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**BIODEFENSE**

When it comes to biodefense, Northrop Grumman is leading the way in biological threat detection, response technology, and services. From detection hardware such as the U.S. Postal Service's Biohazard Detection System, to information systems that collect and analyze data for decision support, to our committed team at Northrop Grumman of more than 1,000 supporting our nation's response to health threats, Northrop Grumman is ready to help protect the public from the largest — and tiniest — threats.
INTRODUCING SUSTAINABLE LABORATORY PRACTICES IN AN ENVIRONMENT OF CUTBACKS

Most, if not all, public health laboratories share the big challenges of the day: funding cuts, workforce changes, preparedness requirements. These are the issues of our time and, as such, we focus intently on them. Laboratories do, however, share other characteristics, including some that reflect the brighter side of public health laboratory science. Our labs have always been eager incorporators of new technologies and scientific advances, and some public health laboratories—including our state, local, and institutional members—have managed to carve paths into the field of applied research. We should remember that this forward-looking, horizon-gazing, energetic approach is a longstanding attribute of PHLs and PHL scientists.

Even in fiscally tight (or desperate) times, it is valuable to look forward. It may be impossible at present to devote significant new resources to major new projects, but there are many opportunities for positive change and innovation, particularly in the arena of sustainable lab practices. There are opportunities here to save both money and the environment, as well as to participate in a burgeoning national conversation on the use of limited resources.

In Colorado, for example, the state PHL xeriscaped its entire footprint, installing typical Rocky Mountain drought-resistant plants and grass. The lab’s water usage dropped from 1,466,000 gallons in FY2005 to 244,000 gallons in FY2010—an 83% reduction that resulted in $35,000 of annual savings. The lab also upgraded the computers and controls that run the HVAC system and boilers, saving 35% ($6,123) on their gas bill and 15% ($135,780) on their electricity bill each year.

In another revealing example, the state of Arizona “retro-commissioned” its PHL for energy efficiency. By optimizing the functionality of exhaust fans, chillers and air handlers, Arizona now saves $230,000 each year in energy costs. They also received a $72,000 rebate from the utility company and are eligible for an additional $200,000 this year. Needless to say, this financial windfall, which in Arizona goes directly to the lab, is welcome in such challenging economic times!

Needless to say, this financial windfall, which in Arizona goes directly to the lab, is welcome in such challenging economic times!

But improvements don’t need to involve an enormous outlay of money, nor do they need to wait for a new facility several years down the road. If you haven’t already, make it a priority for your laboratory to participate in APHL’s Healthiest Laboratory Initiative: www.aphl.org/aphlprograms/eh/Documents/HLIchecklist.pdf. I highly recommend carving out time to complete the assessment tool and, thus, identify small institutional changes your lab can make that may not only improve your energy footprint, but also improve your cash flow. Simple examples include timers on your lights, policies to turn off unused computers and only purchase Energy Star appliances, generation of your own argon or nitrogen gases, etc. The HLI checklist is full of smart practices, many of which translate directly into savings and sustainability.

It may also be helpful to look into local, state and federal programs available to you, such as mass transit subsidies for municipal employees or tree planting initiatives. In Utah, we just planted a large number of trees through a local program, which is aligned with the nation’s “Million Tree Initiative.” When properly placed, trees can add security, as well as block the winter winds and summer sun. In the federal arena, “green grant” stimulus money will be available for another 18 months. My lab recently received a $440,000 grant from the Department of Energy to construct a 35-kilowatt solar array. I look forward to a significant decrease in my electric utility costs and the consequent reallocation of that money to laboratory testing!

The above are workplace “cuts” that staff can embrace, rather than dread. PHLs have a significant share of enthusiastic optimism, so why not harness that energy for financial and sustainability goals? Frugality and environmental stewardship are linked, and despite our current economic challenges, PHLs can—indeed must—maintain their customary role at the forefront of thought and action.
In an effort to ensure continuous improvement in the quality of laboratory practice, APHL actively monitors governmental biosafety and biosecurity activities, seeking input from its Public Health Preparedness and Response and Infectious Disease committees and other members. Recent notable activities include providing comment on current proposed legislation, as well as facilitating member presentations to panels that offer recommendations on issues of biosafety and biosecurity.

On June 25, 2010, the US House Committee on Homeland Security passed the Weapons of Mass Destruction (WMD) Prevention and Preparedness Act of 2010. Prior to the passing of this bill, APHL wrote a letter to Representative Bennie Thompson, supporting a majority of the provisions, as well as communicating some significant concerns on language within the bill that would affect state and local governmental laboratories. (View the letter online at www.aphl.org/policy/advocacy.)

On July 2, 2010, President Barack Obama issued an Executive Order on Optimizing the Security of Biological Select Agents and Toxins in the United States. The intent and direction of the Executive Order—while consistent with the approach recommended by APHL—contained details that required resolution and clarification. The Executive Order created the Federal Experts Security Advisory Panel (FESAP) to provide advice to the Secretaries of Health and Human Services (HHS) and USDA on Select Agent Program security, including: (1) tiering agents, (2) enhancing personnel reliability programs, (3) standards for physical and cybersecurity for facilities, and (4) emerging policy issues relevant to the security of biological select agents and toxins. On September 16, 2010, Michael Pentella, PhD, associate director, disease control, Iowa State Hygienic Laboratory, and APHL’s senior advisor for scientific affairs, Rosemary Humes, MS, MT (ASCP) SM, addressed the FESAP on biosecurity practices in public health laboratories. APHL was invited to provide a perspective on how potential changes in biosecurity requirements would impact public health laboratories, especially those in the Laboratory Response Network (LRN).

Humes and Pentella highlighted the robust biosecurity and biosafety practices used within public health laboratories, as well as the distinction between public health laboratories and academic and production laboratories. US public health laboratories provide the front line of defense against public health threats, performing detection, surveillance and diagnostic testing on a routine basis. Their ability to detect agents of biological terrorism and public health significance plays a considerable role in national security, as witnessed by the response of LRN laboratories to the 2001 anthrax events, as well as to daily threat testing in all 50 states.

Pentella further commented that existing biosecurity measures have proven successful and that increased biosecurity measures would be burdensome and costly to public health laboratories, impacting their ability to provide immediate testing and response capabilities to potential bioterrorism and other threats of public health significance.
He went on to emphasize the funding issues facing laboratories, particularly in light of the economic struggles exemplified by furloughs and extensive budget cuts.

In response to the panel’s many questions, Pentella and Humes noted that adequate personnel controls currently do exist and are further strengthened by the current regulatory requirements, and stringent biosafety and biosecurity controls within public health laboratories. Laboratory directors and responsible officials remain empowered to make decisions necessary to maintain the integrity of their laboratories. In a heartening conclusion to the discussion, Dr. Gerald Parker, DVM, PhD, MS, principal deputy assistant secretary, Office of the Assistant Secretary for Preparedness and Response, HHS, stated, “The LRN is one of the best investments we’ve collectively made in bioterrorism preparedness and response.”

In addition to commenting on the WMD legislation and Executive Order, APHL solicited feedback from its Public Health Preparedness and Response and Infectious Disease committees, membership at large and partners in response to the Federal Register Notice of July 21, 2010, requesting comments on the HHS list of Biological Select Agents and Toxins. APHL feedback specified that no biological agents or toxins should be added to the list of select agents and that the following agents be removed due to their wide distribution in nature, lack of ease of production and limited pathogenicity: *Coccidioides posadasii/Coccidioides immitis*; *Rickettsia rickettsii*; Monkeypox virus; *Cercopithecine herpesvirus 1* (Herpes B virus); Saxitoxin; Shiga-like ribosome inactivating proteins; Shiga-toxin; T-2 toxin; Tetrodotoxin; Conotoxins; Dicetoxyscirpenol; and *Clostridium perfringens* epsilon toxin.

Further, APHL stated that, if implemented, tiering of the HHS select agent list should not translate into more stringent security measures. APHL again emphasized that existing regulations are already rigorous, and increased biosecurity requirements would be damaging to public health laboratories that store limited quantities of the select agents needed for public health emergency response; new measures would compromise laboratory preparedness and the nation’s ability to detect and respond to bioterrorism or naturally occurring diseases caused by select agents.

APHL and its members value opportunities to help shape policies that affect public health laboratories and will continue to promote the role of these laboratories in detecting and responding to bioterrorism, emerging infectious diseases and other public health threats.
DEVELOPING GUIDANCE AND PERFORMANCE MEASURES FOR PUBLIC HEALTH PREPAREDNESS

by Chris Mangal, MPH, director of public health preparedness and response, APHL; Bonnie Rubin, MLA, MBA, MHA, associate director for planning and development, State Hygienic Laboratory, Iowa; and Maureen Sullivan, MPH, emergency preparedness and response unit supervisor, Minnesota Department of Health Laboratory

S
ince 2002, Congress has supported public health preparedness and response activities by appropriating funding to federal agencies. The CDC Office of Public Health Preparedness and Response (OPHPR), under the leadership of Rear Admiral Ali Khan, MD, MPH, is responsible for administering $1.5 billion per year. One of the principal ways OPHPR allocates these funds to 62 state and local awardees is the Public Health Emergency Preparedness (PHEP) Cooperative Agreement. This funding stream is a primary source of support for state and local public health preparedness activities, including the Laboratory Response Network, the nation’s premier network for detecting and confirming threat agents.

The CDC OPHPR’s Division of State and Local Readiness (DSLR) is developing a new PHEP five-year cooperative agreement for 2011-2016. To avoid challenges with new federal mandates and program-specific requirements, which can often alter priorities, DSLR adopted a new capabilities model to clarify the strategic focus of the PHEP program and align with the National Health Security Strategy (NHSS), the Department of Homeland Security (DHS) Target Capabilities List (TCL), the Pandemic and All-Hazards Preparedness Act (PAHPA), the CDC Strategic Preparedness Plan, and other legislative and federal requirements. The new PHEP framework covers 15 capabilities, grouped in six clusters: Biosurveillance, Community Resilience, Incident Management, Information Management, Countermeasures and Mitigation, and Surge Management. The Biosurveillance cluster includes public health surveillance and epidemiologic investigation and public health laboratory testing. As a valued stakeholder, APHL is working with DSLR to develop this new framework, especially in the Biosurveillance area.

Additionally, APHL is working with the CDC DSLR’s Outcomes Monitoring and Evaluation Branch (OMEB) to develop, pilot and implement performance measures for public health preparedness. These are vetted extensively with the CDC PHEP Evaluation Workgroup, which is comprised of experts from across public health. This workgroup met in early October 2010 to review the results of the pilot performance measures developed over the past two years. Using stakeholder input, the workgroup will refine the piloted measures and implement the improvements in August 2011. To begin, the PHEP Evaluation Workgroup reviewed the current Target Capability List to determine which should be addressed and in what order. The initial focus (in the first year of the new PHEP Cooperative Agreement) will be on Biosurveillance. A standard format has been developed, which includes a measure statement, measurement specifications, intent, reporting criteria, reported data elements, and definitions. Beyond reviewing comments to the pilot program, the workgroup also identified a measure in each cluster of capabilities as the high priority goal.

Of note, the PHEP Evaluation Workgroup developed seven laboratory measures that were piloted by eight public health laboratories. These include mobilization of laboratory staff, reporting of significant results to public health partners, acknowledgement by sentinel clinical laboratories of communications from the LRN Reference Laboratory, quality assurance events on both clinical and environmental samples, and two optional measures of Salmonella and Shigella turnaround times for Pulsed-Field Gel Electrophoresis (PFGE). The data collected by OMEB was presented at the 2010 LRN National Meeting and provided critical insight into the process of evaluating and improving public health preparedness, as well as ensuring accountability for federal funds. All proposed measures, except the Shigella PFGE measure, were recommended by the pilot participants, and a select group of reviewers will move forward with minimal modifications. The communication with sentinel clinical laboratories is a crucial new measure to ensure that early detection occurs and the public health system is activated. These new measures will be good for the public health laboratories and will advance practices through continual improvement.
PREPAREDNESS BEYOND PANDEMICS
by Jay Jones, consultant to CDC

Last month, Ali Khan and other members of CDC’s Office of Public Health Preparedness and Response met with state public health preparedness directors from across the country in Newport, Rhode Island, at the 6th Annual ASTHO Directors of Public Health Preparedness Conference to share successes and challenges of response activities during the H1N1 pandemic and other events like the Gulf oil spill. Representatives from APHL, NACCHO, HHS and DHS were also in attendance.

How prepared are we as a nation to deal with all types of disasters that can threaten the public’s health? CDC’s office of PHPR has released its second state-specific preparedness report, Public Health Preparedness: Strengthening the Nation’s Emergency Response State by State, which presents data on preparedness activities taking place at state and local health departments across the nation. The bottom line: we’ve made a good deal of progress, especially in laboratory capacities and response readiness areas, but much more needs to be done. APHL staff and members provided data points for the report.

For more info, email: phprcommunications@cdc.gov.

APHL/FBI PARTNERSHIP YIELDS IMPORTANT TRAINING OPPORTUNITIES
by Tony Barkey, senior specialist, Public Health Preparedness and Response, and Katie Kecman, senior technician, Public Health Preparedness and Response

Since 2009, the APHL Public Health Preparedness and Response team has collaborated with the FBI to develop a new series of trainings focusing on chain-of-custody for Laboratory Response Network (LRN) reference laboratories. The training, which has been in high demand from the APHL membership, helps to ensure that laboratorians are well-versed on evidentiary requirements for maintaining chain-of-custody. The finalized chain-of-custody video presentation was posted to the secure LRN website in early October, and a follow-up teleconference was held October 25, 2010. For the change-of-custody Q&A session, there were participants from 172 sites, totalling 572 participants reaching all 50 states, DC and Puerto Rico. The purpose of the training was multifold:

- To give laboratorians a basic overview of the chain-of-custody process and its importance,
- To provide the FBI perspective on investigations, evidence collection and what situations warrant a chain-of-custody,
- To demonstrate case study models and helpful hints for LRN laboratories, from sample collection through testing and transfer to partners.

The Q&A teleconference featured experts from APHL, FBI and the CDC LRN Program Office, which clarified the key concepts introduced in the video and also reviewed the more complex concepts. In the near future, APHL and FBI partners will decide how to adapt the program for other partner networks.

APHL wishes to thank the following FBI and CDC staff for their work to develop and deliver the chain-of-custody Training:

- Lisa Ference, supervisory special agent, Hazardous Materials Response Technical Unit (HMRTU), FBI
- Alan Giusti, MS, biologist/forensic examiner, Chemical, Biological, Radiological, Nuclear (CBRN) Sciences Unit, FBI Laboratory
- Douglas L. Anders, PhD, chief, Hazardous Materials Science Response Unit (HMSRU), FBI Laboratory
- Laura Jevitt, MPH, microbiologist, Division of Preparedness and Emerging Infections, Laboratory Preparedness and Response Branch, CDC
LRN 2010 AND BEYOND:
BROADENING THE PUBLIC HEALTH RESPONSE

by Sikha Singh, MHS, specialist, Laboratory Response Network (LRN)

“The LRN has set the precedent as an exemplary laboratory system in action, sustainable and capable of responding to public health threats. The future of the LRN lies in continually strengthening partnerships and realizing the value of all laboratories that comprise the LRN. It was with this in mind that the planning committee framed the meeting program.” - Christina Egan, PhD, chair, LRN National Meeting Planning Committee

A PHL, in collaboration with the CDC’s Division of Preparedness and Emerging Infections (DPEI) and the National Center for Environmental Health (NCEH), convened the 2010 Laboratory Response Network (LRN) National Meeting in October in San Diego, CA. The theme of this year’s meeting, LRN 2010 and Beyond: Broadening the Public Health Response, was a timely follow-up to the previous national meeting held last year with its focus on A Decade of Achievements.

“Labs need to be at the table with policymakers. The lab input is critical to maximize resources.”
- Grace Kubin, PhD, Emergency Preparedness branch manager, Texas Department of State Health Services, Laboratory Services Section, on the importance of sustaining the great work of the LRN

Abstracts submitted by network members drove the program, an approach that contributed to a highly successful meeting with 319 participants from local, state, federal and international laboratories. For the first time, the planning committee solicited nominations for a series of awards to honor LRN members for service during the past decade in Broadening the Public Health Response (see sidebar). Preliminary evaluations indicate positive feedback on both scientific content and logistics of the meeting.

A resounding message delivered throughout the meeting was of the lasting value of the LRN. Opening keynote speaker Dan Sosin, MD, MPH, FACP, Captain, US Public Health Service, stated, “The LRN virtually invented the modern use of the word ‘network.’” This network remains a model for all other networks and has proven itself during events such as anthrax, the H1N1 pandemic, disease outbreaks and natural disasters, and on a routine basis with thousands of suspicious environmental and clinical samples tested annually.

Meeting participants were challenged to answer, “What does preparedness mean?” Is it the “warm base” that the LRN laboratories provide in readiness to respond to public health emergencies? Is it the ability to maintain standardized testing and communications protocols on a national level? This overarching question was raised throughout the meeting; its answer discussed when sharing best practices in roundtable sessions, when debating the use of new technologies during chemical, biological and radiological preparedness breakouts, while pondering the value of performance measures during a session on sustaining resources and in dialogue during networking lunches.

Jason Mihalic, chemical terrorism coordinator at the Arizona Department of Health Services State Laboratory, expressed one of the meeting’s central messages well when he opened his presentation by saying, “Hi, we’re from the laboratory, and we’re here to help you!”

This national meeting continues to bring together laboratory preparedness experts to discuss scientific and programmatic issues to ensure the network’s ability to respond to public health threats. It is a model network that showcases a true national laboratory system encompassing clinical, public health, military, veterinary, agricultural, environmental, international and federal laboratories. As Sosin noted, “The LRN itself reflects CDC at its best.”

Congratulations 2010 LRN award winners!

NEW CDC GUIDELINES FOR TARGETED TB TESTING

GUIDELINE HIGHLIGHTS

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EGGS AND EPI’S AND SEAFOOD, OH MY! THE NEW FOOD SAFETY PROGRAM AT APHL
by Shari Shea, MHS, MT (ASCP), director of Infectious Disease and Food Safety Programs

For several years running, news of food-borne outbreaks and food recalls has been a staple for local and national media. The recall of over 500 million shell eggs in August 2010, with the subsequent press articles and a widely viewed Congressional hearing, is one example of the national attention garnered when Americans become ill from contaminated food. Several branches of the US government have set goals to improve the safety of the food supply. The GAO has listed the nation’s food safety system as a high-risk area of concern; FDA has created positions with direct access to the Commissioner, drafted a plan for an integrated national food safety system, and formed the Partnership for Food Protection; USDA/FSIS is considering regulation of non-O157 STEC in beef products; the House and Senate are prioritizing food safety legislation; and the President’s Food Safety Working Group continues to work towards short- and long-term objectives, including a stated goal of implementing the CIFOR Guidelines across the country. APHL needs to be certain that we have the resources to respond to the opportunities presented by these national initiatives. Therefore, our Board of Directors and Senior Leadership have created an independent Food Safety Department within APHL, led by Shari Shea as director of the Food Safety Program.

Most of the food safety events that are depicted in the media are detected using data from APHL member laboratories, through routine surveillance of human illnesses or testing of the food supply. For such laboratory data to have value, it must be analyzed and shared with partners in epidemiology, food protection and regulatory agencies, among others. To better serve our member’s needs as they collaborate with partners across the country, APHL continues to expand our relationships with national food safety partners—both at CDC and with other agencies and organizations.

INITIATIVES OF THE FOOD SAFETY DEPARTMENT

Currently, APHL is considered to be a model partner by CDC’s Food Safety Office and the Enteric Diseases Laboratory Branch within the National Center for Emerging and Zoonotic Infectious Diseases (NCEZID). We will continue to work closely with these longstanding partners, including active involvement in CIFOR activities, management of member activities in PulseNet USA, support for the expansion of CalciNet and PulseNet International, and assistance with technology development for detecting and subtyping foodborne isolates. Enthusiasm for our work is spreading within NCEZID to the Epidemiology Branches, including our partners in OutbreakNet and FoodNet. We are expanding laboratory participation in FoodNet; we are embarking on a collaborative attribution project; we will continue to host joint meetings with laboratory and epidemiology partners; and for the second year, we are managing contracts for the OutbreakNet Sentinel Surveillance Sites.

APHL has an ongoing cooperative agreement with USDA/FSIS through our partners in the FERN National Program Office. For several years, we have co-organized the FERN National Training Conference, bringing together laboratorians from all 50 states to discuss chemical, microbiologic, and radiologic needs of the FERN network. In the coming year, we will also lead a training needs assessment for FERN and create strategic communications and marketing materials around the successes of the network. We also collaborate with FSIS through our participation on CIFOR and our longstanding FSIS liaison to the Food Safety Committee. APHL’s Executive Director was invited to a meeting with FSIS under Secretary Elisabeth Hagen in November 2010.

APHL collaborates with several centers and offices within FDA. Our Food Safety Committee includes liaison positions to both the Office of Regulatory Affairs and the Division of Federal and State Relations, in addition to a position for the CDC liaison to FDA. Through PulseNet and CIFOR activities, we have built relationships with partners at the Center for Food Safety and Applied Nutrition and at the Center for Veterinary Medicine. We are a member of FDA’s Council of Association Presidents, have representatives on the Coordinating Council of the Partnership for Food Protection (PFP), and our members participate in PFP workgroups. To solidify these relationships with the agency, APHL met with the leadership of the new Office of Foods in 2010. We look forward to continued activities with the agency that will benefit governmental laboratories that perform food testing of public health importance.

FLORIDA LAB EVALUATES GULF SEAFOOD

Florida has worked closely with its federal and state partners to ensure that seafood caught in the Gulf of Mexico is safe to eat. The Florida Department of Agriculture and Consumer Services Food Safety Laboratories have developed capabilities to screen seafood for oil contamination, as components in oil can be toxic and/or carcinogenic.

In addition, two analysts received training at NOAA’s Pascagoula facility to detect oil contamination using sensory evaluation of seafood. The human ability to smell oil taint is often more sensitive than chemical analysis. Working closely with FERN and NOAA, the laboratory has validated the NOAA method for analysis of compounds of most concern, PAHs, and began analyzing FERN samples in early August. The NOAA method uses autotraction followed by column chromatography and size exclusion chromatography before gas chromatography mass spectrometry detection. The lab is also validating a more effective and faster screening method, developed by FDA, which uses liquid chromatography fluorescence detection.
PROTECTING THE GULF SEAFOOD SUPPLY: FDA TAKES THE LEAD
by Shari Shea, MHS, MT (ASCP), director of Infectious Disease and Food Safety Programs

When the Deepwater Horizon exploded in the Gulf of Mexico, immediate concerns were for the safety of the crew, for their families, and for the health of the immediate environment. Concerns quickly turned to the seafood supply from the Gulf and the security of those who make their livelihood from this industry. Along with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service, the EPA, other federal agencies, and several state authorities in the region, FDA took a leadership role in responding to concerns about contaminated seafood. Following federal Incident Command Structure protocols, a Unified Command was established to manage response operations, linking the responding organizations and providing a forum for those organizations to make consensus decisions. The Unified Command’s Joint Information Center (JIC) provided the public with reliable, timely information about the response.

The FERN network was called into action. FDA was able to quickly determine the capabilities of the laboratories in the affected region. A national conference call was held in conjunction with APHL, during which the nationally accepted fishery re-opening protocol was described. Through a partnership with the International Food Protection Training Institute, panels of organoleptic sensory assessors were trained within the region. Information about the accepted confirmatory method for detecting poly-aromatic hydrocarbons (PAH) in seafood was distributed to the member laboratories—eight were selected to receive equipment and reagents from FDA to implement the method. Due to the complexity of this confirmatory test, FDA’s Forensic Toxicology Center was tasked with developing an alternative method. Within weeks, a screening method was developed, optimized, validated, and approved; thereby, alleviating an expected backlog of priority samples waiting to be tested. Later, the center developed and released a protocol for detecting a component of the dispersant that was used heavily in the Gulf, offering further assurance to the public that seafood on the market was safe to eat.

APHL has maintained a connection between our members, other responding laboratories, and the federal agencies involved in the response since early June. Many of the FDA leaders involved in the response were present at the APHL Annual Meeting in Cincinnati in June and were gracious enough to participate in late-breaking sessions, opening a two-way communication channel with our members. From those sessions, workgroups were formed to address member concerns around test methods and appropriate target compounds. FDA and other federal agencies have been actively engaged with those workgroups. Later in the summer, sessions on the Gulf Coast Oil Spill response were organized at the FERN National Training Conference co-hosted by APHL, FDA and USDA. When FDA funding became available to support testing at a limited number of laboratories in the region, APHL was contacted by the Office of the Commissioner to compile a needs assessment of the responding laboratories.

The Deep Water Horizon explosion may be the worst environmental disaster in US history; yet many aspects of the multi-agency response to this disaster, particularly the response to the safety of the seafood supply, can be considered successes. Partnerships were forged, science was advanced, and critical information was shared appropriately. As the details of long-term sampling and testing plans are worked out, we can all build on these successes as we continue to provide the best possible laboratory analysis of the seafood going to market in states across America.
PRACTICING A COORDINATED RESPONSE: EPA’S FULL-SCALE LABORATORY EXERCISE
by Adrian Hanley, chemist, EPA

The EPA and the CDC conducted the Region 9 and 10 Laboratory Full-Scale Exercise (FSE) on August 20-27, 2010, to practice a coordinated laboratory response to a major environmental and public health incident. EPA Regions 9 and 10 are located in the western United States. EPA’s Environmental Response Laboratory Network (ERLN) and Water Laboratory Alliance (WLA), as well as CDC’s Laboratory Response Network (LRN) were mobilized to respond to immediate environmental and clinical laboratory needs.

The exercise was designed to test the full spectrum of a laboratory response—from sample collection and shipment, to laboratory analysis, data generation, data validation, and reporting to the incident management team.

The Region 9 and 10 FSE involved multiple concurrent incidents that required the capacity of multiple laboratory networks for chemical and biological analyses of water, soil, air and clinical samples. The exercise was designed to test the full spectrum of a laboratory response—from sample collection and shipment, to laboratory analysis, data generation, data validation, and reporting to the incident management team (IMT).

The FSE was initiated notionally on August 20, 2010, when a terrorist group sprayed a college stadium in Seattle, WA, with chemical agent and then crashed into a building containing organic chemicals. Laboratory activities, which commenced a few days later, were integrated with emergency response personnel from EPA Region 10, EPA Headquarters’ Office of Emergency Management, and other federal agencies such as the CDC and the FBI. Twenty-five laboratories—representing the full spectrum of WLA, ERLN and LRN partners—participated in the FSE with excitement and commitment. Participants included EPA regional, state environmental and public health, county, public water utility, and commercial laboratories. At least one laboratory from each of the states in EPA’s Regions 9 and 10 participated.

Even though the ERLN laboratories were unaware of what sample analyses would be required prior to the start of the exercise, they provided quick turnaround timeframes (24-48 hrs) and complied with specific data quality and electronic data deliverable requirements. These requirements allowed EPA to test a new web-based Electronic Data Review (WebEDR) product. Thirteen of the sixteen environmental laboratories were fully successful in uploading their data into the beta test version of WebEDR; the other three were partially successful. WebEDR was then used by the Region 10 quality assurance team to validate the data in real-time (Level 2 validation—includes review of blanks, spikes, and holding times) and to upload the data into the SCRIBE database to generate GIS maps for the Incident Command. The maps were available at lunch time on Thursday, August 26, 2010—less than two and a half days after sample receipt. By all measures, the FSE was a great success and learning opportunity for EPA and its laboratory partners. The EPA encourages its ERLN/LRN partner laboratories to take advantage of future exercises.

NEW PUBLICATION: NATIONAL BIOMONITORING PLAN

Synthetic cannabinoids are being synthesized by “street chemists” and marketed as “legal marijuana” under brand names like K2, Spice, Spice Dream, or Yucatan Fire. These compounds are posing many public health problems as they emerge as new drugs-of-abuse. Dealers are marketing to young teens and first-time drug users, primarily because regulations are either inconsistent or lacking in most states. The popularity of these drugs seems to be increasing as more people learn that drug tests do not detect the presence of these compounds. It is generally thought that users do not have to be concerned with surprise tests administered by athletic programs or employers.

Early clinical reports show that these are dangerous drugs and cause adverse health effects that are atypical of marijuana use. Although there remains a lot to learn about the toxicological properties of K2 products, it is known that these compounds may cause extreme paranoia, hallucinations, agitation, anxiety, seizures, tachycardia, and death. These early findings, coupled with variable composition and dosages, make them of particular concern for both clinicians and public health officials. It is particularly concerning that reports in Arkansas are showing that drug dealers are supplementing typical “street products” with K2 compounds.

The Arkansas Department of Health—Public Health Laboratory (ADH-PHL) has identified these products as potential emerging agents of public health concern and is working with state and national partners and legislators to determine how to best control exposures to these compounds. ADH—PHL—in collaboration with the Arkansas State Crime Laboratory, Colleges of Medicine, Pharmacy (Arkansas Poison and Drug Information Center) and Public Health at the University of Arkansas for Medical Sciences, Arkansas Children’s Hospital, CDC, DEA, and several private partners—has developed a translational science research group that is systematically responding to public health, medical, forensic, and legal questions regarding K2 use. All of the knowledge and information gained through this workgroup is being used to develop educational and community outreach programs aimed at reducing injuries and deaths related to K2 use.

Some major accomplishments of this group include:
- Development of forensic and human biomonitoring testing capabilities,
- Enactment of statewide regulations to help prevent exposures to K2 products,
- Collection of more than 150 human specimens that are part of a statewide biomonitoring program aimed at determining use and prevalence of K2 products,
- Generation of a clinical symptom database, which will be used to correlate biomonitoring data and potential public health consequences,
- Use of in vitro and in vivo mice models to help understand human pharmacology, toxicology and metabolism of K2 products in man.

Arkansas gets grant for K2 project

In April 2010, the Arkansas Public Health Laboratory was a recipient of a grant from APHL’s “Innovations in Quality Public Health Laboratory Practice” project to develop and evaluate the benefits of new biomonitoring, forensic, and clinical tools necessary for assessing ‘K2 Spice’ exposures. The goal of the project was to help member laboratories implement innovative projects that help to define and assess quality public health laboratory practice, systems and services. The selected topics were identified by APHL laboratory leaders as areas of importance to public health laboratories.
WAITING TO KNOW
Hamsters, gerbils, mice and kin are furry, inexpensive and low-maintenance, making them increasingly popular as pets. The problem is that they are also potential carriers of Salmonella, having been implicated in several cases of illness in children and an outbreak of multidrug-resistant Salmonella Typhimurium a few years ago.

How prevalent is Salmonella in 'pocket pets'? The Minnesota Public Health Laboratory would like to find out. The lab's director, Joanne Bartkus, PhD, said, “Our state veterinarian would like to work with us on a survey of pocket pets in pet stores to see how much Salmonella is out there. It’s a really simple study, a student project easily.”

But it won’t be happening any time soon. Reflecting the frustration of her colleagues across the country, Bartkus said, “It’s very difficult to find the funding to do that kind of study.”

Although the US Public Health Service lists research as one of ten ‘essential’ public health services, public health research has been generally underfunded and, hence, relegated to the bottom of the priority list in many state laboratories.

According to APHL survey data, 26 of 42 state public health laboratories (PHLs) took part in research with other state programs in 2007, 19 PHLs published in peer-reviewed journals, 18 evaluated diagnostic test kits and 12 evaluated laboratory instruments.

Despite this activity, it is easy to overstate the extent of the research taking place. The Oregon State Public Health Laboratory is probably typical of most state labs. Its director, Michael Skeels, PhD, MPH, said “Our lab doesn’t really do any applied research. We sometimes conduct evaluations and comparisons of analytical systems, and we contribute to epidemiologic investigations and newborn screening studies that may be published in journals. However, these are really just by-products of our work as a service lab. We don’t have the resources to hire doctoral-level researchers or to support their activities—and although our enabling statutes don’t prohibit research, they don’t mention it either.”

Of ten state PHLs that participated in a recent APHL laboratory system improvement assessment and have reports available, eight indicated that they carry out minimal or no research and two reported moderate research activity.

Not surprisingly, the state laboratories most likely to engage in research are those with the most resources (generally in more populous states), those affiliated with universities, and those with legislative mandates to carry out research in matters affecting public health.

The Promise of Public Health Laboratory Research
by Nancy Maddox, writer
IMPROVING PUBLIC HEALTH THROUGH RESEARCH: FROM FOOD SAFETY TO PHARMACOGENETICS TO FLU

When state laboratories have been afforded the opportunity to do research, they have made critical contributions to the science base and to public health practice.

The Minnesota Public Health Laboratory, for example, played a key role in the development of a novel method to subtype Salmonella Typhimurium and Salmonella Enteritidis using multi-locus variable number tandem repeat analysis. The new method has discriminatory power as good or better than the standard pulsed-field gel electrophoresis method and can be performed much more rapidly—in 5 hours instead of 24. It was used by the CDC during the recent outbreak of Salmonella Enteritidis in eggs and will soon be available for dissemination to other PHLs nationwide.

The Virginia Division of Consolidated Laboratory Services (DCLS) developed a method to detect cyanuric acid—a metabolite of melamine—in hog urine, enabling the laboratory to detect animals that had eaten melamine-contaminated feed from China during a large-scale recall in 2007. The DCLS is also one of only two state laboratories working on methods to measure chemical warfare agents in environmental samples.

A shining example of a PHL that’s using research to make a difference is the Wisconsin State Laboratory of Hygiene (SLH)—part of the University of Wisconsin in Madison—which devotes about 10% of its $40 million annual budget to research. The SLH was a key partner in a collaborative effort to develop and pilot the first newborn screening test for severe combined immunodeficiency. It has ongoing projects to evaluate new tests for genetic markers associated with malignancies and with the efficacy of certain drug therapies, a staple of the relatively new science of pharmacogenetics.

The benefit of maintaining research programs in state laboratories, however, goes far beyond the value of specific research results, as substantial as this may be.

New York’s Wadsworth Center is often cited as a research powerhouse that is unique among state PHLs. Its deputy director, Jill Taylor, PhD, calls it a “mini NIH, mini CDC and mini FDA all rolled into one.”

The laboratory has about 150 PhD-level scientists, and roughly half of these spend all or part of their time doing basic or applied research. In 2009, this research work brought in more than $30 million from grants and contracts to cover direct and indirect costs.

Among its early achievements, the Wadsworth Center discovered and isolated Nystatin, the first effective antifungal agent, and developed poxviruses as vectors for vaccines.

As a result of its intensive research activity—the center, the surrounding community and the public health community enjoy a host of ancillary benefits.

Research funding supports about 300 Wadsworth Center employees, including scientists and support staff, which has boosted employment in the Albany area where the laboratory is based. The prolific research activity attracts highly trained staff and has raised the bar for the quality of science expected from Wadsworth laboratorians. “It keeps us on the cutting edge,” said Taylor.

When the SARS coronavirus was causing a large outbreak just across the border in Toronto in 2003, Taylor said, “We had two research scientists who work with coronaviruses, and they were tremendously helpful in interpreting what was going on internationally and implementing the [SARS] test once we received it from CDC. We were testing very quickly.”

Applied research has different definitions, but broadly deals with practical problems. Applied research in public health laboratories may include development and evaluation of new test methods or potential solutions to public health systems problems, or may explore novel surveillance methods for emerging diseases.

During the 2009 H1N1 influenza pandemic, two Wadsworth virologists worked with the National Institute of Health and the J. Craig Venter Institute to have hundreds of H1N1 isolates genetically sequenced so the information could be shared with researchers around the world to track the evolution of the virus.

“We couldn’t have done that if we didn’t have researchers here,” said Taylor. “And things like this happen all the time.”

Jim Pearson, DrPH, MPH, head of Virginia’s DCLS, cited other benefits PHLs can derive from in-house research programs. Research funding—particularly for chemical terrorism work—enabled the DCLS to modify its air handling system, improve its security systems, upgrade its laboratory information management system (LIMS) and acquire additional personnel and state-of-the-art instrumentation. All of these changes have dual-use potential.

“There is a huge benefit in terms of the research funding being used to provide additional services for the state,” said Pearson.

An active research program, he said, also helps with student recruitment, enables scientists to develop a better understanding of laboratory tests and technologies, and fosters a “critical-thinking environment.”
“If you’ve been doing research and you see an unusual finding in a ‘routine’ sample or specimen,” said Pearson, “you start wondering why. That can lead to a better answer for the customer you’re working for.” And a research environment is “exciting,” he noted.

**RESEARCH FUNDING—FALLING THROUGH THE CRACKS**

Despite its value, however, most state labs have limited access to the funding that would enable them to engage in research.

The primary sources of federal funding for PHLs—CDC’s Emergency Preparedness and Response (EPR) and Epidemiology and Laboratory Capacity (ELC) grants—typically fund the implementation of research that’s been done elsewhere, rather than original investigations. Some CDC grants explicitly prohibit using the grant funds for research.

The National Institutes of Health (NIH), on the other hand, tend to fund ‘big science,’ rather than the small- to medium-sized research projects most PHLs have capacity for. (The Wadsworth Center, which receives the biggest share of its research funding from the NIH, is a notable exception.)

State funding for PHLs can also be problematic. “There’s an attitude barrier,” said Bartkus, “and that is with the legislators and other government officials who don’t necessarily believe a public health agency should be doing research as a routine activity.”

Even when PHLs have the flexibility to use state dollars or fee-generated income for research, there is often not enough money to spare.

Chuck Brokopp, DrPH, who has directed four state PHLs and currently heads the Wisconsin SLH, said, “You can’t justify taking limited PHL resources that support core programs to do research if some of the more traditional core functions aren’t being met.”

A second complication for PHLs is unfamiliarity with the institutional review board protocols and other regulatory hurdles that must be cleared before clinical specimens can be used for anything other than their originally intended purpose.

Even under the best of circumstances, research projects can take years to come to fruition and meet all regulatory requirements—a complicating factor for laboratories that rely on temporary student labor to support research that is secondary to the lab’s principal obligations.

So where does that leave state laboratories?

“When you start talking about the reasons you can’t do something,” said Pearson, “you never get anything done. What you should be trying to do is find ways to do it. How can you make it happen?”

Said Taylor, “Research is traditionally carried out in academic settings. It takes a different way of thinking about it to see it in a public health way. Nobody’s going to walk up to us and say, ‘Here’s a million dollars to start a research program.’ You have to develop an infrastructure to handle grants, you have to get used to writing grants. All good institutions are continuously re-examining their mission and their role.”

Some state laboratories—including the Wadsworth Center and Virginia DCLS—have specific statutory authority to conduct research. Labs with university affiliations or with a critical mass of scientists with academic appointments benefit from a presumption that independent research is part of their charge. Indeed, the Wisconsin SLH builds this expectation right into the position descriptions and performance evaluations of some of its scientists.

Other labs face a greater challenge educating state officials about the role of research in the PHL.

**“BETTER, QUICKER, CHEAPER”**

One class of low-hanging fruit pertains to strengthening the PHL system itself, as promoted by APHL’s Laboratory Systems Improvement Program and Informatics and Institution Research Program (IIRP).

“Better, quicker, cheaper are really the drivers for applied research,” said Pearson. “That’s the kind of research that is and probably should be done in a PHL. After all, you are a public agency and what you do has to apply to the people you serve.”

A key aspect of PHL systems research is the identification and mitigation of choke points that impede workflow. “There are states that don’t have LIMs,” said Pearson. “They’re not able to send results electronically. There are states that receive samples by mail, and so they may not get them for three or four days.”

Some strategies to consider for potential gains in efficiency and cost-effectiveness, he said, are batching samples, using robotics, implementing entirely different methodologies from what the lab is currently running or consulting with customers to determine whether a different lower limit of detection would satisfy their needs; say, parts per million instead of parts per billion.

Just this past April, APHL awarded a total of $90,000 to the first seven grantees of its CDC-supported institutional research program, Innovations in Quality PHL Practice. IIRP Director Patina Zarcone-Gagne, MPH, said, “We’re trying to motivate our members to do more practice-based research that will highlight and describe quality practices in the PHLs and show metrics that prove they are successful.” Each “Innovations” project addresses one of six questions:

- What is the impact of the PHL system on healthcare, quality of life and economics?
- What quality systems ensure PHL quality assurance?

Wadsworth researchers use high resolution light and electron microscopy to probe the processes by which cells communicate with one another, regulate growth and proliferate, age and die.
What are the implications of the PHL workforce shortage?
What do PHLs need from the next generation of LIMS?
What does the ideal PHL system look like?
What are the benefits of new technology?

For example, the Montana Laboratory Services Bureau is collaborating with PHLs in North Dakota, South Dakota and Wyoming to describe an effective PHL system for the rural, frontier West. The Southern Nevada Public Health Laboratory is working with the local office of epidemiology to document the impact of enhanced, laboratory-based, pediatric influenza surveillance. And the Arkansas Public Health Laboratory is examining the prevalence and health-related outcomes of the use of synthetic, marijuana-like substances, such as K2 (see article on page 13).

The young APHL program has already proven of great interest to association partners and members; 16 PHLs submitted applications for the second round of funding.

The information generated by systems-level research, said Zarcone-Gagne, is “very important for demonstrating the value of PHLs in the greater healthcare system and garnering more [PHL] funding.”

“WE HAVE TO EDUCATE PEOPLE”

A second strategy to boost the level of research in state laboratories is collaboration.

“We have to look at ourselves as not standing alone but building partnerships with others, thinking about what capabilities we have that benefit academia and industry,” said Taylor.

One thing that PHLs have that most universities and private-sector industries do not have is a constant source of samples to test.

It is not uncommon for PHLs to evaluate new technologies and testing platforms that partners would like to place in the PHL setting. (Sometimes, participating laboratories are able to retain new instruments free-of-charge or to purchase them at a reduced cost.)

Colleges and universities are an obvious connection to researchers. The Wisconsin SLH, for example, is one of seven core facilities on the campus of the University of Wisconsin that provide laboratory support for an NIH-funded, university-wide translational research center, placing it on the inside of the research community.

Brokopp said PHLs can initiate relationships with universities by arranging for laboratory staff to give presentations on academic campuses, explaining the laboratory’s core functions and its interest in practical research opportunities.

In addition, he said, laboratories can:

- Host university students in the lab to support research projects proposed by them and their academic advisors.
- Recruit staff with ties to academia, including recent graduates with demonstrated skills working in the PHL.
- Involve researchers or academicians on PHL advisory committees.
- Reach out to health department or environmental health staff who may have interesting research questions they’d like to pursue and who may have ties to academia.

“The more you let a potential researcher know what your capabilities are, the more they’ll start thinking of you when something comes up that needs lab support,” he said.

In the meantime, ongoing studies serve as a reminder of what public health stands to gain from PHL engagement in the research arena.

The Minnesota Public Health Laboratory is involved in a prospective study examining the association between elevated immunoreactive trypsinogen (IRT) levels and the development of intestinal perforation in premature babies. The hope is that repeat testing will detect IRT elevations in time to permit life-saving surgery.

The Virginia DCLS is refining methods to detect polycyclic aromatic hydrocarbons—carcinogenic and teratogenic pollutants found in natural crude oil—in seafood. And the Wisconsin SLH is working on tests that will enable scientists to identify the animal source of viral or bacterial contaminants in the environment.

A host of outstanding questions of direct relevance to PHL practice involve the collection of environmental samples and isolation of analytes, especially trace analytes, from complex matrices, such as soil, foods and consumer products.

ALL COMES BACK TO FUNDING

In the end, said Pearson, it all comes back to funding: “It really does start with having the funding and the flexibility within the funding to do the work. We can’t really do [research] without sustained funding.”
The funding dilemma is not unique to PHLs. According to survey data from the Council of State and Territorial Epidemiologists, 43% of state epidemiology programs have minimal to no capacity to carry out research. Only three programs reported full or almost full capacity.

Research!America, a non-profit public education and advocacy alliance, reports that the US spends less than one cent of every healthcare dollar on public health research and prevention. And no significant increase in funding seems imminent; the president’s proposed 2011 budget for CDC—$6.6 billion—represents a 1.9% reduction from the agency’s 2010 budget.

This past March, Bartkus spoke at a congressional briefing exploring the value of public health research. Although the group of attendees was fairly small, she said, “I do think they got it.”

Everyone interviewed for this article agreed that continued advocacy of this sort is critical. “We have to educate people,” said Taylor. “We’re not just there during emergencies.”

Taylor credits the Wadsworth Center’s strong research focus to the vision of the state’s leadership over the past hundred years. She quoted David Axelrod, MD, New York’s health commissioner from 1979 to 1991:

“We must remain devoted to the canons of science that are so much a part of the practice of medicine and the practice of the allied arts. To do otherwise would be to build public policy on quicksand.”

“Basically what he’s saying,” said Taylor, “is, good science means good public health.”

Without a way to fund the necessary science, officials back in Minnesota are still wondering how many pet store rodents are shedding Salmonella.

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  - Pseudomonas

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APHL SUPPORTS ETHIOPIAN “SISTER” ORGANIZATION
BRINGING TOGETHER LABORATORY LEADERS WORLDWIDE

by Ava Onalaja, specialist, Global Health

APHL’s executive director, Scott Becker, MS, visited Addis Ababa, Ethiopia, to attend the third annual meeting of the Ethiopian Public Health Laboratory Professionals Association (EPHLA) in August. His attendance marked the continuation of a developing collaboration between EPHLA and APHL. While in Addis, Becker also met with individuals from the CDC’s Ethiopian office (CDC-ET) and the Ethiopian Health, Nutrition and Research Institute (EHNRI)—key partners of APHL’s in-country activities.

APHL has been involved with EPHLA from its inception. Like APHL, EPHLA is a member-based association that relies on both internal and external collaboration to pursue its strategic objectives. APHL participated in initial discussions for the EPHLA’s formation and provided planning and content support for the association’s First Annual Conference in 2008, along with the Ethiopian Public Health Association (EPHA) and the CDC.

The mission of EPHLA is to support EHNRI (the country’s national public health and reference laboratory) and public health laboratories in order to promote better laboratory services, policies, research and trainings that support the national and regional health objectives. EPHLA provides a forum for public health laboratorians to convene and discuss key issues of public health importance. As a member-based organization, the association provides an important link to laboratories and laboratory professionals in the growing private health care sector. To further its ability to improve the state of public health laboratories, EPHLA has a seat on the National Technical Working Group, an advisory body to EHNRI.

The EPHLA’s executive director, board chair and executive committee president attended the 2010 APHL annual meeting (earlier in June) and were able to attend an APHL board of directors’ meeting to learn how APHL operates and exchange expertise with APHL members. In continued partnership, APHL is working with EPHLA to develop a five-year strategic plan framework.

Currently, APHL and EPHLA are drafting a Memorandum of Understanding. With this document, APHL and EPHLA will establish themselves as collaborative “sister” associations and will continue solidifying ties between their organizations. The similar agendas and concerns of APHL and EPHLA make international networking and partnership critical to strengthening each others’ effectiveness in the field. APHL will provide guidance and support in the areas of Establishment of Governance, Structure and Strategic Plan, Workforce Development and Training, Communication and Advocacy, Technical Partnerships, Network of Networks, Funding Opportunities and Organizational Leadership. APHL will continue to seek more collaborative opportunities with EPHLA.

As APHL and EPHLA work to strengthen laboratories in Ethiopia through increased capability and capacity building activities, the lessons will be shared with other international laboratory partners. Ideally, this partnership will be one of many that will contribute to an international network serving the world’s laboratorians.
HELPING LABORATORIES IN UKRAINE STEM AN EPIDEMIC

by Marie-Claire Rowlinson, senior specialist, Global Health

As part of US efforts to build sustainable international programs that can stem the HIV/AIDS epidemic, Ukraine has been targeted to receive assistance under the reauthorized President’s Emergency Plan for AIDS Relief (PEPFAR II). The Ukrainian government, its Committee on Countering HIV/AIDS and Other Socially Dangerous Diseases, and CDC-Ukraine asked APHL’s Global Health Program to provide an assessment of the HIV/AIDS network laboratories. Through this process, APHL identified needs in the laboratory network and is now developing a plan with the Ukrainian government and CDC-Ukraine for technical assistance and training.

The assessment took place in Kiev, Ukraine, June 21-25, 2010. The assessment team included APHL consultants Dr. Eric Blank (former director of Missouri’s public health laboratory) and Dr. Harvey George (former director of Diagnostic Laboratories, Massachusetts public health laboratory), the CDC-Atlanta Global AIDS Program’s Dr. Dennis Ellenberger and APHL’s Dr. Marie-Claire Rowlinson. The team was accompanied by CDC-Ukraine Chief of Party, Dr. Charles Vitek, and translator, Eugenia Larionchik. A generic assessment tool was modified and used to document basic operational and technical characteristics of each laboratory. Five laboratories in Kiev City and the region were assessed during the visit, including the National Reference Laboratory, Oblast (at the regional level) and city laboratories. Although the team was unable to visit HIV/AIDS network laboratories outside the Kiev region, the Ukraine representatives reported that those visited were representative of others in the system. The APHL team worked with the Ukraine government, the National Reference Laboratory and CDC-Ukraine to develop a comprehensive environmental scan of the current situation and develop recommendations.

From the assessment, the team recommended the following activities:

- Strengthening the national QA program, validating testing kits used for HIV testing and standardizing the testing algorithm;
- Twinning the National Reference Laboratory with a US public health laboratory;
- Supporting in-service training on new technologies, QA and quality systems, management and safety.

APHL will continue to work with the Ukraine government and CDC-Ukraine to assist in the implementation of some of these activities with the end goal of strengthening the HIV/AIDS laboratory network.

EVALUATING HIV TESTING TECHNOLOGY IN NIGERIA

by Karim Hechemy, retired, Wadsworth Center; Mark Pettigrove, San Diego County APHL; and Marie-Claire Rowlinson, senior specialist, Global Health

The Nigerian Federal Ministry of Health (FMoH) and CDC-Nigeria asked APHL’s Global Health Program to provide technical assistance for an HIV Rapid Test Kit Evaluation, which is supported through PEPFAR funding.

Evaluations of HIV testing technology are usually carried out in three phases. Phase I is conducted in a controlled laboratory environment and involves testing the accuracy, safety, and ease-of-use of test kits. Other considerations are cost and storage temperature, as many testing centers are unable to store kits in refrigerators. Phase II is carried out in a small number of pilot sites to test kit performance in a non-controlled setting. Phase III consists of launching the testing methodology nationwide and monitoring the progress.

APHL’s in-country consultant, Isatta Wurie, has provided continuous support and coordination to this project, which is currently in Phase II. In addition, APHL consultants Karim Hechemy (retired, Wadsworth Center), Georges Dahourou and Mark Pettigrove (San Diego County Public Health Laboratory) traveled to Nigeria to provide training and to assist with development of testing materials prior to the rollout of Phase II testing. APHL supported the workshops and procurement of testing kits and other laboratory supplies for the 12-week Phase II testing period.

Phase II will be carried out in six pilot testing centers located in hospitals in each of the six geopolitical zones of Nigeria. These sites were chosen to give a representative sample of the nation and assess the test performance of kits and test results in a field environment. The goal of the evaluation is to provide objective data to establish the national HIV testing algorithm that will be used uniformly across Nigeria. This project is considered critical by the FMoH to ensure the quality of the HIV testing that supports the diagnostic and screening programs.

The APHL consultants participated in two workshops during the initial stages of this evaluation. The first workshop took place at the National Laboratory External Quality Assessment Center in Zaria, located in North Central Nigeria. There, the consultants provided assistance with QC plasma panel production in concert with the 12 members of the Nigerian national QA team, and assisted with the development of SOPs and training materials to be used during Phase II testing. The second workshop, held in the capital, Abuja, was attended by four laboratory technologists from each Phase II pilot site, CDC-Nigeria and FMoH officials. It provided a historical perspective of the Phase I evaluation and an overview of the Phase II protocol, as well as the roles and responsibilities of participants, logistics, and data entry and collection.

The APHL team will return to Nigeria at the end of the 12-week testing period to assist with data collection, clean-up and the Phase II report.
On September 1, United States and Lesotho officials took part in a grand ribbon cutting ceremony to celebrate Lesotho’s latest strategic asset: a new facility for the Makoanyane Military Hospital Laboratory—one of only 21 laboratories performing clinical testing for Lesotho’s 1.8 million residents.

In a nation where roughly one of four people is HIV positive, the new facility offers critical, state-of-the-art services to support HIV diagnosis and treatment for military personnel and their families. The facility is the result of an 18-month renovation project, supported by the Lesotho Defense Force (LDF), which allocated a building to house the laboratory; the US Department of Defense (DoD), which provided funding through the US President’s Emergency Plan for AIDS Relief; and APHL, which provided extensive technical assistance under its cooperative agreement with the CDC Global AIDS Program.

The laboratory—formerly housed in one small room of the Makoanyane Military Hospital in Maseru—now has dedicated rooms for specimen receipt, chemistry/hematology/CD4 testing, microbiology and tuberculosis testing. Its importance to this small landlocked nation (surrounded by S. Africa) was reflected in the roster of participants at the opening ceremony, including officials from the LDF, the Lesotho Ministry of Health and Social Welfare, the United States Embassy in Lesotho, the US DoD and CDC.

APHL took the lead in the laboratory design, hiring contractors, and workflow. Senior APHL Consultant Kim Lewis worked onsite throughout the project to oversee design (which meets Clinical and Laboratory Standards Institute guidelines), supervise construction contractors, procure laboratory instrumentation and supplies, organize the laboratory’s operational setup, train staff to use the new equipment, and begin the preparation for the WHO-AFRO accreditation process via implementation of the Strengthening Laboratory Management Towards Accreditation Program (SLMTA), a CDC initiative.

APHL will continue to support the new facility through onsite mentoring of laboratory technicians and implementation of quality systems to assure accurate, reliable and timely test results.

“The laboratory provides access to testing services for a population with high rates of TB and HIV, and enables medical providers to effectively treat these diseases,” said Lewis. The success of this program is due to the excellent inter-agency collaboration between US DOD, CDC, APHL, MOHSW and LDF—and such collaborative efforts could serve as a model for other countries.”

LESOTHO’S LATEST STRATEGIC ASSET:
A NEW LAB FACILITY TO SERVE AS A MODEL
by Kim Lewis, MSc, consultant/laboratory advisor, APHL

APHL’s Global Health Program has provided extensive support to Lesotho laboratory programs working closely with MOHSW, CDC-PEPFAR and other partners.
Rotavirus is the number one cause of infant gastroenteritis worldwide. In fact, by age five nearly everyone has been infected with rotavirus. Worldwide, this accounts for 600,000 deaths annually. Yet fatality rates in the United States are much lower than seen in developing countries. There are a variety of reasons why this is so; and with the recent introduction of two new vaccines with a high efficacy against severe disease, the number of positive cases detected annually in the US has decreased dramatically. But what’s to stop the emergence of new rotavirus serotypes not targeted by the current vaccines? The answer is: continued national surveillance supported by quality laboratory testing to monitor for incidence and genotype circulating strains.

In September, 15 public health laboratorians attended a three-day NLTN hands-on training workshop at CDC to learn some of the testing methods that have been developed by CDC scientists for rotavirus detection. Participants learned techniques for RNA extraction from stool specimens, and conventional and real-time RT-PCR for detection. By having the capacity to test for rotavirus, public health laboratories will be playing a vital role in the continued efforts to control this deadly childhood disease.

CDC scientists have also developed molecular testing methods for bacterial vaccine-preventable diseases that cause significant morbidity and mortality annually in the US, such as meningococcus, pneumococcus and whooping cough. In October, another NLTN hands-on training workshop was held at CDC for 16 public health laboratorians to learn some of these testing methods. To start, the course participants learned a multiplex PCR method for detection of *Bordetella spp.* organisms. Many of the participants plan to implement this assay in their laboratories in response to the current outbreaks of pertussis. A validation and proficiency panel that will be sent to the laboratories by APHL’s ARRA-funded Vaccine-Preventable Diseases project will assist the implementation of this assay.

Course participants also performed several PCR-based assays to detect serotypes of *S. pneumoniae* and *H. influenza* and serogroups of *N. meningitidis*. As with rotavirus, these assays allow laboratories to help epidemiologists monitor strains that may be circulating in spite of vaccination efforts. Plus, these molecular assays offer advantages over conventional slide agglutination serotyping and serogrouping by being less subjective, much quicker to perform and often have better sensitivity and specificity.

As vaccine-preventable diseases become less prevalent, the need for laboratory testing often becomes less apparent. However, constant vigilance and surveillance are necessary to quickly detect and identify both current and newly-emerging strains of these diseases. This would be difficult, if not impossible, without the testing provided by public health laboratories. By maintaining and increasing capacity to test for these vaccine-preventable diseases, public health laboratories are proving their critical role in ensuring the nation’s health.
B eth P. Bell, MD, MPH, is the director of the National Center for Emerging and Zoonotic Infectious Diseases (NCEZID). Beth has been with CDC since joining the Epidemic Intelligence Service in 1992. Her career has encompassed outbreak investigations, program and policy development, and organizational leadership, notably in the fields of viral hepatitis and other vaccines-preventable diseases. She was the primary architect of the highly successful US strategy for hepatitis A vaccination, and has played a leadership role in responses to public health emergencies, including the 2001 anthrax attacks and recent influenza pandemic.

Q1: BROADLY, WHAT ARE YOUR PRIORITIES FOR THE CENTER FOR THE NEXT 1-2 YEARS?

This is a new center, formed by bringing together two separate infectious disease centers that had been working collaboratively, but relatively independently, over the last 4-5 years. So, my first priority is to bring the center together and develop a shared vision of near and longer term priorities to maximize our effectiveness and public health impact. In general, I would say that the two centers coming together provides a big opportunity to be a focus for public health infectious diseases within CDC, and to move forward a lot of our core public health infectious disease surveillance and response priorities. Many of these core infectious disease functions are housed in NCEZID, including most of the select agents, the Epidemiology and Laboratory Capacity (ELC) and Emerging Infections Program (EIP), as well as many other programs that are at the foundation of public health infectious disease surveillance, epidemiology and lab activities. So, building a strong, integrated center that brings all of this important work together to be a focus going forward is a priority.

Q2: HOW CAN STATE AND LOCAL PUBLIC HEALTH LABORATORIES (PHLS) ASSIST THE NCEZID IN ACCOMPLISHING ITS MISSION, AND WILL DECLINING FUNDING FROM ALL LEVELS OF GOVERNMENT LIMIT THE ABILITY OF PHLS TO PERFORM THESE FUNCTIONS?

I like to think of public health infectious diseases and the laboratories and epidemiology and surveillance as an integrated system, which includes the federal government and state and local public health departments. I see all of this as being part of one system. So, I don’t see the state and local PHLS so much as assisting us in accomplishing our mission at CDC, but rather that we’re all equal partners in accomplishing a shared mission. State and local labs are a cornerstone of public health infectious disease surveillance, and we really can’t accomplish much of our mission without having PHLS as a strong partner in our efforts.

Regarding the funding environment, I think we can all agree that this is going to be a very challenging time with respect to budget. We'll have to identify synergies, efficiencies and ways to be very focused in our public health mission—and that will help. Finding ways to better explain what state PHLS do and how central these activities are to the health of the public will help. We also need to think about developing metrics to explain our objectives and how we’re going to reach them.
With respect to health reform, there’s a recognized need to build capacity and to strengthen core infrastructure. There’s a lot of interest, for example, in information technologies in general and electronic laboratory reporting in particular, which represents an opportunity for public health laboratories to improve and strengthen infrastructure. In terms of preparedness priorities—as I mentioned, our center houses most of the select agents and the LRN, in addition to the ELC and the EIP programs. There is a continued awareness of the importance of the LRN labs as a component of preparedness, so we have an opportunity to build on what we’ve already accomplished. And housing the LRN group and the ELC group in the same division has created opportunities for synergies that might turn out to be quite helpful.

There are challenges with respect to limited budgets; large increases in budgets in the near future are unlikely. Given this challenging environment, we need to be able to show that we’re having impact—learning to do that in a way that makes sense to a broad audience is going to be an important thing to work on together. APHL has been a great partner, along with CSTE and ASTHO, in explaining our shared mission.

I’d think in broad categories. Resistant organisms is one big category—there are a lot of potential, very serious threats there. Vector-borne diseases is another—for example, this year brought a very large dengue outbreak in Puerto Rico, and dengue is now endemic in southern Florida. We just had an influenza pandemic, and that doesn’t mean that we won’t have another one in the near future; they don’t emerge at regular intervals. Another big category of threats is pathogens that emerge at the animal/human environment interface; that’s an area we’re always paying close attention to. And there is always the possibility of pathogens we don’t know about and don’t anticipate that can emerge.

They all have challenges; I can’t think of one that was particularly difficult. I started my career as an EIS officer assigned to the Washington State Health Department, and I investigated the outbreak of E.Coli 0157:H7 associated with contaminated hamburgers from the Jack-in-the-Box fast food chain in Washington state. This was, by far, the largest 0157 outbreak identified to date, and it turned out to be a watershed outbreak in terms of spurring fundamental changes in how we do surveillance for foodborne illness. The critical role of the laboratory became apparent, growing out of that outbreak, and PulseNet was built in the aftermath. This was where I started my public health career, and it was a central event for me.

There’s always something new, and that’s always exciting. We’re always finding new agents and better ways to detect and prevent infectious diseases. And the multi-disciplinary aspect of it is really interesting—how epidemiology fits in with the laboratories and the role of public health programs in prevention. Also, we are fortunate to have an opportunity to have an impact, and because of our strong surveillance, we’re able to actually document the impact when we have one. Being able to contribute to improving health and reducing disease is very rewarding; you don’t get the opportunity to make that kind of contribution in too many fields. I started my career as a primary care doctor; shifting my focus to public health has provided an opportunity to do interesting work while having an impact on a much broader scale.

I see APHL and PHLs as one of our most important partners. And I look forward to meeting more of the people in the PHL world and strengthening our partnerships and collaborations.
Like many APHL fellows, Trisha Kreman landed a job in a public health laboratory after completing her fellowship—but her career would eventually take her thousands of miles away.

While finishing her master’s program in epidemiology, Kreman was working in a research lab and raising three teenagers. Unsure of her next steps, she attended a graduate seminar on APHL/CDC’s Emerging Infectious Disease Fellowship. “It was the perfect way to blend my research background of seven years with the new skills from the epidemiology program,” she said.

Months later, Kreman was awarded the fellowship and placed in a research lab at the University of Iowa Hygienic Laboratory, working on influenza. “That was a totally different type of project,” she recalled. “I was doing basic molecular biology research before. The influenza project was more focused on clinical work, so it was the first time I’d worked with clinical specimens and regulations.” When the fellowship ended, Kreman was hired by the public health laboratory, where she focused on flu and participated in ground-breaking initiatives like the FDA validation of the flu test. “Working with the CDC to help get the influenza test FDA-cleared was a great experience for our laboratory and an opportunity for me to learn more about large validation studies,” she said.

It would be only a few years before another unforeseen opportunity would come knocking. In 2006, Kreman responded to a call for CDC International Influenza Trainers. Though a novice traveler, she was among the first to submit an application. “I had done only a small amount of travel, vacationing in Mexico and Canada. This was an opportunity to see new places and to really put my skills to use and help.”

Kreman joined the APHL/CDC influenza group in 2007 and headed to India to train laboratory staff on molecular diagnostics for avian influenza and other infectious diseases. “We taught them the real-time RT-PCR test for influenza, including H1N1, to help them speed up an outbreak investigation and assist with global surveillance activities. This type of testing can also be applied to other infectious diseases, so it was a valuable new skill for their technicians to acquire,” she explained.

This year, Kreman has taken APHL/CDC-sponsored assignments to the Fiji Centre for Communicable Disease Control in Suva, Fiji, and the National Influenza Center at the Medical Research Institute in Colombo, Sri Lanka, conducting laboratory capacity assessments and providing basic troubleshooting around quality control. Following her team’s recommendations, the laboratories have begun addressing infrastructural issues and incorporating various best practices, such as improved sample collection techniques.

Three years into her international travel gig, Kreman has a stronger view on global public health issues and considers herself an “international consultant.” She still works full-time at the Iowa lab, focusing on foodborne outbreaks, test design and development, and grants—but she keeps a bag packed for her next adventure.

APHL INITIATES NEW EID LABORATORY FELLOWS

APHL initiated the 16th class of EID lab fellows in August. The new class includes 18 training fellows (bachelor’s and master’s level), two research fellows (post-doc) and two foreign fellows. The fellows will be placed in local, state and CDC laboratories around the country, including: Florida Department of Health, Hawaii Department of Health, Massachusetts State Laboratory Institute, New York State Department of Agriculture and Markets, New York State Department of Health, Orange County, California Public Health Laboratory, University of Iowa Hygienic Laboratory and the Virginia Department of Consolidated Laboratory Services.
CATCHING UP WITH ENVIRONMENTAL HEALTH FELLOWS
by Jennifer Pierson, senior specialist, Environmental Health

Theila Y. García, PhD, at the California Department of Toxic Substances Control, Environmental Chemistry Laboratory, is learning how to analyze the levels of persistent pollutants in human breast milk. The study aims to identify which chemicals are in people within the community, and how those chemicals are delivered, by measuring the “body burden.” A convenient and non-invasive way to evaluate community “body burdens” is to measure the levels of chemicals in breast milk.

Philip Place, at the Rhode Island Public Health Laboratory, is focusing on developing a working method for the measurement of cotinine, a nicotine metabolite, in human plasma. This method will ultimately be used to study the exposure of pregnant women and newborns to secondhand smoke and determine the health implications. A combination of factors makes this an interesting issue to study: the improvement of instrumentation and techniques in measuring cotinine, allowing for the detection of a wide range of secondhand smoke exposure; the recent changes in public attitude towards smoking, resulting in the restrictions imposed on smoking in public areas; and the improved understanding of the pharmokinetics of nicotine among different populations. Currently, his focus is shifting from development of the laboratory methodology to background research and study design. The lab is collaborating with a local area hospital to gain the appropriate approvals for the study and prepare for implementation.

CURRENT EID FELLOWS PRESENT AND PUBLISH RESEARCH
by Heather Roney, manager, Fellowship Programs

Dawn Roellig gave a presentation, “Trypanosoma cruzi in the United States: Molecular and biological characteristics of sylvatic isolates,” at the August International Congress of Parasitology in Melbourne, Australia.

Andrew Taylor presented the poster “Protein energy malnutrition decreases immunity and increases susceptibility to influenza A virus infection” at the Options for the Control of Influenza conference in Hong Kong in September.

The September issue of the Journal of Tropical Medicine and Hygiene includes “Absence of Rickettsia rickettsii and Occurrence of Other Spotted Fever Group Rickettsiae in Ticks from Tennessee” by Charissa Fritzen and Sara Cohen.

Amber Schmidtke’s research was presented as a poster at the 9th International Symposium on Bordetella in Baltimore in October: “Changes in the genetic diversity of Bordetella pertussis strains in the US, 1935-2009.”

Kristen Kreisel’s article, “Illicit Drug Use and Risk for USA300 Methicillin-Resistant Staphylococcus aureus Infections with Bacteremia,” was published in the “Medscape CME Activity” section of the September 2010 Emerging Infectious Diseases, and included in the September EID media highlights. Kreisel also co-authored “Relatedness of Vibrio cholerae O1/ O139 Isolates from Patients and Their Household Contacts, Determined by Multilocus Variable-Number Tandem-Repeat Analysis” in the September Journal of Bacteriology.

Shanna Williams’ poster, “The effects of temperature on the transmissibility of Yersinia Pestis by Oropsylla Montana,” was accepted for the October Yersiniosis conference in Brazil.

Ailyn Pérez-Osorio presented the poster “New Surveillance Tools at the Washington Public Health Laboratory Aid Tuberculosis Control” at the 2010 Washington State Public Health Association’s Joint Conference on Health in October. Pérez-Osorio has accepted a permanent position as a microbiologist at her host laboratory.

Having completed his fellowship at the San Francisco Public Health Laboratory, Sean Buono began a PhD in Environmental Health Sciences at UCLA. Within this major, he is entering the Public Health Laboratory Director Training Program sponsored by Lab Aspire.

Brock Neil completed his fellowship at the State Hygienic Laboratory at the University of Iowa and accepted a position as manager of Immunology/Virology Sections at the Division of Laboratory Services, Tennessee Department of Health.
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MEMBERS AND PARTNERS ON THE MOVE

The FDA’s Office of Regulatory Affairs recently announced its 2010 award recipients. APHL congratulates the APHL members and staff who were honored by FDA:

- Robyn Atkinson, Tennessee Department of Health
- Philip Haines, emeritus member, APHL
- Shari Shea, APHL
- North Carolina Department of Agriculture and Consumer Services (Jessica Dyer)
- Florida Department of Agriculture and Consumer Services (Marion Aller, DVM)
- North Carolina Department of Agriculture and Consumer Services (Jessica Dyer, Audrey Pilkington)
- University Hygienic Laboratory (Mary DeMartino, Michael Pentella)

Welcome New Local Lab Directors!

Mark Pandori, PhD
San Francisco Public Health Laboratory

Bonny Lewis Van, PhD, FACB
Marion County Health Department
Public Health Laboratory

Susan Neill, PhD, MBA, director, Laboratory Services Section, Texas Department of State Health Services, is retiring in December. She has served on the APHL Board for the past 8.5 years and has served in numerous roles including secretary, treasurer, and most recently, as president. We wish Susan all the best in her future endeavors!

Dr. May Chu has joined the CDC as the director of the Laboratory Science, Policy & Practice Program Office (LS3PO), which is part of the Office of Surveillance, Epidemiology and Laboratory Services (OSELS). Dr. Chu has broad national and international experience in laboratory science, practice and systems development, and most recently, was assigned to WHO headquarters in Geneva, Switzerland. APHL has a longstanding relationship with Dr. Chu, who has worked closely with the association on a number of initiatives.

Jim Pirkle, MD, PhD, is the new director of the Division of Laboratory Sciences (DLS) at the NCEH. Previously, he served as the DLS associate director for science from 1985 to 2000 and as DLS deputy director for science from 2000 to 2010. He is board certified in clinical pathology and holds a PhD in physical chemistry.

RECRUITING UNDERWAY FOR THE 2011 EID FELLOWSHIP PROGRAM

APHL is now accepting applications for the 2011 EID Fellowship Program. The application deadline for APHL member local, state, and federal public health laboratories interested in hosting a fellow is March 1, 2011. The application deadline for prospective fellows is February 11, 2011.

For more information, contact Heather Roney at 240.485.2778 or fellowships@aphl.org.
PATIENCE AND PROGRESS AT THE MISSISSIPPI PUBLIC HEALTH LABORATORY

by Nancy Maddox, writer

Mississippi is a lowland state on the East Gulf Coastal Plain. Its rich Native American history is reflected in the names of its towns, rivers and bayous—Natchez, Yazoo, Biloxi and Passacgoula, for example, all take their names from Native American tribes or phrases. The name Mississippi itself comes from an Ojibwe word memorializing the “Great River” that defines the state’s western border.

Daphne Ware, PhD, director of the state’s public health laboratory, said that Mississippi today is best known for its beautiful countryside, “phenomenal blues,” “great food” and laid-back lifestyle. “We’re a farming state,” she said. “Things have to grow, and you have to sit back. It’s a little slow-paced.”

Mississippi is also the Hospitality State. “If you have a flat tire, somebody is going to pull over and help you change it,” Ware said.

Jackson, the state capital, is home to just under 500,000 people in the metro area, as well as the Mississippi Public Health Laboratory—the only public health laboratory serving the state’s three million residents.

SERVING MISSISSIPPI’S SPECIFIC NEEDS

Because Mississippi is a rural state and many residents have limited access to healthcare, a large portion of the laboratory’s workload is patient testing to support the work of a network of county health clinics. Among the lab’s highest volume tests are chlamydia, gonorrhea and other STD tests. It also performs complete blood counts for family planning patients, clinical chemistries for tuberculosis patients and viral load, and CD4 tests for HIV patients. The laboratory plans to implement HIV genotyping within the next year.

In addition, the laboratory provides specialized services to carry out all of the 11 core public health laboratory functions recommended by APHL—everything from routine disease surveillance to emergency response.

A big focus for the laboratory is arbovirus testing. With a huge local mosquito population and Mississippian’s predilection for spending time outdoors, West Nile virus and other arboviruses represent a significant public health threat. The state laboratory performs roughly 2,000 arbovirus tests each year.

Other routine testing areas include milk testing, municipal drinking water testing and influenza testing. In addition, the laboratory maintains capacity for outbreak-related testing of clinical specimens and foods, and for biological and chemical terrorism testing.

Both the public health laboratory and all of the state’s county health departments are under the administrative authority of the Mississippi State Department of Health. Ware said having a “centralized command agency” helps all the public health partners maintain a single vision: “Communication is always the key. Having just one route for the communication makes it easier.”

The public health laboratory fosters a close working relationship with hospital labs across the state to coordinate activities for emergency preparedness. The laboratory’s training coordinator visits every hospital laboratory in Mississippi bi-annually, organizes an emergency response wet workshop bi-annually and hosts annual packing/shipping workshops. These face-to-face activities are supplemented with quarterly laboratory updates and additional updates during outbreaks and other public health emergencies.

Two of the biggest emergencies confronting the laboratory in recent years were hurricane Katrina—which prompted a huge increase in water testing, as well as high-volume testing for vibrio, norovirus and rotavirus in the shelters housing evacuees—and a major pertussis outbreak in 2007, with 170 confirmed cases and one death.

Last year, the environmental chemistry laboratory measured the levels of nearly 47,000 chemicals in thousands of samples of soils, liquids, sludge and other materials submitted by DTSC inspectors.

KEEPING A WELL-TRAINED STAFF

Ware oversees a staff of 90 people. “We have very dedicated staff members,” she said. “I would say the majority of them are here because they care so much about public health.”

The laboratory is currently seeking to fill four vacancies, but, like most public health laboratories across the country, is finding it difficult to recruit experienced scientists.

Ware is working to develop and institute a standardized training program that offers some flexibility to meet the needs of generally inexperienced new hires. At the same time, she would like to implement a new career ladder that was approved last year, but has been on-hold due to funding and hiring restrictions. Ware said the new ladder, once implemented, will “maybe give new staff members a reason to stay.” The current ladder for a bench scientist, she said, has three steps that can be reached in three years. “If a supervisor doesn’t leave, there’s nowhere for other staff members to advance to.”

Finally, she is seeking to offer new incentives as part of employees’ annual performance evaluations. “We’re trying to learn what their vision is for their career,” she said. “We want to develop ways to
offer staff the opportunity to broaden their base of experience, both technically and administratively, even if we can’t offer more money or a promotion.”

One pending incentive is a brand new, state-of-the-art, 80,000-square-foot laboratory building, slated for completion sometime next year.

**NEW FACILITY WILL EASE OPERATIONAL CHALLENGES**

Both the new facility and the 51-year-old, 32,000-square-foot building it will replace are on the central campus of the state health agency in downtown Jackson. For Ware and her staff, the relocation can’t come soon enough.

“We’re out of physical space. We’re out of electrical space,” said Ware. “If we’re going to expand any of our testing, we have to have more room.”

The new building offers a BSL-3 enhanced area that will replace the laboratory’s two current BSL-3 suites; one squeezed into a former broom closet and the other located offsite in a modular unit. The new facility will also allow Ware to bring the radiochemistry laboratory—also now located offsite—back into the main facility.

Other perks will include windows and natural light in all the laboratories, special shades fitted between the window panes to reduce glare and cooling costs, additional restrooms, a reception area, a training lab and a conference room large enough to accommodate the entire staff so meetings can be held within the laboratory itself.

While Ware is consolidating all of the laboratory’s functions into one space, she wants to “make some additional changes to go along with the new building.” These include revamping standard operating procedures so policies are uniformly organized for operations in the new facility and improving the laboratory information management system.

During last year’s influenza pandemic, information management was the biggest bottleneck. Ware said, “Everything was documented on paper. Hospitals had to fill out the [specimen submission] forms, and then our staff had to retype everything.” Ware wants to move the laboratory to an electronic, internet-based reporting system using the protocols developed by APHL’s Public Health Laboratory Interoperability project.

The biggest challenge facing the laboratory is funding. The Mississippi laboratory operates on a budget of about $9 million per year, which comes mostly from fees (59%) and grants (34%), supplemented by a small amount of state funding (7%). Despite increased testing demands—including more clinical testing for local health agencies and state public health programs—funding is decreasing. The laboratory gets Medicaid reimbursement for clinical testing when it can, but many patients under public health surveillance are homeless and lack insurance altogether.

Categorical grant funding has also become more challenging. Ware said grant requirements are “getting more and more specific, and that makes it more difficult to leverage that funding.”

Fortunately, Ware has the perfect temperament to persevere through tough economic times. Mississippi born and raised, she counts patience as one of her virtues.
CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL: KEEPING SCIENCE AT THE CORE OF THE GOLDEN STATE’S ‘GREEN’ FUTURE

by Nancy Maddox, writer

LOCATION

California is a state that has it all: more than 800 miles of coastline with stunning beaches, bays and inlets; more than 20 million acres of forest; about 25 million acres of desert; a dozen or so mountain ranges (including the Sierra Nevada, which contains the tallest peak in the contiguous 48 states); and some of the largest metropolitan areas in the country, such as Greater Los Angeles and the San Francisco Bay Area. The ‘Golden State’ grows a third of the nation’s food, is the center of the US entertainment industry and led the information technology revolution. It is home to 10% of the US population—more people than all but 34 countries of the world.

FACILITY

The California Department of Toxic Substances Control (DTSC) has two laboratory facilities, one in Berkeley and one in Los Angeles. The 14,000-square-foot Berkeley laboratory, the main facility, is housed in a 20-year-old building that was leased and renovated for the DTSC six years ago. It includes a state-of-the-art clean area for biological specimens with trace levels of analytes, advanced instrumentation for biomonitoring and other sophisticated testing and “ample space.” The lab is a block away from San Francisco Bay in a former industrial area that has been transformed into a biotech industrial park. The DTSC is in the process of finding a new home for the 8,000-square-foot Los Angeles lab, which is 42 years old and has been deemed not earthquake-safe.

DIRECTOR

Bruce La Belle, PhD—the DTSC Environmental Chemical Laboratory (ECL) Chief—has loved science ever since he can remember. He grew up in the suburbs of New York City and commuted to Fordham University in the Bronx to study chemistry. But once the East Coast native came to California, he said, “I never wanted to leave. I was misplaced at birth.” La Belle earned a doctorate in chemistry at the University of California in Davis and had post-doctoral fellowships at the University of California in San Francisco and the University of Colorado in Boulder. After finishing his academic studies, he joined the DTSC and has been there ever since, collecting field samples for regulatory enforcement staff, evaluating environmental technologies and, for the past five and half years, managing the entire laboratory.

STAFF

The ECL has 49 full-time positions: 38 in Berkeley and 11 in Los Angeles. Of these, 41 positions are filled and 11 are vacant and subject to a statewide hiring freeze. The laboratory employs 17 doctoral-level scientists and 9 master’s-level scientists. At the moment, there are also seven temporary positions, filled by grant-funded staff or visiting fellows, including an APHL Environmental Fellow.

REVENUE

Given California’s uncertain fiscal outlook, the ECL is “very fortunate” to receive the bulk of its funding through fees levied on entities that generate hazardous waste. “I get my budget at the start of the year, so
I know what I have to work with and then the challenge is prioritization,” said La Belle. In the current fiscal year, the budget is about $6 million, including some extramural funding, coming mainly from a CDC biomonitoring cooperative agreement.

TESTING

The ECL is a reference laboratory for California’s Environmental Laboratory Accreditation Program and performs analyses for more than 2,000 individual chemicals. Last year, it measured the levels of nearly 47,000 chemicals in thousands of samples of soils, liquids, sludge and other materials submitted by DTSC inspectors. The lab also tests specimens from people, wildlife and pets for a range of persistent chemicals that build up in the environment. The most common analytes are metals (14,480 tests in 2009), volatile organic compounds (7,360), polychlorinated biphenyls (PCBs) and organochlorine pesticides in serum (5,946) and polybrominated diphenyl ethers (PBDEs) and brominated flame retardants in people and other living organisms.

The laboratory’s analyses are an important component of California’s Green Chemistry Initiative (GCI), which uses various carrots and sticks to encourage manufacturers to produce safer products and to design products of long-lasting value, such as carpet tiles that can be recycled to make another product. The GCI, said La Belle, takes a proactive approach to identify emerging chemicals of concern “rather than waiting until they become waste and seeing if they’re harmful to health.”

The GCI identifies priority emerging chemicals, as well as products containing those chemicals that have wide usage or usage by sensitive populations. It then helps companies develop a methodology to identify safer alternatives. Said La Belle, policymakers “need the science to support decision-making. We can essentially serve as the eyes of the department.”

The laboratory hosts biweekly seminars on emerging chemical issues and a study of hydroxylated PCB metabolites in serum from California nail salon workers.

Since the mid-1980s, ECL scientists have published more than 170 scientific papers, averaging six to seven papers per year. As of December 2009, these papers have been cited in 2,365 other publications, an indication of the significance and relevance of the lab’s research. Among the papers published in 2009 are a study of exposure of California Peregrine Falcons to PBDEs, PCBs and alternative brominated flame retardants; a study of PBDEs in California wastestreams; and a study of hydroxylated PCB metabolites in serum from California mothers.

The laboratory hosts biweekly seminars on emerging chemical issues for researchers and the public. Recent topics have included the art of x-ray probing materials, the “fire retardant dilemma” and breast cancer risks in California nail salon workers.

CHALLENGES

• A multibillion dollar state budget deficit is a “major” challenge for all California agencies, including the DTSC. The ECL has not suffered layoffs, but has shrunk through attrition from 60 to 41 filled positions. For the past 18 months, the laboratory has lost an additional 15% of work hours due to mandatory furloughs. “We’re working in an area of fewer resources, so we’ve had to work smarter,” said La Belle.

• Replacing $10 million worth of laboratory equipment on a regular basis—as instruments become more costly to maintain with age or become outdated—is a second challenge. “We try to keep them going as long as we can.”

• Finally, the laboratory is looking for funding to purchase instrumentation to enable the structural characterization of unknown chemicals. “Sometimes, there’s a need to look for things you don’t know are there, things that are not well characterized yet,” said La Belle. Nano materials are one example. “We can only measure what we’re looking for, and there so many things we haven’t even thought about.”

NOTABLE SUCCESSES

As a world-renowned scientific leader, the ECL has racked up a long list of success stories. Just recently, the laboratory:

• Developed faster methods to measure phthalates in plastic products. Its analysis of more than 80 plastic toys showed that many exceeded the regulatory limit and some contained more than 50% phthalates.

• Evaluated the toxicity characteristics of copper- and creosote-based wood treatments used to replace arsenic-based wood preservatives in construction and on utility poles and railroad ties. All of the copper-treated wood exceeded federal toxicity criteria for total and soluble copper.

• Measured the lead content of a wide variety of jewelry. In order to do this work, the laboratory evaluated a range of methods to ensure that lead was measured accurately in assorted metal, ceramic, glass and plastic jewelry components. It found high lead content in many items and especially in inexpensive children’s jewelry.

GOALS

• Continued support of the Green Chemistry Initiative;

• Expanding the laboratory’s ability to systematically measure chemicals in a wide variety of matrices: people, wildlife, soil, water, air, manufactured goods, legacy industrial sites and the indoor environment;

• Expanding the laboratory’s ability to detect and measure contaminants of emerging concern.

Ultimately, said La Belle, “We want to see where chemicals come from, where they go, and where we can intervene. We want to be a champion for people and for the environment.”
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Years ago, food safety meant refraining from eating the potato salad at picnics on hot summer days. In 2010, consumers are aware of PAH's in seafood, salmonella in eggs, and melamine in milk. The events of recent years prove that food contamination, deliberate or unintended, presents an ever increasing risk to public health. The scientific community must be prepared to address this risk now, as consumers worldwide demand adequate protection against food threats from those responsible for ensuring consumer safety.

The mission of Thermo Fisher Scientific is to enable customers to make the world healthier, cleaner and safer. Food Safety, a focus area of Thermo Fisher’s efforts, provides technology and application solutions for food safety issues throughout the food chain—from producers to testing labs to research. Thermo Fisher products are found in the lab, in-line, or at the production line and in the field. The company is taking a broad perspective with the food safety program focusing on improving results and efficiency through educational initiatives such as a global seminar series, collaboration with the world’s leading experts and the development of new technologies to address the most challenging food-related issues.

As a further commitment to food safety, Thermo Fisher recently opened the Food Safety Response Center (FSRC). The goal of this innovative laboratory is rapid analytical method development during incidents involving chemical contamination of food. Strategically located in Dreieich, Germany, the Center is in close proximity to Europe's leading food safety research institutions and houses both a wet lab for sample preparation and a state-of-the-art instrument lab. It is staffed by experienced food chemists with expertise in method development. As a result, the FSRC is able to respond quickly to food threats, significantly reducing the delivery time of analytical methods. The FSRC's method development capability aids government regulatory bodies, research institutes, independent test labs and private companies. It is not a contract laboratory and does not perform routine testing. When not in a crisis mode, the lab works on improving methods and investigating applications of technology for food safety testing.

For more information regarding the FSRC and its rapid response with analytical methods during the Gulf Coast oil spill, please visit www.thermoscientific.com/fsrc.
Absorbing the Election’s Reverberations

It is critical that we reach out to our federal, state and local officials to increase understanding of and support for the public health mission.

At the recent ASTHO Annual Meeting, I was struck by the overwhelming sense of change coming our way. New state leadership means new political appointees, which translates to a lack of job security for many state health officials. Leaders in precarious positions inevitably feel pressured to adjust their leadership style. Many will lay low during the coming months; some will ramp up efforts to finish a few key projects before a certain departure. Either way, it may be awhile before the labs get any attention from their health officials—old or new.

In anticipation of such a turnover, APHL and ASTHO combined energies last year to publish A Practical Guide to Public Health Laboratories for State Health Officials. Labs will have only a brief opportunity when a new official comes on board: make the most of it. This guide is written for state health officials, designed to bridge the divide between his or her background and the lab’s work. Share this document with your new health official to bring him or her quickly up to speed. And start planning strategically for how you are going to get to know your health official and any other new political figures. If you need another copy of the Practical Guide, please contact me, and we’ll be happy to provide it to you.

In concert with your new health official, consider inviting members and staff of your new Congressional delegation for a lab tour. Offer your lab’s expertise to new staff of your delegations. And it is probably important to look at what other state agencies are doing during these transition periods to raise their visibility. Health departments are rarely as engaged in the political whirlwind as others, often due to perceived but murky ethical barriers. This sense of unease is likely to lead to missed, above-board opportunities to meet and interact with political figures. Some agencies reach out to family members, host dinners, give awards or special trainings; perhaps your laboratory or health department could offer a lecture series. Health departments offer a lot of value and expertise, so it is unfortunate that they often struggle with their relationship with the public. And the lab is often one of the most tangible aspects of a health agency—let’s use this to our advantage!

Try to anticipate what new leaders will come into office planning to do. What can the lab do differently in the new environment? Make a big effort to meet these influential people. Be forthright. Be prepared to dust off privatization and cost-cutting plans for discussion. Have your numbers ready. In this economic environment, leaders will still have a slash and burn mentality.

Given the results of the recent election, I also think it’s important to note that public health laboratories (and public health efforts) are non-partisan, and historically we have had healthy relationships with leaders of both major parties. With health reform, the public health community is very engaged, united and standing firm. Together, we are tracking these changes closely and sharing information, especially on the status of leadership positions in health and appropriations. There will likely be many threats to the newly enacted health reform provisions that we all worked so hard to obtain; we will continue to highlight how important it is to the health of all Americans.

Shortly after the election, I was on a White House conference call with Valerie Jarrett, who is a senior advisor to the president for Public Engagement and Intergovernmental Affairs for the Obama administration. I asked for a summary of the president’s current position on public health provisions, specifically the Prevention and Public Health Fund. Jarrett responded quickly and emphatically that the President is unwavering in his support for public health funds.

Public health is part of the essential infrastructure of our nation, as necessary as the roads and bridges. While some key politicians have already reached that conclusion, it is critical that we reach out to our federal, state and local officials to increase understanding of and support for the public health mission we hold as our lifesaving work.
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