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Even as interest in biomonitoring has grown exponentially during the past decade, funding constraints have kept most states from implementing active biomonitoring programs. The missing data, say public health advocates, deprive health officials and policymakers of a valuable source of information.
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No Shortcuts
THE POWER OF PARTNERSHIPS: ACTING IN UNISON

In a recent conversation, APHL President Susan Neill and Executive Director Scott Becker identified some of APHL’s productive partnerships and discussed the impact of those relationships on public health laboratory practices.

**Becker:** While this issue of Lab Matters does not have an official theme, I think it is significant that many—if not most—of the articles describe a partnership that is advancing a solution to a public health laboratory issue. Whether that issue is biomonitoring, training, informatics, flu response, standards development, emergency preparedness or even newborn screening, a multi-disciplinary group is at work on it.

**Neill:** Every single function of a public health laboratory is dependent on a partnership or collaboration. Our funding, our equipment and supplies, our training programs, our mission—all of it stems from partnerships with federal agencies, governments, non-profits, private laboratories, vendors, the community...

**Becker:** I’ve been thinking a lot about how APHL functions best. We are often “the convener,” for lack of a better word. Frequently our role is to speak up about a problem, figure out who needs to be involved and bring them to the table so that a solution can be found.

**Neill:** Our recent collaborations with CDC during its reorganization have been very fruitful. When they began the reorganization, they sought input from APHL. The Board of Directors devoted a significant amount of time to making recommendations that would clarify the lab role at the agency. With the changes I think that the laboratory focus will be more prominent now.

**Becker:** Our message was heard. On behalf of all labs, we need to keep highlighting the importance...
of collaborating among every size, shape, type of lab, across every jurisdiction. Over the years the lab "voice" was being chipped away from the national conversation. We appreciate that CDC heard our input, and certainly as a partner we will do our part to contribute.

Neill: It wasn’t so much chipped away, as fragmented. The lab voice was increasingly fragmented. There was such a programmatic focus that the lab component was buried. It made it difficult for laboratorians to speak with one voice.

Becker: All of the flu planning has revealed the power of a group effort.

Neill: We are moving forward with our flu plan. We really stretched our boundaries this year. Our healthcare providers have become valuable partners. We have done considerable outreach to hospitals, physicians and local health departments to establish a comprehensive, thoughtful approach to work through our flu response.

Recently I gave a presentation to CLIAC [the Clinical Laboratory Improvement Advisory Committee] on how we maintained quality when specimens testing surged from 20 per day up to 500. I highlighted the training, the advanced planning at both the national and local level, how we work with our vendors, healthcare providers and other partners.

Becker: Efforts like this one, the flu response, highlight our need to push the National Laboratory System concept. To really protect the public’s health, there must be greater coordination and integration across laboratory systems.

In APHL’s new strategic plan, we have made partnership a cornerstone. One of our six overarching goals is to be a hub for networking and community-building—to ensure information is moving smoothly among stakeholders, to coordinate group response to public health events, to share best practices, to develop a national laboratory system.

Neill: I also just spoke to the Southwest Association of Clinical Microbiologists on partnership. The audience was comprised of clinical hospital microbiologists from Texas and neighboring states. I talked about the importance of the national laboratory system, the difference between individual health and public health, the roles of clinical and public health laboratories and how/why we need to rebuild the national laboratory system. There was a tremendous response to the talk.

Becker: I am about to speak to students at the University of South Florida College of Public Health. Students often seem to believe a lab is a place where a test takes place, and that’s it. I want to impress upon them the level of partnership that is built throughout our work. Can I look at your presentation? Maybe borrow a few slides?


Becker: Now here’s a partnership in action!

Neill: We have some important relationships that are deepening, improving. We have had tremendous recent success with our evolving partnership with DHS. We’re communicating more on BioWatch program activities and strengthening our foundation for testing. And also, the FDA is launching a push for an integrated food safety system now.

Becker: An integrated system will allow laboratories to fulfill our role. The food system is not dependent on just one agency. It is tied in with them all—CDC, EPA, FDA, USDA.

Neill: It’s local and state governments too; not just federal.

Becker: In the same way, biomonitoring will never be successful until industry, epidemiology and public health work together. We feel the time is right. There has been a trickle of funding and support, and our hope is that it will become a gush. Its time has come.

Neill: That small trickle allows states to begin biomonitoring programs and start gathering data. Those data will bring recognition to the importance of biomonitoring. It’s one thing to say that biomonitoring will be useful; it’s another to have data and bring recognition and show the benefits to the state. The data will inform the community.

Becker: On a recent visit to CDC, I asked one of our contacts there what he thought APHL’s role would be in the new organization. He responded, “Do what you always do. Be an honest broker.”

Neill: That’s outstanding.
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APHL/CLSI PARTNERSHIP: A PERFECT COMBINATION

by Karen Breckenridge, director of quality systems; Linette Granen, manager of corporate relations; and Catherine Johnson, manager of APHL training

HISTORY
In 2007, APHL and the Clinical and Laboratory Standards Institute (CLSI) formed a partnership to offer educational teleconferences on topics of importance to clinical, public health and veterinary laboratories around the world. Based on CLSI materials, the programs help pathologists, managers, supervisors and laboratory professionals optimize their laboratory practices and processes.

A catalyst for developing this partnership was the proven success of the National Laboratory Training Network’s (NLTN) annual update on the CLSI document, Performance Standards for Antimicrobial Susceptibility Testing (M100-S19). For years, Janet Hindler, MCLS, MT(ASCP), senior specialist in clinical microbiology, UCLA Medical Center, provided up-to-date information on the CLSI antimicrobial susceptibility testing guidelines through an NLTN teleconference.

The new training programs capitalize on the expertise of subject matter experts associated with CLSI subcommittees and workgroups and the ability of APHL’s Department of Continuing Education and Training (DCET) to develop and deliver education programs via teleconference format. “The teleconference activity is a conduit for CLSI to get the right information to each of our constituencies so that expert guidance can be implemented,” said Ellen Williams, CLSI’s marketing director. The potential audience for each educational program is increased by the access to both APHL and CLSI members. In January 2008, the first teleconference session was launched: a complimentary welcome and overview of the upcoming programs by Glen Fine, CLSI’s executive vice president.

OVERVIEW AND OUTCOMES
So far the collaboration has had more than 32,000 participants from 4,600 sites in 23 countries. The most popular program is the annual CLSI Antimicrobial Susceptibility Testing AST Update, with more than 6,500 attendees in 2008; in 2009, attendance increased by seven percent to almost 7,000 participants.

Teleconference topics are selected by a team of CLSI and APHL staff and supported by recently-published CLSI documents. Additionally, topics identified or requested by participants may be included in the schedule. Since January 2008, 35 CLSI guidelines have been highlighted through the partnership series, ranging from topics as basic as quality systems to the more complex molecular methods implementation.

Teleconferences are available as stand-alone sessions or in a series offered at a discount. All programs are recorded and remain available for six months. The site registration fee includes access to both the live program and recorded session so that laboratory supervisors can share the material with all staff, regardless of work schedules or time zone. Participants can earn continuing education credits by attending the live presentation or the recorded session.

Participants may also submit questions to the presenters at the end of the session. Williams said, “The teleconference approach gives our participants a direct line to the experts and that is, after all, why they choose to participate.”

Participant feedback has shown that these programs help stretch the laboratory’s continuing educational program.

EDUCATIONAL PROGRAM FEEDBACK
Below are comments from past participants:

• Please continue with these teleconference topics and knowledgeable speakers which benefit bench technologists who have a difficult time getting time off to attend seminars and workshops.

• We are a small hospital and look forward to these sessions each year.

• It was a very thorough presentation with a lot of useful knowledge.

• I find these teleconferences very valuable in finding out what is new and what is changing.
education funds by allowing an unlimited number of staff to participate at no additional charge. A teleconference is often the easiest, most effective and cost-efficient way to provide information to a geographically-dispersed audience.

**FORMAL PARTNERSHIP**
The partnership has progressed even further when APHL formalized its relationship with partners like CLSI through a new suite of benefits tailored to the needs of strategic partner non-profit organizations. Both APHL and CLSI realized the potential for collaboration and cooperation beyond the educational partnership. The formal establishment of this partnership has enhanced the exchange of benefits between the two organizations to include:

- APHL members have access to up-to-date information on the CLSI documents reviewed on the training programs.
- Members of both organizations receive information about products and services offered by APHL and CLSI.
- Participants gain insight into the other laboratory community during the joint question-and-answer session at the end of the program.
- APHL has access to subject matter experts who may act as faculty for other training programs.
- CLSI has access to time-critical information about public health laboratories and may participate in APHL-sponsored conferences.
- APHL members may participate in CLSI workgroups to develop and update the standards and guidelines.

The roots of the partnership between APHL and CLSI lie in the teleconferences, which serve a vital role in the entire laboratory community, both national and international. The CLSI guidelines are a roadmap that ensures quality laboratory practice, whether clinical or public health. Encouraging every clinical and public health laboratory to adhere to these guidelines is the overarching goal of this partnership, and clearly supports APHL’s vision of “A Healthier World through Quality Laboratory Practice.”

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BEHIND THE SCENES OF A BIOTERRORISM ‘TRAIN THE TRAINER’ COURSE

by Tony Barkey, specialist, emergency preparedness and response, and Sikha Singh, specialist, Laboratory Response Network

In July APHL Emergency Preparedness and Response staff Tony Barkey and Sikha Singh attended a course, “Agents of Bioterrorism: Designing and Conducting Training for the Sentinel Laboratory,” offered by the National Laboratory Training Network (NLTN) and the Commonwealth of Virginia Division of Consolidated Laboratory Services (DCLS). The course offered guidance on how to develop and implement an accurate, thorough, bioterrorism training program for sentinel laboratorians. In addition to its primary aim—to train the trainer—this course used a combination of lecture, discussion and hands-on laboratory exercises to enable the participants to accomplish three main objectives:

1. Understand the role of the clinical laboratorian in the presumptive identification of organisms with potential for use in bioterrorism,
2. Learn the safety implications of handling suspected pathogenic organisms in clinical specimens and isolates and
3. Identify the microbial characteristics of the primary agents likely to be involved in a bioterrorism event.

The pre- and post-tests offered measurable indicators of education, but the most valuable tools were the expert speakers, course facilitators and the diverse student body. The other students were laboratorians from across the nation, eager to share their state-specific issues and to absorb successful practices from others.

In addition to participating in the Sentinel Laboratory Training course, Singh and Barkey toured the DCLS facility, which supports laboratories from several Virginia agencies that work together to provide testing. DCLS is unique because of the wide breadth of testing conducted in one facility, including specimens such as gasoline, animal feeds, fertilizers and lottery tickets. The laboratory also performs a full array of public health testing services, such as newborn screening. DCLS staff were insightful, informative and gracious in hosting the visitors.

“Taking a walk in our member’s shoes, coats and ill-fitting goggles really makes you appreciate the wonderful work the men and women who staff our nation’s laboratories do on a daily basis.”

-Tony Barkey, APHL

LRN LEADERSHIP AND PARTNERS MEET TO ADVANCE PROJECTS

by Bonnie Rubin, CLS, MBA, MHA, the University Hygienic Laboratory team, and Anthony Barkey, MPH, emergency preparedness and response program manager

In September, the Laboratory Response Network’s (LRN) Joint Leadership Committee (JLC) convened its second meeting of the year. Formed to address strategic and high-level operational issues within the LRN, the JLC is comprised of representatives of the founding partners—APHL, CDC and the FBI. The committee develops recommendations on strategic direction, growth, resources and operational policies. During this meeting the committee finalized a statement on “The Role of CSTs [Civil Support Teams] in Support of the LRN;” It will be distributed to member laboratories and CSTs in spring 2010. Further, the group shared information on agency reorganizations and partnership expansions, and discussed current issues, such as the utility of the LRN during an influenza outbreak response and strategies to secure funding for the network laboratories.

The next day, the LRN Partners Workgroup convened 32 representatives from multiple federal agencies and other key organizations. This workgroup addresses protocols, proficiency testing and other operational items across multiple laboratory networks. It allows stakeholders to provide agency/organizational project updates and to discuss all-hazards preparedness and the role of the LRN in broad public health initiatives. The primary topic of this meeting—field identification of biological warfare agents—generated productive discussion and meshed well with the presentation on the partnership between CSTs and the LRN. Reports from the partners provided insight into agency-specific activities, such as upcoming drills and exercises, increased capabilities and surge capacity gaps.

These meetings present LRN partners with an opportunity to exchange information on current issues and facilitate interactive discussion among multiple federal agencies and organizations.

The next meeting of the LRN JLC and Partners groups will be in February 2010 in Atlanta, GA.
PROTECTING THE COUNTRY THROUGH EXISTING PARTNERSHIPS

by Tony Barkey, specialist, emergency preparedness and response, and Sikha Singh, specialist, Laboratory Response Network

Since early 2009, APHL’s Emergency Preparedness and Response (EPR) staff have worked on developing a new series of trainings focusing on a moot court pilot course and on chain of custody procedures for members of the Laboratory Response Network (LRN). Multiple members have requested such trainings, which will provide necessary expertise to laboratories.

The chain of custody course will guide laboratories through the importance of sample handling, provide background and historical perspective, cover pre-planning and lead the laboratories from sample receipt through testing and disposal. The dual-medium training format will convene with a web-based application to be viewed at the convenience of LRN members, followed by a national teleconference to answer questions.

The pilot moot court training will consist of a one-day, in-person course that will cover background and case studies, tips for preparing for court and testimony and a mock court experience with testimony based on a given scenario. The moot court training, as well as the question-and-answer time, will feature participation and evaluation from field experts and lawyers.

APHL has developed these projects with the help of the FBI. In August, EPR staff members Chris Mangal, Sikha Singh, Gavin Gollehon and Tony Barkey visited the Quantico Marine Base in Virginia to discuss these trainings and learn more about the new FBI laboratory and campus. The primary point of contact on the FBI side of this operation has been Supervisory Special Agent Lisa Ference, who has extensive expertise in evidence handling and collection and is highly experienced in witness testimony. The EPR team was treated to a tour of the famed Hogan’s alley, shooting ranges, weapons displays and explosives recreations.

Look for the chain of custody trainings later this fall and the moot court training to follow early next year.

“Working with a long standing partner [APHL] in a new capacity has been a great experience, and these new courses will not only benefit the laboratories, but will, in turn, enhance the FBI’s investigations”

–Lisa Ference, supervisory special agent, FBI Laboratory

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PROGRESS IN THE PUBLIC HEALTH LABORATORY INTEROPERABILITY PROJECT

by Michelle Meigs, manager, informatics program

Due to the tireless efforts of public health laboratory and informatics subject matter experts, the next 12 months will be an exciting time of continued growth and recognition for the Public Health Laboratory Interoperability Project (PHLIP). Under the direction of its Executive and Steering Committees, the PHLIP community has advanced five distinct, but interdependent, project tracks over the past year, showing discernable success in each. Below is a high-level view of each area.

ELECTRONIC LAB MESSAGING
Delivering influenza test results electronically from public health laboratories to CDC was the original PHLIP goal. Following the Executive Committee’s direction, PHLIP facilitators are focusing on expanding the number of laboratories that can implement the Electronic Laboratory Surveillance Monitoring (ELSM) influenza messaging standards, in an effort to meet the growing need for real-time monitoring of flu result data for both seasonal and pandemic strains. Four PHLIP public health laboratories (VA, CO, IA and NE) are already in production for seasonal influenza, and these states were also successful in transmitting novel influenza H1N1 results with limited modifications to the reporting process. Four states (ID, FL and CA) are in the final steps of validating the HL7 influenza messages and will be in production for the flu season. Fifteen additional public health laboratories are developing their infrastructure and message streams, using the PHLIP ELSM HL7 influenza resources.

STATE-TO-CDC
Two PHLIP state public health laboratories will soon exchange Electronic Test Order and Result (ETOR) messages with CDC laboratories for Salmonella and Bacillus anthracis. This improves the original scope of the project, which was to begin with a paper order and end with an electronic result; the project is now moving to a comprehensive bi-directional electronic communication.

STATE-TO-STATE
Five PHLIP public health laboratories (Iowa, Nebraska and Minnesota in one pan flu pilot exchange, and Florida and Texas in the other) are implementing the PHLIP ETOR messaging for state-to-state contact for influenza surge capacity and mutual assistance (SCMA).

ROUTE NOT READ HUBS
The PHLIP Route Not Read (RnR) Hub workgroup has developed the architecture and resources needed to implement two regional messaging hubs (located in NE and FL). The RnR hub solution meets the interim needs for secure electronic messaging and prepares PHLIP states to scale to a long-term architecture solution as the National Health Information Network (NHIN) develops. The two RnR hubs are operational, interoperable and able to share data with CDC.

COLLABORATION
PHLIP is driving efforts to harmonize its projects with other national efforts, including the Laboratory Response Network, NHIN, environmental, newborn screening and electronic laboratory reporting initiatives.

As ELSM and ETOR evolve, so does vocabulary harmonization. PHLIP vocabulary harmonization is performed systematically to represent specific public health laboratory tests and results in a consistent way.

For more information about PHLIP, contact phlip@aphl.org.
This winter, APHL will release a new member benefit, the Survey Resource Center. The Survey Resource Center is a web-based survey and data repository that provides access to and utilization of APHL’s raw survey data. The resource center re-visions the original APHL LabNet platform and will allow member laboratories to view their responses to survey questions in comparison to the national descriptive statistics.

KEY IMPROVEMENTS
The Survey Resource Center is a web-based data reporting tool that pulls data directly from APHL’s survey administration software (SPSS MR Interview) and allows members to download and manipulate their state’s raw survey data. These are major improvements over the legacy system, LabNet, which required staff to use third party developers to upload survey instruments and results and did not allow members to download data in a useable format. Members will have the ability to export their responses to APHL surveys in a variety of ways and formats. In addition, the Survey Resource Center can generate simple charts and provide basic descriptive statistics for individual survey questions.

GAINING ACCESS AND SECURITY
In its inaugural year, the Survey Resource Center will be available to member laboratory directors and delegates. It will eventually be open to other levels of APHL membership. For security purposes, the Survey Resource Center will be visible only to individuals logged in as members at APHL.org; it will then have an additional login screen that requires an individual username and password.

NEXT STEPS
Moving forward, APHL will organize hour-long, quarterly webinar tutorials to ensure members are comfortable using the Survey Resource Center. The webinars will be archived and available to members as needed. APHL will continue to refine the utility of the Survey Resource Center by soliciting member feedback.
LESSONS LEARNED: ASSESSING THE PUBLIC HEALTH RESPONSE TO FOODBORNE INVESTIGATIONS

by Kara Watarida, PulseNet program manager

Evaluating past foodborne investigations through “hotwashes” and after-action reviews allows officials to understand the complexity of multi-state outbreaks and to assess the response to improve future investigations. In May, CDC’s Foodborne and Diarrheal Diseases Branch, along with state and local public health laboratory and epidemiologists, federal food regulatory agencies and agricultural officials, conducted an after-action review of the multi-state *Salmonella typhimurium* outbreak associated with peanut butter and peanut-containing products. The goal of this review was to evaluate the agencies’ performances collectively and to identify the teams’ strengths and weaknesses. Ultimately, such reviews should lead to improved foodborne surveillance and outbreak response.

Ian Williams, PhD, from the CDC Enteric Diseases Epidemiology Branch, led the after-action review, which examined the different stages of the epidemiological investigation—from detecting clusters to generating hypotheses and implementing prevention measures. Conclusions focused on lag times in case reporting, turn-around times for laboratory analysis of clinical isolates, accuracy in assessing case control studies and the public availability of recall information.

Participants noted that the PulseNet surveillance system provided quick identification of related cases one month after illness onset dates, pointing epidemiologists to the possibility of an outbreak. This outbreak highlighted the complexities of “ingredient-driven” outbreaks and the importance in detecting and investigating local clusters. One of the lessons learned was that “ingredient-driven” outbreaks do not provide an immediate source since the contaminated ingredient can be in many products and distributed widely. For example, this outbreak strain was found in dog food treats, packaged peanut butter crackers and freshly ground peanuts, among others.

During this review, it became evident to participants that timely lab results and epidemiological investigations at the local and state level provided critical clues to solving the larger national outbreak. This outbreak again illustrated the importance of *Salmonella* serotyping and molecular subtyping in public health labs in detecting and investigating outbreaks.

Ideally these after-action reviews will persist among CDC, federal regulatory agencies and state and local public health laboratorians and epidemiologists. Lessons learned from these outbreaks continue to demonstrate the need to enhance the capacity of the public health infrastructure at all levels of government.

THE EPI-LAB INTEGRATED REPORTING PROJECT

by Michael Smith, MPH, specialist, food safety program

Most state health departments have independent epidemiologic and laboratory information management systems, with no way to integrate data to create timely, epidemiologically-useful reports. Programs with good data-sharing practices are generally more successful at identifying and investigating in-state and multi-state foodborne disease outbreaks.

To address this issue, APHL, in conjunction with the Council to Improve Foodborne Outbreak Response (CIFOR) and the Council of State and Territorial Epidemiologists (CSTE), created the Epi-Lab Integrated Reporting Project. APHL and CIFOR contracted with the Minnesota Department of Health to develop open-access software that facilitates both rapid case reporting and cluster identification. The software, completed in April 2009, has been designed to be database and platform independent, and represents a universal interim technology that can be used until continuous electronic epidemiology/laboratory links and cluster detection and evaluation mechanisms can be established. It could be used to share information among jurisdictions for regional surveillance and may be modified by the user to accept data from both epidemiology and laboratory systems to create integrated reports.

The project has reached Phase II and is piloting the software in three health departments with different information management systems. After reviewing proposals, APHL, members of CSTE and the CIFOR EpiLab Workgroup chose three sites—the Utah Department of Health, the Tennessee Department of Health and Labpoint/the Nebraska Department of Health. The pilot sites will develop a plan to extract laboratory data automatically on a daily basis for upload to the reporting system. Sites will identify the specific data elements to be extracted for these reports; all of them will include basic case and specimen identifiers, standard demographic information and result information such as pathogen, serotype and PFGE pattern. By June 30, 2010, each pilot site will conduct a final evaluation of the software and issue a summary report.

Ideally, at the end of the project, there will be a new system that laboratorians and epidemiologists can use to bridge the electronic communication gap and decrease foodborne outbreak detection and response times, leading to improved public health strategies and in the number of cases of foodborne illness.
Newborn screening is a highly successful state public health program that identifies rare genetic, congenital and functional disorders and ensures early management and follow-up for those affected. Newborn screening policies are usually implemented with input from multi-disciplinary advisory committees. State responsibility allows for local control and accountability, which gives rise to wide variations in practices.

All US newborn screening programs obtain blood specimens for laboratory tests and retain portions of these specimens (residual specimens) for some period of time after testing. The collection of stored specimens is often referred to as a “biobank.” Specimens are retained primarily to benefit the child/family by documenting that a specimen was collected and analyzed properly. They are most often used for result verification and quality assurance activities (including new test validation).

Newborn screening specimens are unique since they are usually a baby’s first blood sample and are collected from almost all American newborns. They provide critical information about risk for certain inherited conditions and have the potential to generate additional population-based healthcare knowledge. Specimen storage must ensure that family privacy is respected and that the specimens are protected. Specimen retention/usage policies in each state should promote public trust, emphasize transparency of administrative practices and create supporting information that encourages informed public participation.

The working group of the Advisory Committee on Heritable Disorders in Newborns and Children has prepared a guidance ‘white paper’ on issues and actions, including draft national recommendations, for discussion and consideration for possible action by the Secretary of Health and Human Services’ Advisory Committee on Heritable Disorders in Newborns and Children.

For more information, contact Brad Therrell, therrell@uthscsa.edu.

Written on behalf of the Advisory Committee on Heritable Disorders in Newborns and Children Working Group members:
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- Sharon Terry, MA
- Alaina Harris, MSW, MPH

ENVIRONMENTAL HEALTH TRAINEESHIP: MOTIVATING AND EDUCATING LABORATORIANS

by Jennifer Pierson, MPH, senior specialist, environmental health

APHL’s Environmental Health Program aims to improve laboratory practice through its Traineeship Program. In an atmosphere of state and local budget cuts and travel restrictions, the traineeship allows laboratorians to attend conferences or trainings in environmental public health. Many awardees have gained much more than just technical skills or knowledge.

Chris Ellis, PhD, at the Rhode Island Department of Health Laboratory received a traineeship to attend an AOAC International Annual Meeting in 2007. Ellis said the meeting “provided me the chance to stay on top of current analytical developments and ‘hot’ topics related to my job activities.”

Betsy Edhlund, PhD, at the Minnesota Public Health Laboratory attended a biomonitoring training series and said, “In addition to learning a new method, I gained insight into the LC-ICP-MS technique, which will help me explore additional metals speciation projects.”

Deki Kelsang Yangser at the Utah Public Health Laboratory attended the 2009 Arkansas Toxicology Short-Course, planned by APHL’s Toxicology Workgroup and the Arkansas Public Health Laboratory. Yangser said, “The study materials covered during the course were very relevant to my work …and [the course] reminded me why I chose this field of work.”

For more information, visit www.aphl.org/profdev/fellowships/eh/Pages/default.aspx.
Prominent signage along the shoreline of the Aberdeen Proving Ground (APG), at the head of the Chesapeake Bay, warns boaters not to disembark. Further warning, if needed, comes in the form of the occasional 155 mm artillery round poking through the sand.

But unexploded ordnance is only one of the hazards associated with this 72,000-acre Army garrison, located 20 miles north of Baltimore. A 2008 public health assessment lists a host of concerns ensuing from APG’s history as a receiving center for low-level radiological waste and as a venue for munitions testing and chemical warfare material development.

Polychlorinated biphenyls (PCBs) and toxic heavy metals contaminate the soil, surface water, groundwater and local aquatic animals. Three Superfund sites are on the garrison.

Jack DeBoy, DrPH, head of Maryland’s state public health laboratory, began to take serious notice of APG about 15 years ago, when the Department of Defense proposed hauling away some of the accumulated toxic waste on barges and burning it.

Had the plan gone forward, DeBoy wanted to develop the capacity to assess human exposure to the waste using biomonitoring—a laboratory technique that directly measures levels of toxic chemicals and chemical byproducts in the blood, urine or other specimens of potentially exposed persons.

At that time, few public health laboratories had much biomonitoring capability, but the technology had been used to great effect at the national level. In the early 1980s, CDC data showing that population-wide blood lead levels rose and fell in parallel with gasoline lead levels prompted the federal government to begin phasing out leaded gasoline.

The military’s disposal plan for APG waste was never carried out. Yet even as interest in biomonitoring has grown exponentially during the past decade, funding constraints have kept most states from implementing active biomonitoring programs. DeBoy’s laboratory, for example, has only a passive program, which tests for cyanide and pesticides in patient specimens submitted mostly by the Maryland Poison Center.

The state still has no data on residents’ exposure to the toxic substances leaching into the environment around APG.

Ewa King, PhD, head of the Rhode Island Department of Health Laboratories and co-chair of APHL’s biomonitoring subcommittee, said, “Biomonitoring data are missing at the state level. We see this as a huge gap in the general knowledge.”

The missing data, say public health advocates, deprive health officials and policymakers of a valuable source of information.

Jim Pirkle, MD, PhD, who oversees biomonitoring studies at the CDC’s environmental health laboratory,
said, “High quality exposure information yields much, much better public health decisions. [Biomonitoring] brings data to the table, when in many situations there have been only opinions.”

Moreover, said Pirkle, “There isn’t a Plan B. If you don’t have biomonitoring data, there’s no other way to determine how much of these chemicals is getting into people.”

**ESTABLISHING A NATIONAL BIOMONITORING NETWORK OF PHLS**

APHL, CDC and partners are now in the early stages of formulating a plan to establish a national biomonitoring network of public health laboratories that will ensure access to biomonitoring capabilities at the state and local levels and enable researchers to investigate potential human exposures more easily.

Participants at an APHL-convened meeting—scheduled to follow the CDC’s National Environmental Public Health Conference in October in Atlanta, GA—will flesh out the desirable features of a national biomonitoring network, along with the resources necessary to develop and maintain it. In addition to laboratory leaders, APHL hopes to engage epidemiologists, toxicologists, environmental health experts and policymakers, all of whom will be key system stakeholders.

At a minimum, the network will aim to ensure the quality and comparability of biomonitoring analyses across public health laboratories by maintaining laboratory training and quality assurance/proficiency testing programs for members. It will also support efforts to improve biomonitoring technology and create tools to help laboratory leaders communicate biomonitoring findings to policymakers, the public and other audiences.

As now envisioned, the network would be operational in 2014, but implementation is entirely contingent on future federal funding.

In conjunction with the network development, APHL is creating a database to document existing state and local biomonitoring capabilities, including the methods and instrumentation in use. The database would, for example, enable a scientist to identify the nearest public health laboratory with the ability to measure mercury in urine.

The nation’s premier biomonitoring resource is the CDC’s periodic National Report on Human Exposure to Environmental Chemicals. The report documents the amount of high-priority chemicals in the bodies of a random, nationally representative sample of individuals identified through the National Health and Nutrition Examination Survey (NHANES). The biennial survey provides unique information on national exposure trends. It also provides reference range values physicians and health scientists can use to gauge whether an individual or a population group has an unusually high “body burden” of a specific chemical, meriting follow-up investigation.

The report debuted in 2001 with data on exposure levels for 27 chemicals and will feature more than 200 chemicals when the fourth report is released this fall.

While the national exposure report serves a critical function, it also has an important limitation: it does not permit examination of exposure levels by jurisdiction, proximity to sources of exposure or use of particular products.

This is precisely where targeted studies are needed.

**STATE-BASED BIOMONITORING TARGETS LOCAL EXPOSURE**

The CDC helps to fill this void with 50 to 70 studies per year, often requested by collaborators, examining how biomonitoring exposure levels relate to health risk and how exposure sources and pathways influence biomonitoring levels.

At the same time, CDC is a big proponent of state-based biomonitoring.

Said Pirkle, “States are much more familiar with their individual exposure situations; they have primary knowledge of their needs. And they are ideally situated to conduct studies that address the sources and health significance of those exposures. When states do biomonitoring, for example, they can specifically target children living in metropolitan areas in their state. They can come up with state aggregate exposures for chemicals of concern in their state. NHANES was not designed for that. The NHANES design is to provide national data.”

State biomonitoring limitations have already resulted in missed opportunities to assess the need for new environmental health policies and to assess the effectiveness of existing policies. One example, said King, is a restaurant smoking ban instituted in Rhode Island in 2004.

“This would have been such a great biomonitoring study to document exposure to restaurant workers before and after the ban,” she said. “That’s the type of immediate gain one can see with biomonitoring.”

Pirkle said building state-level biomonitoring capacity “is a high priority for us, a very big deal to us. The principal barrier has been just being able to get funding.”

**SHAKY FUNDING HAMPERS BIOMONITORING PROGRESS**

In fact, uncertain funding has made CDC and APHL efforts to build state biomonitoring capacity frustratingly slow, sometimes ending in one step backward for every two steps forward.

In 2001, CDC disbursed nearly $10 million to jumpstart biomonitoring planning in 33 states. But
anticipated implementation funding never materialized.

Only three programs—in New Hampshire, New York and the six-state Rocky Mountain Biomonitoring Consortium—received money to pilot their plans. And even this support (about $2.7 million dollars for all three programs) fell short of needs, leaving recipients to cobble together supplemental funds as best they could and pare their plans to fit the new budgets.

Programs without follow-up funding from the CDC were completely on their own.

In Rhode Island, King said, “We had a plan, but we had no funding whatsoever. Our saving grace was that we put together a chemical terrorism (CT) response laboratory, for which there was ample funding in 2003. As it happened the laboratory instrumentation for biomonitoring was very similar if not identical to the CT response instrumentation.” And CDC encouraged dual-use of the equipment.

Even with the instrumentation in place, the laboratory was able to initiate a small pilot study only because King was willing to commit the staff time and able to capitalize on the interest and resources of outside partners.

The Rhode Island study involved acquiring umbilical cord blood samples from a local hospital and analyzing them for mercury, cadmium and lead. Results, which are being submitted for publication, showed no detectable concentrations of cadmium or lead, for the most part, but showed blood mercury levels that were five times higher in black mothers than mothers of other racial groups.

Unfortunately, the study had only a small cohort of black women, so findings must be interpreted with caution.

The researchers would like to do a follow-up study, this time collecting information about possible dietary or occupational sources of mercury exposure. No study, however, is planned.

“There’s only so much we can do without funding,” said King. “That’s our dilemma right now.”

The evaporation of expected federal funding, as well as the hefty reductions in federal CT preparedness grants, continues to threaten nascent state biomonitoring programs.

Megan Latshaw, PhD, APHL’s environmental health program director, said, “CT funding is still on the decline, and laboratories continue to struggle with budget cuts, staff furloughs, layoffs and hiring freezes. It’s a challenge just to keep their doors open five days a week.”

Latshaw, however, is hopeful for renewed federal investment in state biomonitoring.

Already, on September 9, CDC awarded a total of $5 million to California, New York and Washington. Awardees were chosen from 33 states that applied for funding, either individually or in partnership with other states.

Said Pirkle, “We’re very excited about this [grant program] and we’ll be working to get the funding increased.”

Another hopeful sign for the future of biomonitoring comes from Capitol Hill.

POTENTIAL LEGISLATION MAY HELP

Before becoming president, then-Senator Barack Obama introduced a bill supporting development of state biomonitoring capacity. Similar legislation is now pending in both houses of Congress, and one high-level congressional insider said prospects for passage are “better than they’ve ever been.”

Said Latshaw, “There have always been several people in Congress who have been supportive of biomonitoring; President Obama was one of them. The issue never really got to the table [during the previous administration]. Now I think the political environment has changed.”

The Coordinated Environmental Public Health Network Act (H.R. 3426)—introduced by Speaker Nancy Pelosi (D-CA) and Congresswoman Louise Slaughter (D-NY)—is under review by the House Energy and Commerce Committee. As now written, the act would perform much-needed functions:

- Authorize the CDC to enter into cooperative agreements with states and multi-state consortia to gather biomonitoring data on a range of environmental exposures.
- Establish coordinated state and federal health tracking networks to monitor trends related to priority health conditions and analyze possible connections with environmental factors.

Senator Christopher Dodd (D-CT) has worked to include similar language in one of two health reform
bills expected to be merged and brought to the Senate floor.

APHL will continue to monitor the legislation’s progress.

While bills to establish state biomonitoring programs have been introduced in a handful of statehouses, only two have been successfully enacted: in California and Minnesota.

In both cases, highly motivated legislators played pivotal roles. In California, a key legislative backer was interested in the connection between environmental toxicants and breast cancer, a disease afflicting one of his aides. In Minnesota, three legislators focused on biomonitoring after a public outcry over reports of perfluorinated compounds (PFCs) in the drinking water in their legislative districts near St. Paul.

In addition, Illinois has unfunded legislation authorizing the University of Illinois to study the feasibility of future biomonitoring studies.

California, whose 2006 biomonitoring law was the first in the nation, planned to phase in its program over five years. With the state of California in fiscal freefall, however, legislators appropriated no funding until 2007. Baseline funding is now limited to $1.9 million per year, split among three departments.

Given these financial constraints—and with state workers on furlough three days per month—the expensive statewide studies specified in the legislation have been shelved for the foreseeable future.

California’s Environmental Health Laboratory is instead working with the state’s environmental health tracking program on small-scale pilot studies to test and refine protocols that can later be used for a statewide study. The recent infusion of more than $2.6 million from the CDC will help to support these.

One project will examine exposure to chlorpyrifos, a pesticide linked to neurological effects and birth defects, in an agricultural community. Another will examine exposure to perchlorate, a thyroid hormone inhibitor, among Imperial County residents in southern California.

And a third project may investigate paired maternal and infant exposures in collaboration with researchers at the University of California at San Francisco. (Researchers are still determining the feasibility of collecting maternal urine and blood specimens and fetal cord blood specimens at the time of delivery.)

Because specimen collection is so costly, state scientists have also tried to identify existing sources of blood and urine specimens obtained from Californians over the past five years. The intent is to provide state scientists opportunities to generate data by performing limited analyses using newly acquired equipment and to add value to ongoing external research.

Minnesota’s biomonitoring legislation authorizes only community-based projects, and the state provided funding for a two-year period from July 2007 through June 2009.

Louise Liao, PhD, who heads the Minnesota Public Health Laboratory’s environmental section, said, “The funding was not sufficient to do the projects to the level of quality that we would have liked, so there was some creative effort to piggyback on other opportunities.”

The resulting four projects are all considered proof-of-concept studies:

- A study of exposure to organic and inorganic arsenic species in children living in certain neighborhoods in south Minneapolis, where elevated levels of arsenic were detected in the soil of several hundred residences.
- A study of adults’ exposure to PFCs in two communities in Washington County, where the drinking water is known to be contaminated with low levels of the chemicals, which are used in the manufacture of nonstick and stain-resistant surface treatments.
- A study to measure pregnant women’s exposure to cotinine, an indicator of exposure to cigarette smoke.
smoke, and to environmental phenols, which are found in some plastics, cosmetics and toiletries and are suspected of having adverse effects on fetal development.

- A study to test a sampling of newborn dried blood spots for mercury, as a proxy measure of mercury exposure among women in northeastern Minnesota, along the Lake Superior Basin.

The prenatal study is an ancillary study to a research project at the University of Minnesota. And the newborn dried blood spot study is funded primarily by the EPA and will also include specimens from state newborn screening programs in Wisconsin and Michigan.

These pilot studies, all involving human subjects, have introduced laboratory research to a whole new world of institutional review boards and neighborhood canvassing. "The amount of work that went into knocking on doors and recruiting people... was a very eye-opening experience," said Joanne Bartkus, PhD, head of the Minnesota Public Health Laboratory.

Findings so far have raised more questions than answers. For example, one PFC present in negligible amounts in Washington County drinking water is actually measurable in people, prompting the state to look at other possible exposure pathways.

Overall, mean PFC concentrations in Washington County residents are slightly higher than the geometric mean concentrations in the CDC’s national exposure report.

"Should we be anxious?" asked Liao. "I don't know what the answer to that is."

Ultimately, accurate interpretation of biomonitoring data requires knowing what body burden is associated with illness. And actionable levels of exposure have been established for few of the more than 5,200 chemicals the EPA considers likely sources of human exposure.

Efforts to study the relationship between exposure and health outcomes have been complicated by the sometimes lengthy lag time between the two and by the absence of linked exposure and disease tracking systems.

In fiscal year 2002, CDC began developing a nationwide environmental public health tracking network to address these problems by integrating data about environmental hazards and exposures with data about diseases potentially linked to the environment. Since then, the agency has funded environmental public health tracking programs in New York City and 22 states, including Maryland, Minnesota and California.

Laboratory-based biomonitoring programs work closely with these public health tracking programs, as well as with state epidemiology, environmental health and toxic substances control programs to provide a broader context for data interpretation.

In Minnesota and other states with fledgling biomonitoring programs, the work is just beginning. Bartkus said, "I do think these pilot studies have been very, very helpful to spur the development of additional questions. Biomonitoring can provide, if not definitive answers, at least arrows pointing to the next steps."

In the meantime, the science of biomonitoring gets better and better: technological advances allow the identification of an expanding list of chemicals, in smaller concentrations using smaller samples.

Minnesota scientists, for example, have refined methods to achieve high-sensitivity testing for mercury using only two 3-mm punched spots from newborn screening dried blood specimens.

The CDC recently developed methods to detect tobacco-specific nitrosamines, potent carcinogens formed from nicotine. "It's really interesting," said Pirkle, "where on the one hand we can use serum cotinine levels to track exposure to tobacco smoke, and on the other we can measure this very specific carcinogen that comes from tobacco smoke. We can relate the amount of tobacco smoke exposure to how much nitrosamine you have in your body."

The soon-to-be-released fourth national exposure report includes data on 75 more chemicals than the previous report. Among these are speciated forms of arsenic, which enable researchers to distinguish between exposure to arsenic in water and exposure to arsenic in food; acrylamide, a carcinogen present in fried foods; polybrominated diphenyl ethers, a class of flame retardants; and Bisphenol A (BPA), an organic compound commonly used in hardened plastics.

Biomonitoring experts expect the field to be a major growth area for environmental and public health, with relevance for everything from emergency preparedness to chronic disease prevention.

A recent Government Accountability Office report recommends the EPA develop a comprehensive research strategy to improve its ability to use biomonitoring data in risk assessments and set up an interagency task force to coordinate federal biomonitoring research.

And in August, chemical manufacturers for the first time agreed to share their own biomonitoring data with the EPA, saying robust government regulation is the best way to assure consumers of product safety.

Said CDC's Pirkle, "What people are always saying is, 'We want the best science to make the right decisions.' Biomonitoring is a big step in that direction... It's a very good thing for us to be doing."

The major limiting factor, especially at the state level, is funding.
APHL/CDC WESTERN BLOT WORK GROUP ENDS DELIBERATIONS

by S. Michele Owen, PhD, associate director for laboratory sciences, NCHHSTP, CDC

At the conclusion of the 2007 HIV Diagnostics Conference, sponsored by APHL and CDC, many attendees suggested updating the Western Blot (WB) interpretive criteria. The request was aimed primarily at changing the criteria to reduce the number of indeterminate results.

To address this issue, CDC and APHL formed a workgroup of HIV diagnostics experts from public health and private laboratories, blood banks and numerous government agencies such as CDC, the Department of Defense and FDA. Initial workgroup meetings focused on data collection and how best to move forward. The workgroup concluded the best approach would be to examine changing the interpretive criteria to eliminate non-viral bands as criteria for reporting an indeterminate WB result.

Although the workgroup recognized the value in revising the WB interpretative criteria, after several meetings and deliberations of both the workgroup and the APHL/CDC HIV Steering Committee, it decided that in an atmosphere of limited time and resources this project would not move forward for several reasons:

• The viral lysate WB has utility, but it is less sensitive during seroconversion than many of the initial tests currently on the market.
• There are other options for supplemental (confirmatory) testing (Nucleic Acid Amplification, Immunofluorescent Assay, etc.), which may lead to new testing algorithms that do not rely on WB.
• While indeterminate blots defined by only non-viral bands are unlikely to represent infection, extensive data collection would be required for adequate documentation. At this time, there is no clear determination as to who could dedicate the time and resources necessary to collect the amount of data required to make a definitive recommendation.
• Test manufacturers would need to submit data to FDA in support of a label change for new interpretive criteria to prevent laboratories from having to do validations to remain CLIA compliant.
• Other diagnostic issues, such as collecting data for updated algorithms and HIV Enzyme Immunoassay testing technology for dried blood spot and oral fluid specimens, were thought to have higher priority to the HIV testing community than updating the WB criteria.

Any comments on the deliberations of this committee can be addressed to Kenneth Landgraf, HIV program specialist, at kenneth.landgraf@aphl.org.

PUBLIC HEALTH LABORATORIES RESPOND TO INFLUENZA H1N1 PANDEMIC

by Natalia Machuca, MS, specialist, infectious disease program

State, local and county public health laboratories have been busy responding to the 2009 novel Influenza A H1N1 pandemic. Additionally, many APHL members have provided CDC’s Influenza Division with valuable advice and technical assistance by reacting promptly to specimen requests, reviewing draft guidance and performing validation studies and testing to increase the nation’s capacity to monitor influenza infections.

FULFILLING CDC SPECIMEN REQUESTS

In the last few months, CDC’s Influenza Division has requested specimens from public health laboratories. These specimens have been used to conduct extensive instrument performance evaluations. APHL worked closely with state public health laboratories in Arizona, Florida, Massachusetts and Michigan, which rose to the occasion to fulfill these time-sensitive requests.

VIRUS ISOLATION REGIONAL SITES

Virus isolation and virus culture are essential components of the surveillance needed to monitor antigenic, antiviral and genetic changes among viruses. CDC’s Influenza Division and APHL worked together to recruit three public health laboratories to isolate novel H1N1 virus from specimens that had previously tested positive by PCR.
Rectal and oropharyngeal infections caused by *Chlamydia trachomatis* and *Neisseria gonorrhoeae* remain a significant public health concern among men who have sex with men. The CDC currently recommends routine screening at least annually for rectal gonorrhea and Chlamydia and for oro-pharyngeal gonorrhea. However, the current standard method of testing extragenital specimens for these diseases is culture, which is time consuming, costly and often not readily available.

In January 2009, CDC and APHL convened an expert panel to evaluate available information and produce recommendations that will likely be included in the upcoming publication, *Guidelines for the Laboratory Diagnosis of Chlamydia trachomatis and Neisseria gonorrhoeae* in the United States. The major conclusions of the panel are summarized in the "Laboratory Diagnostic Testing for *Chlamydia trachomatis* and *Neisseria gonorrhoeae*: The Expert Consultation Meeting Summary Report." In the report, the panel recommends the use of nucleic acid amplification testing (NAAT) for the identification of *C. trachomatis* and *N. gonorrhoeae* in rectal and oropharyngeal specimens. However, because these specimens have not obtained FDA clearance, laboratories performing this test must establish performance characteristics in compliance with current Clinical Laboratory Improvement Amendments (CLIA) regulations.

In response to this and similar situations, the APHL/CDC STD Steering Committee has developed checklists to aid laboratories with verifying and documenting the performance characteristics of tests that are not FDA-cleared or approved or with verifying and documenting off-label testing (using an FDA cleared or approved test in a manner not covered in the product insert). The checklists have been reviewed extensively by representatives from the Centers for Medicare and Medicaid Services (CMS), CDC’s Division of Laboratory Systems and the APHL CLIA Workgroup. However, before using the checklists, a laboratory should consult with its CLIA inspector to ensure any verification is performed to his or her satisfaction.

Additionally CDC will provide rectal and pharyngeal specimens for use in CLIA verification of NAAT, when the technique is used to identify chlamydia and gonorrhea infection. Laboratories interested in receiving specimens for verification studies should contact Kelly Wroblewski at kelly.wroblewski@aphl.org.

Public health laboratories in California, Iowa and Utah were selected to provide this domestic capacity; other public health laboratories were instructed to submit specimens to one of these three state laboratories. The capacity provided by these public health laboratories has helped CDC meet the demand for international virus isolation and surveillance.

**POOLING INFLUENZA TESTING STUDY**

When the pandemic hit in April 2009, one thing was evident: public health laboratories needed to find ways to increase throughput to keep up with the number of incoming diagnostic specimens. The Wisconsin State Laboratory of Hygiene and CDC’s Joe Miller, PhD, worked together to create a protocol for pooling influenza specimens that will help labs test more efficiently and conserve reagents when the prevalence of circulating influenza viruses reaches specific percentages. After obtaining promising results, the protocol is now being piloted at the Massachusetts and Washington state public health laboratories to generate the reproducibility data required by the FDA. Should this pilot prove successful, the protocol will be made available for national and international use.

**INFLUENZA WORKGROUP**

APHL’s Influenza Workgroup has provided its subject matter expertise to review CDC guidance and to draft surge testing algorithms to share with APHL members. Throughout the 2009-2010 influenza season, APHL will provide members with the latest information through email updates and regularly scheduled member calls. These calls will be recorded and available for seven days. In addition, meeting minutes will be sent promptly to all public health laboratory directors and delegates.

Although the future of the pandemic is unknown, one thing is certain: APHL and public health laboratories will be ready to respond.
Several fellows attended and presented posters at the August 2009 American Society for Rickettsiology meeting in Hilton Head, SC. International fellow Vijaya Gundi presented “Identification of diverse Bartonella genotypes among small mammals in equatorial Africa.” Kelly Fitzpatrick presented “Purification of DNA from Environmental Samples: Improved DNA Yield and Quality After Sequential Use of Commercial Protocols.” Fitzpatrick also participated in a field education and protection exercise in response to a Rocky Mountain Spotted Fever outbreak at an Apache Reservation in Arizona.

At the July 2009 American Society for Virology (ASV) meeting in Vancouver, BC, Lindsay Gabbert presented the poster, “Serotype-Specific Enhancement and Inhibition of Dengue Viral Replication in the Presence of Exogenously-Expressed Non-Structural Protein 1 in Human Hepatocytes.” Former EID fellow James Colborn was a co-author. Also at the ASV meeting, Jenish Patel gave an oral presentation, “Impact of NADPH oxidase inhibition on influenza virus-induced inflammation.”

Allison Demas spent the month of August in Ghana at the Noguchi Memorial Institute for Medical Research. She provided training in malaria parasite culture and in vitro assays for drug sensitivity and drug resistance surveillance to local lab staff.


Amanda Pullman gave a presentation, “Recognition of and Response to Biological and Chemical Agents” on behalf of the Florida Department of Health as part of a training course for first responders, hazmat and law enforcement, and health officers at the Florida Department of Law Enforcement.

Current fellow Abel Wu and former fellow Alyssa Ren were co-authors on “Identification of Mosaic Neisseria gonorrhoeae Penicillin-Binding Protein 2” in the June issue of Antimicrobial Agents and Chemotherapy.

Mike Woods recently completed his fellowship and accepted a position at the Lawrence Livermore National Lab in Biodefense Knowledge Center, a component of the DHS National Biodefense Analysis and Countermeasures Center. Woods commented, “This position will allow me to use my background and training to communicate with policymakers about the realistic threats posed by bioterrorism and bio-warfare.”

APHL initiated the fifteenth class of Emerging Infectious Diseases (EID) lab fellows in August. The new class includes 22 training fellows (bachelor’s and master’s level), eight research fellows (post-doctorate) and four international fellows. The fellows will be placed in local, state and CDC laboratories in Florida, Hawaii, Iowa, Maryland, Michigan, New Mexico, New York, San Francisco, Tennessee, Virginia and Wisconsin.
Christopher Atchison, University Hygienic Laboratory director and associate dean for the University of Iowa College of Public Health, received the Damen Award from Loyola University Chicago on June 6. The award is given to alumni in recognition of leadership in industry and community and for service to others.

The American Association of Bioanalysts announced its new officers for the 2009-2010 term, with David F. Carpenter, PhD, assuming the office of president-elect. Carpenter, an Emeritus member of APHL, is currently a research associate professor at the Southern Illinois University School of Medicine’s Department of Medical Microbiology and Immunology.

William Hauser, PhD, director emeritus of the University Hygienic Laboratory (UHL), recently received the laboratory’s inaugural Hauser Career Achievement Award. The new award is named for Hauser, who began his career at UHL in 1958 and served as laboratory director from 1965 to 1995. The Hauser Career Achievement Award recognizes lifetime achievement and professional activities that extend beyond the laboratory and greatly impact the field of public health.

Dr. Nathan J. Schneider, former director of the Public Health Laboratories in Florida, died on September 21. Schneider was director from 1958 until his retirement in 1981. He was an early member of the Association of State and Territorial Public Health Laboratory Directors (which later became APHL) and is a past president of the association.

STAFF NEWS

Gavin Gollehon, MPH, became a specialist, environmental laboratories. He joined APHL in a temporary capacity in March of 2009. He holds a master’s of public health from Eastern Virginia Medical School.

Cassandra Hadley joined APHL as a senior technician, informatics. She previously worked at NEC Corporation as a supply chain vendor. She earned a bachelor’s of arts in sociology from the University of Colorado at Boulder.

Travis Jobe has accepted the senior specialist, vaccine and preventable disease, in the laboratory systems and standards area. Jobe previously served at APHL as senior specialist, global health.

Lucy Maryogo-Robinson, MPH, is the new director of global health. She began working at APHL in 2003 and most recently as manager, global health programs.

Patricia Smith joined APHL as a specialist, accounting. She previously worked at the National Association of Home Builders. She holds a bachelor’s of science in accounting from Barry University.

Public Health Laboratories: A Climate of Change

2010 Annual Meeting and Fourth State Environmental Laboratory Conference
June 6-9, 2010
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For more info, contact Terry Reamer at 240.485.2776; terry.reamer@aphl.org or www.aphl.org/2010annualmeeting
Delaware's public health laboratory is located on lakefront property in Smyrna, DE. Constructed in 1990, the one-story, stand-alone facility has an open central courtyard that staff can use to host BBQs and other events. The lab shares a campus with the Delaware Hospital for the Chronically Ill, a turn-of-the-century building used as a nursing home.

The facility has 32,000 square feet and a newly-remodeled BSL-3 level CT/BT area. There are two other BSL-3 level testing areas—one for microbiology (mainly TB) and one for virology.

A full service public health laboratory, Delaware is divided into sections focused on clinical microbiology, molecular virology, environmental chemistry, newborn screening, special projects and chemical and biological preparedness. The lab routinely handles a large number of STD and newborn screenings; currently the lab is gearing up for the flu season, and the advance of H1N1.

"There have been a steady number of swine flu specimens and a steady number of positive tests. No huge jumps," said Laboratory Director Jane Getchell, DrPH. Over the summer, the lab tested for Flu A, but on October 5 switched to its Flu A/B algorithm, sub-typing everything to identify all of the circulating flu strains. "We have three ABI DXs and will be getting a fourth soon, so we’re pretty well-prepared," said Getchell. "We’ve cross-trained staff, but we’ve also encouraged doctors to send specimens to commercial labs. LabCorp and Quest Diagnostics have a pretty huge presence in Delaware."

Delaware’s agricultural roots impact the types of testing performed at the public health laboratory. "We have more chickens than people," said Getchell, due to large chicken processing centers in the southern part of the state. In addition to concerns about avian influenza, the lab operates a TB program that helps trace the disease among undocumented workers. The public health laboratory also partners with the state agricultural lab on issues such as West Nile virus, rabies and other animal diseases.

A new project in the newborn screening section of the lab is underway. "We've recently received a grant for our cystic fibrosis testing," said Getchell. "We will be able to conduct molecular DNA characterization on all IRT-positive specimens." Some of the other mid-Atlantic public health labs have not developed this capability yet so Delaware will offer to test newborn specimens from other areas too. Getchell explained, "We think this may introduce some cost-savings all around."

Getchell grew up in Worcester, MA, and pursued laboratory work under her mother’s practical guidance. “I blame my mother,” Getchell said. “She was a schoolteacher, and a very independent woman. She impressed upon me that I would go to college and major in something that I could get a job in... not an English degree.” After a “horrible” experience teaching Sunday School, Getchell ruled out the possibility of following her mother into teaching. At the University of Massachusetts, she scoured the book of majors, discovered Med Tech and was interested. She flunked her first chemistry test. But she stuck with it.

Getchell’s first job was at the Texas Department of Health in the serology lab. She spent ten years there, and Texas funded her through her master’s degree in public health from the University of North Carolina. Getchell also earned her doctorate in public health from UNC; for her doctoral research, she developed assays for Ebola and Lassa viruses in CDC’s maximum security lab. (The lab was actually the module that had been used to isolate the astronauts and moon materials from the first moonwalk. “Of course, it’s long gone now,” remarked Getchell.)

She was the first person hired to work in the newly created AIDS lab at CDC. She was even able to go to the Institut Pasteur to learn how to grow and isolate the virus, then called Lymphadenopathy associated virus (LAV). She was the Assistant Director in the Iowa public health laboratory for twelve years and has now been at the Delaware lab for ten years. “I blew into Delaware with Hurricane Floyd,” laughed Getchell.

Like other public health labs, Delaware is struggling with the current economic storm. The lab’s staffing levels have been affected. "I used to be able to say we had 55, even 60, staff," said Getchell. "We’re down to 50. And yes, some of those positions have been deleted. There is a hiring freeze and the state continues to delete unfilled positions. However, they have made promises not to lay-off state workers. Still, she said, "state workers have received a two-and-a-half percent pay cut, and five extra vacation days.”

To cope, the laboratory has shifted staff and eliminated some small volume tests. “We’re working harder and avoiding overtime and weekend work because there is no money to pay for it,” said Getchell. The lab is feeling the pinch most acutely in the managerial levels: Lab Manager I and II positions are open, impacting daily operations. For the most part, open bench-level positions have been staffed with contract employees, who are paid with grant funds. “Every grant application we write, we build in money for contract employees,” explained Getchell.

The Delaware public health laboratory operates on
about $1.6 million in revenues, $1.5 million in grant funds and $55,000 in state funds (excluding personnel costs).

“I have to give our staff credit,” said Getchell. “We have had a pay cut. Positions have disappeared. But morale is still pretty good. Everyone is working hard and feeling good about the work that is done.” She noted that an active employee committee has helped bolster staff attitudes by organizing potluck dinners, a boat trip and other fun events.

“We need to make sure that morale doesn’t slip,” said Getchell. “We’re small, but vital.”

In an annual effort to boost staff morale and focus public attention on the important work conducted within the public health laboratory, Delaware celebrates National Laboratory Week “in a big way” each year. “The format changes from year to year,” said Getchell, but they use the week as a platform for community outreach, opening the lab to schools and local partners. One year the lab scheduled the opening ceremony for its remodeled BT-CT suite during Lab Week, hosting the governor and other politicians for the celebration. “Laboratory Week celebrations have given us access to politicians that we don’t normally have access to. We can showcase the lab and our work, and impress upon them why we are here.”

On another occasion, the lab used Lab Week as an opportunity to revamp the waning Delaware Laboratory Association into a new Laboratory Preparedness Advisory Committee (LPAC), to reinvigorate communication among multi-disciplinary laboratories. This year the Lieutenant Governor attended the festivities and gave a talk: his participation was tied to the newborn screening program, and stemmed from his involvement with recent legislation that requires insurance companies to cover medical formula for babies with diagnosed genetic conditions.

“Lab Week has always been a morale booster and while our speakers and programs are typically externally focused, we also have fun that week,” remarked Getchell.

The lab is also contemplating some greater measures to alleviate the economic pressure. At the end of 2008, Delaware completed the APHL Lab Assessment, which sparked communication among the state’s public health, environmental and agricultural laboratories. “The assessment showed us what might be cost-effective as a lab system,” said Getchell, “and since then we’ve worked together to identify ways to cooperate and save money. We realize that our future is at stake.”

The labs have earmarked a number of processes that could be consolidated to save money: purchasing equipment and supplies, training, and equipment maintenance. Laboratory leadership has also examined overlap in programs, such as water testing, which is conducted in both the environmental and public health laboratories.

“But, we may not stop there,” said Getchell. “Originally, I had proposed a co-located lab, on the Utah model, but of course we don’t have the funding for a new building now. However, lack of funding doesn’t preclude administrative consolidation.” At this point, the labs are working at the governor’s initiative to create the best solution for the state and have not advanced any formal recommendations.

Getchell said, “Be careful what you wish for. We’re there!”

Getchell is forward-thinking in all of her plans for the lab. She has identified growth areas in public health and is working to realign the lab with those priorities. “The future is molecular,” she said matter-of-factly. “Multi-arrays, multi-analyte assays.” She would also like to build a biomonitoring program and was disappointed that the Delaware lab did not receive a recent CDC grant in this area. “We’ve done a lot of the background work, and we have the equipment,” she said.

“Public health needs to concentrate on chronic disease, on healthcare over sick-care,” said Getchell. “We should begin looking at genetic tendencies for disease. And also ask ourselves—how can we be more helpful to ensure the population’s health? It’s going to be about keeping people healthy.”

Microbiologist II Jennifer Cascarino demonstrates PFGE to DHSS Deputy Secretary Henry Smith; Delaware Lt. Governor Matt Denn; and Delaware Division of Public Health Director Karyl T. Rattay, MD, MS, FAAP, FACPM.

Photo courtesy of Delaware PHL
SAN LUIS OBISPO COUNTY PUBLIC HEALTH LABORATORY: GUARDING CALIFORNIA’S CENTRAL COAST

by Emily Mumford, writer

LOCATION
San Luis Obispo County is located centrally on California’s coastline, equidistant from San Francisco and Los Angeles. It is largely rural, with about 260,000 residents, and is known for both agricultural production and its natural beauty. Tourists come to see the beaches, hike the hills, drive the coastline or visit one of the county’s 100 wineries, bringing an important influx of revenue to the area. The Hearst Castle at San Simeon and Morro Bay are well-known landmarks of the region.

The city of San Luis Obispo is about 12 miles inland from the Pacific Ocean and at the foot of the Nine Sisters, a once-volcanic mountain range that reaches to the coast. The city is home to the county’s public health laboratory and to California Polytechnic State University.

FACILITY
The San Luis Obispo County public health laboratory is located one mile from the city’s center in a one-story building with a walk-out basement. The county health department headquarters is across the street in an old public health hospital that closed in 2004. The lab has a view of two of the Nine Sisters. “It’s a lovely area,” said Laboratory Director James Beebe, PhD, D(ABMM).

The laboratory shares its building with a county nursing clinic and the health officer, and occupies about 2,500 square feet. It will soon gain another 300-400 square feet as the down-sized county AIDS program moves across the street into the health department building. The extra space will create an office, which will double as training space.

The lab has two BSL-3 laboratories to handle TB and select agent detection. In addition to testing potential agents of bioterrorism, the lab handles “a local, naturally-occurring select agent—Coccidioides—that appears one to two times per month,” said Beebe. More room has just been created by moving the current PCR platform into the lab’s new amplification room. A new ABI 7500 fast Dx will replace it.

The lab began a badly-needed remodel in 2003, but due to “a number of interlocking problems,” said Beebe, the remodel was halted. Efforts to bring the lab up-to-date were renewed about two years ago, using the last of the federal preparedness funds. Very recently, the lab received a HRSA grant that will enable the completion of the project.

The remodel is progressing slowly around the working laboratorians. “It’s like remodeling your kitchen while you’re cooking in it,” said Beebe. They are concentrating on turning unusable space into usable space and are adding a new air handling system, an amplification room, a microscope room, a room to receive and prep specimens and new benchwork. “The old benchwork is wood; it’s been out of code for... 40 years?” remarked Beebe. “It’s one of the worst facilities I’ve ever seen, with some of the best laboratorians I’ve ever worked with.”

DIRECTOR
Beebe has worked with many laboratorians in his career. Born in New Jersey, he attended Seton Hall and then Rutgers University for his doctorate. He trained as an academic research microbial chemist. While working in that capacity at Cornell University, Beebe was exposed to the clinical microbiological group and became interested in the field. After five years on the medical faculty at Cornell, Beebe left for a two-year post-doc at Columbia-Presbyterian Medical Center to earn his board certification. Beebe then spent 10 years working in private reference labs. After a transfer to a private lab in Denver, CO, Beebe decided it was time to make a major life change.

Beebe left his job, embarking on one year of Christian ministry service: he was sent to Tallahassee, FL, and found work as a clinical microbiologist in a hospital, an experience that reawakened his interest in the field. Returning to Denver, Beebe accepted a position as chief microbiologist at the Colorado Public Health Laboratory and embarked on “a lot of on-the-job training.” Twenty years later, he retired—for about two weeks. He learned that California needed local lab directors: in fact, the San Luis Obispo County laboratory had been without a full-time director for two years. The lab supervisor, Sharon Beccacio, had been filling both jobs.

“It’s been great,” said Beebe. “It’s wonderful to work with such dedicated people.”

STAFF
In addition to Beebe, the lab has 12 employees. Beccacio is the lab supervisor, and there are seven public health microbiologists, two technicians and two senior account clerks. “This staff has a ‘can do’ attitude about everything,” said Beebe. “At times, the working conditions have been very uncomfortable during this remodel, but everyone has been very patient.” Beebe also noted that the staff have taken on the daunting task of converting the paper-based quality control system to an electronic one, and are making good progress.

REVENUE
The county laboratory runs on about $1.6 million annually, receiving 25% of its funding from the county
and 75% from fees for services. “Twenty-five percent is a goodly amount; I am very happy with the county support,” said Beebe. The fees-for-service are paid from a variety of sources, including MediCal (California’s Medicaid program), state-administered federal grants (for water testing), state tourism and recreation funds (for ocean water testing) and other submitting agencies.

TESTING
The county public health laboratory conducts a wide variety of testing. In addition to testing drinking, ocean and waste water, the lab tests local shellfish for a dangerous marine toxin, domoic acid.

“We occasionally test food, although we are not a PulseNet lab,” said Beebe. “We currently have an E. coli 0157 cluster in California, with about 15 local cases. The state lab is conducting the Pulsed field typing but we’re involved at the ground-level, encouraging hospitals to provide isolates.”

The lab can test “at the highest level for infectious disease” and has expertise in bacteriology, molecular biology, mycobacteriology, virology, parasitology, serology and mycology; and serves as the Level B Laboratory Response Network laboratory for the central coast.

Flu response efforts are underway in San Luis Obispo County. The lab has participated in exercises with the health agency and has received Homeland Security funding for the new PCR platform, the ABI 7500 Fast Dx, so staff will be able to conduct CDC’s new influenza test. “We’re still sorting through the red-tape of adding new technology to the lab and need to train staff, but the acquisition is in process and we expect to have the new platform running by the end of October or early November.” Currently the lab is handling a steady rate of about 12-20 flu specimens per week.

The lab has also filled an important niche with its TB testing efforts. “This county has a large Latino population that was born outside of the United States, and it is important to be able to detect latent TB in this group,” said Beebe. Using the Quantiferon test, he said, “we most often identify latent TB infection in pregnant, and often uninsured, women.”

RECENT SUCCESSES
Increased Testing Volume. “I have spent a lot of time on the road to meet with customers and find out their needs. This has been very helpful,” said Beebe. “These conversations led us to add the Aptima method for gonorrhea and Chlamydia testing, so we can test throat and rectal swabs now. This is a large part of the reason our testing volume increased by 13% last year.”

Identified Source of Local Pollution. The lab partnered with California Polytechnic State University to conduct a pollution study at nearby Pismo Beach. “Ocean pollution has been a controversial issue here,” said Beebe. “Tourism is very important to the local economy.” Tests revealed high indicators of E. coli and enterococci in the local waters, and the media and the public blamed multiple suspects. At the completion of the study, the lab and Cal-Poly scientist indicated the likely culprits are the pigeons that populate the pier.

CHALLENGES
Ongoing Facility Remodel. “We must create a proper in-code lab space,” said Beebe.

Economic Downturn. “My main focus since I have arrived is to make sure that everyone gets paid,” said Beebe. “The economy is definitely our biggest problem.”

While the budget cuts throughout California have not impacted the lab as severely as feared, the local housing industry has been very depressed, leading to significant losses in county revenue. The county is still wrestling with the fallout. So far the lab has lost one empty position and one more may be at risk.

“If you’re not pulling as hard as you can in this economy, you’re going to get swamped,” said Beebe.

GOALS
Complete the Facility Remodel. Using the new HRSA grant, the lab will move through the last several stages of the remodel.

Upgrade the Information Technology. “Our customers need to be able to order tests electronically, and we need to be able to return those results electronically,” said Beebe. The lab incorporated a new information system in November, which is allowing internal electronic transmissions among related areas in the health department, but not external communications.

Beebe noted that the information system has upgraded service to the clients, improving the appearance of the report. “Like ecology,” he said, “in labs everything is related to everything else. As we generate information for our clients, our quality systems, information systems, all of it helps determine whether those clients will use us again.”
ENTERPRISE-LEVEL INFORMATION MANAGEMENT FOR PUBLIC HEALTH LABS

by Simon Wood, PhD, executive director, marketing and education, STARLIMS Corporation

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