WHERE IS THE NEXT GENERATION OF SCIENTISTS?

Also in this issue, our special radiation coverage:

5  APHL Responds to Japan Radiation Event
29  CDC Expert Robert Jones Talks RAD
37  Book Review on Radiation and Modern Life
At The Baker Company, we not only share your passion for your work, but also the wider mission of most efficiently utilizing our limited natural resources. That’s why we are proud to introduce the SterilGARD e3, which offers a new standard in complete life protection—for you, your work and our environment. Its advanced technologies are engineered to provide the optimum balance of efficiency and performance, with extended filter life, reduced energy costs, and the most comfortable working environment in the industry. Making the world a better place just got a little bit easier.
Columns
3 President’s/Executive Director’s Column
38 Industry Matters

Sections

ENVIRONMENTAL HEALTH
5 APHL Responds to the Japan Radiation Event
7 Exploring New Avenues for Environmental Labs

FOOD SAFETY
9 Expanding the Net: Pulsenet Testing for Salmonella and STEC
10 Regional Meeting on Food Safety Investigation

INFECTION DISEASES
11 Staying Vigilant Against Influenza

NEWBORN SCREENING AND GENETICS
13 Expanding the NBSG Framework to Identify Other Genetic Disorders
14 APHL Taskforce Takes on Genetics Issues

INFORMATICS
15 Latest PHLIP Innovations

LABORATORY SYSTEMS AND STANDARDS
23 Improving Laboratory Quality Through Proficiency Testing
25 Filling the Gaps: Laboratory Capacity Models for VPD Testing
26 New Cost Accounting Tool Captures Lab Expense

GLOBAL HEALTH
27 APHL Joins Global Health Dignitaries for ASLM Launch

WHAT’S YOUR STORY?
29 Q&A: 15 Minutes With CDC’s Robert L. Jones
31 Fellows Make Contributions Globally

MEMBERSHIP
32 The Exit Interview: Pat Luedtke
32 Members on the Move
33 Member Profile – San Mateo
35 Member Profile – Hawaii

MEMBER RESOURCES
37 Book Review: Radiation and Modern Life
37 New APHL Publications

INDUSTRY MATTERS
38 CDC Improves Salmonella Serotyping Using Luminex xMAP Technology
38 Gen-Probe Trichomoniasis Assay FDA-Cleared

FEATURE: WHERE IS THE NEXT GENERATION OF SCIENTISTS? 17
Hiring clinical laboratory scientists is hard work these days – qualified candidates are not easy to come by. And the dearth of those scientists is only one facet of a larger nationwide shortage of laboratory professionals. What’s more, this difficult workforce environment poses additional challenges for public health laboratories, some of which are unable to recruit new staff due to government hiring freezes. This article explores the challenges of finding and retaining qualified candidates, and innovative ways to make do.

APHL LAB MATTERS STAFF
Kim Ross, Editor
Emily Mumford, Associate Editor
Jada Matthews, Graphic Designer
Jody DeVoll, Advisor

APHL BOARD OF DIRECTORS
Patrick Luedtke, President
Victor Wadell, President-Elect
David A. Butcher, Secretary, Treasurer
Mary Celotti, Member-At-Large
Charles Brokopp, Member-At-Large
Mary Sue Kitchen, Local Institutional Member Representative
Mimi Lachica, Local Institutional Member Representative
Yvonne Salfinger, Associate Institutional Member Representative
Scott J. Becker, Ex-Officio

The Association of Public Health Laboratories (APHL) is a national non-profit dedicated to working with members to strengthen laboratories with a public health mandate. By promoting effective programs and public policy, APHL strives to provide public health laboratories with the resources and infrastructure needed to protect the health of US residents and to prevent and control disease globally.

Hints: It can be transferred to humans by contaminated foods. It causes many food recalls; most infected persons have minor symptoms. This bacterium can be killed through cooking.

Visit www.aphl.org, click on “About APHL” and “Publications.”

Can You “Guess This Pathogen?”
Editor’s note: We sat down with APHL President Pat Luedtke and Executive Director Scott Becker to talk about what they see as some future challenges and opportunities for APHL member labs.

Scott Becker: When we talk about efficiency—and there will be a lot of talk about this in the coming year—we are looking at both internal lab efficiency and network efficiencies. Some of these conversations are going to be difficult, but it is imperative that we examine the hard realities and make decisions as fast as we possibly can. Change is going to happen, like it or not, and we are far better off leading the way than being shaped passively by the inevitable market or political forces.

Patrick Luedtke: It is time for lab leaders to look at the horizon and look at where we could be. There may be some non-Utopian vistas, but largely I think there are some reasonable solutions out there that have not been explored fully yet.

Becker: CDC has been talking about a “higher efficiency lab system” for a while now. As this discussion evolves, clues to what that actually means are emerging. As funding shrinks, it makes sense to reward and support laboratory efforts to reduce costs and improve efficiency through new partnerships, upgraded billing practices or quality improvement initiatives. The idea of shared services is in our future; better that we shape it than have it shape us. We’re even hearing of potential new budget initiatives still years away that may help us shape and innovate for greater efficiencies.

Luedtke: Too often, we don’t think of partnering with another lab until it becomes an obvious partner, when there is an oil spill or a waft of poison blowing toward your state. We should be much more proactive developing shared sustainable programs, especially within specialized disciplines. Some call that “regionalization” and get scared, but given our current challenges—significant spending limits and political partisanship—we’re stuck with this milieu. We need to look internally and externally at getting better.

Becker: None of this is new or even unique to the US, which I hope allows us to approach this less fearfully. I went to a meeting of the Canadian Public Health Laboratory Network—a much smaller network, about 20% our size—and they have many of the same issues despite their completely different funding structures and support mechanisms. They are also trying to improve service and become more efficient. These are cross-cutting issues, shared by us all, wherever we are. I think the two big topics we need to talk about are 1) efficiency, of all kinds, and 2) identifying new work.

Luedtke: I’ve been thinking about that Thomas Friedman book, The World Is Flat, where he argues that due mainly to efficient technology, no one in the business world has the upper hand anymore. We can all compete equally wherever we are. Is the lab world flat? Or can we flatten it?
Becker: Well, projects like PHLIP will help. We could become flatter if we could ensure data transmission across the network.

Luedtke: We have terrible gaps in our healthcare IT, which makes all of this so much harder than it needs to be. I see a diabetic patient every two months for monitoring. Recently, after we discussed his progress, he asked, “What about the staples, doc?” In the two months since our last appointment, he had gone to the ER for back pain, received a cancer diagnosis, and then endured numerous surgeries, a 33-day hospital stay, radiation and other therapies. In all, there were 11 opportunities for those doctors to communicate with his primary care doctor—me—but not one had occurred. Likewise, my public health lab conducted two tests for this patient—H1N1 and Hepatitis—and neither result made it to his medical file. Health IT gaps like these leave our medical providers with no alternative but to practice defensive, and expensive, medicine.

Becker: And, I think, the lab’s ability to communicate with healthcare providers is about to become even more important. Lab leadership needs to decide how we can impact chronic disease. To be frank, high sodium levels kill more people than foodborne outbreaks. Why shouldn’t this type of testing be in our realm? Our job is to improve public health.

Luedtke: This could mean nutritional testing on our kids’ school lunches, glucose monitoring for diabetics, imported drug testing or improved food safety testing programs.

Becker: What do labs do? We measure stuff. The difference between clinical, public health and environmental lab work is why we are measuring stuff. Tackling the biggest public health problems of our day—for example, obesity, its causes, its ramifications—makes sense.

Luedtke: Expanding our focus especially makes sense when we are simultaneously talking about streamlining our overlapping areas. I’ve given a lot of thought to what I call the “small state syndrome.” We all have unique structural challenges, but small states have fewer qualified job applicants, fewer vendor options at higher costs, and smaller university systems to partner with. We also have small testing volumes, which make it difficult to compete for grants and maintain expertise, and our bulk purchasing is more expensive—the Texas State Lab pays 29 cents apiece for blood agar plates while we pay 91 cents. We need to identify our logical partners and figure out how to get this done.

Becker: We’re not talking about shrinking down to 20 regionalized labs, or any arbitrary number like that. That is not what this is about. We will continue our advocacy for all labs. But we need to provide value with our programs... and these issues cross over into moderate and large labs too.

Luedtke: As it stands, we already don’t do it all on our own. We all share a goal for public health. Does everything have to happen in your space?

Becker: We need to continue to advocate for preparedness, for response, for all of the important testing that occurs in public health labs, but also be realistic with our fiscal responsibilities and team up to make good decisions that will benefit us all.

Luedtke: Labs should also be evaluating internal efficiencies. This can yield enormous benefit. After a Lean Six Sigma evaluation at the Louisiana State Crime Lab, they saw a 400% improvement, increasing their output from two to eight cases per day.

Becker: All of this, this entire discussion, belongs in our sphere. But it has become such a pressing issue, so quickly, that it is being talked about at all levels of the public health system. I think it is imperative that we take leadership of this discussion and make certain that the right decisions are made, whether we’re talking about vaccine-preventable disease, tuberculosis, HIV, emergency response or other testing programs.

Luedtke: We need to look to existing regional models—such as Washington state’s radiation program and its role after Japan’s nuclear disaster—and identify geographic or population issues.

Becker: Recently, an editorial in the American Journal of Public Health advised transforming the public health mindset from victim to victor by taking charge and being accountable. Creating new efficiencies in our lab system is something that we can and should do to meet our responsibilities to the public. The editorial also recommended a bold commitment to lofty goals, which is also something to keep in mind as we discuss our proper role in chronic disease prevention.

Luedtke: When something isn’t working, it might be time to try something else. It’s time to partner with other labs and to weigh the value of our services in addressing our communities’ greatest health needs.

Becker: I hope many of you are able to join this discussion at APHL’s Annual Meeting in June.
On March 11, 2011, a 9.0 magnitude earthquake in northwest Japan triggered a string of events that endangered the Japanese and put the US on high alert. The subsequent tsunami caused flooding, a series of explosions and the destabilization of the Fukushima Nuclear Power Plant in Japan, releasing radiation into the environment.

Within the week, US federal agencies activated emergency response mechanisms to support Japanese efforts and prevent any potentially harmful effects of fallout in the US. The FDA issued an import alert against certain foods from restricted areas of Japan and activated the Food Emergency Response Network (FERN) in the event it became necessary to test the US food supply for radiation contamination. CDC also activated its Emergency Operations Center (EOC) to provide assistance during the response.

ROLE OF APHL
Quickly after the FERN and CDC EOC activations, APHL began providing information and coordination to member laboratories, as well as outreach to the westernmost states that would experience any fallout first. The first member call on the radiation response took place March 22, 2011. CDC, FDA, EPA, the Conference of Radiation Control Program Directors (CRCPD) and members from public health laboratories in Alaska, Hawaii, Washington, Oregon and California provided updates. APHL continued to hold weekly calls through April 18, 2011, and hosted a webinar titled Radiation 101 for Laboratorians on April 14, 2011.

WHAT IS HAPPENING?
EPA, state radiation control program directors, and some public health laboratories—including Washington State—monitor air, ground water, drinking water, precipitation and milk for radiation on a routine basis. Since this event, sampling frequency has increased and several states have reported iodine-131 in air, precipitation and milk samples. However, none of the levels are actionable or a cause for public health concern. Even more reassuring, the levels appear to decrease slightly with each sample set, in all the matrices being monitored.

AT THE FEDERAL LEVEL:
- EPA continues collecting data from the RadNet network, which includes air, filter, water and milk samples. The frequency of sampling was increased for some of these sample types. The public can access all of the EPA data at http://epa.gov/japan2011.
- FDA increased the monitoring of domestic and imported foods, and medical devices and supplies, mostly using the capacity available at the Winchester Engineering and Analytical Center in Massachusetts. FERN laboratories nationwide are ready to provide surge testing.
• CDC collaborated on a protocol developed with Customs & Border Protection, the Association of State and Territorial Health Officials (ASTHO) and CRCPD. It details how to handle a person entering the US with a radiation screen that is above background level. CDC sent urine cups to all the state radiation control directors; the sample collection protocol is on CDC’s website. The radiation control directors would send these specimens to the state public health laboratory for packaging and shipping to CDC. That protocol and shipping manifest are also on CDC’s website.

• Communication has proven critical to the coordination of information and laboratory data among multiple US agencies. While testing results for radiation at member and partner laboratories never approached levels of health concern and appear to be declining, APHL continues to serve as a resource to member laboratories and public health partners to ensure effective and efficient response to public health events.

---


---

ACROSS THE US, APHL MEMBERS EXHIBIT DIVERSITY IN RADIOLOGICAL PREPAREDNESS CAPABILITIES.
FOLLOWING IS A GLIMPSE OF RECENT LABORATORY ACTIVITY:

**Washington Public Health Laboratory** – The Washington laboratory signed an a Memorandum of Understanding with public health laboratories in Alaska, Idaho and Oregon to handle surge capacity for public health threats such as this one. The Washington facility has collected and analyzed more than 130 samples from many environmental media, including air, rainwater, deposition and milk samples.

**Massachusetts Department of Public Health State Laboratory Institute** – The Massachusetts State Radiochemistry Laboratory performed analysis of precipitation, air and surface water associated with drinking water for detection of fission products.

**Vermont State Public Health Laboratory** – The Vermont Radiological Health Program analyzes samples from air, groundwater, surface water, soil, vegetation and milk as part of routine environmental surveillance conducted near the Yankee Nuclear Power Station.

**Oregon Department of Environmental Quality** – The Oregon Department of Environmental Quality will collect seawater samples bi-weekly through summer for analysis by the Oregon Radiation Protection Laboratory.

**Maryland Department of Health and Mental Hygiene** - Maryland’s radiation laboratory found radiation “so far below any regulatory standards or public health kind of guideline that we’re basically looking at the lowest possible edge of our ability to detect this.” Maryland also serves as one of the FERN radiological laboratories.

1 http://www.baltimoresun.com/health/bs-md-radiation-testing-20110404,0,5218789.story
EXPLORING NEW AVENUES FOR ENVIRONMENTAL AND LRN-C LABORATORIES: ADOPTING A BUSINESS MODEL
by Dr. Jeffery Moran, branch chief, environmental chemistry, Arkansas Public Health Laboratory, and Dr. Megan Latshaw, director, environmental health programs, APHL

THE ISSUE
Disastrous incidents like Hurricane Katrina and the Deepwater Horizon oil rig explosion stretch public health laboratories beyond what is seemingly possible. Unfortunately, due to the economic downturn, staff shortages and rising demands for routine testing, state laboratories find emergency response even more challenging.

It is vital that CDC’s preparedness funding remain stable. It represents more than just preparedness: it is a lifeline that ensures adequate state assets exist to protect public health in times of need. There have been numerous uses of chemical terrorism/preparedness laboratories as effective state assets and, as legislatures trim budgets, it is important to broadcast these examples of laboratories supporting state and national public health practitioners.

The LRN-C laboratories built across the nation with CDC preparedness funding are state-of-the-art and should be utilized to their full potential. Environmental health chemists should reach out to local poison control centers and hospitals, to state environmental protection agencies, or perhaps to regional and national offices of federal agencies to determine how existing resources can be used to support ongoing work. For example, the Agency for Toxic Substances and Disease Registry and the EPA handle hazardous waste sites, and often analytical support is limited and costly. Using existing state and local environmental and public health laboratory resources could greatly support this ongoing work, while providing necessary real-world experience to LRN-C chemists as they prepare for the next emergency response.

REAL-WORLD EXAMPLES
During the Gulf Coast oil spill, the Arkansas Department of Health-Arkansas Public Health Laboratory (ADH-PHL) leapt to the forefront of creative thinking as they worked with their state counterparts and private partners to determine if LRN-C laboratory infrastructure could be used to support Gulf food testing. Recognizing that the method for measuring PAHs (the chosen marker for oil) in seafood was outdated and the turnaround time was unacceptably long, ADH-PHL worked with LRN infrastructure and GERSTEL Inc. to develop new testing technology capable of meeting the response demands (See http://gerstelus.com/applications_category.php?id=65). The technology developed did not impact LRN-C obligations and allowed laboratories to remain fully functional to support CDC programs.

Hurricane Katrina response efforts are another example of the LRN-C infrastructure becoming vitally important to the public’s health. Along with other states, ADH-PHL supported Louisiana’s drinking water program by providing long-term analysis of drinking water. Surge equipment purchases for the LRN-C at ADH-PHL were necessary to help meet the long-term analytical demands of Arkansas and Louisiana.

IN SUMMARY
By understanding state needs, LRN-C laboratories can find astute ways to reach out to public health partners and fill specific state gaps. Laboratories should consider partnering on specific investigations or developing sustainable programs that support local biomonitoring projects.

Laboratories should not assume that projects will be fully funded prior to initiating the work. By using available resources, labs will develop relationships and lay the groundwork for future funding. Once partners understand laboratory capabilities and receive preliminary data, they can often open avenues to new funding sources.

As always, balance is important, and the mission of LRN-C should never be sacrificed or compromised. Staff at APHL continue to seek ways to help members market their services and support LRN-C laboratories so they can be relied upon when states are confronted with public health emergencies.
Unseen challenges

New contaminants and unexpected adulterants move through the food chain. Innovative methods and superior detection are required. Our food safety expertise, instruments and methods drive bold progress and allow professionals to detect trace levels of microbial and chemical contaminants in complex samples. We provide solutions designed to work together to target known and unknown threats to food safety.

innovative answers

• make bold progress • thermoscientific.com/foodsafety
To encourage the use of emerging technologies that improve surveillance for foodborne pathogens, APHL and CDC announced a funding opportunity for public health laboratories in the fall of 2010. The funding supported the validation and incorporation of multi-locus variable number tandem repeat analysis (MLVA), molecular serotyping and immunomagnetic separation (IMS) testing for enteric bacterial pathogens in public health laboratories. Through a request for proposals, 23 requests from 18 laboratories were funded to implement and validate MLVA subtyping (E. coli O157 and Salmonella Enteritidis and S. Typhimurium), molecular serotyping for Salmonella, and IMS assays to detect shiga toxin-producing E. coli in hemolytic uremic syndrome (HUS) cases.

Eight laboratories received $12,500 to incorporate MLVA subtyping. Since protocols for E. coli O157 and Salmonella Typhimurium and S. Enteritidis have been fully validated at CDC, laboratories applied the funds to start-up costs for enhanced real-time subtyping. Laboratories then submit the analyzed data to CDC for upload to the PulseNet databases. Laboratories subtyped all E. coli O157:H7 in real-time, and Salmonella Typhimurium and S. Enteritidis by CDC request.

Eight laboratories received $20,000 to validate and integrate molecular Salmonella serotyping. Laboratories ran the molecular assay in parallel with conventional serotyping on 200 isolates. The molecular assay utilizes the Luminex platform and targets the O and H antigens, which compares very closely with traditional serotyping and the Kauffman-White classification scheme. This assay can detect the vast majority (95%) of all Salmonella seen in the United States, detecting the top 100 serotypes of Salmonella.

For enhanced surveillance of post-diar-rheal HUS cases, seven laboratories received $7,000 to validate IMS assays for use on any culture negative, HUS-positive cases received through public health departments. Past FoodNet data suggests that approximately 4% of cases with STEC infections are due to non-O157 STEC. Testing algorithms utilizing IMS technology have found better rates of recovery for bacterial pathogens compared to conventional culture methods alone. Ideally, tests such as IMS can help laboratorians detect more non-O157 STEC cases, which are generally more difficult to detect by conventional methods.

APHL hopes that PulseNet laboratories will eventually implement these technologies nationwide to improve real-time foodborne surveillance. Projects like these foster collaboration and the sharing of experiences and best practices across the network. Ideally, future funding for these projects will continue to be a priority for governments at all levels.
The third Mid-Atlantic Regional PulseNet Meeting & CIFOR Workshop held in April was a success. APHL member laboratories, public health epidemiologists, agriculture laboratorians, and environmental health specialists from the region gathered in Richmond, Virginia, to discuss barriers and solutions to foodborne disease surveillance and investigations. With the aid of the CIFOR Guidelines and Toolkit, public health laboratorians and food safety partners assessed and strategized ways to apply these guidelines to their current practices. CDC, FDA, USDA-FSIS and APHL facilitated discussions and provided updates ranging from laboratory practices to effective communication between different agencies/jurisdictions.
When an influenza A/H3N2 virus could not be sequenced on a new assay in November 2010, Jennifer Laplante knew something was wrong. As supervisor of influenza resistance testing in the Virology Laboratory at the Wadsworth Center, Jennifer had been developing and performing antiviral resistance assays for almost five years to monitor influenza viruses for resistance. These included pyrosequencing assays for individual point mutations, full length gene sequencing assays, and functional assays that determine if sequence changes have actually altered drug susceptibility. When H3N2 reemerged in the 2010-2011 season, the CDC's pyrosequencing assays for resistant variants in that subtype were added to the test menu. But there was something odd about this one sample in November—sure, the test assay didn’t work, but the results did not make sense. One assay produced sequence, and the other did not.

Working with staff scientist Lauren Forbes and lab chief Dr. Kirsten St. George, the Wadsworth team reviewed the data. Wondering if the viral load in the original sample was too low for the assay, they checked the original test results. There was plenty of virus for any pyrosequencing test to work. They decided there was no choice but to sequence the entire region around the assay site, by using a method Jennifer had developed some years before. When this data was analyzed, a single point mutation could be seen exactly where the pyrosequencing assay was failing, which explained the problem. Also, when the global data bases were reviewed, the change was present in about 2% of the influenza viruses of that subtype for 2008, but almost 50% of them for 2009. Data for H3N2 in 2010 was too minimal to make an assessment on its prevalence that year, but clearly this variant posed a problem for surveillance.

Jennifer redesigned the relevant primer for the pyrosequencing assay, and the team contacted the Influenza Resistance Laboratory at CDC to share the information. When Wadsworth tested the redesigned primer on multiple samples from their own archives that contained the sequence change, they found that it was able to successfully sequence all that had previously caused the assay failures. CDC subsequently updated their protocol with this newly designed reagent.

In the end—curiosity, dedication and good lab work solved the case!

The genomic sequences of influenza viruses are constantly changing, and cause ongoing challenges for the use of molecular assays for their detection and characterization. Surveillance efforts by public health laboratories for the detection of resistant strains are critical in making recommendations on which antiviral drugs should be used for treating or preventing flu.
The **T-SPOT.TB** Test

Comprehensive TB testing coverage for high risk groups such as healthcare workers, immunosuppressed, TB contacts, and TB suspects.

**Benefits of the T-SPOT.TB Test:**
- Reliable in immunosuppressed patients*
- Results not affected by BCG vaccine*
- “One and Done”; no second visit required
- Utilizes standard collection tubes

TB testing available through Oxford Diagnostic Laboratories®.

**TB Screening Just Got Easier.**

www.TSPOT.com

---

*T-SPOT.TB Pivotal Clinical Trial. T-SPOT.TB test results were not associated with immunocompromised status or BCG vaccination. (T-SPOT.TB Package Insert)

T-SPOT, the Oxford Immunotec logo and Oxford Diagnostic Laboratories are trademarks of Oxford Immunotec Ltd. JA-TB-US-V5

© 2011 Oxford Immunotec, Inc. All rights reserved.
Genetic screening is the testing of a population to identify individuals who have or are at risk for developing a genetic disease or passing one to their offspring. Although the definitions are often blurred, genetic screening is usually distinguished from genetic testing because it is a preliminary form of testing and requires further diagnostic confirmation. Examples of genetic screening include newborn screening for phenylketonuria, carrier screening for sickle cell disease, and prenatal screening of fetal cells to detect chromosomal or other congenital abnormalities.

The US newborn screening system has been very effective at identifying newborns with genetic and congenital diseases. In the medical setting, couples have increasingly relied on genetic screening through blood samples to determine if they are at a greater risk of having a baby with a genetic disorder. Recommendations for this screening are made when a parent has a known genetic abnormality, a family history of genetic abnormalities, or an ethnicity that elevates the risk for a specific disease.

Beyond prenatal and newborn screening, the American health system has not adequately incorporated genetic screening into preventive care and medicine. This may be due, in part, to the issue’s complexity. To address this topic, the CDC’s National Office of Public Health Genomics (OPHG), Genetic Alliance, and other governmental organizations began the Genetics for Early Disease Detection and Intervention (GEDDI) project in 2009.

The GEDDI project is using the newborn screening system as a framework to analyze and initiate a systematic approach for early disease detection, combining clinical, genetic and family health history information to develop a screening model for other disorders. Two of the targeted disorders are Duchenne muscular dystrophy and familial hypercholesterolemia, which cannot be conducted in the newborn screening realm. Duchenne muscular dystrophy is an X-linked recessive disorder characterized by muscle deterioration. The age of onset is typically between the age of two and six years. Familial hypercholesterolemia is an inherited condition that occurs in 1/500 individuals and is characterized by very high cholesterol levels in the blood, occurring at a young age. Individuals with familial hypercholesterolemia have a greater risk of developing coronary artery disease. Screening for these diseases would be beneficial for early treatment and improved long-term health outcomes.
The GEDDI project takes a life-stage approach: screening and identifying individuals before the age of typical disease onset, thus enabling treatment before symptoms or disability occurs. This framework helps educate families about unknown health risks. GEDDI will focus on developing guidance for rare genetic disorders that have substantial amounts of scientific evidence, and then expand to more common diseases. “Too often, we miss opportunities to achieve early diagnosis, and reduce the diagnostic odyssey for many patients with genetic conditions. Using a multidisciplinary, systems-based approach, the GEDDI project works to support the establishment of new paradigms for screening and to integrate these approaches into public health and clinical care,” stated Amanda Field, public health programs manager at Genetic Alliance.

As with newborn screening, there must be careful consideration of ethical and logistical issues. Prior to mass implementation, experts will need to determine the prevalence of the disease being screened, costs, availability of treatment, risks versus benefits of screening and treatment, as well as how to handle any unintended information resulting from the genetic screening. The group must also address what type of tests will be most useful, who should be screened, and when and where screening should be conducted. The GEDDI group will publish a white paper in a peer-reviewed journal in mid-2011. The public health community should embrace these efforts, which will increase understanding of rare and complex genetic diseases and help clinicians screen at-risk populations.

APHL TASKFORCE ADDRESSES THE INTEGRATION OF GENETICS INTO NEWBORN SCREENING

by Elizabeth Jones, specialist, newborn screening and genetics

In 2009, APHL’s Newborn Screening and Genetics in Public Health Committee formed a Genetics Taskforce to address new and emerging trends in genetics and develop a whitepaper. Taskforce members included representatives from APHL, CDC, state laboratories, the Health Resources and Services Administration (HRSA), Genetic Alliance, and the International Society of Neonatal Screening.

“Drawing on their expertise in newborn screening ... the group worked very hard over the past few months to put this document together,” stated Oregon State Public Health Laboratory’s Cheryl Hermerath, who helped lead the taskforce. The finalized white paper, *Integrating Genetics and Genomics into Newborn Screening and Public Health Programs*, covers the history of newborn screening, quality control and quality assurance, technology, applications for use in genetic testing, genetic testing outside of newborn screening, regulatory oversight, challenges for public health genetics, health information exchange and protecting genetic information, and public health genomics.

The CDC’s Division of Laboratory Science and Standards “commended APHL in developing a document that addresses the benefits and challenges of integrating genetics into public health laboratory services. Responsible and appropriate implementation of new and evolving technologies is anticipated to improve the capacity of public health laboratories to identify individuals at-risk for disease where effective interventions are available.”

In March 2011, the APHL Board of Directors approved the white paper and encouraged its submission to a peer-reviewed journal. The taskforce will submit a shorter version of the document to a journal this summer. For more information on the taskforce findings, contact elizabeth.jones@aphl.org.
The public health laboratory interoperability project (PHLIP) advocates for electronic collaborations that strengthen the public health laboratory community. Sharing laboratory data among public health partners and across public health domains is essential for reporting and planning, and crucial in responding to outbreaks, events and emerging health threats. Promoting and supporting the PHLIP effort furthers the goal of nationwide electronic laboratory data exchange—a major priority for public health.

PHLIP INITIATIVES WILL BE SHOWCASED AT THESE UPCOMING EVENTS:

- AMIA PHI (May 2011)
- APHL Annual Meeting (June 2011)
- Public Health Informatics Conference (August 2011)

For more information, contact phlip@aphl.org.

LATEST PHLIP INNOVATIONS & WHAT’S NEXT?
by John Vaughan, PHLIP project manager, TS/JG consultant to APHL, and Linda Cohen, MPH, manager, Informatics Program

MOVING LABS TOWARD INTEROPERABILITY

ELECTRONIC LABORATORY SURVEILLANCE MESSAGE (ELSM) FOR INFLUENZA
Since March 2010, this initiative has deployed two technical PHLIP Assistance Teams (PATs) to bolster in-house laboratory messaging capabilities within the state laboratories with virtual or hands-on support. To date, the PATs have visited 26 public health laboratories (PHLs) and will visit at least seven more through August 2011. Personnel from the CDC Influenza Division have participated in some of the visits to strengthen partnerships with the laboratorians. The PHLIP ELSM message is in its third influenza season with 24 public health laboratories sending production seasonal and novel influenza data to the CDC, and another 24 labs working on implementation.

PHLIP – ELECTRONIC TEST ORDER AND RESULT (ETOR) FOR INFLUENZA
The PHLIP ETOR message for influenza has been tested successfully among five public health laboratories for surge capacity and mutual assistance. These states now have the ability to assist each other with testing during natural disasters or outbreak surges.

PHLIP – ELECTRONIC TEST ORDER AND RESULT (ETOR) FOR SALMONELLA
Another use of PHLIP messaging is to enable two-way messaging between state PHLs and CDC. This will allow a PHL to submit electronic test orders straight from its laboratory information management system (LIMS), and receive electronic results directly from...
the CDC lab. This is the first case of direct LIMS to LIMS integration between states and CDC, which will result in faster turnaround of test orders and results, as well as increased data quality. This pilot project involves three state PHLs and is on track to pilot for salmonella samples by the fourth quarter of 2011.

**PHLIP – VOCABULARY HARMONIZATION**

The PHLIP Vocabulary Team, in collaboration with state PHLs and CDC, have harmonized 14 nationally notifiable conditions, as well as created HL7 implementation profiles for the ETOR and ELSM use cases. Additionally, the team has analyzed how the ELSM message can be migrated to the recent v2.5.1 ELR standard.

**WHAT’S NEXT?**

More states are slated to send the PHLIP ELSM for influenza format over the next months, giving the CDC Influenza Division a more accurate picture of disease trending. Other divisions within CDC have also expressed interest in the PHLIP methodologies. Due to this initiative’s knowledge base and its flexibility to expand, health care entities outside of the PHL realm may be turning to PHLIP for further direction as “meaningful use” guidelines spread the demand for national electronic data-sharing networks.

---

**Abstracts accepted until June 24, 2011.**

**2011 NEWBORN SCREENING AND GENETIC TESTING SYMPOSIUM**

*Fair Winds for the Future*

Sheraton San Diego Hotel and Marina
San Diego, CA

This symposium addresses state and national newborn screening, genetic testing and policy issues important to public health systems, emphasizing reports from states, the challenges they face and the data they have generated. All persons involved with newborn screening and genetic testing systems are invited to submit abstracts, accepted until June 24, 2011.
WHERE IS THE NEXT
Just four years ago, Asheville, North Carolina, earned a spot on Frommer’s “must-see” list, thanks to a thriving arts community, vibrant downtown and beautiful Appalachian Mountain scenery. Thus, when the North Carolina State Laboratory of Public Health advertised for a clinical laboratory scientist (CLS) to work in the Asheville area, Director Leslie Wolf, PhD, was surprised at the response.

“We really ended up with one qualified applicant,” said Wolf. “Luckily, we liked her and she liked us and we were able to fill a key position.”

With a nationwide shortage of CLSs—and no end in sight—Wolf’s experience is not unique.

Many states away in sunny Phoenix, Victor Waddell, PhD, chief of the Arizona Bureau of Laboratory Services, has had similar difficulty hiring CLSs. He said, CLSs “tend to be mostly hired in the private and clinical laboratory settings in Arizona; they tend to go there because they get better money.”

While federal laws and most state laws do not require the use of CLSs in public health laboratories (PHLs), they are often preferred because of the CLS program’s specific focus on clinical testing. CLS students typically spend two or three years taking courses to meet general university requirements, followed by one or two years of professional courses, supplemented with practicums in working clinical labs.

Wolf said she prefers that first-line supervisors in clinical positions and her four regional laboratory improvement consultants be CLSs, sometimes still referred to as medical technologists or “med techs,” as they were previously known.

“I would say for us, the main benefit of getting a med tech is that they come in with the knowledge of QC (quality control) and quality assurance,” she said. “People with just a BS in biology generally have no concept of clinical laboratory work and how regulated it is; it’s not the same as doing lab work in an academic environment.”

Wolf would also prefer that entry-level bench scientists have a CLS background, but said there is just a 50-50 chance of finding even one CLS among the vetted candidates for any entry-level clinical position at the North Carolina laboratory.

She said, “We don’t see med techs as often as we used to. We just can’t compete with the hospital salaries.”
A 2011 survey of US clinical laboratories conducted by the American Society for Clinical Pathology (ASCP) found “startling” vacancy rates across a range of disciplines: 9.8% for histologists, 8.6% for chemists, 6.8% for microbiologists, 5.6% for immunologists and 5.1% for cytologists. ASCP reports the highest vacancy rates in the Far West, and the lowest in the South Central Atlantic.

According to the Medical Laboratory Observer (MLO), by 2012 there will be 100,000 vacancies for “medical technologists” and less highly trained medical technicians. A 2010 MLO survey found

**The dearth of CLS graduates is one facet of a larger nationwide shortage of laboratory professionals.**

A Decline in Quality?

Michel, who originally trained as an economist, said, “When you have a shortage of something, two things happen: you substitute for it or people pay a higher price to meet the demand.”

In the healthcare arena, however, there is pressure to ratchet down the cost of laboratory tests, with predictable consequences for CLS salaries. A 2010 MLO survey found
that wages for many clinical laboratory professionals are not even keeping pace with inflation, which averaged 2.4% between January and April. Forty-two percent of 2,375 responding MLO subscribers (most in their late 50s) reported that they expect to receive a raise of 2% to 4%. Just over 20% of respondents expect a raise of less than 2%. About 24% expect no raise.

According to the MLO survey data, the average “medical technologist” salary was $53,781 in 2008 and $60,815 in 2010. The average salary for a microbiologist in 2010 was $69,641. Overall, salaries tended to be highest in West Coast states and lowest in the South.

With substantially higher labor prices unlikely, at least in the near-term, substitution becomes a greater priority. And the main substitute for labor is automation. But even this strategy, said Michel, “can only take you so far.”

First, a lot of automation and process improvements have already occurred, making it difficult to eke out more efficiency. Second, with fewer staff on-hand, it is more important to have highly qualified staff.

David McCullough, MPH, a senior microbiologist with the Arkansas Public Health Laboratory, has been working at the bench for 31 years. He said greater automation makes his work easier, but requires “rather extensive quality control in order for us to say that [the laboratory instrument] is doing what we would be doing manually.”

McCullough said laboratorians “need to know what the machine is doing, whether you might need to repeat a test or have the machine serviced, whether a cutoff point is being correctly calculated.” Errors in judgment or failure to adjust for even slight changes in readouts associated with different batches of reagents or controls can all affect final reported results.

Said Michel, “There reaches a point where the system has put in inadequate resources and the quality of the product begins to decline. In the domain of lab testing, the US may reach a point where the resources required to run a high quality laboratory with results of high integrity are inadequate.”

Michel recalled an incident in Canada in which a pathology lab gave roughly 400 breast cancer patients incorrect test results between 1997 and 2005. The erroneous information led some patients to forgo anti-hormonal treatment and, in 2008, the Canadian government disclosed that 108 of those patients had died. Similar incidents have occurred in other countries.

Rodney Forsman, assistant professor emeritus of laboratory medicine and pathology at the Mayo Clinic College of Medicine and president-elect of the Clinical Laboratory Management Association, acknowledged that “the potential always exists for errors to occur.” However, he said it is rare for a clinical laboratory to fail inspection, and the more likely result of the laboratory workforce shortage is that existing staff “will be forced to work harder and harder” and do whatever it takes to keep patients from harm.

Nonetheless, even Forsman conceded, “The shortage is real, and at some point it may affect patient care at the local level.”

Within this difficult workforce environment, PHLs face additional challenges.
Many are unable to recruit new staff at all due to government hiring freezes. Some are actively reducing staff positions.

Twenty-five of 32 state PHLs responding to an APHL survey reported that they have had to "take action" since January 2008 to accommodate reduced state or local funding. Twenty-two of those respondents met budget reductions through some combination of planned furlough days, layoffs and staff loss through attrition.

When PHLs are able to fill vacancies, they pursue multiple recruitment strategies. Some serve as placement sites for CLS-in-training, hoping students will take an interest in PHL practice. Some have hired seasoned laboratorians who are re-entering the workforce after raising families or coming out of retirement to boost their incomes. Many are turning to baccalaureate graduates in lieu of scarce CLSs, even though it means a greater on-the-job learning curve.

With virtually all new hires, however, PHLs must invest in some degree of job-related training. APHL—through the National Laboratory Training Network and its own independent training program—is working to help meet this need. The association conducts ongoing training needs assessments and recently completed a market research survey of about 4,000 laboratorians in the public and private sectors.

Ken Carter, MS, director of the association’s Continuing Education & Training Program, said, “The folks coming out of BS programs generally have pretty strong molecular backgrounds, but don’t know basic microbiology techniques. The older folks who are just getting into molecular diagnostics need some basic molecular training. Quality assurance/quality control is a constant need in all of the labs.”

The association has even enlisted Honeycutt at UNMC to create on-line refresher courses—due out this summer—for people who have been out of the profession for a while.

But recruitment and training are not the only challenges; increasingly, retention is an issue as well.

"When we hire people, they often don’t last long," said Waddell. "If hospitals and private labs can’t find med techs out there, they start to come after our experienced staff."

Last year, the Arizona PHL lost several employees to a private lab that opened locally. "Most of the people they took from us," said Waddell, "were people we hired straight out of school and trained for three to four years. Those seem to be the prime targets, particularly those with molecular biology training."

The first employee hired away was offered a $15,000 pay increase and bonuses for successful recruitment referrals. "In the end, five people left," said Waddell.

With the recent closure of the Arizona State University CLS program, Waddell expects his local CLS shortage to worsen and the labor market to grow more competitive.

PHLs were once able to compensate for lower salaries vis-à-vis the private sector with job security and ironclad pension plans. But budget cuts have whittled down those advantages, and salary disparities persist.

APHL is developing a series of basic courses in molecular biology and microbiology and also offering up more courses on quality indicators, federal laboratory regulations and other high-demand topics.
Waddell’s aid, “We’re left with people who are getting close to retirement and the newcomers.”

Inevitably, the workforce shortage has had repercussions up the chain of leadership, feeding into a shortage of qualified supervisory staff. Cathy Johnson, MA, MT(ASCP), who manages APHL’s training programs, said, “We don’t have people getting proper managerial training. And when bench scientists are promoted upward, that often leaves a deficiency at the bench level.”

Less vigorous laboratory leadership, in turn, adversely impacts bench scientists. Said Johnson, “It could matter when you don’t have someone to represent you at budget time, someone to address instrumentation, training dollars, deciding on the test menu, numbers of FTEs to support the bench work. Without good management, you don’t have support for bench workers.”

“THE EDGE OF THE CLIFF”

Ultimately, the root cause of the labor shortage, has to do with science education. “It starts really in K-12,” said Forsman. “When you hear that children aren’t interested in science, that’s the fundamental thing.”

Another problem is the relative obscurity of the field of clinical laboratory science, in particular. “We are constantly recruiting [CLS students],” said Honeycutt, “because students just don’t know about our profession. I don’t know that interest has gone down or up. We just struggle to get the word out that, #1, the profession exists, and, #2, education is required to work in the clinical lab.”

The nature of clinical laboratory practice—necessitating the handling of blood and other human specimens—is undoubtedly a barrier to some potential students. Forsman said for a time after the emergence of HIV/AIDS, parents would actually interview along with student candidates for the Mayo Clinic CLS program to assure the work was safe.

Both Forsman and Johnson credit the CBS television series CSI: Crime Scene Investigation with popularizing laboratory science to some extent, even though the show is “more glamorous than reality.” But both agree more needs to be done.

APHL’s National Center for Public Health Laboratory Leadership (NCPHLL) has begun several initiatives to educate students about the field and to improve PHL laboratory retention rates. One of its emerging leader cohorts—a group of mid-level PHL professionals participating in leadership enhancement activities—is developing and marketing the website LabScienceCareers.com, an offshoot of Abbott Diagnostics’s LabsAreVital.com website. The site targets students ages 16 to 19 and provides general information about laboratory careers, stories from the field and information about educational career requirements.

Another NCPHLL emerging leader cohort is working on an “enrichment toolkit” that current laboratory leaders can use to mentor new employees and bring them up to speed on the unique aspects of PHL practice.

APHL is also a member of the Coordinating Council on the Clinical Laboratory Workforce, a group of clinical laboratory organizations working to gain greater recognition for clinical lab professions.

Unfortunately, the workforce shortage defies quick solutions. Asked if stakeholders will be discussing this problem five or ten years from now, Forsman said, “We will.”

He said, “Do the math. The median age of laboratory staff is like 57. We’re going to rub up against the ‘baby boomer’ lip [of retiring older laboratorians], and there won’t necessarily be people to backfill the vacancies.”

Indeed, according to ASCP’s 2011 vacancy survey, 17.9% of immunologists and 14.6% of microbiologists are expected to retire within the next five years.

Even if federal and state governments take action to address the gathering crisis, it will take time to get CLS programs restarted and accredited and to recruit and graduate students. “You can’t change this whole daisy chain overnight,” said Forsman.

In the meantime, understaffing has already had an effect on PHL emergency response, slowing the testing of suspect specimens during the 2009 H1N1 pandemic. APHL’s Johnson said personnel shortages could delay the detection of future outbreaks and emerging diseases by weeks or months.

“People aren’t aware of the severity of the situation,” she said. “We are that close to the edge of the cliff.”
**IMPROVING LABORATORY TESTING QUALITY THROUGH PROFICIENCY TESTING**

by Travis Jobe, senior specialist, laboratory systems and standards program

**ASSESSING LABORATORIES’ NEEDS**

Proficiency Testing (PT) programs are an integral component of every public health laboratory’s (PHL) quality assurance practices. However, PT programs for infectious disease diagnostics are typically designed to evaluate a laboratory’s analytical performance, giving straightforward pass/no pass results for any given sample. These PT programs are not necessarily designed to test the performance of the assays themselves, and many laboratories have indicated that this is a need of theirs. In a February 2010 survey, more than 80% of PHLs performing PCR for *Bordetella* pertussis indicated they would benefit from implementing a PT panel. In addition, more than half of PHLs performing viral serology—such as for measles, mumps and rubella—indicated a need for PT panels.

In a February 2010 survey, more than 80% of PHLs performing PCR for *Bordetella* pertussis indicated they would benefit from implementing a PT panel.

One laboratorian stated the situation simply: “PT and validation materials for IgM tests are very scarce. Is there something you can do to help?” In response, APHL and CDC have helped develop two-assay and analyte-specific PT-like pilot panels for *Bordetella* spp. PCR and measles IgM serology testing.

**MEASLES IgM SEROLOGY PT-LIKE EXERCISE**

Serology PT panels are often designed for multiple analytes. But for this exercise, APHL contracted with SeraCare Life Sciences, Inc. to produce, distribute and analyze a measles IgM-specific PT-like panel. The seven-specimen panel included low- and mid-range IgM positive specimens, as well as specimens that could potentially cause other assay interference (i.e., rubella IgM and measles IgG positive specimens). Thirty-five PHLs returned results.

The majority of laboratories identified all of the panel members correctly, with one notable exception: of the 19 participating PHLs using the Trinity Biotech Captia™ Measles IgM test kit, 89% gave an incorrect response of IgM “positive” for the panel member containing high levels of measles IgG. This is contrary to the other 16 PHLs that used IFA, in-house developed EIA, or the Measles IgM Capture EIA kit by Microimmune Ltd. that correctly reported this specimen as IgM “negative.” The presence of high levels of IgG is suspected to have caused the false positive results, which indicates a limitation in the performance of this specific commercial assay rather than a deficiency in the testing performance of the participating laboratories.

**BORDETELLA PCR PT-LIKE EXERCISE**

One of the difficulties in understanding pertussis diagnostics is the lack of standardization of methods used for *Bordetella* pertussis PCR testing. To gauge *Bordetella* PCR performance nationally, APHL contracted with the Wisconsin State Laboratory of Hygiene (WSLH) to develop a 12-sample PT-like panel. The panel also included *B. parapertussis*, *B. holmesii*, and *B. bronchoseptica* samples that can be detected by some *Bordetella* PCR methods.

WSLH reported the results from 58 PHLs: there were eight different DNA extraction methods and three PCR platforms used, 19 different gene targets utilized for identification, and a wide variety of Ct values used to determine positive DNA amplification. In consequence, a significant number of PHLs reported incorrect or indeterminate results for samples containing *B. holmesii* and *B. bronchoseptica*. Also, more than half the PHLs do not test for *B. parapertussis*, although they did identify these samples correctly as...
negative for B. pertussis. In all, this exercise leaves many unanswered questions regarding the role of B. holmesii in respiratory diseases and how best to address the lack of standardization of PCR methods for Bordetella PCR.

During its validation of the CDC’s Bordetella multiplex PCR protocol, the Wisconsin laboratory “found that approximately 10% of our specimens that were PCR positive, using only IS481 as a target, were actually positive for B. holmesii and not B. pertussis,” said Dave Warshauer, PhD. “Being able to differentiate B. holmesii from B. pertussis will be of great benefit to our local public health departments and allow them to eliminate unnecessary follow-up and inappropriate patient management for cases of B. holmesii. The CDC protocol will help us determine the incidence of B. holmesii in our population and, hopefully, help better define its role in respiratory disease.”

WHAT’S NEXT?
Choosing an adequate assay for any given test can be difficult. Information on assay performance may not always be available, even for a test a laboratory already employs. The need for assay-specific PT panels to address test performance questions has been demonstrated clearly by these two pilot PT-like exercises. APHL will continue to work with the participating laboratories to identify proper corrective actions to address incorrect results and to provide guidance on any changes in laboratory practice that may be instituted as a result of these exercises. This includes two follow-up teleconferences with the participating PHLs in May 2011 to discuss the results. A poster on the results and value of these two pilot PT-like panels will be presented at APHL’s 2011 Annual Meeting in Omaha, NE, in June.
As vaccine-preventable diseases (VPDs) have decreased in prevalence over the years, many public health laboratories (PHLs) have discontinued testing for these now rare diseases. However, when a specimen arrives, particularly during an outbreak, it is a disquieting time to ask: “How will I test this specimen?” or “Where do I send this?” Yet those were the types of questions addressed at a VPD meeting at CDC in March 2011 by a group of more than 30 state and local PHL representatives, state epidemiologists, CDC subject matter experts and APHL staff.

CURRENT TESTING PRACTICES
Under budget cuts, PHLs cannot retain the capability to test for all disease agents. In fact, most PHLs already do not. Also, for much VPD testing, the availability of commercial assays is declining, which increases the reliance on the laboratory-developed tests used by a handful of facilities. In response, PHLs have had to come up with different solutions to maintain testing capabilities, most often informal “shared services” testing agreements among neighboring state PHLs; or PHLs may simply count on CDC to perform testing.

LABORATORY CAPACITY MODELS – DOES THIS MEAN “REGIONALIZATION”?
The idea of regional testing centers as a capacity model for VPD testing has been identified previously as a potential solution for addressing testing gaps. To assess the feasibility and roles of such regional centers, as well as identify alternative solutions, the VPD meeting participants weighed various “capacity” issues. These issues included diagnostics and surveillance testing capabilities, outbreak surge testing capacity, proficiency testing, training, and test method evaluations. For all of these issues, participants agreed the shared services model was not sustainable, particularly in the event of an outbreak, since VPD testing capabilities vary greatly from state to state by disease and testing type. A single PHL cannot be expected to do everything. So, a capacity-enhancing network could enable PHLs to have better access to reference testing they do not perform themselves.

“Regionalization” as a solution to testing gaps may work for some PHLs for some types of testing, but there’s no single model that can address all laboratories’ testing needs.

Meeting participants decided the most viable solution is a hybrid capacity model that allows PHLs to maintain a baseline testing capacity where desired, and utilize a reference testing center for more complex testing and surge capacity. “Regionalization” as a solution to testing gaps may work for some PHLs for some types of testing, but there’s no single model that can address all laboratories’ testing needs. As one meeting participant, Lillian Stark from the Florida Bureau of Laboratories, stated, “Each state has very different needs and strategies. One size does not fit all.”

OUTBREAK! WHOSE JOB IS IT?
Will these laboratory capacity models work when it really counts? To understand the roles of each level of the laboratory response, the VPD meeting attendees participated in measles and pertussis outbreak scenarios to further evaluate the components of possible capacity models. These outbreak tabletop exercises allowed the participants to see how different parts of the system work and to better understand each other’s roles. A hybrid capacity model was identified as the most appropriate solution for the scenarios that arose during the tabletop exercises.

ENVISIONING A “PHL RESOURCE CENTER”
Without replacing any testing that PHLs already perform, reference laboratories could function as “resource centers” for various components identified by the VPD meeting participants as priorities. For all VPD testing types, the components with the most universal need were diagnostic surge capacity, laboratory subject matter expertise, and support with proficiency testing programs. Other components, such as diagnostic test method evaluations, surveillance testing, genetic sequencing, and even training, were also identified as needs for specific VPD testing types. In the current climate of programmatic and budget cuts, PHL resource centers may be an effective solution for increasing the national testing capabilities and enabling laboratories to respond effectively to daily public health challenges.
There has long been a need for a standard method to calculate laboratory test costs. In 2000, several laboratory directors noted that the most common tool used to calculate test costs was a College of American Pathologists document that was outdated and discontinued in 1992. Since then, in listserv discussions and informal discussions, there has been consensus that laboratories need a consistent framework and standard method upon which to estimate costs. Moreover, many laboratories would like such a method to justify staffing, funding, zero-based budgeting, and fee-for-service pricing. To meet this need, APHL worked with a consultant to develop a cost accounting tool that is now available to laboratories to capture laboratory expenses.

The Laboratory Systems and Standards Committee formed a Metrics Subcommittee to explore potential solutions. The subcommittee convened a meeting in June 2009 to map out a strategy, including business requirements, time frames, budget, and other issues. The subcommittee developed an RFP to set the scope of the project, and eventually accepted a proposal from the University of Maryland. The scope of work was to 1) create a baseline methodology (the “calculator”) to capture expenses associated with conducting laboratory tests, and 2) develop an archive so that data could be collected over time and used to develop benchmarks. After working with the University of Maryland to develop the model needed to calculate test costs, APHL and the Metrics Subcommittee developed an in-house system (based on the assumptions of the model) to archive the data. Both the test cost calculator and the archive will be housed on APHL’s SharePoint site.

Every laboratory will have its own unique reporting requirements, fiscal accounting codes, blended revenue and cost accounting process, variant overhead formulas, system-specific use of instrumentation for multiple tests, multiple panels within a test, and so forth. Therefore, the method is intended to be a template that a laboratory can customize to its own unique accounting requirements and organizational structure. As examples, laboratory-specific cost data regarding labor, consumables, and indirect costs can be captured using this tool.

Each laboratory will eventually have its own URL to access the SharePoint site, thereby protecting confidentiality of the data. In the future, as the tool is used by states, APHL can better explore trends seen in the data. An overview to the tool will be given in late June 2011 via a web conference.

For more information on the cost accounting tool and to obtain access to its SharePoint site, contact Tina Su at tina.su@aphl.org.
APHL's staff, members and partners participated in the highly successful, three-day launch of the African Society for Laboratory Medicine (ASLM) in Addis Ababa, Ethiopia. In attendance were six Ministers and a Deputy Minister of Health; Ambassador Eric Goosby, coordinator of the US Office of Global AIDS; Dr. Kevin DeCock, director of the CDC Center for Global Health; and more than 300 dignitaries and senior health professionals from Africa and other continents.

ASLM will work with laboratory leaders individually and collectively to strengthen the existing national laboratory professional associations, and help create these associations where none exist. ASLM will advocate for and assist in the development and implementation of policies and guidelines from WHO and national health agencies to guide the certification of laboratory medicine training and continuing education. Specific initiatives will support development of standards and accreditation systems, establish a resource library, provide collaborative workspaces through a web portal, and offer training and certification.

The seven pillars of ASLM are defined in its charter as Advocacy, the Laboratory-Clinical Interface, Network Strategy, Accreditation, Workforce Development, Research and Technical Assistance and Policy.

During the three-day kick off, APHL contributed greatly during the workgroup deliberations. Ralph Timperi, APHL senior director, co-chaired the Laboratory Strategy and Networks Group with Dr. Jack Nyamongo, APHL senior consultant; and Lucy Maryogo-Robinson, APHL director of global health, also participated in this group. Professor Jeanne Jordan of George Washington University and director of the GWU-APHL partnership for Public Health Laboratory Management took part in the Laboratory Accreditation and Quality Management Systems Group, while Dr. Alpha Diallo, APHL global health committee liaison, contributed to the Policy Group. APHL is supporting this important initiative in many ways, and Timperi is a member of the ASLM Board of Directors and two of its committees, Human Resources and Accreditation.

The Ethiopian Minister of Health opened the meeting, and then Ambassador Goosby and Dr. John Nkengasong, CDC/GAP and chair of the ASLM Board, gave presentations about the vision for the new association. Dr. Jean Bosco Ndhokukubwayo, laboratory manager, WHO-AFRO, made a compelling
presentation: “Laboratory health systems are the Achilles heels for health services delivery in Africa – WHO AFRO perspectives and partnership with ASLM.” Other presenters included Michael Battle, US Ambassador to the African Union, and Jean Ping, president, Africa Union Commission.

The Ministers of Health were active participants, contributing their experience to the roundtable discussions. The workgroup sessions were lively and productive due to the participants’ depth of knowledge. Summary reports were presented for each group in plenary sessions; and a set of objectives, challenges and strategic initiatives were developed to present to the Board for follow-up actions.

The leaders and participants at the launch meeting understand the major challenges ahead, but are keenly aware of the need for action and believe this is the right time to rally action through ASLM. The Board has set an aggressive agenda; and recruitment of staff, including the ASLM CEO, is underway by the association’s Human Resources Committee. ASLM’s Board is sensitive to the need to achieve successes early to bolster support and maintain the momentum from its enthusiastic first meeting. Members are committed to the idea that ASLM will strengthen partnerships and advocate for needed change in the laboratory infrastructure of African countries. For further information, see www.afslm.org.
Q1. IS THE US AT RISK FOR A RAD EVENT LIKE THE ONE IN JAPAN? WHAT’S THE NEXT RAD DISASTER WAITING TO HAPPEN?

No one can predict the next radiological incident to occur in the US, so it is always prudent to prepare for any emergency no matter how rare or unlikely. At CDC, we continue to prepare to respond to different types of public health emergencies, including radiological or nuclear threats.

Q2. IN 2007, THE UK POLONIUM-210 EVENT SPARKED AN INCREASE IN AWARENESS OF RADIATION EXPOSURE AND BROUGHT IT TO THE FOREFRONT FOR NEEDED IMPROVEMENTS IN HUMAN EXPOSURE RADIATION TESTING CAPABILITIES, WHAT HAVE THE EVENTS IN JAPAN BROUGHT TO THE FOREFRONT OF OTHER TESTING CAPABILITIES?

The Japan incident has shown the value of both local and national programs for the detection of radionuclides in environmental samples such as air, milk, rainwater, etc. The EPA’s national RadNet system was very valuable in monitoring the radioactive plume that came across the Pacific Ocean and was seen by the RadNet monitoring system of detectors. The local monitoring of environmental samples by the state radiation control groups also highlighted the active radiological monitoring system in place in the US throughout the states.

Q3. ARE US LABS PREPARED FOR A DOMESTIC RAD EVENT, AND WHAT MUST PUBLIC HEALTH LABORATORIES DO IN ORDER TO BE BETTER PREPARED?

Many of the public health and environmental laboratories are experienced in testing for radionuclides in environmental samples such as water, soil, and plant materials. But, according to a recent APHL Public Health Laboratory survey, the public health laboratories have limited or no capabilities and capacities to respond to a radiological incident of national significance where tens to hundreds of thousands of clinical samples will need to be measured. CDC is working with the state public health departments and laboratories to inform them of what CDC is doing for radiological laboratory preparedness for their planning purposes.

Q4. WHAT IS CDC’S ROLE IN A DOMESTIC RADIATION EVENT, AND WHAT IS YOUR VISION FOR CDC’S ROLE IN 5 OR 10 YEARS?

During a radiological event, CDC can contribute technical expertise with regard to the health effects of radiation, population monitoring, and communications. We work with partners to provide health physics, laboratory and epidemiological expertise. CDC may carry out or support laboratory analyses, epidemiological surveillance, and medical countermeasures. CDC also provides information for general audiences and specific groups of people such as health departments, emergency responders, doctors, parents, teachers, and others. The responsibilities of the different federal agencies that may be involved in a national

Q5. WHAT CAN BE DONE TO ENHANCE LABORATORY CAPACITY AND CAPABILITY TO TEST ALL SAMPLE TYPES (HUMANS, ANIMALS, FOOD, ENVIRONMENTAL (AIR, WATER, SOIL) AND OTHER NON-CLINICAL SAMPLES) FOR A RADIOACTIVE RESPONSE?

The federal government, notably the EPA and the FDA, is currently working to increase state laboratory capabilities and capacities for a radiological response. Such programs provide training, technology transfer, and infrastructure support. CDC is working to develop new analytical methods to rapidly identify and quantify priority radionuclides of concern and increase sample throughput via automation to enhance laboratory capacity. One of CDC’s future goals is the establishment of a Laboratory Response Network – Radiological (LRN-R), including 10 or more state public health laboratories. This would include training, technology transfer and ongoing performance evaluation.

Q6. NATIONWIDE, THE CURRENT LABORATORY CAPABILITY FOR MEASURING RADIONUCLIDES IN PEOPLE IN RESPONSE TO AN EMERGENCY IS LIMITED. WHY IS IT IMPORTANT FOR LABORATORIES TO TEST HUMAN SPECIMENS FOR RADIONUCLIDES?

Radio-bioassay methods detect and measure the radionuclides that have been incorporated into people’s bodies. Such data can be used to determine who has been affected, the extent of a person’s contamination, and what steps, if any, should be taken to protect health. With few exceptions, internal radionuclide contamination cannot be detected by radiation equipment or clinical assessment during both the initial and extended response activities. People will feel fine but may have incorporated radionuclides into their bodies at unsafe doses.

The radio-bioassay methods developed as part of CDC’s Urine Radionuclide Screen (URS) can be used within 24 hours of an incident to assess the extent of individual contamination as well as the overall level of internal radionuclide contamination in a community. Bioassay sample results can be generated within 24 hours of sample receipt. These analytical results can provide valuable information to make public health decisions on proper medical management of individuals and communities. They can help determine which medical countermeasures should be used and who should be treated. If internal radionuclide contamination is not properly assessed, treatment and responses will be ineffective and major health consequences could go unnoticed.

Q7. ANYTHING ELSE YOU’D LIKE TO SHARE WITH OUR READERS?

APHL members, and really, anyone, can respond best to emergencies when they are prepared. CDC provides some emergency-related resources and guidance for laboratories at http://emergency.cdc.gov/labissues/.
APHL FELLOWS CONTRIBUTE TO PUBLIC AND ENVIRONMENTAL HEALTH SCIENCE ACCOMPLISHMENTS

APHL'S EID LABORATORY FELLOWS

by Heather Roney, manager, fellowship programs

Katy Hamlin spent February in American Samoa participating in a Lymphatic Filariasis Assessment Survey. Funded by the Gates Foundation to evaluate survey methodology and surveillance criteria for Lymphatic Filariasis elimination programs, the survey uses children between ages 6 and 7 as a marker for ongoing transmissions. If the number of antigen-positive children falls below the critical value, a recommendation is made to stop Mass Drug Administration (MDA). During the survey, teams of nurses, students and Department of Health workers traveled to each elementary school on the island to collect blood samples for assessment by a rapid antigen test (ICT card). Only two of the 956 samples were found to be positive after confirmatory testing; the critical value for the survey was six children. A recommendation was made to stop MDA and move to surveillance.

EID Fellows Amma Semenya and Molly Hyde traveled to Kenya in February to work on data collection as part of a multinational schistosomiasis control project. Working at CDC KEMRI in Kisian, they conducted field work for a study investigating how markers of morbidity might be differentially affected by various treatment regimens for Schistosoma mansoni infection in high prevalence areas.

A poster authored by Jordan Estes and former fellows Kara Levinson and Anna Van Stelten was accepted for the April 2011 Iowa Governor’s Conference on Public Health in Ames, IA: “Virus Culture and Isolation of Influenza Specimens from Bangladesh at the State Hygienic Laboratory at the University of Iowa for Antiviral Resistance Screening by the Centers for Disease Control and Prevention.”

Sarah Buss gave a presentation, “A pyrosequencing assay for differentiation of Bartonella species that infect humans,” at the January 2011 Laboratory of Clinical Microbiology seminar series.

Finalists for the next class of EID laboratory fellows will be interviewed in June. APHL looks forward to placing this 17th class of fellows.

APHL’S ENVIRONMENTAL HEALTH FELLOWS

by Jennifer Pierson, senior specialist, environmental health

Alona Umali, PhD, environmental health fellow at the Texas Department of State Health Services (DSHS) in Austin, TX, is collaborating with the Tampa General Hospital in Florida on a study of toxins that exacerbate acute lung injury (ALI) from smoke inhalation. The biomarker for morbidity in burn patients suffering from ALI is still unknown. Umali is also helping the Texas DSHS lab adapt a high throughput LC-MS/MS method that determines a number of volatile organic compound metabolites. In hand with previously obtained data, the LC-MS/MS method will help find the correlation of metabolite levels with morbidity and mortality. Results from the study will help develop more sensitive and rapid screening tools for clinical diagnosis, inform treatment and predict clinical outcomes in smoke inhalation patients.

Colin Johnson, environmental health fellow at Bureau of Laboratories, Michigan Department of Community Health, is working on the analysis of PBDEs in human blood serum. The blood samples arrive in small vials and are then prepared for processing through a GC/MS. Johnson is learning calibration methods, how to use standards and how to quantify and analyze the results.
Following a year as President-elect then a year as APHL President, Utah public health lab director Pat Luedtke is moving on to a new position as Public Health Officer/Medical Director for the Lane County Department of Health and Human Services in Oregon.

Pat joined the Utah laboratory in 2005, and his new bond with APHL was soon strengthened by luck and tragedy—the luck was his fortuitous selection to the “Lab Team” of the 2005 National Public Health Leadership Institute class, and the tragedy was Hurricane Katrina. These events quickly ingratiated him into the APHL community and, in turn, helped him get through his own first major lab event. “They really showed the value of having a membership that is connected to each other and the outside world,” he recalls.

Pat’s time at the Utah lab has brought many unforgettable moments, among which was May 2, 2009—the day his lab began testing for the H1N1 pandemic. But above all his experiences, he considers advocating for and building a new flagship laboratory one of his proudest, a “once-in-a-career event for a lab director,” he calls it.

Pat’s unlikely path to public health makes his accomplishments even more surreal. “I laugh sometimes and say it’s all due to President Bill Clinton,” he explains. Pat was a physician in the Navy during the 90s when the President’s nation-building efforts took the young doctor from his military base in Italy to numerous countries, setting up clinics, laboratories, and radiology facilities. The work inspired him to pursue public health, and later, to educational and career pursuits that would make him a leader in the laboratory profession.

He has many accolades under his belt, but he considers his term as president of APHL “the singular professional highlight” of his career. “It’s extraordinarily special to be a part of this organization and to be able to serve as President,” he said. “It’s been both a joy and an honor.” APHL thanks Pat for his leadership and looks forward to a continued relationship in his new role, which will include directing the county public health laboratory.

MEMBERS ON THE MOVE

SUSAN NEILL JOINS LUMINEX AS SENIOR DIRECTOR
Susan Neill, PhD, MBA, former APHL President, 2009-2010, has joined Luminex, an APHL platinum level sustaining member, as senior director for Scientific Affairs and Public Health. Dr. Neill has 24 years of laboratory experience and served as director of the Texas Public Health Laboratory for 10 years.

ROYDEN SAAH, MS, RECEIVES FULBRIGHT
Royden Saah, coordinator of the Bioterrorism & Emerging Pathogens Unit at the North Carolina State Laboratory of Public Health, was recently accepted into the Fulbright Scholar Specialist Program, which awards scholars grants to complete short-term projects in over 100 countries. Royden credits his previous international experience with APHL’s winning project in Guyana.
San Mateo County occupies much of the western half of the San Francisco Peninsula, with the Pacific Ocean on one side and San Francisco Bay on the other. It is about 30 miles south of the city of San Francisco and just north of California’s Silicon Valley. The San Francisco International Airport is located here, and San Mateo County Public Health Laboratory is responsible for any public health concerns related to international travelers.

Among the 20 most affluent US counties, San Mateo is variously described as “liberal,” “forward-thinking” and “scenically beautiful.” The largely suburban county is home to a number of high tech companies—including Oracle and YouTube—as well as roughly a dozen beaches, more than a dozen state parks and innumerable hilly green spaces that have been set aside by the local government to assure ample open space. Its 700,000 residents encompass a range of ethnicities, from Hispanic to Asian to European; a sizeable minority comes from the Kingdom of Tonga in the South Pacific.

The public health laboratory is in the city of San Mateo (Spanish for Saint Matthew). It occupies 2,500 square feet of the second floor of a 1950s-era building shared with part of the local health department—cramped quarters for a high complexity laboratory that performs about 45,000 tests per year. The building, in turn, is one of several owned or leased by the county on a larger medical campus shared with the San Mateo Medical Center.

Fujikawa’s first “real job” was director of the Fresno County Public Health Laboratory, which he headed for 20 years. He left to direct the City of Long Beach Public Health Laboratory, and, after six years, took over the helm of the San Mateo County Public Health Laboratory in 2005. “I’m always looking for new challenges,” he said.
The San Mateo County laboratory has five microbiologists, two laboratory assistants, a technician, a clerical staff member and two assistant directors—one is a county employee, and the other is a post-doctoral scientist in a two-year laboratory director training program funded through California’s LabAspire program. Although California public health microbiologists must be state-certified to practice, Fujikawa said the laboratory has had no difficulty attracting new hires: “We have lots of applicants for our openings. I probably interviewed nine or ten people for one microbiology vacancy.”

The county, he said, is “very much interested in the welfare of its employees,” with incentives for healthy lifestyles and many continuing education offerings in topics such as management training, computer skills and financial planning.

Aside from the one LabAspire-funded assistant director position, the laboratory receives no direct state funding and no grant funding. About $1.8 million of its $2.4 million annual budget comes from fees generated by clinical testing for the San Mateo Medical Center, public health clinics and the county’s environmental health department and water purveyors. The remainder comes from county general funds.

The laboratory, said Fujikawa, has “an extensive test menu for the size of our lab.” Of the 45,000 tests performed annually, 80% are clinical and 20% environmental. Its highest-volume tests are gonorrhea/chlamydia (44% of all tests), childhood blood lead testing (11%), HIV testing (10%) and QuantiFERON® testing for latent TB (9%). However, it also performs PCR testing for norovirus, influenza, methicillin-resistant Staphylococcus aureus (MRSA), Clostridium difficile and herpes; R-mix for respiratory viruses; mycobacteriology and mycology testing; enteric bacteriology; testing for ova and parasites; rabies testing (required by state law to be performed in a public health laboratory); drinking water, surface water and ocean water testing; tick identification; and testing for Borrelia.

Since Fujikawa arrived at the laboratory, it has greatly expanded its PCR testing capabilities, going from just two tests (HIV viral load and herpes) to eight (including MRSA, C. difficile, influenza, norovirus, Hepatitis C viral load and Bordetella pertussis). “We’re using CDC methods, so we can do pandemic strain typing for influenza,” he said. The Bordetella pertussis RT-PCR has been very useful this past year, as California has experienced its largest pertussis outbreak since 1947, with more than 9,000 confirmed cases. In the past 12 months, the San Mateo County Laboratory tested 590 specimens. Having norovirus RT-PCR was extremely valuable during the winter of 2006-07, when 54 confirmed and unconfirmed outbreaks occurred in congregate living facilities in the county. The availability of the PCR testing reduced the need to perform enteric bacteriology during these outbreaks. The C. difficile RT-PCR test can be performed in two hours and is more sensitive than older enzyme immunoassays. The lab follows CDC guidelines for nucleic acid amplification testing to identify M. tuberculosis.

Given his facility’s size and age, Fujikawa said his one major goal is securing funding for a new building. “That’s a tough one,” he said. “The main problem is lack of space. We had to remove a biological safety cabinet to change the way we do our viral load testing. I can’t really expand in terms of equipment or programs without more room. The next thing you know, I’ll have an instrument in my office.”
“Aloha” from the Hawaii State Laboratories Division

Nancy Maddox, writer, and A. Christian Whelan, lab director, contributed to this article

The fresh, floral air energizes you. The warm, tranquil waters refresh you. Look around. There’s no place on earth like Hawaii.

This beguiling introduction to Hawaii’s official tourism website sums up the reasons seven million visitors travel to the islands each year, swelling the resident population of 1.3 million people. The newest state in the union—admitted to statehood in 1959—Hawaii is indeed unique. It is the only US state comprised entirely of islands, and, lying smack in the middle of the Pacific Ocean, it is the most remote population center on the planet.

A. Christian Whelan, PhD, D(ABMM), administrator and scientific director of the Hawaii State Laboratories Division (HSLD), unabashedly avers that his facility has “the best view of any lab in the nation,” sitting high atop Waimano Ridge on the island of Oahu with a sweeping vista of Pearl Harbor.

Despite being separated from Hawaii’s seven other major islands by miles of brilliant blue ocean, he said travel is surprisingly easy: “You can’t drive from one county to the next, but frequent plane flights make inter-island travel easy.” Whelen should know; he travels to district health laboratories on Maui, Kauai and the Big Island of Hawaii twice annually because they operate under his state license.

Playing a Leading Role in Influenza Detection

Although the Hawaiian archipelago extends in an arc for 1,600 miles, the state’s relatively small populated area has fostered a close-knit laboratory community. “This really paid off during the 2009 H1N1 pandemic,” said Whelen.

Well before the pandemic hit, the HSLD facilitated the implementation of RT-PCR influenza testing in major commercial laboratories; thus, “there was less uncertainty,” said Whelen. “The private labs did much of the flu A/B detection (testing), leaving state laboratories capacity to focus on subtyping.” Pandemic assistance to American Samoa and the Republic of the Marshall Islands actually led to an APHL-supported contract to support influenza surveillance and response testing for six US-affiliated Pacific Island jurisdictions.

External funding is important because of limited state resources, and has supported HSLD work in food safety methods development, enhanced respiratory disease surveillance and molecular detection of drug-resistant influenza and tuberculosis (TB).

Key Testing

But Hawaii also contends with novel illnesses. Leptospirosis, a bacterial disease rare in the continental US, is endemic in Hawaii. The need for local testing spurred the Kauai District Laboratory to become the Leptospira test lab, performing complex analyses that would normally be done at CDC. Murine typhus (a rickettsial disease spread by fleas) and rat lungworm (a nematode carried by slugs and snails that can be accidentally consumed with raw vegetables) are also endemic; however, HSLD has yet to obtain funding to establish testing for these diseases so specimens must be sent to CDC.

In addition to the 60,000 clinical tests performed annually, HSLD also provides environmental testing for state programs. In a typical year, the HSLD tests 650,000 air samples, 8,500 recreational water samples, 300 food products, 5,000 drinking water samples and 1,500 bird samples (tested for West Nile virus or avian influenza).
Hawaii’s location also influences environmental testing. The laboratory’s Environmental Health Analytical Services Branch (EHASB) augments the US Environmental Protection Agency (EPA) water quality testing with additional analyses, because EPA standards are based on temperate areas and, hence, inadequate for subtropical Hawaii.

COMMUNITY REACH

The HSLD also maintains an active presence in the broader laboratory science community. It leads the state’s Laboratory Response Network, licenses medical review officers for substance abuse testing, trains law enforcement supervisors to perform breath alcohol testing, and provides judges for science fairs and volunteers for the annual statewide “Stop Flu at School” campaign. Scientists also collaborate with multidisciplinary investigators, lecture at local colleges and provide training opportunities for university and community college students.

Unfortunately, the couple thousand miles of ocean separating Hawaii from the nearest continent has not been enough to insulate “paradise” from the financial crisis that rocked much of the world.

FINANCIAL CRISIS TAKES A TOLL

Hawaii’s #1 industry is tourism, and fewer visitors means less state revenue. Although there are signs tourism is rebounding, difficult times are still ahead. Analysts project a $1.3 billion shortfall for the 2012-13 budget cycle, and Hawaii has a balanced budget law.

WHAT DOES THIS MEAN FOR THE HSLD?

State funding to the laboratory is $5.8 million, down 20% from two years ago. At the beginning of 2009, the laboratory had 87 state-funded positions. The state legislature abolished five vacant positions, and ten filled positions were lost to the RIF.

One casualty was the microbiology food and dairy testing unit, whose virtual elimination leaves the HSLD struggling to meet statutory obligations for a nascent shellfish industry and for food safety response.

Despite having one of the highest TB incidence rates in the US, the HSLD lost TB staff as well. “Most of that testing is done by a commercial lab now. We are processing specimens once a week using staff from virology part-time and our APHL/CDC Emerging Infectious Disease (EID) training fellow as back-up,” said Gail Kunimoto, chief of the Medical Microbiology Branch.

Fortunately, a small APHL grant has enabled the laboratory to pursue molecular TB drug resistance testing, a service not readily available in the private sector. “If the project succeeds, it holds a high value for the community in terms of finding drug resistance in a matter of days rather than weeks,” said Rebecca Sciulli, MS, the lab’s Emergency Response Program manager.

“Accumulated vacancies have now become an issue,” said Kent Kitagawa, MPH, the division quality manager and acting administrative officer. The laboratory is down to 63 filled positions and nine vacancies.

Sheer necessity has led Whelen to look for innovative ways to cut costs and leverage staff expertise. HSLD has installed variable speed drives on much of the lab’s mechanical plant, high efficiency lighting and new building management software, enabling significant reductions in energy use.

“It’s been difficult because you can’t just cut for savings,” said Whelen. “You have to look for return-on-investment, and even those savings seem to disappear amidst rising prices.”

When the lab’s core IT specialists got bumped out of their jobs, one of those former employees, who is now pursuing a master’s degree at Hawaii Pacific University, re-designed a software application for the lab, which allows commercial labs secure, web-based access to test results, saving HSLD an estimated $100,000 in contractor costs.

LOOKING AHEAD

When facing demanding situations, Whelen takes solace in the “unlimited potential” of HSLD staff. During “one of the most difficult years in memory, with a budget crisis and the H1N1 pandemic,” the laboratory was named Hawaii Department of Health, Team of the Year in 2010. “We have energetic laboratory professionals and support staff with positive attitudes who have responded admirably to each and every challenge,” said Whelan.
BOOK REVIEW

TITLE: RADIATION AND MODERN LIFE: FULFILLING MARIE CURIE'S DREAM

Book Author: Alan E. Waltar

SUMMARIZED FROM READER REVIEWS

No one would argue that the effects of radiation exposure can be bad... very bad. But that's only one side of the story. There are also benefits of radiation when used responsibly.

In the book Radiation and Modern Life: Fulfilling Marie Curie’s Dream, author Alan Waltar lays out the positive uses of radiation. The book begins with a tribute to Marie Curie by her granddaughter Helene Langevin-Joliot, who gives a brief and interesting history of the Curies and their quest to discover and isolate radium.

The book describes the properties and various applications of radiation in basic terms and illustrations that can be easily understood by most readers. Explaining the origin of radiation, Waltar gives detailed examples of its use in agriculture, medicine and nuclear power and many other sectors, as well as its impacts on terrorism, crime, environmental protection and even the economy. The book cites many little-known examples of radiation’s benefits and impact on society, and includes a glossary of terms to help readers follow.

Waltar’s writing style is chatty and anecdotal, which some readers enjoyed, while others felt it distracted from the material. Written for a general audience, this book is nontechnical and recommended to anyone interested in understanding radiation and its everyday uses around the world.

CHECK OUT THESE NEW PUBLICATIONS FROM APHL ...

The Core Functions of State Public Health Laboratories

State Public Health Laboratories Emergency Contact Directory

The Brave New World of Consolidated and Shared IT Services

For copies, contact Kim Ross at kim.ross@aphl.org. Download PDFs at aphl.org, under “Publications.”

What’s New in Dengue Diagnostics?

DENV Detect™ IgM Capture ELISA
FDA Cleared

The recently FDA cleared DENV Detect™ IgM Capture ELISA is a qualitative enzyme immunoassay that detects IgM antibodies to dengue virus in human serum.

Easy to Use – Excellent Reproducibility – Superior Results

Contact us today for more information or visit our website:

InBios International Inc, 562 1st Ave, South, Suite 600
Tel.: 1-866-INBIOS | Fax: 206-344-5823
Email: info@inbios.com | www.inbios.com
CDC IMPROVES SALMONELLA SEROTYPING USING LUMINEX XMAP TECHNOLOGY
by Susan Neill, PhD, MBA, senior director, Scientific Affairs and Public Health, Luminex Corporation; Michaela Hoffmeyer, MA, R&D manager, Life Science Research & Food Safety, Luminex Corporation

Salmonella poses a risk to human health on a scale much broader than most people realize. Despite frequent outbreaks, including the recent Salmonella enteritidis outbreak in 2010 that spanned 11 states and accounted for 1,939 illnesses, the true impact of the bacteria is often understated. Estimates are that 1.4 million cases of Salmonella occur annually in the US, of which approximately 40,000 are culture-confirmed cases reported to CDC. However, since many milder cases go undiagnosed or unreported, the actual number of infections could be more than 30 times greater. This bacterial infection accounts for nearly 400 fatalities each year.

Among the numerous challenges facing state public health and agriculture labs is the ability to detect over 2,500 different Salmonella serotypes that can cause human disease. Traditional methods, which are laborious, time-intensive and subjective, use agglutination-based testing with antisera, which are notorious for lot-to-lot inconsistency. This process calls for labs to run hundreds of antisera to test all the possible different variants. In order to reduce the time and cost, and to improve efficiency and quality of results, CDC developed a multiplexed Salmonella serotyping assay using Luminex’s innovative xMAP technology that completely identifies 85 percent of the top 100 serotypes posing the greatest risk. Obtaining a complete serotype provides a significant advantage, and, because the assays use multiplexing technology, there are labor, efficiency, and cost savings as well as enhanced reproducibility for the laboratories running the assay.

The open architecture, flexibility and scalability of Luminex’s xMAP technology allow users to run either protein or nucleic acid assays on the same instrument. CDC’s Salmonella assay is run on Luminex’s LX200 system. For more information, please contact Michael Burgamy, Director of Government Accounts at mburgamy@luminexcorp.com or Michaela Hoffmeyer, Manager of Research and Development at mhoffmeyer@luminexcorp.com.

For more information about Luminex Corporation, an APHL Platinum Level Sustaining Member, visit www.luminexcorp.com.

GEN-PROBE TRICHOMONAS ASSAY FDA-CLEARED
by H. Peter Kelley, director of National Accounts, Gen-Probe

Trichomonas is a sexually transmitted parasite that causes vaginitis, urethritis and cervicitis in women. If left untreated, complications can include premature labor, low-birth-weight offspring, and premature membrane rupture in pregnancy. CDC estimates that 7.4 million American men and women are infected with Trichomonas annually. Screening for Trichomonas is limited today, in part, to the shortfalls of current testing techniques. Most testing currently is done via culture methods, which are slow and less sensitive than molecular tests, or “wet mount,” which requires the microscopic examination of a sample shortly after it is collected and is even less sensitive than culture.

The Gen-Probe APTIMA assay is the first and only FDA-cleared amplified nucleic acid test specifically cleared to detect Trichomonas vaginalis, the most common curable sexually transmitted infection in the United States. The assay may be used to test clinician-collected endocervical or vaginal swabs, urine, and specimens collected in PreservCyt solution from symptomatic or asymptomatic women. “We believe our APTIMA Trichomonas assay will improve detection of a potentially serious sexually transmitted infection that is common in women of all ages,” said Carl Hull, Gen-Probe’s president and chief executive officer. “Our assay will provide a convenient tool for physicians and laboratories because it employs the same technology as our market-leading tests for chlamydia and gonorrhea, can be used with the same female samples, and runs on our unique, fully automated Tigris® System.”

Only the Tigris® System automates all phases of molecular diagnostics testing from sample preparation, amplification, and detection to reporting results. Integrating the Tigris® DTS® System with APTIMA assay kits for amplified nucleic acid testing offers true freedom from hands-on processing, enabling laboratory support for Trichomonas screening programs. For more information, contact pete.kelley@gen-probe.com.

For more information about Gen-Probe, an APHL Diamond Level Sustaining Member, visit http://www.gen-probe.com.
APHL SUSTAINING MEMBER PROGRAM
The following corporations partner with APHL to support the nation’s public health laboratory system.

DIAMOND PARTNERS

PLATINUM PARTNERS

GOLD PARTNERS

[Logos of various companies]