systems.

We at APHL value clean drinking water just as much as untainted food. Thus, the association is also working with the US Environmental Protection Agency (EPA) to help assure the safety and security of US water supplies, which face potential contamination from myriad sources, natural and manmade.

In other news, 2013 saw a celebration of one of America’s greatest public health achievements: universal newborn screening. Last year was the 50th anniversary of the first state-mandated newborn screening programs, and APHL pulled out all the stops to commemorate this milestone. The year ended, however, with public acknowledgement that, although the newborn screening system does what it does well, gaps remain. APHL is already focusing on improvements.

Despite continued financial and political stresses on state and local laboratory systems in 2013, the association and its members have been resilient. APHL, member laboratorians and partners are working on such diverse and important issues as “nightmare bacteria;” informatics self-assessment tools; opportunities for emerging public health laboratory leaders; and standards for equipment used by first responders for detection, protection and decontamination of health threats. As ever, the association has worked in the US and worldwide to help laboratories improve in quality and address critical public health problems, while advocating for the strongest public health laboratory system possible.

Funding for advanced molecular detection technology at the Centers for Disease Control and Prevention (CDC) remains a top policy priority. The President has asked Congress for $200 million over five years to give the agency the sophisticated disease surveillance capabilities necessary to protect the public from emerging health threats, and, so far, $30 million has been approved. Since CDC is a source of guidance and technology transfer for members, this funding will have a substantial impact throughout the US public health laboratory system.

Looking back at the year past is always a humbling experience. Many of APHL’s accomplishments would not have been possible without the support of our many friends. We thank the association’s leadership, active membership and numerous partners for all their contributions to our work throughout 2013.

Sincerely,

Christine Bean, PhD, MBA, MT(ASCP)  
President

Scott J. Becker, MS  
Executive Director
Connecting the Dots
From Food Science to Food Safety


What do they have in common?

These were among hundreds of products voluntarily recalled last year, after they were linked to foodborne disease outbreaks involving (respectively) *Salmonella* *typhimurium*, *Listeria monocytogenes*, *E. coli* O121 and hepatitis A.

Altogether, millions of US residents were sickened by foodborne pathogens in 2013, including more than 600 who ate cilantro or salad greens imported from Mexico and became unwitting hosts for *Cyclospora cayetanensis*, a single-celled intestinal parasite.

Detecting such outbreaks—and identifying their source—is a full time job for laboratory scientists, epidemiologists, environmental health specialists and regulatory officials. The better the coordination among these groups, the faster contaminated foodstuffs can be removed from grocery shelves and other points of commerce, preventing needless cases of illness or death.

Just in November, a California company recalled more than 90 tons of prepackaged salads and sandwich wraps likely tainted with *E. coli* O157:H7. At least two dozen people had been sickened by the organism, but the swift response averted countless additional cases of illness.

APHL is a longtime food safety leader and a strong advocate for advancing food science. In 1996, the association helped establish *PulseNet*, a laboratory-based network for foodborne disease surveillance, which relies on bacterial DNA “fingerprints” to identify clusters of foodborne illness linked to a common organism. When most of the federal government shut down for 16 days last October, the largely state-based PulseNet members continued work, aided by a skeletal federal crew and two APHL staff members who helped analyze and name new bacterial DNA patterns.

Throughout 2013 and into the new year, the association has been focused on efforts both to strengthen food safety systems with rigorous, science-based practices and to promote seamless collaboration among outbreak responders.

• Last November, APHL convened the four-day Integrated Foodborne Outbreak Response and Management (InFORM) conference in San Antonio, TX. The conference—co-sponsored by APHL, CDC, the US Food and Drug Administration (FDA) and the US Department of Agriculture—combined the annual meetings of PulseNet and OutbreakNet (a US network of epidemiologists) and also for the first time included, environmental health specialists involved with foodborne and enteric disease outbreak response. More than 400 food safety experts discussed best practices, new technologies and the future of food science, with a goal of better integrating the work of all foodborne outbreak responders. The Association of Food and Drug Officials, Council of State and Territorial Epidemiologists and National Environmental Health Association contributed to the meeting’s success.
• Working with The St. John Group, a private health IT firm, APHL created open-source software to facilitate reporting of laboratory data to health authorities to speed the detection of foodborne disease clusters: food safety in real time. Development of the Epi-Lab Integrated Reporting Software was supported by the Council to Improve Foodborne Outbreak Response and is already in use in four pilot sites, generating daily foodborne disease cluster and frequency reports. It can be adapted for use with many laboratory information management systems.

• September 2013 marked the end of the first year of APHL’s cooperative agreement with FDA to assist food and animal feed laboratories working to achieve International Organization for Standardization (ISO) 17025:2005 accreditation or to expand their ISO accreditation to include additional test methods or foods. Accreditation to the ISO/IEC 17025:2005 standard assures that laboratories have state-of-the-art quality management systems, boosting confidence in their test data.

APHL launched a food and feed laboratory accreditation website listing proficiency testing providers, test method verification activities, accreditation training resources, a collection of best practices organized around ISO 17025 requirements, information on electronic transmission of food testing data and more. The association also:

(a) Began an online discussion board where laboratorians can post and answer questions regarding food or animal feed testing/quality systems; for example, how to interpret part of the ISO standard or how to achieve it in the most cost-effective manner.

(b) Convened a technical assistance meeting of 31 laboratories funded by FDA to achieve ISO 17025 accreditation. The meeting was held in conjunction with APHL’s annual meeting in Raleigh, NC, and included a tour of the ISO-accredited North Carolina Food & Drug Protection Division Constable Laboratory.

(c) Developed and hosted two webinars on ISO 17025 accreditation.

(d) Published Data Exchange among Food and Feed-Testing Laboratories and FDA’s eLEXNET, a comprehensive report outlining steps to achieve full automation and standardization of data transmissions to the FDA’s secure Electronic Laboratory Exchange Network (eLEXNET), a central repository for food testing data and a key tool for early detection of foodborne disease outbreaks.

• Working with a media production company, APHL created an interactive, web-based version of The Yardstick—a popular laboratory self-assessment tool with “gold standards,” against which labs can measure their food safety testing infrastructure and practices.

• APHL members are playing a critical role in FDA’s GenomeTrakr program, an effort to map entire genomes of pathogens implicated in foodborne disease outbreaks for swifter trace-back to contaminated foods. Member laboratories have been supplying samples of pathogens for sequencing and state public health laboratories in Arizona, Maryland, Minnesota, New York, Virginia and Washington are assisting with the sequencing itself.

• APHL has been working closely with sustaining member Luminex® Corporation on the roll-out of its xTAG® Gastrointestinal Pathogen Panel. The panel is one of a new wave of culture-independent diagnostic tests, which enable clinical labs to test patient specimens directly, without growing the pathogen in culture. This saves time, but doesn’t necessarily preserve the specimen for later PulseNet testing—a disadvantage for disease surveillance. By working together, APHL and Luminex® hope to have the best of both worlds. The company is encouraging customers to preserve specimens when positive results occur and also alerting state public health laboratories—through APHL—when local clinical labs implement the test, so public health laboratories can follow up directly with any special instructions.

Microbiologist Kaye Eckmann preparing Salmonella isolates for PFGE subtyping to support a foodborne contamination test at the Washington State Public Health Laboratory

Ashley Sabol prepares Listeria DNA for sequencing on the MiSeq. Credit: CDC

Data Exchange among Food and Feed-Testing Laboratories and FDA’s eLEXNET

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Michael Last, clinical laboratory technical specialist at the State Hygienic Laboratory, identified the first cases in the outbreak of Cyclospora cayetanensis. Photo Credit: State Hygienic Laboratory at the University of Iowa
Last June and July, hundreds of people in New York City and 25 states fell ill with the same set of symptoms: watery diarrhea, loss of appetite, cramping, bloating, nausea and fatigue. Fifty were hospitalized.

Unknown to physicians, patients were suffering from a microscopic parasite transmitted in food: *Cyclospora cayetanensis*. Because many clinical laboratories have discontinued traditional parasitology testing—and *Cyclospora* is most readily detected using a specialized, physician-requested stain on stool specimens—the cause of the outbreak was initially unknown. However, even without the special stain, expert parasitologist Mike Last at the Iowa State Hygienic Laboratory at the University of Iowa identified the organism.

APHL spread the word to public health laboratories via a 50-state conference call, along with information about the best stain to use, and lined up public health laboratories to help with backlogged testing. State public health laboratories, in turn, shared the information with clinical labs. Eventually, trace-back investigations led to the recall of cilantro and salad greens from Mexico.

But *Cyclospora* was not the only infectious health threat in 2013. More than 150 people, mostly in Saudi Arabia, contracted Middle East Respiratory Syndrome (MERS), a viral respiratory illness. MERS is caused by a coronavirus called “Middle East Respiratory Syndrome Coronavirus” (MERS-CoV), with a mortality rate of nearly 50% in diagnosed individuals.

Even though there have been no US cases yet, CDC fast-tracked the development of an assay to confirm MERS infection and APHL identified the first states to receive it (those with a high influx of international travelers). The association also convened two 50-state conference calls with public health laboratories to discuss assay validation and performance and test kit deployment. So far, 46 of 50 state public health laboratories can test for MERS coronavirus, and many of those labs have been performing rule-out testing.

Even as *Cyclospora* and MERS work was underway, APHL supported and CDC-funded Vaccine Preventable Disease (VPD) Reference centers at the Minnesota and Wisconsin public health laboratories were busy helping out in two big measles outbreaks: one in Texas and one in North Carolina. The VPD reference centers (including two others in New York and California) perform more advanced test methods than other labs are able to offer. These methods included polymerase chain reaction (PCR) and genotyping—and sped up the turn-around time for test results.

Other high-priority pathogens—influenza, tuberculosis (TB) and carbapenem-resistant enterobacteriaceae—were also on APHL’s radar screen. The association:

- Completed the roll out of its Right Size Influenza Virologic Surveillance Project Roadmap—a detailed document that offers guidance to increase the efficiency and robustness of influenza surveillance systems. A critical feature is the sample size calculator that enables health agencies to gauge the number of specimens they need to test to confidently answer important surveillance questions: What is the prevalence of particular influenza strains? The incidence? Drug resistance characteristics? Have any novel influenza strains emerged?

- Completed evaluations of test panels for detection of viral and bacterial respiratory pathogens in a single assay. This effort involved scrutiny of tests developed by six different public health laboratories, by CDC and by commercial manufacturers.

- Completed evaluations of tests for detection of drug-resistant TB using molecular methods, such as PCR or pyrosequencing. A key question was the performance of the tests in populations in which drug-resistant TB is rare.

- Funded pilot projects in the Indiana and Michigan public health laboratories to examine how public health laboratories can best work with clinical labs to improve detection of carbapenem-resistant enterobacteriaceae (CRE). CRE is impervious to antibiotics and a major cause of healthcare-associated infection deaths. Moreover, clinical labs often test for the “nightmare bacteria” using commercial assays that are less adept at detecting drug resistance.

Jaye Boman, interim general supervisor for bacteriology, stacks containers of the thousands of specimens that the State Hygienic Laboratory at the University of Iowa has tested for *Cyclospora* since the outbreak began in July 2013
NEWBORN SCREENING

Celebrating 50 Years of Newborn Screening

The year 2013 marked the 50th anniversary of state-mandated newborn screening, representing a half century of work to prevent infant deaths and disabilities. Today, newborn screening detects heritable and congenital disorders, heart defects and hearing loss in more than 12,000 US babies each year, preventing diagnostic odysseys and ensuring immediate access to critical treatment.

To commemorate this milestone, APHL sponsored a year-long campaign to bring attention to this vital, state-sponsored public health program. Beginning in January with a public service announcement on a jumbotron in Times Square and culminating in a high-profile program on Capitol Hill, APHL shared information with thousands of parents, families, health care providers, policy makers and newborn screening family advocates. Within one year, APHL:

- Published *The Newborn Screening Story: How One Simple Test Changes Lives, Science, and Health in America*, an engaging and insightful overview of the evolution of newborn screening, and a brochure for parents, *What's the Best Thing You Can Do to Protect Your Newborn’s Health?*. These publications have been widely distributed to newborn screening programs, state and federal decision makers, health care providers and families. Both publications are available for purchase by contacting newborn.screening@aphl.org.

- Designed two educational exhibits, one that traveled to local newborn screening celebrations in 15 states to educate families and policy makers, and a second, directed to health care providers, that circulated to 15 medical and scientific conferences.

- Shared stories of families whose lives have been touched by newborn screening on APHL’s blog, social media platforms and website; on exhibit panels; and through partners’ channels.

- Built relationships with newborn screening supporters through proactive outreach via Twitter and Facebook.

- Brought together family advocates, policy makers and newborn screening specialists for a reception and panel discussion on Capitol Hill. The panel, led by Richard Besser, MD, chief health and medical editor for ABC News, featured a lively discussion among key newborn screening supporters and providers. The program included Patricia Guthrie, daughter of Robert Guthrie, MD, PhD who devised the first newborn screening test, and closed with awards to Congresswoman Lucille Roybal-Allard (D-CA) and other congressional sponsors for their leadership in passage of the groundbreaking Newborn Screening Saves Lives Act. Also featured was a video profile produced by newborn screening advocate and PKU spokesperson Kevin Alexander.
While celebrating the history of newborn screening, APHL did not neglect its future. The 2013 Joint Meeting of the Newborn Screening and Genetic Testing Symposium and the International Society for Neonatal Screening, co-sponsored by APHL, attracted over 600 newborn screening scientists, health officials and advocates from more than 30 countries. Topics ranged from emerging newborn screening technologies to candidate conditions to short- and long-term follow-up of infants diagnosed with newborn screening disorders.

Finally, the association’s Newborn Screening Technical assistance and Evaluation Program (NewSTEPs)—funded through a cooperative agreement with the Health Resources and Services Administration, Genetic Services Branch, Maternal and Child Health Bureau—reached its second year of operation, providing quality improvement services, an innovative data repository and technical resources for newborn screening programs.

Congress Expected to Stand Up for Babies!

Good news from Capitol Hill at last. As of the end of December, bills to reauthorize the Newborn Screening Saves Lives Act were poised to pass the US Senate and House. This landmark legislation—enacted in 2008—authorizes critical federal activities to evaluate and improve newborn screening and follow-up for heritable disorders. The reauthorization bills were introduced by the Act’s original sponsors: Representatives Lucille Roybal-Allard (D-CA) and Mike Simpson (R-UT) and Senator Orrin Hatch (R-UT), who is joined by a new sponsor, Senator Kay Hagan (D-NC).
ENVIRONMENTAL HEALTH

The town of Hinkley, CA, and its toxic water became famous in the film Erin Brockovich highlighting the environmental-activist’s work.

In fact, many communities have legitimate concerns about environmental health threats stemming from landfills, incinerators, industrial wastewater, consumer products (including foods) and a long list of other potential hazards. Years ago, public health laboratory leaders determined that they could play a role investigating such concerns to verify or allay community worries. In 2012, APHL reached out to advocacy groups and environmental leaders to learn the challenges associated with this work. And last year, APHL laid the groundwork for more substantive support.

The association:

• Created an online discussion forum where anyone can pose questions about environmental health issues. APHL staff actively monitor the forum and solicit expert feedback from member environmental scientists.
• Secured CDC funding for two public health laboratories to investigate local environmental health concerns. APHL will issue a request-for-proposal and, once grantees are chosen, will facilitate daylong meetings in each location to identify possible challenges to accessing the environmental health system.
• Increased environmental health workforce capacity and skills through supporting three new Environmental Public Health Laboratory Fellowship assignments in Delaware, Hawaii and Iowa.
• Dedicated an APHL annual meeting session to community partnerships and health risk assessment.
• Released results of APHL’s environmental laboratories capabilities survey report. Among the findings: of the 50 respondents (comprising APHL member and non-member public health, environmental and toxicology laboratories in 44 states), 32% test consumer products like toys and lotions, 28% routinely test shellfish or other seafood and 9% conduct routine dairy monitoring. Of concern, APHL learned that environmental laboratory funding is down nearly $900,000 per laboratory since 2006.

It is important to know that testing the environment provides only half of the information needed to gauge the seriousness of environmental health threats. The other half comes from testing people to measure actual human exposure—a process known as biomonitoring.

Five years ago, APHL brought together a select group of environmental leaders—including US Environmental Protection Agency (EPA) and CDC officials, toxicologists and epidemiologists—and drafted a five-year plan to create a national biomonitoring network. Today, APHL is pleased to report all major goals have been met, including the first CDC national biomonitoring meeting in 2012. In 2013, the association:

• Disseminated a set of talking points, Biomonitoring: An Integral Component of Public Health Practice, outlining the public health and policy utility of biomonitoring.
• Published stories of biomonitoring in action, illustrating its utility.
• Developed a biomonitoring toolkit with information on everything from laboratory test methods to communicating findings to public health practitioners, clinicians, academics and community activists.
• Launched a biomonitoring discussion board.
• Developed a CLIA inspection checklist for chemical laboratories in the national Laboratory Response Network to assure quality testing and regulatory compliance.

All of APHL’s work relies upon robust partnerships. And, in 2013, the association worked to build new ones. Within EPA—already a core collaborator—APHL sought to broaden the scope of its relationship via outreach to the Office of Research and Development, the Science Advisor, the Office of Solid Waste and Emergency Response, and the Office of Environmental Information. APHL also met to discuss areas of mutual interest with leadership at the National Institute of Environmental Health Sciences, National Institute for Occupational Safety and Health, and the Consumers Union, the policy division of Consumer Reports.
Building A Water-Wise World

The introduction of clean water technologies was a life-saving achievement in the early 20th century. Yet clean drinking water can never be taken for granted. Among its own achievements last year, APHL engaged in important work to advance water security.

- Diarrheal disease is the biggest killer of children worldwide and most is caused by contaminated drinking water. APHL joined The Coca-Cola Company, US Department of State, US Department of Agriculture and other committed institutions to address global water challenges as a member of the non-profit US Water Partnership.

- Closer to home, APHL continued to work closely with EPA’s Water Security Division to assure the safety and security of US drinking water. APHL proudly participated in EPA’s Water Laboratory Alliance Security Summit, which focused on the laboratory response to hurricanes, floods, industrial accidents, water terrorism and other incidents that threaten domestic water supplies.

Environmental Public Health Laboratory Fellows Alejandro Preciado (HI), Leah Wingard (DE) and Megan Melkoli (IA)

An endangered Kemp’s Ridley turtle swims out from under an oil pattice as rescue workers attempt to capture the oiled animal for rehabilitation. Credit: NOAA

North Carolina State Laboratory of Public Health laboratorian Bernard Barrameda in the lab’s Chemical Terrorism Unit

ICPMS testing for highly toxic element thallium at the Utah Public Health Laboratory
Achieving an AIDS-free Generation Across the Globe

Religious pilgrimage at Debre Libanos, Oromia Region, in Ethiopia

APHL consultant Bob Sokolow works with colleagues to launch laboratory information management system in Kenya
An “AIDS-free generation is within reach,” declared President Obama last December, as he pledged up to $5 billion to reduce the burden of AIDS, tuberculosis and malaria worldwide.

This commitment comes at an important time. In 2013, the President’s Emergency Plan for AIDS Relief (PEPFAR)—a US aid program begun under former president George W. Bush—celebrated its ten-year anniversary and issued a blueprint for future action. Already, PEPFAR has supported over five million people on antiretroviral treatment, mostly in Africa, and prevented hundreds of thousands of new infections.

APHL has been a major PEPFAR laboratory partner from the beginning, helping to strengthen public health and clinical laboratory systems, expand access to quality testing services and build local capacity. The new PEPFAR focus syncs perfectly with APHL’s own global health goal: building indigenous capacity to achieve local ownership and sustainability of programs established over the past decade.

For example, maintaining the complex laboratory instruments needed for HIV/AIDS-related testing has been a chronic weakness in developing countries. In Ethiopia, APHL developed an effective model to address this vexing problem. Working with partners, APHL renovated the training laboratories in two of the country’s educational institutes, equipping them with modern laboratory instrumentation. APHL experts then delivered a three-week, APHL-developed equipment maintenance training course to a cohort of biomedical equipment technicians at a polytechnic college. Those individuals can now sustain the training course and begin to graduate competent technicians to support Ethiopia’s laboratories. No more waiting for foreign experts to arrive before testing can resume after an equipment failure.

Ethiopia is just one of 22 countries where APHL is active.

In Nigeria last year, APHL provided technical assistance to develop and validate a testing algorithm for the HIV rapid test kits used by laboratory and non-laboratory staff in the field. With the largest population in Africa, Nigeria requires a sophisticated testing strategy with multiple options at each of three tiers of testing to avoid stockouts. And these testing options must be organized to avoid false-negative and false-positive results so HIV-infected persons are identified and provided timely treatment and care and uninfected persons are not burdened with unnecessary treatment and stigma. APHL’s complex analysis of test kits and algorithm design provided the Nigerian Federal Ministry of Health with the essential information to develop effective public health policy.

In addition to addressing discrete problems, such as equipment maintenance and testing algorithms, APHL is also focused on the big picture: building quality laboratory systems that focus on national public health problems.

- A major association initiative has been technical assistance to help develop national strategic plans and policies that enable ministries of health to continually expand access to high-quality laboratory diagnostic and surveillance testing and to effectively manage donor funds. With APHL assistance, 15 countries have so far developed or begun work on national laboratory strategic plans and policies—including the Democratic Republic of the Congo, Nigeria and Namibia that began work in 2013.

- A second important APHL initiative is the development of paper-based and electronic laboratory information management systems (LIMS) and databases to support laboratory operations—such as analyzing and reporting test results and tracking supply inventories—and to provide timely, reliable data for national health planning. Because commercial LIMS are expensive—usually requiring annual licensing fees and maintenance contracts—APHL is working on LIMS sustainability plans and examining cost models that will work long-term.

Last year, APHL and its in-country consultants went a step further, partnering with Strathmore University in Kenya to customize an open source software product and interface the system with one laboratory instrument. That customized LIMS software is now up and running in a handful of Kenya’s district laboratories. This significant and exciting achievement demonstrates proof-of-concept for free, clinical laboratory information software that provides a potentially more sustainable option for developing countries.

Working with PEPFAR and other partners, APHL is doing its part to achieve the vision of an AIDS-free generation, while addressing other pressing, global infectious disease problems.
Always Ready to Roll

Measuring America’s Health Security

How do you measure a nation’s health security? Last year APHL participated in the development of the National Health Security Preparedness Index—a set of indicators that will be used to assess readiness for public health emergencies, to guide quality improvement and to advance community resilience. The index includes legal and policy measures (e.g., the existence of emergency plans and authorities to implement them), resources (e.g., funding, facilities, equipment) and operational factors (e.g., regular emergency response drills). Data sources range from association surveys to CDC public health preparedness capability assessments. The index will provide annual comprehensive information about how well states, communities and the nation are prepared for a range of emergencies.
There is no antidote for ricin poisoning.

With sufficient exposure, the toxin infiltrates human cells and disrupts protein synthesis. It can take three days of vomiting, abdominal pain and shortness of breath before organ failure and dehydration lead to death.

Ricin’s potency and easy availability—it occurs naturally in castor beans—have earned it a spot on the federal government’s list of possible warfare agents.

Thus, when ricin showed up at the US Senate mail handling facility two days after the Boston marathon bombing, the government was on high alert. Fortunately, no one was harmed. A 41-year-old martial arts instructor from Tupelo, MS, was eventually charged with producing a biological toxin, presumably to frame a foe. Yet, the incident demonstrated, once again, the value of preparedness.

The Laboratory Response Network (LRN)—a coordinated network of laboratories that employ standardized protocols to detect lethal threat agents—was poised to respond. And last August, APHL trained 15 LRN laboratories in the use of a new assay for rapid ricin detection. The training course and associated quality control testing gave CDC laboratorians in the use of a new assay for rapid ricin detection. The training course and associated quality control testing gave CDC valuable feedback for assay improvements.

The LRN—founded by APHL, CDC and the FBI in 1999—is a national security asset. Supporting the network is a top APHL priority. In 2013, APHL:

• Transitioned 15 additional LRN reference laboratories (for a total of 31) to CDC’s Laboratory Information Management System Integration (LIMSI) electronic data messaging service. The LIMSI service captures high-consequence test results from in-house laboratory information systems and directs them to CDC, enabling real-time threat surveillance. Among the 15 new LIMSI users is the County of San Luis Obispo (CA) Public Health Laboratory, the first local lab to use the system.

• Convened three LRN conventional methods courses, which cover everything from how to safely open a suspicious package in an isolation glove box to polymerase chain reaction testing on biological isolates. These hands-on courses give laboratorians indispensable practice with real threat agents, such as anthrax, plague and tularemia.

• Issued two laboratory preparedness exercises to over 1,300 sentinel clinical laboratories—the foundation of the LRN. APHL worked with the American Society for Microbiology, the College for American Pathologists and CDC to test the ability of hospital and other clinical laboratories to rule out threat agents in patient specimens or to safely package and ship suspicious specimens to LRN reference laboratories. The LRN depends on these sentinel clinical laboratories to identify human specimens that might trigger a larger public health and homeland security response.

• Issued a revised position statement on field testing devices, calling for their performance standardization and field validation, plus certification of individuals who use the devices. Currently, few field devices have been evaluated, and some are known to generate an unaccept­able level of false-positive and false-negative results.

• Hosted a webinar in partnership with the Department of Homeland Security (DHS) outlining the federal vision for coordinating standards for CBRNE (chemical, biological, radiological, nuclear and explosi­on) testing equipment among local first responders (HAZMAT teams, fire fighters, et al.) public health responders and FBI responders. By 2020, DHS aims to have all three groups using interoperable equipment and standardized operating procedures.

• Partnered with CDC to examine the value of reconfiguring the LRN for biological threats preparedness and response. Proposed changes would increase network efficiency and leverage the existing LRN infrastructure to respond to emerging infectious disease threats.


The 16-day closure of the federal government last October had serious consequences for public health in the United States.

• A skeleton crew at CDC and FDA to track the source of foodborne illness.

• Delayed genetic sequencing of TB bacteria to identify patients with drug-resistant strains.

• Fewer food manufacturing facilities inspected for compliance with food safety regulations.

• No daily LRN reagent shipments.

• No daily LRN reagent shipments.

And the list could go on.

Fortunately, some adverse consequences were avoided or mitigated because APHL member laboratories were willing to take on some of the federal workload when contacted by the association. State public health laboratories in CA, UT and WI performed national surveillance testing on flu specimens. Public health labs in CA, MN, NY and WI—which house APHL-funded Vaccine Preventable Disease (VPD) Reference Centers—accepted specimens for mumps, whooping cough and other VPD testing that would have gone to CDC. And PulseNet food safety laboratories in MA, VA, MI, MN, TX, UT and WA stood ready to assist other labs with any sudden influx of potentially tainted food samples for testing, again, in place of CDC. These work-arounds were vitally important.
Moving Data to Where It Matters

Although food and feed testing is an essential component of food safety, test data does little good sitting in the laboratory. Enter eLEXNET—a US Food and Drug Administration (FDA) database that serves as a central repository for food testing data and a key tool for early detection of potentially hazardous edibles.

The problem is, the database—whose full name is the Electronic Laboratory Exchange Network—has been underutilized. An APHL study found that many smaller food and feed testing labs still rely on manual data entry or electronic spreadsheets to report information to eLEXNET. Of nearly 300 labs with registered eLEXNET users, only about three dozen have a completely automated process for data submission. It’s no wonder data is often not delivered in real time.

A comprehensive APHL report released last year, Data Exchange among Food and Feed-Testing Laboratories and FDA’s eLEXNET, examines the problem and outlines steps to achieve full automation and standardization of these consequential transmissions. Timely eLEXNET reporting is also necessary for food and feed laboratories to achieve International Organization for Standardization (ISO) 17025:2005 accreditation. In 2014, APHL will be working with laboratories to develop eLEXNET data standards and to assure states capitalize on all eLEXNET capabilities. Closing the information loop will get tainted foods and animal feeds out of the marketplace faster.

Yet, food safety data is not the only laboratory information that must be shared with partners to be useful. And results reporting is not the only use for informatics in the lab. APHL’s ambitious goal is to help modernize and standardize the entire state and local laboratory informatics infrastructure.

An important first step is laboratory self-assessment—a process made easier with APHL’s newly released Informatics Self-Assessment Tool. The tool (funded by the joint APHL-CDC Laboratory Efficiencies Initiative) walks lab officials through a comprehensive process reviewing 19 capability areas covering everything from automatically flagging samples that need retesting to electronically tracking hazardous materials in the laboratory. The next version of the tool will itself be automated, giving APHL the ability to capture data on the informatics capabilities of member laboratories across the country.

Also in 2013:

- APHL’s Electronic Laboratory Reporting and Technical Assistance Initiative responded to more than 60 technical assistance requests from health agencies, hospital labs, public health laboratories and commercial clinical labs. The long-term goal is completely electronic reporting of all laboratory disease surveillance data to health authorities.
- The association’s Public Health Laboratory Interoperability Project (PHLIP) continued work to assure that all US state public health laboratories in the World Health Organization collaborating laboratories network can send electronic surveillance messages to CDC’s Influenza Division. As a result of PHLIP near every participating state laboratory can now send near real-time influenza surveillance data. Project staff are fine-tuning messaging protocols to capture additional information, such as drug-resistance data and data from outpatient and institutional populations. The initiative is expanding to include vaccine preventable diseases and disease targets.
- APHL supported a health economist to conduct a cost-benefit analysis of PHLIP. The results—showing a significant cost-savings—will be published in a peer-reviewed journal in 2014.
- APHL began migrating its IT platforms—including the messaging hubs that route public health laboratory data to CDC—to be “moderate compliant” with FISMA, the security standard for operating systems that touch federal IT environments. At the same time, the association is expanding the functionality of its messaging hubs to support electronic laboratory reporting data among commercial labs, hospital labs, health agencies and public health laboratories.
- APHL began developing a National Lab Data Hub that would serve as a central repository for the laboratory informatics needs of public health laboratories. Published in a peer-reviewed journal in 2014.
- APHL began migrating its IT platforms—including the messaging hubs that route public health laboratory data to CDC—to be “moderate compliant” with FISMA, the security standard for operating systems that touch federal IT environments. At the same time, the association is expanding the functionality of its messaging hubs to support electronic laboratory reporting data among commercial labs, hospital labs, health agencies and public health laboratories.

Sustainability Through Efficiency

Even in a tough economy, budget cuts should not compromise food safety testing, disaster response or infectious disease surveillance. To assure this does not occur, APHL and CDC began the Laboratory Efficiencies Initiative (LEI). The project’s goal is simple: sustainability through efficiency.

Last year the two-year-old effort logged significant achievements. Here is a sampling:

- Developed the Public Health Laboratory System Database. This innovative tool will be housed at individual public health laboratories to store information about testing capabilities, personnel positions, equipment and more. Laboratories can use the information to generate reports, monitor laboratory operations and needs, and facilitate regulatory compliance. The database is in testing, but will be operative in early 2014. Once the system is up and running, APHL will be able to extract information from its member laboratories to create the nation’s first public health test service directory, which in turn, will enable labs to identify other labs with specific testing capabilities—a critical asset when novel testing needs arise or laboratories need extra surge capacity.
- Published a report and recommendations to assist laboratories that are just beginning to bill for their services.
- Published the Policy Guide for Public Health Laboratory Test Service Sharing to help public health laboratories interested in multi-jurisdictional sharing of testing services. The guide explores potential legal issues, how to manage stakeholder expectations, and roles and responsibilities of service partners.
- Sponsored a Public Health Reports supplement with 15 editorials, commentaries and manuscripts detailing public health laboratory systems improvements and research.
- With CDC funding, launched the New England Environmental and Public Health Laboratory Directors consortium of states, a soon-to-be formalized collaboration among environmental and public health laboratories in CT, ME, MA, NH, NJ, NY, NYC, RI, VT. The Massachusetts Public Health Laboratory has long performed newborn screening for a few New England states, and the vision is to expand this model of shared services, with electronic state-to-state reporting. The group is looking at having two member laboratories perform West Nile virus and other arbovirus testing for the other jurisdictions and two laboratories perform limited radiologic tests on drinking water for the consortium.
Helping Laboratory Leaders Soar

Being a public health laboratory leader isn’t easy. The job is complex. And it’s changing. Today’s laboratory directors and managers need scientific acumen, knowledge of lab technologies, administrative skills, political skills, communication skills and more. They must be versatile and nimble; able to manage budget cuts and regulatory inspections, to motivate a multi-generational workforce and to adapt to an increasingly internet-dependent world.

With experienced laboratory leaders retiring every month, APHL has been working overtime to assure a pool of qualified replacement candidates. The association’s National Center for Public Health Laboratory Leadership (NCPHLL) works to interest students in laboratory careers, to provide early training opportunities in public health and to cultivate leadership skills. In 2013, the Center was especially busy.

- Recruited the 19th class of Emerging Infectious Disease Laboratory fellows. Among the 14 new fellows, half were placed at CDC laboratories and half at state public health laboratories. Fellowship projects range from surveillance testing for dengue to improving specificity of Lyme disease testing. Of note, three fellows who completed their assignments in 2013 were hired in permanent, full-time laboratory positions: two by their host labs and one by another public health laboratory. Four continued with their host labs in temporary positions.

- Recruited the 3rd class of environmental fellows and awarded funds to begin recruitment of the 4th class. Four PhD-level fellows have placements at state public health laboratories in Delaware, Hawaii, Iowa and Rhode Island, working on clinical, environmental chemistry projects. One fellow, for example, is investigating effects of maternal tobacco smoke exposure on newborns.

- Graduated Class 5 and recruited Class 6 of the Center’s emerging leaders. These mid-career professionals develop leadership skills as they plan and implement projects to advance the field of public health laboratory practice. Recent projects include an online certificate program in grant writing, a legislative advocacy workshop at APHL’s 2013 annual meeting, an electronic toolkit for laboratory leaders and a science fair for students in grades 6-10, at which students had an opportunity to extract their own DNA and carry it home in plastic necklaces. (The science fair was hosted by the North Carolina State Laboratory of Public Health in conjunction with APHL’s 2013 annual meeting, with considerable on-site support from emerging leader La’Vonda Benbow.)

- Brought 10 first-year public health laboratory directors to Atlanta, GA, for a comprehensive new director orientation program at CDC. The program not only acquaints novice directors with important CDC systems and colleagues, but also creates a peer support group for those in challenging new positions.

- Completed work on the first-ever core competencies for public health laboratory scientists. The competencies span 14 domains from chemistry to bioinformatics and include more than 400 sub-competencies. This unprecedented, 18-month effort involved more than 300 contributors from public health laboratories, academia and national organizations. Ultimately, the competencies will promote consistency, efficiency and effectiveness across the workforce and inform career ladders, training curricula and performance management. They are slated for publication in CDC’s MMWR.

- With the Network of Laboratory Leaders Alumni group, comprising past emerging leader cohorts, held forums on crisis management and advocacy/story-telling.

The APHL/CDC National Laboratory Training Network™ (NLTN) continued to deliver 276 trainings including hands-on workshops, on-demand courses, teleconferences and seminars to hone and update the skills of public and private sector laboratorians performing tests of public health significance. In 2013, the NLTN also brought together the nation’s public health laboratory training coordinators for an extensive 2.5-day program.

Given tight laboratory budgets, training coordinators often wear many hats and must be creative to meet the training needs that arise as new technologies and new health threats emerge. NLTN training conferences are crucial to build a community of practice and to gauge training needs and resource limitations throughout the US.

My EID fellowship gave me a headstart on my goal of becoming a public health laboratory director. I shadowed the assistant director of the LA County public health laboratory. And I became certified as a public health microbiologist in California. That was huge!

-Syreeta Miles, Class 17 EID Fellow

Charting the Future: A Public Health Workforce Roadmap

Partnering with CDC and the Association of State and Territorial Health Officials, APHL provided valuable input into a strategic roadmap for development of America’s public health workforce. Its four broad goals are (1) enhancing academic preparation of public health professionals, (2) increasing capabilities of the current workforce, (3) improving career pathways and (4) strengthening the workforce with professional standards, supportive organizational cultures and an understanding of the numbers and types of workers needed. All of these are necessary to assure the human talent to improve health in America.
2013 FINANCIALS

Conferences and Exhibits: $948,528
Membership Dues: $847,595
Workshops: $623,618
Other: $902,933
Grants and Contracts: $31,351,038

Total Revenue: $34,673,711
2013 FINANCIALS

**Domestic Programs**

- Infectious Diseases: $5,581,436
- Informatics: $4,529,829
- Leadership Development: $2,640,547
- Workshops: $2,546,626
- Lab Strengthening/Leadership: $2,439,296
- Food Safety: $2,137,624
- Newborn Screening: $2,022,334
- Public Health Preparedness: $1,272,029
- Environmental Health: $1,127,732
- Laboratory Systems and Standards: $928,518
- Administration: $714,703
- Member Services: $639,381
- Conferences: $611,510
- APHL Consulting: $434,442

**Domestic Programs Total**: $27,626,007

**Global Programs**

- Angola: $35,131
- APHL Consulting: $301,492
- Botswana: $208,835
- Central Asia: $1,810
- DRC: $86,806
- Ethiopia: $314,796
- Ghana: $151,911
- Guyana: $42,024
- Haiti: $432,291
- Kenya: $456,749
- Lesotho: $679,154
- Mozambique: $841,623
- Namibia: $179,075
- Nigeria: $586,302
- Other Global Health: $256,504
- Program Management: $451,365
- Rwanda: $101,129
- Sierra Leone: $171,680
- South Africa: $12,744
- Sudan: $151,882
- Swaziland: $283,028
- Tanzania: $321,100
- Ukraine: $133,704
- Vietnam: $93,532
- Zambia: $587,000

**Global Programs Total**: $6,881,667

**Total Expenses**: $34,507,674
Presidential Award

Ernie Schoenfeld, DrPH, MPH
Senior Advisor, Public Health Leadership Program
The University of North Carolina at Chapel Hill

Presidential Award

Laura Conn, MPH
Associate Director for Informatics, Public Health Surveillance and Informatics Program Office
Centers for Disease Control and Prevention

Emerging Leader Award

Sanjib Bhattacharyya, PhD
Deputy Laboratory Director
City of Milwaukee Health Department

On The Front Line Award

Desiree Mustaquim, MPH
Surveillance Epidemiologist, Influenza Division
Centers for Disease Control and Prevention
**Gold Standard for Public Health Laboratory Excellence Award**

*Wanda Andrews*, MT(ASCP)  
Laboratory Operations Director  
Virginia Division of Consolidated Laboratory Services

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**Silver Award**

*Michael Wichman*, PhD, MS  
Associate Director, Environmental Health  
State Hygienic Laboratory at the University of Iowa

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**Healthiest Laboratory Award**

1. Utah Public Health Laboratory  
2. Hawaii State Laboratories Division  
3. Delaware Public Health Laboratory

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**Champion of the Public Health Laboratory Award**

*Christopher Christie*, JD  
Governor  
State of New Jersey

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**Thomas E. Maxson Education, Training and Workforce Development Award**

*Maria Paz Carlos*, PhD, DVM  
Virology and Immunology Division Chief  
Maryland Laboratories Administration
2013 TIMELINE

**JANUARY 2013**
- NCPHLL sponsors a leadership forum on Advocacy and Impactful Storytelling
- APHL celebrated the 50th anniversary of newborn screening in a new public service announcement on the jumbotron in New York’s Times Square

**FEBRUARY 2013**
- APHL launches the Survey Resource Center (a central repository of APHL surveys) and Laboratory Profiles (snapshot of laboratories) to membership
- APHL conducts LRN Conventional Methods Course in Albuquerque, NM
- NLTN sponsors two Public Health Series Teleconferences: Select Agent Regulations with Special Focus on Clinical Laboratories; and Division of Select Agents and Toxins Regulation Changes for Incident Response

**MARCH 2013**
- APHL receives extremely successful response rate of 98% on its longitudinal survey, Comprehensive Laboratory Services Survey
- Colorado becomes the 29th state to convene an L-SIP assessment
- APHL hosts annual Hill Day
- NLTN sponsors a training on MicrobeNet: The Next Generation of Online Tools for Microbial Identification
- APHL’s 50th Anniversary exhibit, with visits to 15 states across the country in 2013, travels to Minnesota for display at the state capitol, science museum and public health laboratory
- APHL enters into a partnership with 5AM Solutions, Inc. for development of the NewSTEPs Data Repository and website

**APRIL 2013**
- NLTN sponsors a training on MicrobeNet: The Next Generation of Online Tools for Microbial Identification
- APHL’s 50th Anniversary exhibit, with visits to 15 states across the country in 2013, travels to Minnesota for display at the state capitol, science museum and public health laboratory
- APHL enters into a partnership with 5AM Solutions, Inc. for development of the NewSTEPs Data Repository and website

**MAY 2013**
- APHL conducts LRN Conventional Methods Course in St. Paul, MN
- APHL publishes the Informatics Self-Assessment tool
- APHL and CDC co-sponsor the LEI Public Health Workforce Strategic Planning Meeting with representatives from APHL member laboratories, CDC principals and other organizations
- NCPHLL sponsors a three-day New Laboratory Director Orientation Program for 10 new directors to introduce them to APHL, CDC and skill-building exercises
- APHL publishes The Newborn Screening Story: How One Simple Test Changes Lives, Science, and Health in America
- APHL co-sponsors the Joint Meeting of the Newborn Screening and Genetic Testing Symposium and the International Society for Neonatal Screening
- APHL’s second 50th Anniversary exhibit travels to conferences of the American College of Obstetricians & Gynecologists, and the Joint Meeting of the Newborn Screening and Genetic Testing Symposium and the International Society for Neonatal Screening
- APHL launches the NewSTEPs website, www.newsteps.org

**JUNE 2013**
- APHL releases its Biomonitoring Toolkit for those working in the environmental health system
- APHL hosts the first face-to-face meeting of FDA’s ISO Grant Awardees in Raleigh, NC, pertaining to ISO 17025:2005 accreditation
- APHL hosts Second Annual APHL/CDC Policy Summit in Atlanta, GA
- APHL co-hosts the student event “Under the Microscope: A Look at Careers in Public Health” in Raleigh, NC in collaboration with the North Carolina PHL where local students toured and participated in hands-on science
- APHL Global Health Program supports the launch of the Namibia Public Health Laboratory Policy
JULY 2013

• APHL develops a database to capture the ID testing capacities and capabilities of the United States Affiliated Pacific Island laboratories
• APHL proposes Healthy People 2020 Public Health Infrastructure objective related to increasing the proportion of public health laboratory systems which perform at a high level of quality
• APHL releases Right Size Influenza Virologic Surveillance Roadmap
• APHL launches Emerging Technologies in Public Health Blog

SEPTEMBER 2013

• APHL celebrates the 50th anniversary of newborn screening at an event at the US Capitol Visitor Center
• APHL orchestrates Capitol Hill visits for newborn screening parent advocates and members
• APHL publishes State Public Health Laboratory Billing: Status Report and Recommendations as a resource for laboratories
• APHL Global Health Program and Informatics Program delivers Laboratory Information Systems Training at the African Centre for Integrated Laboratory Training in Johannesburg, South Africa
• APHL releases the NewSTEPs Data Repository

NOVEMBER 2013

• APHL attends EPA’s Water Laboratory Alliance Security Summit and a WLA Strategic Planning session
• APHL co-convenes the Integrated Foodborne Outbreak Response and Management (InFORM) conference in San Antonio, TX, to bring together PulseNet laboratorians, epidemiologists and environmental health specialists involved with foodborne and enteric disease outbreak response
• APHL hosts the LRN Conventional Methods Course in Richmond, VA

AUGUST 2013

• APHL enters a study on fluoridation and thyroid outcomes in the Central Washington Perfluoroalkyl Substances Study (CWPFSS)
• APHL completes LIMSi implementation in 28 public health laboratories
• APHL releases the National Health Security Preparedness Index

OCTOBER 2013

• APHL becomes a member of the Joint US Water Partnership, a group whose mission is to unite and mobilize best of US expertise, resources and ingenuity to address global water challenges, with a special focus on developing countries where needs are greatest
• APHL releases online the Essentials for the Mycobacteriology Laboratory: Promoting Quality Practices, training modules for clinical laboratorians
• APHL hosts Legal and Public Health Perspectives Surrounding Residual Dried Blood Spots in Newborn Screening meeting in Atlanta, GA
• The Health and Human Services (HHS) Office of Human Research Protection (OHRP) and the Colorado Multiple Institutional Review Board (COMIRB) determines that NewSTEPs data collected within the repository is deemed Non-Human Subject Research

DECEMBER 2013

• APHL releases an RFP for members to host meetings to improve the environmental health system in order to better meet community health needs
• APHL publishes CLIA Inspection Guidance for LRN-C, Radiobioassay and Biomonitoring Laboratories and a companion checklist
• APHL completes LIMSi implementation in 28 public health laboratories
• APHL releases the National Health Security Preparedness Index
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Office of Noncommunicable Diseases, Injury and Environmental Health; National Center on Birth Defects and Developmental Disabilities; National Center for Environmental Health/Agency for Toxic Substances and Disease Registry

Office of Public Health Preparedness and Response

Office of State, Tribal, Local and Territorial Support

Office of Public Health Scientific Services; Center for Surveillance, Epidemiology, and Laboratory Services; Division of Health Informatics and Services; Division of Laboratory Programs, Standards, and Services; Division of Scientific Education and Professional Development

**Other Federal Agencies**

Centers for Medicare and Medicaid Services, Division of Laboratory Sciences

Department of Defense

Department of Homeland Security, Office of Health Affairs; Science and Technology Directorate

Department of State, Office of Global AIDS Coordinator

Environmental Protection Agency, Office of Water; Office of Solid Waste and Emergency Response

Federal Bureau of Investigation, Hazardous Materials Science Response Unit; Hazardous Materials Response and Training Unit; Chemical, Biological, Radiological Nuclear Sciences Unit; Weapons of Mass Destruction Directorate

Food and Drug Administration, Center for Biologics and Evaluation Research; Center for Devices and Radiologic Health; Center for Food Safety and Applied Nutrition; Center for Veterinary Medicine; Office of Regulatory Affairs

**Health Resources and Services Administration, Maternal and Child Health Bureau**

National Institutes of Health, National Institute of Allergy and Infectious Diseases; Regional Centers of Excellence

US Department of Agriculture, Animal and Plant Health Inspection Service; Food Safety and Inspection Service; Agricultural Research Service; Agricultural Marketing Service

US Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response; Office of the National Coordinator for Health Information Technology

**Associations, Non-Governmental Organizations, and Other Partners**

AOAC International

Association of American Feed Control Officials

African Field Epidemiology Network

African Society for Laboratory Medicine

Alliance to Make US Healthiest

American Academy of Pediatrics

American Clinical Laboratory Association

American College of Medical Genetics

Association of Food and Drug Officials

American Public Health Association

American Society for Clinical Pathology

American Society for Microbiology

American Thoracic Society

Association of Maternal and Child Health Programs

Association of Schools and Programs of Public Health

Association of State and Territorial Health Officials

Booz Allen Hamilton

Canadian Public Health Laboratory Network

Caribbean Epidemiology Center

Children’s Environmental Health Network

Clinical and Laboratory Standards Institute

Clinton Health Access Initiative

College of American Pathologists

Columbia University Mailman School of Public Health, University Technical Assistance Program

Council of State and Territorial Epidemiologists

Council to Improve Foodborne Outbreak Response

deBeaumont Foundation

D4O- Design for Others

Elizabeth Glaser Pediatric AIDS Foundation

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Foundation for Innovative Diagnostics

Genetic Alliance

The George Washington University, Schools of Medicine & Health Sciences and Public Health & Health Services

Global Laboratory Initiative

International Food Protection Training Institute

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Management Sciences for Health

March of Dimes

National Alliance of State and Territorial AIDS Directors

National Association for Public Health Statistics and Information Systems

National Association of County and City Health Officials

National Coalition of STD Directors

National Conference of State Legislatures

National Environmental Health Association

National Tuberculosis Controllers Association
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<td><a href="http://www.diasorin.com">www.diasorin.com</a></td>
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