Putting PHLs on Information Highway: APHL, CDC Building On Ramp through PHLIP (page 3)
APHL and CDC have launched a program—the Public Health Laboratory Interoperability Project (PHLIP)—that promises to change the way we do business. Just as laboratory information management systems (LIMS) have revolutionized operations on the state-scale, PHLIP aims to link us nationally and give us fluid electronic dialogue among all labs and CDC. (See page three to learn more.) The possibilities are incredible. If we examine the way former technological advances have changed our world, PHLIP becomes even more exciting.

The effect of a good LIMS is perhaps the best herald to the benefits PHLIP may reap. Delaware’s new LIMS has been a huge advance. We thought it would save us personnel time and effort—and it does—but it has improved the quality of our work immeasurably. There is no more duplicative data entry with copying and perhaps miscopying information. Data go directly from the instrument, to LIMS, to the report. Submitters enter specimen information directly into LIMS. As soon as tests are completed, results are available to the submitter. This service is provided to other state agencies, clinic-based health centers and soon to hospital laboratories. All of our quality data are right there in LIMS, automatically. We don’t lose specimens in the courier van: we know it’s on its way, and if we don’t get it, we go look for it. All of our SOPs are online and are much easier to update—which, of course, helps us meet CLIA requirements. Our inventory management has improved. It has streamlined our lab operations.

The initial success we have enjoyed with the LIMS has encouraged us to spend a lot of money to get our newborn screening system onto the Web. We will be able to store each child’s data, track the specimen from the hospital to the lab and tie it all together with the birth certificate, hospital identification and immunizations. We are not going to lose that blood spot! Having the test results available online for doctors will eliminate delays in getting treatment to a baby. This real-time reporting of results can make a huge difference in the quality of a child’s life.

With LIMS, it has become easier to direct public health activities and treatment options toward clusters of positive results. All reportable disease results go automatically to our Epidemiology Office for follow-up. I often need to know: How many of that test have we performed? How many results were positive? Where did they come from? The data are available. It took me moments this year to check which of the state’s influenza sentinel physicians were actually submitting specimens. Only two of the ten physicians had sent us anything at all; it was clearly time to get on the phone to find out what was going on.

Now imagine all of this on a national scale.

These advances all have a price—literally. It’s expensive. The Delaware lab used bioterrorism grant money to implement a LIMS, as others have done. As we rely more and more on APHL, not only to assist us with our technological advances, but also to provide us with more technology-based services and support, we must ask how the association can absorb the financial impact. APHL’s Finance Committee has begun to discuss a number of issues, including the fact that key member programs are not fully funded by CDC (leading to a projected deficit) and that the current strategic plan calls for greater investment in public policy, communications, technology and workforce development, areas that are not historically funded through the cooperative agreement. The committee is beginning to explore financial options, which include the possibility of a dues increase. This discussion is in its infancy, and we welcome feedback and ideas from the rest of the membership.

As scientists, we should embrace the electronic age completely. A few years from now, people will wonder how we ever managed without instant, electronic data transmission with CDC. Tackling these expensive propositions with our public health budgets is daunting at best, but a can-do spirit has reaped immense benefit for us all in recent years. Teamwork, creativity and dedication often manage to trump the financial bottom line. Fortunately, those are all resources that APHL has tenfold.

Jane P. Getchell, DrPH
President, APHL
Director, Delaware Public Health Laboratory
Putting PHLs on Information Highway: APHL, CDC Building On Ramp through PHLIP

People have already begun to divide modern history into two eras: the world before the Internet and the world after the Internet. But such a distinction is misleading.

The real turning point in electronic information exchange was not so much the launch of the first wide area electronic network in the early 1980s as it was the introduction of HyperText Markup Language (HTML) in the early 1990s. HTML provided a standard that anyone could use to write a Web browser or publish a Web page. It was only after HTML became the norm that computerized information exchange mushroomed, with e-retail, e-zines, blogs and more.

But without a similar, widely adopted standard for the exchange of clinical laboratory data, this communications revolution largely bypassed the laboratory. So, for example, when a laboratory worker in a Boca Raton hospital tentatively identified anthrax in a patient’s blood specimen in late 2001, the information was communicated to the Florida Bureau of Laboratories (FBL) via telephone, not electronic laboratory reporting (ELR). And when the FBL communicated the same information to the CDC, scientists again relied on phone messages, supplemented by e-mail.

An estimated 50% of public health laboratories lack the capacity to exchange any electronic laboratory data with partners.

In the wake of that incident, public health laboratories in every state collectively performed hundreds of thousands of analyses on suspicious white powder samples, but without ELR, national health authorities had no easy way to monitor and integrate the test results.

Today in the midst of *E. coli* outbreaks and the 2006-2007 influenza season, some laboratories are delaying the reporting of test data to the CDC so that they can aggregate the data and fax multiple test results together.

Michelle Meigs, APHL’s informatics program manager, said, “If you stop somebody on the street and ask ‘How do you think data get from public health labs to the CDC?’ they’re not gonna say paper, fax, phone. They’re gonna say, ‘electronically.’ But right now that’s not happening.” In fact, an estimated 50 percent of public health laboratories lack the capacity to exchange any electronic laboratory data with partners. And those that can rely on a hodgepodge of systems of varying capabilities, with various messaging interfaces.

Yet even in the laboratory, the world is beginning to turn. Standard tools to enable the transmission of test orders and other health care information exist, and the clinical laboratory community is finally beginning to refine and exploit them.

November 30, 2006, marked a milestone in this process of electronic modernization. On that day, five state public health laboratories transmitted sample test data to the CDC Influenza Branch using that agency’s Public Health Information Network Messaging System (PHIN-MS). Four states were able to receive electronic data from the CDC. “That’s never been done before,” said Meigs.

This simple data exchange was the culmination of the first phase of an APHL-CDC project to integrate information technology (IT) into the realm of public health laboratory practice. The Public Health Laboratory Interoperability Project (PHLIP) is a collaboration among the CDC’s Coordinating Center for Infectious Disease (of which the Influenza Branch is part), the National Center for Public Health Informatics and the APHL informatics program. Also involved are the state public health laboratories in California, Colorado, Iowa, Minnesota, Nebraska and Virginia (all of which have representatives on the APHL Informatics Committee).

Phase two of the $1.7 million project is slated to conclude by July 2007 with the piloting of a prototype data exchange router that will provide a single computer interface to eventually replace the myriad, costly and labor intensive messaging interfaces and Web-based reporting tools now in use in public health labs across the country.

The short-term goal is both simple and complex: to give every public health laboratory in the nation viable options for electronic transmission of clinical data. In practice, these options boil down to three solutions, corresponding to three levels of IT sophistication.

Laboratories with minimal IT staff, including many low-volume, local public health labs, may employ Web-based tools that require little more than an Internet hook-up. Staff will be able to manually enter data into larger data systems and to receive electronic reports from state or federal laboratories. The newest tools of this type will replace disease-specific or “silo” programs such as the National Respiratory and Enteric Virus Surveillance System, in which participating laboratories report on a weekly basis the detection of parainfluenza viruses, adenoviruses and rotavirus, the most common cause of severe diarrhea in children.

A second solution encompasses proprietary or closed network messaging systems, such as PHIN-MS, the system
The short-term goal is both simple and complex: to give every public health laboratory in the nation viable options for electronic transmission of clinical data.

The CDC’s secure data network ensures that the correct computer receives the message. The encryption of the message ensures that it is not stolen and read during transmission.

In time, the most technologically savvy laboratories will have a third possibility—a data exchange router, analogous to an e-mail server that uses Internet-based technology. PHLIP is laying the groundwork for this solution. The router, said Meigs, represents “IT nirvana.” When this option is fully functional, a public health laboratory scientist will be able to finish a test and hit one button to send the test report to all relevant stakeholders. The router will do the rest: it will discern what type of report it is, where it originated and where it needs to go. And then it will deliver it. Instantaneously. Using predetermined algorithms, with all the usual security safeguards.

Thus, at the same time that a physician is receiving the result of a patient’s test and deciding on a course of treatment, state or local epidemiologists will be alerted that a new case of a reportable disease has been detected in a particular jurisdiction. Instead of daily or weekly disease updates, public health officials will have the benefit of real-time information.

Said Meigs, “The difference will be huge. The data will be there in real time. And the data will always be up-to-date. They will be able to see spike increases (in laboratory confirmed cases of particular diseases) immediately.” However, this will not diminish the central role of the epidemiologist in assessing whether it is a true outbreak of disease or an anomaly of a testing process.

The underlying standard enabling data exchange through PHIN-MS and eventually through the router is Health Level Seven (HL7), developed by the American National Standards Institute-accredited organization of the same name. Just as there are standard rules for organizing text in haiku poetry or an English sonnet, HL7 provides standard rules for organizing information in a clinical data file. It provides a schema both for how the data fields work and how the overall message is laid out.

While HTML enables information to be displayed on a screen, HL7 enables information to be stored and processed in a database (and to be used for other HL7 applications).

Just last June the Council of State and Territorial Epidemiologists (CSTE) adopted a position statement asserting that all public health entities should be able to accept electronic messages in HL7 Version 2.5 by January 1, 2008 and to receive messages in HL7 Version 3.0 sometime thereafter.

Version 3.0, the latest version, relies exclusively on Extensible Markup Language (XML). XML is now the

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**Anatomy of Two LOINC® Codes**

**LOINC® Code 5062-5 = Borrelia burgdorferi Ab.IgG|Acnc|Pt|Ser|Qn|EIA**

- Test name: Lyme disease serology
- Analyte: Borrelia burgdorferi Ab.IgG
- Property: arbitrary concentration (as opposed to mass conc. or number conc.)
- Timing: point-in-time
- Sample: blood serum
- Scale: quantitative (e.g., Titer 1:40)
- Method: enzyme-linked immunosorbent assay

**LOINC® Code 6321-4 = Borrelia burgdorferi Ab.IgM|Acnc|Pt|Ser|Ord|IB**

- Test name: Lyme disease antibody
- Analyte: Borrelia burgdorferi Ab.IgM
- Property: arbitrary concentration
- Timing: point-in-time
- Sample: blood serum
- Scale: qualitative (e.g., positive versus negative)
- Method: immune blot
preferred notation for describing clinical laboratory data in HL7 files. (Note that HL7 and XML provide a means to format and describe messages; they are not the means for the electronic transmission of the message.)

Gary Jones, the information services manager at the Minnesota Public Health Laboratory (MPHL) and chair of the APHL Informatics Committee, said the MPHL currently uses a variety of communications media: paper, electronic fax and computer. He quickly pointed out the advantages of electronic data standardization.

“The way we’ve done (computer messaging) in the past, we had to write a program to create a special file for every client. Lots of programs for lots of clients. Using HL7, you all agree on the format of the message and the content, so you only do that once.” Jones said that over the past year the MPHL has been trying to switch to the HL7 format whenever feasible with specific clients.

But having a standard messaging format and implementing it are two different things. Michael Davison, director of informatics in the Washington State Department of Health, Division of Epidemiology, Health Statistics and Public Health Laboratories, noted that the task is “all technical, and all in the details. People will say, it’s easy; the reality is it’s hard.”

The Washington Department of Health receives electronic laboratory data from the state public health laboratory, two commercial labs, one large HMO lab and one hospital lab, collectively representing at least 60 percent of the state’s reportable test results. But getting to this stage has been a challenge.

Said Davison, “These (institutional) information systems are monolithic and take a lot of planning to change. When you’re handling test results and you’re liable for them, you don’t just go in there and make changes willy nilly. (Clients) really did have to agree; public health couldn’t just pass a law to get laboratories to do this.”

Davison, who has been convening a monthly, CSTE-sponsored ELR conference call for the past five years, noted that there are several versions of HL7 in use, and organizations can choose to implement the same version in slightly different ways. The challenge has been to write parsers—computer programs that perform syntax analysis—to handle the variety of HL7 formats coming into a central data system. This is one of the goals of Phase II of PHLIP.

Another problem has been to get laboratories to agree on common codes to identify specific laboratory procedures and test results. The most widely used coding systems for clinical data are SNOMED Clinical Terms (SNOMED CT®) and Logical Observation Identifiers, Names & Codes (LOINC®).

SNOMED CT, developed and owned by the College of American Pathologists, identifies a variety of clinically useful data, notably including disease organisms, such as fungi, bacteria and plants.

LOINC, developed in 1994 by the Regenstrief Institute, an informatics and healthcare research organization affiliated with the Indiana University School of Medicine, identifies six aspects of a laboratory procedure:
- **Component/Analyte**—the substance or entity that is measured, evaluated or observed, such as glucose, *Brucella sp.*, the influenza A virus antigen or Cytomegalovirus antibody.
- **Property**—the characteristic or attribute of the analyte that is measured, evaluated or observed, such as mass/unit volume or identity of an organism.
- **Timing**—the period over which the observation or measurement was made; such as a point in time versus a 12- or 24-hour collection.
- **Sample**—the system or specimen type upon which the observation was made, such as whole blood, urine or food.
- **Scale**—the type of result yielded from the observation, such as ratios versus ordinal numbers versus a taxonomy (e.g., list of bacteria identified).
- **Method**—the test method, such as immunoassay or probe with target amplification.

But because laboratory testing is so complex, scientists using the same coding systems can still reach different coding decisions. Meigs said, “We could have 100 labs all correctly coding their local tests and test names to LOINC and end up with 100 labs that have different correct codes for the same tests.”

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Interoperability can be defined as the ability of different types of computers, networks, operating systems and applications to work together effectively, in order to exchange information in a useful and meaningful manner. This is the ultimate goal of the Public Health Laboratory Interoperability Project (PHLIP).

On November 30, a little over a month after the project launch, the PHLIP pilot took a step forward to meeting the goal of interoperability. Electronic connectivity between CDC and APHL’s six PHLIP pilot laboratories had been established via the Public Health Information Network Messaging System console. Four of our six PHLIP laboratories had proven the technical infrastructure and ability to send and receive mock influenza results via a Health Level 7 (HL7) v. 2.3.1 message between themselves and the CDC data messaging broker. Steve Hinrichs, MD, of the Nebraska public health laboratory stated, “This represents an important milestone and paves the way for all of the other subsequent steps to follow as outlined in the PHLIP proposal.”

Although there are many challenges ahead before fluent bi-directional data exchange in a live environment is achieved, the drive of all parties to meet this first important milestone proves the level of dedication and collaborative spirit that has infused this project to date.

Achieving all of the goals and documenting the outcomes of PHLIP takes the coordination and cooperation of many groups. The PHLIP collaborative is made up of three interconnected groups:

1. Project direction and oversight is provided by the PHLIP steering committee, whose membership includes director level participation from all stakeholder groups (APHL, APHL state representatives, CDC’s CCID and NCPHI).

2. Standardized vocabulary and HL7 messaging expertise and guidance are provided by the PHLIP vocabulary harmonization workgroup. This workgroup includes subject matter experts from member laboratories and CDC who possess knowledge in standardized vocabularies, HL7 message specifications and laboratory science.

3. Technical architecture options and message transport implementation is undertaken by the PHLIP pilot implementation workgroup. This group is responsible for determining and implementing the mechanism for data exchange between disparate public health systems, most notably between the PHLIP pilot laboratories and CDC. The group consists of technical personnel at the PHLIP pilot sites and CDC.

Although the pilot is beginning with small milestones and a focus on exchanging influenza data with CDC, the PHLIP steering committee recognizes the need to account for all of the partners with which a state/local laboratory must be able to communicate. As a member of the Informatics Committee stated, “We do not want one protocol for exchanging data with the CDC and another for our other partners.”

Different scenarios for data exchange that must be taken into account:

- Clinical laboratory or partner sends test order to state/local public health laboratory (PHL). The PHL sends the response/test results to the clinical partner.
- State/local PHL sends test results, specimen and test order to CDC. CDC sends response/test results to the state PHL.
- State/local PHL-A sends test order to state PHL-B. State PHL-B sends response/test results to state PHL-A.
- Clinical laboratory or PHL sends case report to a state/local public health agency.
- Clinical partner sends laboratory result information to an Electronic Health Record.

All PHLIP stakeholders will contribute to an implementation guide that will be made available through APHL. This guide will outline a strategy for other laboratories to achieve data exchange capability and will clearly state the capital and human expenditures (from a management and technical perspective) needed to realize the strategies outlined in the implementation guide.

The PHLIP pilot is a 13-month project, and is still in its infancy, but as the project moves forward APHL hopes that this extraordinary member service will minimize the obstacles a laboratory will encounter on the journey to implementing a rich data exchange mechanism at its institution.

PHLIP hopes to accelerate this journey with a minimum of cost and disruption to ongoing laboratory activities. Although challenging, the undertaking will be minimized by working as a community to attain interoperability and seamless data sharing for the benefit of all stakeholders.

Questions, suggestions or comments about the PHLIP pilot may be directed to Michelle Meigs, laboratory informatics program manager, at michelle.meigs@aphl.org.
Hurricane Katrina was one of the most violent and deadly storms ever recorded in the US. The morning after it passed through coastal Louisiana in August 2005, Stephen Martin knew that difficult decisions were ahead.

As chief of the Louisiana Public Health Laboratory, he was in charge of directing the laboratory’s emergency response. But floodwaters had knocked his main facility in New Orleans out of commission even as the need for laboratory services skyrocketed. Where to begin?

In those critical early hours after the storm, Martin decided upon three priorities: 1) testing drinking water for bacterial contamination, 2) providing basic microbiology services to test people for water- and vector-borne diseases and 3) newborn screening (NBS).

Compared to the first two items, NBS may seem to be a low priority after a hurricane. But, said Martin, “I looked at the things that affected the most people. And babies were gonna continue to be born. I couldn’t stop that. And if they weren’t tested within the first few days of life, some might be irreparably harmed. So when I made my list, it was in the top three. Everything else that the lab does I set aside.”

The situation in Louisiana that summer represents only one of the predicaments that might derail a state’s NBS program. Roughly 18 months before Katrina materialized, for example, the FDA shut down a major NBS test kit producer (for regulatory infractions) and unknowingly precipitated a test kit shortage that threatened screening in several states.

In the wake of these crises, NBS contingency planning has become a matter of grave public health concern. As Martin discovered, few elected officials are aware that all screening of newborns in the US for heritable and congenital disorders is either performed or coordinated by state public health laboratories (SPHLs).

“The equipment and the expertise are so expensive,” he said, “it’s almost always done as a high-through-put, single-site operation.” Thus when Louisiana scientists unexpectedly lost access to the New Orleans laboratory, Martin said, “We lost 100 percent of our NBS capacity.”

Authorities recognize, however, that continuity of NBS should not depend upon luck. Thus, APHL’s Newborn Screening and Genetics in Public Health Committee has spent the last 15 months outlining the necessary elements of an emergency NBS contingency plan, sometimes also called a continuity of operations plan, and educating state NBS programs and vendors about the need to implement such a plan. Key elements include:

- Forward-stocking of testing reagents and supplies by individual NBS testing laboratories and by manufacturers.
- State-specific plans to continue NBS on-site (e.g., back-up electrical generators, alternate water sources and alternate plans for specimen collection and transport).
- Back-up plans for follow-up services for infants who are diagnosed with a NBS disorder.
- Regional and inter-regional burden-sharing agreements among states so that alternative public or private laboratories are identified in advance.
- Method harmonization so that the results obtained for any one test are comparable among all the states involved in a burden-sharing agreement.

Few elected officials are aware that all screening of newborns in the US for heritable and congenital disorders is either performed or coordinated by state public health laboratories.
Water Quality Should Be Treated as Public Health, Safety Issue

Since the attacks of September 11, 2001, the US Department of Homeland Security (DHS) has encouraged drinking water systems to treat any source water breaches as terrorist activity until the consequences of the breach can be confirmed. Drinking water facilities should have accurate response and testing systems since they are potential terror targets, and water quality is a vital public health and safety issue. Interruption or cessation of a drinking water supply can disrupt a city’s infrastructure, impacting human health and critical activities such as fire protection. Reservoirs and wells are sometimes easily accessed; so many cities and municipalities are looking into improved security measures. It is not difficult to find examples of recent threats.

In September 2006, a five million gallon reservoir in Eugene, OR, was drained after officials found signs of possible water contamination. Alerted by a detection system, officials reported the security breach to the police, who wouldn’t respond unless an intrusion could be verified. Technicians found that someone had removed a lock from the reservoir’s roof and gained access. Locks on an interior chain-link gate and a door to the catacombs also were missing. Officials immediately isolated the reservoir from the utility’s larger water distribution system and took test samples. Normal sampling points showed no signs of contamination, but two surface samples showed low levels of E. coli bacteria. It was unclear whether the contamination was related to the break-in. As a precaution, officials drained, disinfected and retested the reservoir before returning it to service.

A New Castle, IN, water well was also shut down, after locks on a gate and control box were cut. Local investigators treated the incident as a terrorist threat, since the source of the breach was unknown. Fortunately, tests showed no contamination in the well. Officials believe copper theft was the motive for the break-in. Because the city does not run all its wells at the same time, the shut-down did not interrupt water service to residents.

Colorado’s Effort to Develop an Early Warning System

Water is most vulnerable to pollutants or attack after it leaves the treatment plant for distribution. To address security gaps, Colorado State University (CSU) engineering researchers and a California-based company, ST-Infonox, are testing an early warning security system designed to alert utility officials when major pollutants are detected in water supplies. Researchers are currently testing the SCOPEH2O system in municipal water system laboratories in Loveland and Ft. Collins. Ken Carlson, a CSU civil engineering professor, says their methods for simulating intentional contamination events are unusual: there are only a small number of laboratories in the country with the capability. The team believes their work on this real-time monitoring system will eventually help the rest of the nation protect its water resources, particularly drinking water, from potential terrorist or natural threats in a cost-effective way.

EPA Efforts to Protect Our Water

Significant actions are underway by EPA to assess and reduce vulnerabilities to terrorist attacks, to plan for and practice response to emergencies and incidents and to develop new security technologies to detect and monitor contaminants and prevent security breaches.

The Water Information Sharing and Analysis Center (WaterISAC) is a secure, rapid threat-notification system that monitors drinking water and wastewater supplies/systems across the nation. An online tool available to subscribing utility companies, WaterISAC provides a unique link between the water sector and federal environmental, homeland security, law enforcement, intelligence and public health agency laboratories. WaterISAC provides utilities with current laboratory information and access to tools for analyzing incident reports, identifying and assessing threats and taking corrective action. Subscribing utilities receive early warning of physical contamination and cyber threats, enabling them to protect their consumers and the environment. See www.waterisac.org for more information.

The EPA is developing a program called Water Security Contamination Warning System (formerly known as Water Sentinel); APHL member James Pearson, DrPH, of Virginia’s Division of Consolidated Laboratory Services, serves on the executive committee. The pilot warning system is currently being tested in a Cincinnati laboratory. EPA’s Water Security Division is also working closely with APHL environmental laboratories to develop a drinking water laboratory preparedness project. EPA sought input on its project template from environmental laboratories in the fall of 2006; the agency will conduct regional laboratory exercises throughout the country in 2007.

EPA and DHS are in the early stages of developing a report on the risks of water utility terrorist attacks. Expected in 2007, the report will focus on helping drinking water and wastewater utilities understand and mitigate the risks posed by a chemical, biological or nuclear attack on their systems, while also helping channel research funds. EPA Assistant Administrator for Water Benjamin Grumbles spoke at the American Water Works Association Water Security Congress in Washington, DC, where he told conference participants to look at worst-case scenarios since the risk is significant.

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Conference on Environmental Sampling for Bio-Threat Agents

In October 2006, the Department of Defense (DoD), Department of Health and Human Services (HHS), Department of Homeland Security (DHS) and the EPA sponsored the second annual National Conference on Environmental Sampling and Detection for Bio-Threat Agents. Held in New York City, the conference attracted more than 450 scientists, first responders, administrators, vendors and policy makers. Participants convened for three days to address critical issues in environmental sampling through focused presentations, discussion and exhibits. APHL member Anthony Sambol, MA, and staff Chris Mangal, MPH, represented the association; several other association members, including Emergency Preparedness and Response Committee members Andrew Cannons, PhD, Denise Pettit, PhD, and Maureen Sullivan, MPH, were in attendance. Topics included sampling for biological agents, sample preparation technologies, standards development and bio-detection advancements. (To review a complete list of the sessions, see www.sampling-conference.com/.) At the close of the conference, participants were offered a special tour of Ground Zero. Highlights of the conference are described below.

**Standardization: A Priority for All**

Delivering the keynote address, Douglas Bryce, the DOD’s deputy joint program executive officer for chemical and biological defense, analyzed the main challenges for environmental sampling. Bryce believes the lack of consensus—on sampling methods and standards, as well as on a rapid method to determine viability of agents—is the critical problem in the field. The standardization of universal sample collection methods must be a priority for all agencies and partners.

**Development of National Standard for Collecting Suspicious Powders**

Laurie Locascio, PhD, from the National Institute of Standards and Technology, described the development and validation of a new standard to collect visible powders that are suspected biological agents from nonporous surfaces. E2458-06 Standard Practices for Bulk Sample Collection and Swab Sample Collection of Visible Powders Suspected of Being Biological Agents from Nonporous Surfaces was developed by a DHS-organized task group that represented several federal agencies and stakeholders. The standard is divided into two parts: Sample Collection Method A – Bulk Sample Collection and Sample Collection Method B – Swab Sample Collection for on-site analysis. The standard was successfully validated in a study conducted by Dugway Proving Ground under the direction of Bruce Harper. The standard was then adopted by two independent standard development organizations: the American Society for Testing and Materials and the Association of Official Analytical Chemists International.

There was heated debate on the validity of this standard. Many public health laboratorians were concerned about the inclusion of field screening in Method B, which differs from current HHS recommendations. Locascio noted that this is a first attempt at developing a standard; conference participants could submit comments and recommendations to her in writing.

**Era of Environmental Biomonitoring for Threat Agents**

CDC’s Richard Meyer, PhD, and Pamela Diaz, MD, discussed the biothreat environmental monitoring systems in use in the United States. Many of these systems were designed to detect intentional releases. However, after years of use, it is clear that they also detect low levels of naturally occurring enzootic organisms in the environment. Diaz and Meyer stressed that local public health officials must consider all elements, including interpreting positive bio-monitoring signals, before making public health decisions.

There are numerous vendors promoting field screening devices for the detection of chemical and biological agents. Many of these devices have not been validated; as such, implementation and consequence management plans are not in place. DHS and CDC are in the early stages of exploring the development of public health actionable assays—an evaluated, high confidence assay that has been independently validated. A positive result from such an assay would generate an immediate response from the public health community.

**Environmental Sampling and Data Interpretation**

Max Kiefer, from CDC’s National Institute of Occupational Safety and Health, hosted an interactive session on how environmental sampling could drive decisions in a terrorism event. He noted that, during an emergency, large numbers of samples could delay important communication. He also discussed the use of targeted versus characterization sampling in terrorism events.

Conference participants acknowledged that significant gaps in environmental sampling standards still persist. First responders re-emphasized that the lack of federal-level guidance hinders response. Public health and environmental laboratorians are calling for the federal government—specifically, the DHS Standards Portfolio—to develop standards for sample collection and to establish validation guidelines for all commercially-developed screening kits and devices for use in the field to detect hazardous biological and chemical agents.
Wyoming PH and DoD Labs Build LRN Relationships

Strong relationships among public health and sentinel laboratories help form a foundation for successful preparedness planning and emergency response. Sentinel laboratories play a critical role in the Laboratory Response Network (LRN), so it has proven vital that public health laboratories engage these partners through training exercises and healthy lines of communication.

In recognition of the importance of these relationships, the CDC’s Public Health Emergency Preparedness Cooperative Agreement requires its public health laboratory grantees to engage non-confirmatory laboratories—commercial, hospital and Department of Defense (DoD)—in sentinel training activities. In Wyoming, the F. E. Warren Air Force Base laboratory performs routine testing, bacteriology and PCR and is part of the state’s Sentinel Laboratory Network. The Air Force laboratory utilizes grant money for education programs, reference materials and support for its shipping and handling requirements.

As a funding recipient, the Air Force laboratory participates in Wyoming’s Grand Rounds testing—a program that evaluates sentinel laboratories’ ability to rule out or refer agents of bioterrorism. The bioterrorism program at the Wyoming state public health laboratory ships mimic organisms to participating labs to simulate a bioterrorism event. The F. E. Warren laboratory staff have been successful in these exercises. In future training events, the Wyoming public health laboratory intends to use a scenario that will require the base laboratory to involve its HazMat Unit.

APHL encourages LRN public health laboratories to reach out to local reference and sentinel laboratories when conducting training and proficiency testing programs.

Position Statement on Validation of Field Testing Kits, Devices

In November, APHL’s Board of Directors approved—for interim use—a position statement, Standardized Validation of Screening Kits and Devices for Use in the Field to Identify Hazardous Biological and Chemical Agents, developed by the Emergency Preparedness and Response (EPR) Committee. The position statement is consistent with current guidance from the Department of Health and Human Services (HHS), which recommends against field testing for biological agents. However, the EPR Committee expanded on this recommendation, stating strong opposition to the use of biological and chemical agent detection kits and devices for field testing in the absence of performance standardization, field validation and certified operators.

Analytical results obtained in the field without appropriate device validation and performance training can yield false positive or negative results. Such data can be dangerously misleading and may delay appropriate public health responses. Additionally, failure to conduct field testing correctly, using standardized protocols prescribed by the validation process, may result in depletion of available sample material with consequential losses of criminal evidence and the ability to conduct appropriate confirmatory analytical testing that is essential. In the absence of standardized and validated field kits and devices, public health laboratories must be contacted for confirmatory testing or guidance.

The committee made specific implementation recommendations, including that the Department of Homeland Security’s (DHS) Standards Portfolio establish comprehensive guidelines for performance standardization and validation of commercially-developed screening kits and devices, as well as standards to assure adequate training. When a screening kit or device meets these standard parameters for validation and training, it should be placed on a federally-approved list. The committee further recommended that DHS collaborate with LRN reference laboratories during the validation process; all field-testing results from credible threats should be confirmed at the nearest LRN reference laboratory to guide state and local public health action. Additional recommendations focused on the need for DHS, through partnerships with other organizations, to develop and implement a training, certification and proficiency testing program for first responders.

Prior to board approval, the position statement was shared with APHL members for review and comment. All comments were reviewed by the EPR Committee and incorporated where feasible. Next, APHL’s voting membership will be asked to review and approve the statement. Pending this approval, the position statement can be shared as “APHL Board Approved for Interim Use” with the first responder communities and commercial manufacturers in each state.

For more information, contact APHL’s emergency preparedness and response program manager, Chris Mangal, at chris.mangal@aphl.org or 240.485.2769.
A CDC team visited China for two weeks to launch a three-year project that aims to strengthen the Chinese CDC public health laboratory system. Due to the SARS epidemic, China reorganized its Disease Institutes in 2003 and established the Chinese CDC with a mandate to strengthen disease surveillance and control. Since then, China has invested significantly in public health laboratory infrastructure, gaining new health center facilities with dedicated laboratory space, personnel and equipment. However, challenges still exist: the Chinese CDC needs to develop a strong laboratory network for disease surveillance and improve its quality management systems.

APHL members and staff joined Tom Hearn, acting director of CDC’s Division of Laboratory Systems, to form a six person team. Pairing off in the first week, the team managed to visit three provinces—Jiangsu, Hubei and Shanxi—to observe current laboratory practices. Reconvening, the American team worked with Chinese CDC officials to formulate ideas that will strengthen the lab network, improve quality assurance and safety and develop the sensitivity and accuracy of the laboratory-based surveillance.

The team concluded that the Chinese CDC needs a comprehensive strategic plan to address some significant gaps. In particular, Chinese officials must develop a financial plan to support operational expenses; they should also consolidate laboratory capacity in areas where multiple political jurisdictions—such as province, city and district—co-exist. Although the laboratories currently lack a laboratory information management system that integrates with the national case reporting system, an effort to implement one is underway.

Currently most clinical case reports are not confirmed by laboratory tests, thus limiting the accuracy of prevalence and incidence rates. Most laboratories receive a low specimen volume per capita due to multiple factors: the current financing of infectious disease testing services, a lack of relationships among levels of China CDC laboratories and hospital laboratories and inadequate protocol for routine laboratory-based disease surveillance. Increasing public health laboratory specimen testing through medical submissions would provide:

- Earlier detection of outbreaks and new or re-emerging diseases
- Adequate baseline test data to improve the interpretation of trends and detect exceptional events
- Improved proficiency of laboratory personnel, and stronger capacity of laboratories to respond to events

The overall quality management system needs an overhaul, focusing upon improved quality control and EQA procedures; a personnel training plan; dedicated funding for essential testing supplies, EQA systems, safety equipment and training; and assignment of quality managers at all levels of the laboratory system.

Over the three-year project timeframe, the US CDC team will work with their counterparts in the Chinese CDC to develop a strategic plan for laboratory surveillance of infectious disease; provide training for laboratory quality management to laboratory leaders and policy makers; strengthen quality standards of infectious disease laboratories; and facilitate increased capacity for detecting priority infectious diseases.
ID Committee Tackles Priority Issues

A

PHL's Infectious Diseases (ID) Committee, chaired by Barbara Werner, PhD, convened in December to continue working on issues prioritized by its strategic plan. This year the committee is focusing on:

- Providing expertise to assure quality of infectious diseases testing performed in public health laboratories and within the public health laboratory jurisdiction
- Developing a systematic strategy/process for monitoring and evaluating new technologies
- Developing and maintaining relationships with commercial, private and hospital labs
- Identifying and prioritizing needs in public health laboratory practice
- Addressing gaps

Comprehensive Quality Systems and Practices

To advance the development and use of comprehensive quality systems and practices at public health laboratories, APHL's board asked the ID Committee to develop relevant performance metrics for Epidemiology and Laboratory Capacity (ELC) grant that will provide data to underscore the need for sustained funding. To this end, the committee consulted with Shari Rolando, APHL's senior manager for food safety, to study the progress of the Food Safety Committee's Yardstick Taskforce: a group created to update and recommend new national guidelines for state laboratory food safety capacity. Next, the ID Committee will gather outcome measures developed by state public health laboratories for the 2007 ELC grant, focusing on metrics for West Nile, antimicrobial resistance and influenza.

Staying Connected with CDC

Michele Owen, PhD, acting associate director of laboratory science for CDC's National Center for HIV, Hepatitis, STD and TB Prevention (NCHHSTP), updated the committee on current center activities and news. Hepatitis funding will not be included in the next ELC grant, but will have a separate funding stream. Also, NCHHSTP representatives have conducted site visits to state public health laboratories to increase program integration within the center.

The ID Committee also discussed current issues with Jan Nicholson, PhD, senior advisor for laboratory science at the Coordinating Center for Infectious Diseases. The committee is concerned with a US Postal Service (USPS) interim rule revising mailing standards and packaging requirements for Division 6.2 infectious substances. Nicholson stated that CDC and HHS representatives have met with USPS officials to discuss the ruling and have commented on the potential impact on public health surveillance across the country. To help APHL member laboratories understand the changes, APHL's National Laboratory Training Network held a teleconference in January with Patricia Payne, PhD. Payne provided a brief review of the new USPS Interim Final Rule and compared USPS, IATA and DOT regulations for air transport.

The ID Committee discussed a number of other laboratory issues, such as upcoming advocacy efforts, extensively drug resistant tuberculosis (XDR-TB) and the need for laboratorians to use online communication tools, such as the molecular diagnostics Web board and the microbiology list-serv. The committee continues to address all of the board priorities, as well as other issues critical to infectious diseases testing. For more information, contact Patricia Blevins, MPH, patricia.blevins@aphl.org, 240.485.2749.

Syphilis Screening in Low Prevalence Settings

Traditionally, serum specimens to be tested for syphilis have been screened with an inexpensive, but sensitive, nontreponemal test such as the Rapid Plasma Reagin (RPR) or Venereal Disease Research Laboratory (VDRL) test. Unfortunately these tests lack specificity since they detect heterophile antibodies and those sera initially found to be reactive need to be confirmed with a more specific (and expensive) treponemal test such as the fluorescent treponemal antibody absorbed (FTA-ABS) or Treponema pallidum particle agglutination (TPPA) test. This approach, which is based on sound scientific principles, continues to be applied slavishly despite considerable changes both in the prevalence of disease in most developed countries and the development of newer test technologies.

When this testing algorithm was first introduced, labor costs were relatively low and the cost of treponemal tests relatively high, which justified this approach to syphilis testing solely on financial grounds. However, in the United States as elsewhere in the industrialized world, personnel costs have increased dramatically. During the 1980s, enzyme immunoassays (EIAs) were developed for a number of infectious diseases, including syphilis. Since these syphilis EIAs were treponemal tests, they were originally used as confirmatory tests, and in some cases as initial screening tests—particularly in high-volume laboratories that were able to automate the testing procedures.

Since 1995, four EIA tests have been approved for use by the FDA and the manufacturers have often marketed their

Continued on page 13
By Berry Bennett, MPH—Retrovirology Section Chief, Florida Bureau of Laboratories

In recent years, the collaborations among APHL, CDC, FDA, diagnostic manufacturers and others have resulted in improvements to laboratory-based HIV diagnostic assays. The primary focus was to increase performance of the assays in detecting the different groups of HIV-1 (M, N & O) as well as HIV-2. In addition, several manufacturers are striving to increase sensitivity and specificity of their assays as recognition of the importance of detecting acute HIV infections and novel diagnostic algorithms grows.

In May 2006, the ADVIA Centaur HIV 1/O/2 Enhanced assay was approved by the FDA for diagnostic use. It is not approved for screening blood and plasma donors or pooled specimens. The assay is an in vitro diagnostic immunoassay for the qualitative determination of antibodies to HIV-1, including Group O and/or HIV-2 in individual serum or plasma specimens using the ADVIA Centaur System. The assay is an antigen bridging microparticle chemiluminesometric immunoassay. This assay incorporates recombinant antigens of HIV-1 envelope (gp41/120), an HIV-1 core protein (p24), an HIV-2 envelope protein (gp36) and a synthetic peptide to detect antibodies to HIV-1 Group O. The HIV-1/O/2 antibody activity present in the specimen is measured by relative light units (RLUs) detected by the Centaur System. Repeatedly reactive results should be followed up with appropriate supplemental tests for HIV-1 and HIV-2. The assay is considered to be a “third generation” screening assay with an expected increase in sensitivity and specificity over that of viral lysate assays. Bayer HealthCare Diagnostic Division is the manufacturer of the assay and testing system.

In October 2006, the APTIMA HIV-1 RNA qualitative assay was approved by the FDA to aid in the diagnosis of an acute or primary HIV-1 infection, as well as an additional test, when it is reactive, to confirm HIV-1 infection in an individual whose specimen is repeatedly reactive by a screening method. A review of the package insert indicates that it is not a Western blot or Immunofluorescent antibody (IFA) assay replacement choice for all applications. Also, this assay is not intended for use with screening blood or plasma donors. The APTIMA HIV-1 RNA qualitative assay is an in vitro nucleic acid amplification test (NAAT) for the detection of HIV-1 in human plasma. The assay involves three main steps: sample preparation, HIV-1 RNA target amplification by Transcription-Mediated Amplification (TMA) and detection of the amplified products by the Hybridization Protection Assay (HPA). Gen-Probe Inc. is the manufacturer of the assay and testing system.

Syphilis Screening

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tests for screening applications. This has caused some confusion in the laboratory community that has previously adhered strictly to the “nontreponemal screen, treponemal confirm” routine.

There is no doubt that screening with a treponemal EIA can prove cost-effective, particularly in a situation where the disease is uncommon. However, this approach raises more important issues: the treponemal tests, unlike the nontreponemal ones, tend to remain reactive for life, even after adequate treatment for the disease. As a result, a quantitative nontreponemal test should be performed in all cases where a screening treponemal test has proved reactive, in order to distinguish between recent and old, treated infections.

In order to determine the most appropriate screening algorithm for an individual laboratory, the following in-house statistics should be obtained:

- The total number of syphilis tests performed.
- The proportion of positive nontreponemal tests.
- The proportion of positive treponemal tests.
- The total cost per nontreponemal test performed.
- The total cost per treponemal test performed.

- The costs incurred to perform testing on 1,000 specimens using the alternative algorithms.

In many developing countries, where syphilis is extremely common and the disease has been endemic for many years, the “old” algorithm should remain cost-effective, but in the majority of settings in the United States the new algorithm is more appropriate. However, it should be remembered that only significant (four-fold) changes in titer detected between nontreponemal tests performed on paired serum samples can be used to determine the efficacy of treatment or to indicate re-infection.
Taskforce Devises Guidelines for Food Safety Laboratory Capacity

The Yardstick Taskforce, a Food Safety Committee subgroup, convened in November to update and recommend national guidelines for state laboratory food safety capacity. The project arose out of a need to provide laboratories with a measure of performance that accounts for growth. Performance measures that focus on lab capabilities at a single point in time quickly become obsolete.

Taskforce participants include Billie Ann Junie, MS (MN); Victor Waddell, PhD (AZ); Denise Toney, PhD (VA); Timothy Monson, MS (WI); John Fontana, PhD (CT); Sun Kim (FL); Delores Willis (MD); and Lori Smith (UT). At the recommendation of the Council to Improve Foodborne Outbreak Response (CIFOR), APHL invited epidemiologist Pamela Jenkins, PhD (NC), to join the taskforce. CIFOR intends to harmonize metrics from its own performance indicator project with the Yardstick laboratory guidelines; epidemiologist Craig Hedberg, PhD (MN), the CIFOR performance indicator project lead, also joined the Yardstick taskforce to create continuity between the two projects.

The recent meeting was facilitated by Richard Skibicki, public health advisor in the CDC Food Safety Office.

The group decided to format the food safety laboratory guidelines into a self-assessment tool. The tool will emphasize communication among public health labs, epidemiologists, federal agencies, environmental health practitioners and agricultural labs, and will accommodate multiple users. The Yardstick taskforce will continue to identify and define the food safety laboratory “gold standard,” taking into account the growth of laboratories, new technologies, laboratory demographics, turn around times and laboratory capacity during times of routine surveillance and outbreak investigation. Laboratories will be able to use the self-assessment tool to evaluate their ability to do food safety testing based on their administration, facilities and equipment, personnel, testing methods, data analysis and reporting procedures, and identify areas that need improvement. The self-assessment may become useful in advocating for increased food safety support from national and state legislatures.

Laborators Attend Epi-Ready Training

APHL remains committed to increasing cooperation between state and local laboratories and epidemiologists. To underscore that commitment, APHL provides four travel scholarships each year, enabling laboratories to attend Epi-Ready Team Training. Epi-Ready, a collaborative effort between CDC and the National Environmental Health Association, is a national initiative that brings together local teams of laboratories, epidemiologists and sanitarians to improve foodborne outbreak response.

APHL gave two scholarships this year to Rossina Stefanova, PhD (AR), and Nicole Clarke, MPH (DC), to attend the workshop, which was held in conjunction with the USDA/National Science Foundation Food Safety and Education conference. This Epi-Ready workshop was unique in that individuals were able to register without a team. Stefanova and Clarke found the course “helpful” and “relevant to laboratories.” Clarke added, “I learned a great deal from the course and brought back many ideas that I can apply to my current projects and routine.”

The 2007 schedule of Epi-Ready Team Training workshops is available at www.neha.org/research/food_safety.htm l#train_schedule. Contact Heather Green, APHL’s food safety program manager, heather.green@aphl.org, 240.485.2759, with questions about travel scholarships.

Congressional Staff Visits APHL Food Safety Committee

During the Food Safety Committee’s annual meeting, congressional staff members Dora Hughes, MD, MPH, and Sirat Attapit, MPH, visited the group from the offices of Senators Barack Obama (D-IL) and Richard Durbin (D-IL), respectively. John Besser, MS, gave a presentation on foodborne illness surveillance and the role of public health laboratories and PulseNet. The committee fielded questions from Hughes and Attapit about the timeline of the September 2006 E. coli outbreak in bagged spinach, as well as their reaction to the recent Senate hearing on the outbreak. The committee agreed that coordination between health departments could be improved and that the traceback and identification process could be faster. However, they stressed that laboratories need greater resources to expedite the investigative process. The committee will address the outbreak timeline issues in a future position statement.

Senator Durbin—along with Rep. Rosa DeLauro (D-CT)—is a proponent of creating one combined food safety agency, and Attapit asked the committee to comment on this idea. Members of the committee reflected that it may or may not be a positive change, but that the initial years after the agency’s creation are likely to contain more problems than solutions. The meeting concluded on a positive note when Hughes commented that APHL is rising in prominence and visibility and will certainly be looked to by Congress for commentary on future public health issues.
There are more than 100 LOINC property options alone, with scientists needing to differentiate between “fraction” and “ratio,” for example, or between “number fraction” (e.g., % eosinophils) and “substance fraction” (e.g., % HBG). Many LOINC components have subanalytes or even subclasses. Davisson said even when laboratories routinely use LOINC codes, they may not define all six fields. “I don’t think there are any labs that are 100 percent LOINC-SNOMED coded,” he said.

Thus, an important adjunct to the two phases of PHLIP dealing with data transmission is a vocabulary harmonization project that will map laboratory test methods and test results to appropriate LOINC and SNOMED codes for all national notifiable diseases—those diseases that must be reported to the CDC because of their potential impact on public health. Going one step further, the harmonization workgroup will also devise HL7 implementation guidelines for this set of diseases.

Ultimately, PHLIP aims to produce a reference set of LOINC and SNOMED codes that correspond to a standard panel of public health laboratory tests.

Although the communications revolution may seem to have suddenly materialized in the public health laboratory, Steve Hinrichs, head of the Nebraska Public Health Laboratory (NPHL) and a long-time proponent of ELR, noted that recent developments are not an “overnight wonder.” APHL, he said “has been working for a number of years to set the stage for these successes.”

As far back as the late 1990s, APHL established an information management committee began to review the IT needs of public health laboratories. In 2002, the association partnered with the Public Health Informatics Institute—in a project underwritten by the Robert Wood Johnson Foundation—to create a list of specifications and a software blueprint that could be adapted by any public health laboratory designing an in-house laboratory information management system (LIMS). [While HL7 defines the layout for a message, and XML describes the message content, a LIMS is the tool used to create and send such messages and to receive and process them.]

This project detailed the many functions that a LIMS must carry out to manage the business activities of a public health laboratory and provided a schema showing how the pieces fit together. Through PHLIP, APHL and CDC have now organized LIMS user groups to establish a base set of LIMS requirements for vocabulary and messaging standards.

All of this work was given new impetus when Mike Leavitt became secretary of the U.S. Department of Health and Human Services in 2005 and declared health IT a top priority. Leavitt, who has described avian influenza as the most serious threat to U.S. security, initiated the American Health Information Community (AHIC), a federal advisory committee tasked with making recommendations on health IT standards and policies.

Leavitt’s office appointed Hinrichs to the AHIC Biosurveillance Data Steering Group and APHL Executive Director Scott Becker to the AHIC Biosurveillance Workgroup.

Said Hinrich’s, “From a national vantage point, it’s clear that PHLIP will contribute directly to a nationwide health information network that includes laboratory test data.”

Building the infrastructure for ELR in hundreds of laboratories across the country, though, will be a costly undertaking. Minnesota’s Jones said, “If you want to set up a system that’s going to be a permanent part of disease reporting it takes a long-term commitment . . . (with) new dollars, and not one-time dollars.”

Some experts have suggested that funding currently subsidizing syndromic surveillance—surveillance of health-related data that precedes a laboratory-confirmed diagnosis—might be better spent on ELR. According to this view, spikes in certain patient symptoms may represent nothing more than statistical anomalies of little public health significance, whereas a laboratory report yields definitive data.

The MPHL funds its informatics program through a combination of state revenue, federal bioterrorism grant funds and designated CDC funding available to states participating in the PHLIP pilot. Funding, said Jones, “is always a huge challenge, because more sophisticated systems, they’re expensive, and it takes people with a very high skill set to be able to use some of the new (computer) tools.”

The Washington State informatics program is funded through the federal Epidemiology and Laboratory Capacity Grant, Public Health Emergency Preparedness Grant, Environmental Public Health Tracking grant and general state revenues. Davisson said he is concerned about the basis for this funding.

Once it is institutionalized, the payback from ELR is likely to be significant. Electronic reporting would allow data to be entered once and used many times, thereby reducing errors and speeding analysis. Overall, said Jones, “It’s easier from a surveillance standpoint to understand what kind of disease or outbreaks might be occurring (using ELR). It requires less human intervention to
interpret the data, so you can respond much more quickly.”

In terms of savings, Jones said, “I think when you look at the spinach outbreak—how many people got sick because it took days or weeks to respond instead of hours—you’re trying to measure the cost-savings by how many people did not get sick. We don’t always estimate that; the cost in the medical care system, lost days of work. When you start adding up all these costs, it doesn’t take much to see that these systems have a huge cost-savings. In the spinach outbreak people died, and that’s a tough one to measure.”

Virginia Sturmfels, who oversees public health reporting at Quest Diagnostics, said Quest welcomes the implementation of ELR in public health. “At times,” she said, “we actually put a hold on things because the public health labs, and maybe even the state labs, are not as advanced as we are.”

What are the benefits of ELR for commercial labs? According to Sturmfels, “We see it as speeding up what normally would have been a more manual procedure of producing paper copies and having to segregate that to different (public health) agencies. One Quest Diagnostics lab would cover more than one state. There are costs involved to do the mailing. And certainly in this day and age, that’s probably not the safest way of sending public health information.”

But thanks in part to PHLIP, the world is turning. And for public health laboratories, the on ramp to the information highway lies within sight.

**Correction**

In last issue’s feature article, “From Spinach Suspicion to Salinas Cows: How PulseNet Broke the E. coli Investigation,” a quote incorrectly referred to the FDA Seattle District Lab. The correct name of the laboratory is the Pacific Regional Laboratory Northwest of the FDA located in Bothell, WA. APHL apologizes for any confusion.

**A National Perspective**

The APHL-CDC Public Health Laboratory Interoperability Project contributes directly to federal health information technology (IT) goals.

Federal interest in health IT was renewed in 2004 when President George Bush said he hoped to make digital health records available to most Americans by 2014. In September 2005, US Department of Health and Human Services Secretary Mike Leavitt established the American Health Information Community (AHIC) to make recommendations to achieve that target as well as related health IT objectives.

AHIC, in turn, developed three use cases—biosurveillance, consumer empowerment and electronic health records—to focus the work of government contractors enlisted to work on standard harmonization, health IT certification and the development of processes essential for a nationwide health information network (NHIN).

Among the partners engaged in this work are the:

- **Health Information Technology Standards Panel (HITSP)**—a group sponsored by the American National Standards Institute (ANSI) and other strategic stakeholders to develop standards to support widespread interoperability among healthcare software applications.

- **Certification Commission for Healthcare Information Technology (CCHIT)**—a voluntary private-sector organization established by three leading health IT industry associations to certify health IT products.

- **Health Information Security and Privacy Collaboration (HISPC)**—a group established by Research Triangle Institute International and the National Governor’s Association to assess how organizational business policies and state laws regarding privacy and security affect health information exchange on a national level.

- **Four consortia of healthcare and health IT organizations** awarded more than $18 million to develop prototypes for a NHIN architecture.

- **State governments** engaged in state-level health information exchange initiatives.
Fellows

Fellowship Placements Often Take Permanent Turn

APHL’s EID Laboratory Fellowship Program is fulfilling its mission of building the public health laboratory workforce, as fellows continue to accept permanent job offers from their host laboratories.

Kari Belin will remain at the Virginia Division of Consolidated Laboratory Services, working with the emergency preparedness and response team in the molecular laboratory. On her first day of employment, she presented the poster “Real-Time Polymerase Chain Reaction Analysis of Environmental Air Filters for Biothreat Agent Detection” at the Virginia Branch American Society for Microbiology meeting, which is based on her fellowship work.

Peter Davidson accepted a full-time position at the Michigan Department of Community Health Bureau of Epidemiology. Davidson is the coordinator of the state tuberculosis control program.

During her fellowship at CDC’s Division of Bacterial and Mycotic Diseases, Julie Anderton collaborated with the Austrian firm Intercell AG. The company has hired Anderton to continue her research at the CDC laboratory.

Scott Shone accepted a position as a research scientist at the New Jersey Department of Health and Senior Services.

Following completion of her two-year, post-doc fellowship, Angela Fritzinger has become a senior scientist in the molecular group at the Virginia Division of Consolidated Laboratory Services.

Lisa Steele accepted an ORISE fellowship in CDC’s National Center for HIV, Hepatitis, STD and TB Prevention. Steele will provide support and training to STD surveillance programs abroad.

As a result of a collaborative proteomics project between the immunology section of CDC’s Coordinating Center for Infectious Disease and the National Center for Environmental Health (NCEH), Yulanda Willamson accepted a permanent position in a NCEH laboratory at CDC. Willamson will be working on the development of methodologies to detect microbial toxins and the identification and isolation of proteins in microorganisms.

Rebecca Garten accepted a position as an associate service fellow in the influenza branch at CDC. Garten will be working on the phylogenetic analysis of seasonal influenza for vaccine recommendations and integrating epidemiologic, genetic and antigenic data on seasonal influenza.

APHL congratulates these fellows who continue to make important contributions to the field of public health laboratory testing and research.

2007 Fellowship Program Deadlines

APHL is now accepting applications for the 2007 EID Fellowship Program! The application deadline for APHL member local, state and federal public health laboratories interested in hosting a fellow for the 2007 EID Laboratory Fellowship Program is March 1, 2007. The application and instructions can be found at www.aphlorc.org/host-labapplication. The application deadline for prospective fellows is February 16, 2007. For more information, contact Heather Roney at 240.485.2778, fellowships@aphl.org.

EID fellows and staff from the University of Iowa Hygienic Laboratory attend a “Disease Detectives” conference at an Iowa high school. Pictured l-r are: Victoria Ulrich, Rebecca Anderson, Beth Hochstedler, Brad Changstrom and Jennifer Boddicker.
Molecular diagnostics expert Daphne Ware, PhD, and South Central Center for Public Health Preparedness impact intern Timothy Lockhart helped Marshall develop “Pandemic Influenza: A Tabletop Exercise for Labo- ratorians.” Ware gave a presentation to the class on the history, epidemiology and implica-
tions of a novel pandemic for the clinical laboratory. Following the lecture, a tabletop exercise focused on planning and preparedness, the World Health Organization Alert & Pandemic Phases and recovery with a “hotwash” of the lessons learned during the exercise.

In the tabletop scenario, a microbiology supervisor and her co-workers experience all of the phases of a novel avian influenza pandemic. At the end of each section, prepared questions stimulate discussion. Class participants hailed from hospitals, government and military labs, veterinary labs, private reference labs and blood centers, reflecting a cross-section of the clinical laboratory community. The level of pandemic planning at these facilities varied widely: some had only discussed a plan, others had written one and some had exercised their plan.

One participant observed, “The group work was excellent; it helped me with the thought process of what to do.” Of key concern is the need to have a written plan for the laboratory and to participate in the hospital’s separate planning process. Labs should also conduct a risk assessment to determine if the facility meets minimum biosafety level recommendations for testing. Other proposed biosafety preparations include educating staff on biosafety precautions and ensuring that PPE inventories are well-stocked. The groups also discussed ways to alleviate personnel shortages and develop staff support plans for child care in the event of school closures.

Two representatives of the veterinarian community stated that they need to be involved in pandemic influenza response planning both locally and nationally. Veterinarians see a need to increase public awareness about the spread of avian influenza strains within poultry and the ongoing surveillance of influenza within poultry and wild birds. Also, the veterinarian community believes that they should be a high priority H5N1 vaccination population since they are at significant risk for infection. Both representatives agreed that participating in the tabletop exercise was an important first step toward addressing these concerns.

With assistance from the National Laboratory Training Network’s Nashville office, the workshops were a success, with 121 participants trained in three cities in November. Several states are interested in using Mississippi’s tabletop as a template to design similar exercises. For details, contact Regina Marshall, regina.marshall@msdh.state.ms.us.

**NLTN Brings State Training Coordinators Together**

The National Laboratory Training Network (NLTN) sponsored four regional meetings in 2006 for state laboratory training, bioterrorism and chemical terrorism coordinators.

- Twelve states participated at the midwest regional meeting in Chicago, IL. Presentations covered new packaging/shipping guidelines and how to develop an online training course.
- Thirteen states met at the northeast regional meeting in Port Jefferson, NY, to discuss emergency preparedness competencies, biosafety and biosecurity best practices and packaging and shipping.
- Twenty-eight attendees met at the southeast regional meeting in Charleston, WV, to discuss a real-time simulation exercise of a bioterrorism event in Georgia and the development of online courses in Mississippi.
- Thirty-five participants represented 12 states at the Pacific regional meeting in Reno, NV. Highlights included a keynote address by Elliott Masie, an internationally-known analyst and researcher, on the topics of learning, technology, business and workplace productivity. State training coordinators discussed innovative training methods, including the use of slides viewable online to simulate wet workshops and an exercise to plan for after-hours specimen transport.

**2007 National Training Conference**

Sponsored by the NLTN and CDC, the National Laboratory Training Conference IV will be held April 30-May 2, 2007, in San Antonio, TX. Participants will be able to network, identify similar challenges, and share solutions, and collaborate to maximize resources. Increasingly, separate laboratory programs need to work together to meet training and readiness demands, so state public health laboratory directors, and bioterrorism and chemical terrorism coordinators are also invited. Travel expenses for one state training coordinator from each state will be paid through a grant from CDC.
Th e September 2006 Risk Policy Report Newsletter reports that EPA and DHS have examined data and technology gaps in laboratory detection and remediation of chemical, biological or nuclear attacks to develop a roadmap for research investments that can produce results within five years. Preliminary findings indicate that water utilities are extremely vulnerable to terrorist attack—especially through inadvertent or planned assistance from utility employees—and that detecting and reversing many kinds of attacks remains difficult. Both this report and the recent incidents in Oregon and Indiana demonstrate that much work remains before localities and drinking water suppliers can protect their drinking water supplies well.

Newborn Screening
Continued from page 7

• Appropriate data systems to ensure record integrity and the timely transmission of test results to an infant’s provider and state public health authority.

In addition, APHL has recently suggested establishing a national NBS back-up laboratory at the CDC in Atlanta, equipped with all existing NBS technologies and ample reagents to test at least 1,000 specimens/day for 30 days. When not in use for crisis testing, the laboratory—which has been dubbed the National Newborn Screening Resource and Emergency Response Laboratory—could be used to train scientists, conduct NBS research and house a stockpile of pharmaceutical products for infants who are diagnosed with a disorder.

Water Quality
Continued from page 8

The September 2006 Risk Policy Report Newsletter reports that EPA and DHS have examined data and technology gaps in laboratory detection and remediation of chemical, biological or nuclear attacks to develop a roadmap for research investments that can produce results within five years. Preliminary findings indicate that water utilities are extremely vulnerable to terrorist attack—especially through inadvertent or planned assistance from utility employees—and that detecting and reversing many kinds of attacks remains difficult. Both this report and the recent incidents in Oregon and Indiana demonstrate that much work remains before localities and drinking water suppliers can protect their drinking water supplies well.

Wadsworth Center
New York State Department of Health

The Wadsworth Center, New York State Dept. of Health is seeking to fill the position of Director of Mycobacteriology. The Mycobacteriology Laboratory serves as the primary diagnostic reference and testing laboratory for mycobacterial diseases in New York State. The Director of the Mycobacteriology Laboratory will direct, plan, implement and evaluate laboratory testing; oversee the Mycobacteriology Proficiency Testing Program; perform independent and collaborative research; interact with the Division of Epidemiology to provide laboratory support for outbreak investigations and provide reference system services to laboratories in New York State.

The Wadsworth Center is the country’s most comprehensive state public health laboratory, with a staff of 200 scientists and 800 support personnel. The Mycobacteriology Laboratory is part of the Division of Infectious Disease, which includes diagnostic as well as basic and applied research laboratories in many disciplines. These laboratories define an outstanding scientific environment, while centralized core facilities provide state-of-the-art instrumentation and support services. Doctoral and post-doctoral training programs within the Wadsworth Center provide mentoring opportunities for faculty in graduate education at the School of Public Health. Additional information about the Wadsworth Center can be found at http://www.wadsworth.org.

Candidates must have a doctoral degree in an appropriate field and a minimum of four years postdoctoral experience. Board certification (ABMM) in medical microbiology is encouraged, but not required, and excellent communication skills are necessary. Salary will be commensurate with experience.

Applicants should submit a curriculum vitae, names and addresses of five references, and a brief description of their laboratory experience via email (word or PDF file) to Dr. Christina Egan at TBlabdir@health.state.ny.us or Dr. Christina Egan, Mycobacteriology Search Committee Chair, Wadsworth Center, David Axelrod Institute, New York State, Department of Health, P.O. Box 22002, Albany, NY 12201-2002

WADSWORTH CENTER
Science in the Pursuit of Health

From now until APHL’s next annual meeting in June 2007, we are asking members to invite their colleagues to join APHL. For more information, see http://www.aphl.org/about_aphl/membership/ or contact Anna Dillingham, anna.dillingham@aphl.org.
Rhode Island is the smallest state in the union. And with just 1,100 square miles of land compared to 650 miles of shoreline, it is no wonder it is considered the ocean state. Ewa King, the state’s associate director of health and manager of the Department of Health Laboratories (Health Laboratories), pointed out that recreational beaches are one of the “main assets of the state,” outlasting the heyday of Rhode Island’s once-famous jewelry industry and other manufacturing enterprises.

King, a native of Poland who first came to the US in 1990 to do biochemistry research at Brown University, has found that the Rhode Island’s small size may be another asset. With just over a million residents and a dozen or so hospitals, the state gets by with just one health department and one public health laboratory, which simplifies networking. And because the entire state can be traversed by car in an hour, stakeholder meetings are usually face-to-face and specimen transport is much simplified.

“Generally,” said King, “we receive all specimens the day of collection or the day after if the collection occurred at night or in the late afternoon. Generally, we do not receive specimens or environmental samples by mail; everything is brought right over to us. If there is a problem, we can just get in the car and go and get it. It’s pretty easy for us, really.”

Because of its singular position, the laboratory performs high-level reference testing as well as routine procedures to support patient care—such as STD testing for community health centers—that in larger states might be handled by a local public health laboratory. However, the Health Laboratories is more versatile yet: as a consolidated laboratory it not only performs clinical work, but also environmental testing, food chemistry and forensic science. When, for example, a clam digger contracted Vibrio vulnificus (a saltwater bacterium) this past summer, the laboratory was able to identify the organism in both the patient’s specimen and in samples of seawater collected along the coast.

“We have a broad range of programs and customers that you might not necessarily find in a traditional public health lab,” said King. “I do think that, especially for a relatively small state in terms of area or population, this is really the most efficient way of providing laboratory services.”

King, who is an enzymologist by training, is especially interested in exploiting the overlap in environmental chemistry and biomonitoring. “We’re looking for the same chemicals in air, water and people’s blood. We expect to see some similarities,” she said. The laboratory has just begun work with the Memorial Hospital of Rhode Island to test umbilical cord blood for heavy metals: mercury, cadmium and lead.

Another key interest of the laboratory director is quality assurance (QA). When King began her tenure at the Health Laboratories—after doing post-doctoral work in Paris (“more enzymes, but in a different country”) and a stint in a commercial environmental laboratory—she started out as a QA officer. And when she took over as director in...
early 2006, the entire department of health was in the midst of establishing performance measures to gauge the quality of department services.

One of King’s first administrative projects as director was to meet with internal health department customers to find out “what is it they expect of the laboratory?” “Sometimes,” said King, “we assume we know what our customers want, but it’s not always what they would say.” Among King’s surprise findings was that “some programs that we assume have no laboratory component really do have one.” Smoking cessation programs, for example, would like to use blood cotinine measures to evaluate program effectiveness.

Said the former QA officer, “Quality is about delivering exactly what your customers need and want.”

Based on the general findings of King’s interviews, laboratory staff have designed a short questionnaire, which they plan to administer annually to internal customers and then extend to external customers, such as private physicians, police, the state attorney general and others.

Among the questions:

- Why do you choose to use the Rhode Island Department of Health Laboratories as opposed to contracting with a commercial laboratory?
- How satisfied are you with turnaround-times? Quality of services? Staff response time?
- Is the scope of our services responsive to your needs?
- Are our reports easy to interpret and use?
- Are you satisfied with the way we handled your complaint?

The push to sync laboratory services with community needs builds on a long tradition in Rhode Island. The Health Laboratories was one of the first two public health laboratories established in the US and began by offering two services—examination of sputum for tuberculosis (TB) and throat cultures for diphtheria—to private physicians in 1894. A guiding philosophy was to fill gaps in the laboratory services generally available in the community. Thus, the laboratory started a program for tissue pathology in 1915, biochemistry in the 1920s, toxicology in 1928, metabolic diseases in 1964 and, more recently, food safety and environmental testing.

Updating the laboratory’s philosophy for the 21st century, King said, “Our main performance measure will be customer satisfaction.”

But as King strives to hone the laboratory’s services, efficiency is necessarily a concern. The Health Laboratories employs 81 full-time employees and has three authorized vacancies. But these numbers, she said, “don’t tell the full story,” owing to “structural deficits” in the organization’s allotted workforce.

“We recognize there is a mismatch between available personnel and the workload,” she said, particularly in the forensics section of the laboratory, which has seen a steady uptick in its work as DNA has gained popularity as a tool for criminal investigations. In King’s estimation, laboratory backlogs could be eliminated with eight to ten additional scientists.

Of course, staffing is related to the laboratory’s budget, which comes entirely from state appropriations and federal grants. The Health Laboratories charges fees for many of its services, but this income goes directly to the state treasury.

In the past year, the laboratory received roughly $7 million in state appropriations and $2.5 million in federal grants, which is about half a million dollars less than it received the year before. Said King, “We have taken a real hit in terms of federal funding.” The hit has been felt most in the facility’s environmental lead laboratory—which is funded through the CDC Childhood Lead Poisoning Prevention grant—and the emergency preparedness program—which is partly funded through the federal Public Health Emergency Preparedness grant.

“Loss of federal funding has to be one of our biggest challenges at the moment,” said King, who also noted that the entire state of Rhode Island faces a deficit of about $100 million.

Another challenge is the laboratory’s physical infrastructure. Throughout its long history, the Health Laboratories has operated under less than ideal conditions; first in a corner of a hospital, then in one room in the basement of the State House, and now in a 28-year-old, nearly windowless office building by the train tracks. As public health laboratories become more high-tech, the Health Laboratories’ aging 60,000-square-foot facility has become more and more of a handicap. “Installing equipment,” said King, “can take up to a year because of required changes in the HVAC system. This significantly impacts our ability to implement changes in our programs.” A large, new BSL-3 suite lies unfinished and unused, partly because of problems with the air handling system.

Given the state’s fiscal situation, a new laboratory building is probably off the table in the near future. Instead, King is focusing her attention on other matters: streamlining high-volume testing and support services through automation, coordinating environmental and human testing, and getting to the point where QA is appreciated “as something more than filling out a bunch of forms.”
The Denver public health laboratory can’t possibly become more integrated with the major clinical laboratory in its neighborhood: they are both part and parcel of the former Denver General Hospital, now Denver Health.

The evolution of Denver General Hospital to Denver Health began in 1997, when the hospital—then owned by the city—split off to become a non-profit entity as a separate political subdivision of the state. At that time, the Denver Public Health Department was split, with the hospital assuming responsibility for public health functions and the health department retaining regulatory and environmental oversight functions. Today, Denver Health’s mission is part classic public health, part HMO and part academic research and training. It operates the city’s primary indigent care hospital, a network of 10 neighborhood health clinics, all of Denver’s school-based clinics for middle and high school students, a national poison and drug center, a Level I trauma center, an HMO and a disaster preparedness center.

Such an arrangement offers several advantages. Michael Wilson, director of Denver Health’s Department of Pathology and Laboratory Services, said “Public health labs were chronically under-funded for many years, but as part of a larger entity you have a little bit more clout to gain resources.” Plus, integration allows clinical and public health laboratories to harmonize their standards better “so they’re on the same page on a lot of quality issues.” And last, but not least, integration has allowed the Denver public health laboratory to upgrade to state-of-the-art information technology.

Director

Michael Wilson took over laboratory operations for Denver General Hospital in 1994. An anatomic and clinical pathologist by training, Wilson was born in Colorado and has only relocated from the state once: to pursue a microbiology fellowship at Duke University, following medical training and a residency program in Denver. His long-time position with Denver Health, he said, is “the only job I’ve had since leaving the faculty at Duke.”

Location

Colorado is among the most urbanized states in the union, based on the percentage of its population living in cities of 50,000 or more. “Most of the traditional Western agriculture and mining industries are gone,” said Wilson. Instead, what drives the economy today are large-scale corporate agriculture, tourism, telecommunications and high-tech manufacturing.

Although Denver has a population of a half million or so, Denver Health draws its clients from the greater metropolitan area of roughly 2.5 million. More than a third of Denver County children, for example, receive healthcare through Denver Health.

The main portion of the institution itself is situated on a multi-building campus on the edge of downtown Denver. “I don’t have a window,” said Wilson, “but from our hospital you can see the front range of the Rocky Mountains and the skyline of downtown Denver.” The campus is strategically located within walking distance of the state capitol buildings and the city police headquarters. The area surrounding Denver Health is among the hottest real estate in the region.

Facility

The main laboratory is located in the Denver Health Medical Center building. This 15,000-square-foot facility handles about 1.3 million tests per year in support of clinical care for hospital and off-site clinic patients. The 80-year-old public health building down the street houses a 1,000-square-foot STD laboratory and a facility for bioterrorism and tuberculosis testing with between 1,500 and 2,000 square feet of BSL-3 space. In addition, off-campus neighborhood and school-based clinics have laboratories of varying complexity, ranging from waived testing to hematology work. “We’re always looking for opportunities to expand our space,” said Wilson. “That (public health) building is part of a master plan and will be rebuilt in 5, 10 or 15 years.”

Photo courtesy of Denver Public Health Laboratory

The Denver public health laboratory is located in a multi-building campus of Denver Health, on the edge of downtown.
**Staff**
About 125 full-time equivalents, with “at most three or four vacancies.” Wilson attributes his low vacancy rate to several factors. “We’ve always had good supervisors and people who are able to recruit well,” he said. In addition, the whole Denver area is “building like mad” with four of the city’s largest hospitals moving to bigger, better quarters in the suburbs. “That helps us,” said Wilson, because many of the other hospitals’ staff members don’t want to relocate or commute far from the city. Denver Health is also helped by its position as a teaching hospital for the University of Colorado Health Sciences Campus. Finally, said Wilson, “Denver Health has a good reputation, and people like the mission of Denver Health. That does attract a fair number of applicants.”

**Revenue**
Denver Health is almost totally self-sufficient, with limited state funding for indigent care. Its income comes mainly from HMO, Medicare and Medicaid patients, supplemented by federal “disproportionate share” hospital funding. A top-notch trauma care unit also generates significant revenue, along with special services including a nationally known center for complex fractures, medical complications of eating disorders, minimally invasive urological surgery and atrial fibrillation ablation.

**Distinguishing Characteristics**
- Because Denver Health is a teaching hospital for the University of Colorado Health Sciences Center, all of its physicians—including Wilson—are full faculty members at the University of Colorado School of Medicine. “Our work is very heavily integrated with the university. All of the residents rotate down here. We all teach.”
- Denver Health’s strong emergency response focus takes many forms. It has its own emergency medicine training program and paramedic school. It owns all the city ambulances and owns and operates the Denver County 911 system. And it runs the Rocky Mountain Poison and Drug Center and the Rocky Mountain Center for Medical Response to Terrorism and Mass Casualties.
- Denver Health provides all the correctional care for a number of local counties and for some of the state prison population.

**Highest Volume Testing**
STD tests are “by far” the most common, followed by TB tests (in the public health laboratories). Denver Health performs no regulatory testing and no environmental testing, both of which are handled by the city.

**Notable Success Stories**
- Going from four independent laboratory systems—hospital, public health, community health centers and school-based clinics—to one fully integrated system in seven years. “This is something that is very unusual in the US, but I think people are beginning to see this as a model.”
- Integrating the public health laboratories with the main hospital laboratory. “They’ve each kept their own unique identity and mission, but we’re moving personnel back and forth now, integrating information systems and harmonizing standards.”
- The first local laboratory in Colorado—and only the second laboratory in the state—to start a bioterrorism testing program.
- Implementing a state-of-the-art information system. Denver Health was recently featured in Newsweek magazine as one of the more computerized healthcare systems in America. “Using my computer, I can look at someone’s chart—even someone who came in last night—and look up x-rays, vaccination records, lab results and pathology reports.”

**Biggest Challenges**
- Recognition: “I think that the single biggest challenge for public health laboratories in general is that there is not enough recognition for what public health is and does. The public doesn’t recognize that and politicians don’t recognize it. Every city needs a good public health department, and you can’t have a good public health department unless you have good public health laboratories.”
- Workforce: “Pick any high school in America and ask 20 seniors and I’ll wager that none have heard of medical technology or epidemiology. Public health and laboratory medicine are something that most Americans aren’t aware of. Without that recognition it will be difficult to maintain a viable workforce.”
- Funding: “There’s always a chronic challenge for operational funding, but what I mean by funding is the long-term investment in infrastructure, training, recruitment and retention. In the last 30 to 40 years in America that investment has not been there.”

**Goals**
- “Expand the functionality of our public health laboratories to be a resource for the public.”
- Work on all the common challenges facing public health laboratories, including public recognition, workforce maintenance and funding. “We need to improve our informatics systems and our ability to communicate electronically with our state health department and the CDC. This is something we should all be working on. The LRN (Laboratory Response Network) has made some pretty good initial steps in that direction, but there’s still a long way to go.”
An Alternative Program to Educate Laboratory Professionals

By Wiley D. Jenkins, MPH; laboratory bioterrorism coordinator and adjunct assistant professor and David F. Carpenter, PhD, MBA, research associate professor

One effect of the anthrax letters in the fall of 2001 was to direct public focus toward the public health infrastructure. Other issues regarding the identification and monitoring of emerging infectious diseases have done the same. Yet, in 2000, a report concluded that state public health departments had reduced capability to identify biologic agents due to previous long-term reductions in laboratory staffing. While practices and methodologies of public health laboratory work have evolved substantially in recent years, there are documented needs for trained scientists in the nation’s public health laboratories. To address this need, the Illinois Department of Public Health and the Southern Illinois University (SIU) School of Medicine have collaborated to develop a novel master’s degree program. The Public Health Laboratory Sciences (PHLS) program consists of graduate level classroom instruction augmented with extensive public health laboratory training.

Program Year One
The majority of the required academic credit hours are scheduled for year one. Courses are identical to the Microbiology, Biochemistry and Molecular Biology graduate curriculum in the SIU Graduate School, and include such topics as microbiology, immunology, biochemistry and environmental chemistry. These are augmented by program-specific courses such as “Introduction to the Public Health System” and “Public Health Laboratory Disciplines.” The training consists of work in the public health laboratory. Students maintain a schedule of 15 hours per week and rotate through testing sections such as diagnostic microbiology, environmental microbiology, blood lead, HIV/serology and molecular diagnostics.

Interim Summer
Students work 25 hours per week during the summer. Their skills are utilized to support routine laboratory work and this period focuses on practical skill application. Students also have opportunities to participate in field work with local health department staff. Activities include animal control, family case management, food sanitation, immunization clinics and senior home visits. This experience exposes them to the wider practices of public health.

Program Year Two
Students are required to work 30 hours per week and are assigned to one section for an entire semester. This second year of the program is largely devoted to further refining and expanding the student’s practical skill set. Academic requirements include seminars and other courses totaling approximately five hours.

By the end of the program, students will have attained many of the following skills (with slight differences depending upon personal preferences):

- CLIA Personnel Assessments in the following areas: GC/Chlamydia, biological waste management, blood lead by GFAAS, parasitology and enterics;
- FDA provisional/full certification for plating PAC and HSCC Petri-film procedures and Delvo 5 Pack inhibitor test; and
- Technical mastery and/or in-house validation for bioterrorism agent sample receipt, preparation and analysis via bacteriological and molecular methods; coliform analysis; RT-PCR, viral cell culture and Western blot; TRF for bioterrorism agents; other milk program methods such as antibiotic and phosphatase level detection; and water analysis for NO2/NO3.

Students are also involved in method development, such as analyses for HIV-2 and serotyping. The end result is the production of a highly educated and experienced individual who can assume lead worker duties in a modern public health laboratory.

Students are involved in method development, such as serotyping, in the master’s program.
The PHLs program will be graduating its first cohort in May 2007. There have been many lessons learned, and the integration of scholastic and professional workforce environments took some adjustment by all parties. The students have been of great practical benefit to the laboratory by providing analytical support for many routine analyses for such things as HIV, rabies, coliform and E. coli, and bioterrorism agents, and by serving as a real surge capacity augmentation for bioterrorism planning.

The authors hope that this model program may be expanded to serve as a resource to meet the workforce shortages. We have found it to be feasible to create and implement this program utilizing existing resources and funding, though new sources of funding, consistent over a multi-year period, need to be identified for the program to continue past the immediate future. State and local laboratory directors are encouraged to emulate the program in their area or seek similar collaborations. The benefits to the host laboratory are immediate and practical, and there is great potential for contribution to public health infrastructure as a whole.

For further information, please contact the authors:

- Wiley D. Jenkins, MPH; laboratory bioterrorism coordinator; adjunct assistant professor; wiley.jenkins@illinois.gov, 217.782.6565
- David F. Carpenter, PhD, MBA; research associate professor; dcarpenter@siumed.edu, 217.545.8465

Or visit the PHLs Program Web site:

- www.siumed.edu/mmi/index.html (follow the Public Health Laboratory Science Program link)

**APHL Members Debate Voting Rights**

As APHL grows and changes, so does its membership. At the association’s Council of Chairs meeting in October, important issues were raised about the current distribution of membership voting rights. The council encourages broad membership involvement in the association, but some members feel hampered by their inability to vote.

To encourage a healthy dialogue among the membership, the council solicited statements from two committee chairs with differing viewpoints on the issue. Their statements are printed on the next page.

All member categories are encouraged to respond; submit your remarks to shawna.webster@aphl.org before February 5, 2007. Representative responses will be published in the March-April issue of Lab Matters.

Would you like to discuss the issue in person? Come to the 2007 annual meeting; the issue will be featured prominently on the Member Assembly’s agenda (formerly known as the Annual Business Meeting).

**Voting Rights as of January 2007**

Of the seven member categories, only the Public Health Institutional-State member category has full voting rights. The Associate Institutional and Public Health Institutional-Local categories may only vote for their representative on the Board of Directors (one seat is allotted per group). No other member category has voting rights.

**APHL Membership as of October 2006**

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Point—Extending the Vote
By Mike Wichman, PhD, Environmental Health Committee chair and Delegate member (Iowa)

We are all encouraged to exercise our right to vote and participate in shaping our future. Unfortunately, that is not an option for most members of APHL. Most members, including environmental, food safety and local laboratory directors, have limited or no opportunity to vote for the policies shaping the future of the association. Is an association that allows voting privileges by just 8.5 percent of its membership truly representing the organization as a whole? This disparity sends the message that leadership on a state level is more highly valued than that on a local or county level, and that public health is separate and disproportionately valued above environmental and agricultural health issues. While recent changes to the membership and board structure are substantial, they did not significantly address the voting rights.

Any organization’s primary strength is its ability to attract new talent and grow with ideas presented by its membership. If APHL sends the message that one sector has more status than another by restricting voting rights, it is potentially cutting off opportunities to remain dynamic; it stifles change by muzzling the voice of the individual; it sends the message that APHL is good enough as is and is not interested in future growth.

Incorporating additional laboratories into APHL may also generate additional financial support for the association. Dues currently comprise slightly more than 1 percent of APHL’s unrestricted revenue. Financial support for APHL is largely provided through cooperative agreements with the CDC and, to a much lesser extent, the EPA. Increasing environmental, agricultural and other state laboratory membership will lead to increased unrestricted revenue and may very well lead to additional cooperative agreement support from various federal agencies.

I urge the APHL Board of Directors and Membership Committee to make a commitment to our future by expanding voting rights to all local and state laboratory directors at a minimum. Take that resolution one step further and open the vote to all members of the association. Such action sends a message that APHL seeks the best and the brightest of our industry and gives them a voice in steering its course.

I am proud of APHL and honored to be a member. I simply wish to have the right to vote on the policies shaping the future of the association. Let us embrace full voting rights so that APHL reflects the full talents and interests of its diverse membership.

As APHL proceeds with this debate, it will need to find an appropriate balance between the needs of the association and those of all its members. It must be sure that, in its quest for increased membership and inclusive diversity, it does not fall victim to ineffective, unfocused mediocrity. No one wants the current strength of APHL to be compromised.

Counterpoint—Maintaining a Centralized Organizational Voice
By Norman Crouch, PhD, Emergency Preparedness & Response Committee chair and Public Health Institutional-State member-representative (Minnesota)

With the recent expansion of APHL membership, there is thought that voting rights among its members may need to be changed. In the current arrangement, each state and territory is given a single vote by an invested official and therefore all states are equally represented in the association. As the thinking about this matter moves forward, any discussion will by necessity have to be centered on whether or not state/territorial equality remains essential to the association’s future.

Any expansion of voting rights must be exercised with caution. Today, as APHL focuses on developing functional laboratory networks to assure quality laboratory practice worldwide to detect and respond to known and unknown public health threats, it is essential that each state and territory be part of a national network. To make this happen, there needs to be strong, centralized public health laboratory leadership at the state level. Consequently, it is imperative that there be voting equality among the states and territories.

If voting rights were open to the entire membership, state and territorial public health laboratory officials would represent only 8.9% of the total vote. Additionally, states with more voting members would have a significantly stronger voice in association affairs. This could have a dramatic impact on the vision and mission of APHL. Furthermore, as membership becomes larger and more diverse, with fewer members being jurisdictional decision-makers, votes may be cast with less information or understanding about higher level affects. One option to avoid these problems of imbalance would be to limit expansion of voting rights to the member-representatives of the two new institutional categories, i.e., Public Health Institutional-Local and Associate Institutional. This would need to be done in a way that would maintain voting equality between the states and territories.

Elections are coming!
Look for more information about upcoming elections for President-Elect and Member-at-Large in the March-April issue of Lab Matters.
In this issue, you may have noticed something different (other than the newsletter’s name!). We have included two opinion pieces from active members on a controversial subject: membership voting rights. It is not unusual to hear opposing opinions from the membership. Typically these views are coherent, thoughtful, substantial—and yet, still at odds with one another. As a membership association, we rely on this type of dialogue to make decisions that affect the future of the organization. I encourage you to read the point/counterpoint letters, on page 26. Let us know what you think. I hope we can periodically highlight other differing opinions in future issues of Lab Matters.

The issue of voting rights has been voiced before, but now re-emerges, phoenix-like, due to our recent membership restructure and expansion. And it’s not alone—other issues, equally deserving of consideration, are in the air. Big changes bring big questions. For such a healthy organization, APHL has historically been resource-poor when it comes to member services, due largely to the nature of our cooperative agreements. The Finance Committee has just begun to examine these shortfalls, with the goal of coming up with some practical solutions. Financial support for member services—whether through increased dues or another means—will help APHL provide a more balanced array of programs and staff support. We are working hard to figure out how to serve members well. We take our expansion very seriously, and want to strike a balance among our membership groups that will help us achieve our public health mission.

Yet, the changes to be made are not all large-scale—the details need to be updated as well. A member recently pointed out to me (are you catching the recurring theme of this column?) that there were several straightforward changes that could be made, at no cost, in future versions of APHL literature to highlight laboratories’ environmental health functions. She was right, and when it is time to re-work the brochures, her suggestions will influence the process. It will take time, and a lot of member input, before we completely reflect the full community of our member labs.

In a similar vein, we are re-inventing the way we do a significant part of our annual meeting in June. The “Members’ Assembly” (formerly known as the “Business Meeting”) will no longer have a lengthy series of committee reports—that information will be provided in advance. While the precise format is still in the works, the time will be used to encourage members to air opinions and start discussions, perhaps with the help of the electronic polling that we used successfully last year in the workforce development sessions. Overall, there will be a greater emphasis placed on community building at the conference. There will be new opportunities for membership category meetings, so shared issues can be addressed.

Starting in the New Year, there is new leadership in Congress. APHL is staying on top of the changes, maintaining a strong voice for labs. Please continue to tell us what you need so that we can represent you fully. Join a committee, attend a meeting, pick up the phone—we welcome your participation.
New APHL

Institutional Members

APHL offers institutional memberships to state and local public health laboratories, as well as state environmental and agricultural laboratories. Please join us in welcoming our newest APHL institutional members, listed below.

Associate Institutional Members

Louisiana Department of Environmental Quality Laboratory, Melvin C. Mitchell

Member Notes

Norman Crouch, PhD, director of Minnesota’s PHL, has accepted the position of assistant commissioner for the state’s Health Protection Bureau. Crouch will be responsible for coordinating the functions of the public health laboratory division, the infectious disease epidemiology division, the environmental health division and the office of emergency preparedness.

Max Salfinger, MD, has been named the new chief of the Bureau of Laboratories in the Florida Department of Health. Prior to his current position, Salfinger was the Wadsworth Center’s Clinical Mycobacteriology Laboratory Director from 1992-2006 and was Section Head in Mycobacteriology of the Clinical Laboratory Evaluation Program of the New York State Department of Health.

APHL Staff News

In December, Laura Dice resigned as senior program assistant, scientific programs.

Lauren DiSano Bradley resigned as environmental health program manager in November.

Charles Green, senior accountant, was married to Deanna Hopson on November 25.

In December, Louise Lang became the NLTN program assistant for the Richmond office.

On Dec 9, 2006, Nerissa Majid, senior program manager, international laboratory capacity building, was married to Jerome Cordts.

Dina Purcell resigned as director of finance and operations in January.

Dannielle Smallwood, senior program assistant, operations, will begin her new position of human resources generalist in February.

APHL Sustaining Member Program

The following corporations partner with APHL to support the nation’s public health laboratory systems.