Public Health Labs Not Ready For Chemical Terrorism

Increased Funding Vital to Strengthen Laboratory Infrastructure

As the national security alert level was raised from yellow to orange in recent weeks, federal officials urged Americans to prepare for unspecified terrorist threats. But how prepared are the nation's public health labs to deal with a weapons of mass destruction event? According to Sarah Lister, APHL director of public health preparedness, there are two answers. If an event involves biological pathogens, such as anthrax or smallpox, laboratories have good response plans that are being optimized. If an event involves military-grade chemicals, most state labs have no plans.

An APHL study completed in January documents laboratory deficits. Three-quarters of the nation's state labs are unable to safely accept samples suspected of containing multiple hazards, such as toxic chemicals and infectious organisms. Only eight state public health labs (SPHLs) report having a chemical terrorism (CT) response plan in place. And half of SPHL directors rate their lab's ability to respond to a chemical terrorism event as only 1 or 2 on a 10-point scale, where 10 is excellent.

The study, conducted for APHL by RTI International, wrapped up in early January with a consensus meeting of public health laboratorians from the 50 states, two US territories, and the District of Columbia to itemize the steps necessary to shore up laboratories’ CT response capabilities. Recommendations produced at that meeting range from the safe collection and handling of unidentified substances to improved coordination with HazMat teams and other first responders to the urgent need for robust, standardized protocols for analyzing environmental samples. They carry a collective price tag of $472 million, less than one-tenth of one percent of the more than $750 billion in discretionary spending in the 2003 federal budget:

- $200 million to the EPA to develop methods to test for CT agents in soil, water or other environmental samples and to transfer technology and methods to SPHLs to create national surge capacity for chemical testing.
- $200 million to the CDC Environmental Health Laboratory to expand its program to detect CT agents in human...
Dear Members:

Several months ago, Scott Becker and I attended a leadership seminar for chief elected officials and chief staff officers of non-profit organizations. The goal of the seminar was to investigate ways these two positions could work together to achieve the goals of the Board of Directors in pursuit of the organization’s mission. In a discussion linking organizational functions and culture with governance processes and policies, the term “nimbleness” was introduced. According to seminar leaders, a successful organization – and Board of Directors – must be “nimble”

While at first this struck me as an unusual way to think about the function of an organization, upon reflection, it seemed quite sensible. The organization that is nimble in its thinking, structure and function will be able to respond rapidly to changes in its environment and to respond to requests and demands both from within and without. It will continue to be relevant and vital. The organization that is not will gradually become less effective, less relevant and less influential.

I realized that the concept of “nimbleness” is also extremely relevant to APHL. Since 9/11/01, the world of the public health laboratory has been challenged with constant, rapid and significant change. From anthrax in the mail system to HIPAA, Select Agent Rule, LRN expansion, chemical terrorism preparedness, smallpox immunization and Bio-Watch, APHL and public health laboratories are being called to respond rapidly and decisively at both local and national levels. To fail in this will be to lose relevance and influence in the public health arena.

Toward this end, the governance initiative in process at APHL will improve the “nimbleness” of the association. At its annual leadership meeting in January, the APHL Board of Directors and committee chairs met with federal partners to hear the final report of the APHL Governance Task Force, which has worked for the past six months to recommend changes in governance that meet the objectives of the APHL Strategic Plan. These recommendations will be addressed by the Board at its meeting in March and presented as a package to APHL members in anticipation of a vote at the annual meeting in June. I am convinced, more than ever, that these reforms will lead to a more vital, relevant and “nimble” organization.

Sincerely,

David E. Mills
Executive Director’s Note

Dear Members:

Choices. Each day we are faced with a myriad of choices. It may be as simple and mundane as what to wear or which route to take into work that day or it could be as important as which laboratory information system you adopt or which new laboratory design you choose. But more and more, the decisions I’m hearing laboratory directors make is which service area do they cut back, which employees do they let go or what new technology they won’t be adopting this year.

These are the realities of life in your shoes. For so many years, it seems public health laboratories were close to forgotten in governmental public health. And then came the large infusion of federal resources that many thought were an answer to our prayers (I was among them.) Policymakers began to understand the value public health laboratories offer to the communities they serve. Our prospects looked bright.

Yet now we see what I call a ‘train wreck,’ and it’s happening in front of our eyes. Though we in state public health laboratories have lots of federal resources, most state governments are in cutback mode due to some of the worst deficits in modern times. We also face unprecedented demands — bioterrorism, emerging infectious diseases, chemical threats and now a new, White House-mandated program known as ‘Bio-Watch.’ Meanwhile we can’t find qualified people to fill the positions we may still have available (that is, if we haven’t been told to trim back our federally supported FTE’s). Local health agencies and their laboratories are in even worse shape.

So let’s recap. We have greater demand and need for public health laboratories, fewer people to fill positions, strong funding for some programs and massive cuts in others. Looks like a train wreck to me. The juxtaposition from just a few years ago is stunning.

Now why all this doom and gloom? The answer is simple. It’s the reality. But despite these challenges, APHL is trying to do all it can to help. We are making public health laboratory needs known in Congress. We are taking the message to the American people through the press. And we are working hard to continually build our collective knowledge base, so that we are better able to respond to your inquiries.

You need not experience these difficult times alone— I believe we gain more from collective wisdom and experience. I hope that you will turn to your colleagues and to the association for guidance. We might not have the answers, we might not always know where to turn — but we will do our best to assist you and other public health laboratories to serve your constituency.

But all is not doom and gloom. We have some recent success stories growing out of our 50-state chemical terrorism meeting. By all accounts, that gathering was a resounding success. Virtually overnight, we saw multiple federal agencies rise to the challenges we laid before them and before ourselves. They began to coordinate closely, fight for chemical terrorism support within their agencies and liaise more effectively with public health laboratories and with APHL. We also received very impressive press coverage when we released our preliminary findings.

Soon you will receive information about APHL’s annual meeting to be held June 8-10 in Richmond, VA. Please consider this opportunity to meet, learn, and yes, even commiserate with your peers. Despite the challenges that lie ahead, we have things to celebrate as well. Let’s try and divert further train wrecks together.

Sincerely,

Scott J. Becker
sbecker@aphl.org
specimens — blood, urine, saliva — and to convey this expertise to SPHLs.

- $50 million to an agency designated by the Department of Homeland Security to provide safe and secure sample screening and processing facilities in all states.
- $2 million to the CDC to develop a worker safety manual for chemical testing.
- $10 million to the EPA to expand the agency’s program to evaluate devices for rapid sample screening and to identify those with performance characteristics acceptable for field use.
- $10 million to the Department of Homeland Security to coordinate federal and state activities to build the laboratory infrastructure necessary for CT and bioterrorism preparedness (e.g., instituting electronic communications and reporting standards and providing consultation in chain-of-custody and evidence handling protocols).

Already, CDC’s National Center for Environmental Health (NCEH) has spearheaded activities to address two of these recommendations, but other federal agencies must ramp up their support.

**Nation Lacks Capacity to Test Large Volume of Environmental Samples**

Mary Gilchrist, director of the University of Iowa Hygienic Laboratory and a conferee at the APHL meeting, said that her lab’s most pressing need for CT preparedness is validated protocols for analyzing unknown environmental samples safely and expeditiously. While it is not always possible to definitively identify a mysterious liquid or powder, Gilchrist said that laboratories at least need methods and chemical standards (small quantities of agents that can be compared to suspect samples in various laboratory tests) to rule out the most hazardous possibilities.

The first call to Gilchrist’s lab after the September 11 terror attacks was from someone who reported being sprayed by a passing airplane. The spray could have been a bacterial pathogen, a pesticide, an herbicide or some other noxious chemical. In this type of suspect situation, speedy detection is crucial; there are antidotes for deadly poisons such as cyanide and nerve gases, and antibiotics for pathogens such as anthrax, but they must be administered quickly.

In this case, no hazardous substance was involved. But if a toxic chemical had been sprayed, the outcome would be uncertain. Whereas public health labs in every state can readily test for anthrax, their ability to test for chemical weapons agents is extremely limited.

**EPA MIA?**

The president’s homeland security strategy tasks the Environmental Protection Agency (EPA) with providing laboratory diagnostic surge capacity for environmental samples during crises. Yet Virginia’s state lab director, Jim Pearson, said the agency has been “missing in action in terms of providing standardized robust protocols to do environmental analyses.”

Bob Bostock, assistant to the EPA administrator for homeland security, disagreed with Pearson’s statement. He said the issue “is on our radar screen.” Yet he stressed that the EPA’s responsibility is limited to surge capacity and that the Department of Defense is the designated lead for environmental sampling and testing in the beginning of a crisis situation. Asked if the EPA planned to disseminate test methodologies to public health labs to build surge capacity, Bostock said, “It’s a question of what resources we’ll get.” He noted that EPA officials are engaged in discussions with Department of Homeland Security personnel “to make sure that we can provide surge capacity,” but declined to comment further or to speculate which agency might provide test methodologies for environmental analyses if the EPA does not.

Today, even a relatively small-scale CT event might tax the nation’s laboratory capacity. Gilchrist pointed out that the US Army’s Edgewood Chemical and Biological Forensic Analytical Center in Maryland is the only laboratory in the country capable of conducting analyses for some chemical weapons of mass destruction. But the Edgewood lab can process only about 20 samples per day. By comparison, in October 2001 — at the height of the anthrax scare — the nation’s public health laboratories were processing more than 1,000 potential anthrax samples each day.

More than two-thirds of these tests were conducted by state public health laboratories. (The Connecticut state lab alone handled more than 2,000 potential anthrax samples that fall.)
State labs were prepared for a biological attack due to several years of dedicated federal funding and the existence of the Laboratory Response Network for Bioterrorism (LRN) — a coordinated, multi-level system of laboratories with methods, training and equipment in place to respond to such an emergency. While a few protocols for CT preparedness have been delivered to the network by the NCEH, laboratorians at the APHL consensus meeting urged further expansion of LRN capabilities to prepare for CT threats. (According to Lister, it makes sense to build CT response capabilities within the LRN because the network has an established chain-of-command with ties to federal agencies. Integrating biological and chemical analyses in one seamless laboratory system is also logical for reasons of safety, speed, and practicality — for example, an individual sample may be so small that it is not possible to subdivide it.)

Additional Safeguards Critical to Protect Labs, Laboratorians

In addition to lack of protocols, equipment, and training, public health laboratorians are worried about worker safety and the security of their facilities during a CT event. The CDC and the National Institutes of Health have developed a manual that lists comprehensive guidelines for the handling of potential agents of bioterrorism. There is no comparable set of civilian guidelines for safe handling of agents of chemical terrorism.

Pearson said that lack of triage protocols for unidentified samples “presents a huge risk to our staff. Are they chemical? Biological? Radiological? Explosive? Or a combination of any of the four?” Safety guidelines, he noted, should include containment methods, space requirements, a list of proper protective gear and proper screening methods to determine risk level. Currently, almost half of 52 SPHLs surveyed by the APHL indicated that personal protective equipment is “not very adequate.”

In a worst-case scenario, unknown or mixed-hazard samples can cause worker injury or shutdown of laboratory operations due to structural damage or contamination, disabling the laboratory when it is most needed in a crisis. One SPHL is located on the top floor of a state office building. A shutdown would likely affect the entire building and multiple public services.

“Quantum Leap” Needed in WI

Ronald Laessig, who heads Wisconsin’s state lab, said his facility is in relatively poor shape for a CT event compared to a biological event because there has been “no comparable input of federal support.” Laessig said his lab needs to make a “quantum leap” in instrumentation and training to reach the state-of-the-art necessary to analyze complex mixtures of chemical agents. The array of equipment necessary to fingerprint chemical substances — including liquid chromatography mass spectrometers and inductively coupled plasma mass spectrometers — costs a million dollars or more and must be managed by skilled chemists using validated methodologies. The Wisconsin public health lab does not have the resources to acquire that equipment or to develop those methodologies.

As things now stand, Laessig said his lab would have no independent response capability during a local CT attack and would be forced to rely on federal assistance. He said, “We fully recognize that in a CT event, if we’re one of one (site affected), we’ll get good federal support, but if we’re one of five (sites affected), CDC will be overwhelmed and we will not get laboratory support as a highest priority. If I were at CDC and there were an event in New York City and in Eau Claire, I know where I would commit resources first.” Conversely, he pointed out the national benefit of enhancing CT preparedness in Wisconsin. If his lab had adequate infrastructure in place to handle CT events, “We could and should feel capable of reallocating our Wisconsin resources to a bigger plan, if we’re uncommitted.”

NCEH Responding to Safety Concerns

Since the APHL’s consensus meeting in January, the National Center for Environmental Health has responded to these safety concerns by organizing an interagency workgroup of federal officials and APHL members to discuss the development and distribution of self-contained, modular facilities for screening unknown environmental or clinical specimens. According to Dayton Miller, an associate
director of the NCEH laboratory division, CDC will continue as one of several partners in this effort. He speculated that another federal agency (or group of agencies), such as the EPA, the Department of Homeland Security or the Justice Department, will assume lead responsibility for the project.

“We’ve got the ball in the field and moving,” said Miller, “It’s a matter of who kicks it through the goal posts.” Needless to say, SPHL directors are hoping for quick progress.

The NCEH is, however, the designated federal lead for chemical terrorism related biomonitoring—analysis of human specimens for evidence of exposure to chemical toxins. The center has rapid toxic screens for 150 military chemical weapons agents and is transferring testing technology to five states: California, Michigan, New Mexico, New York, and Virginia. SPHLs in these states will be able to supply surge capacity to the CDC once human exposures have been identified.

Miller said the NCEH is now hoping to expand this program as urged by APHL so that virtually every US state and territory receives some level of technical assistance for chemical terrorism. At the very least, he explained, the CDC expects to fund one or two CT lab coordinators in each SPHL. “Every state will have someone who knows the laboratory issues and can communicate the issues to health officials, first responders and others,” he said. Laboratory CT coordinators will assist in general CT preparedness by “making sure appropriate connections are established among labs and other health agencies to move data and specimens appropriately.”

In addition to receiving support for the CT coordinators, a subset of states, perhaps as many as 35, will be funded to develop analytical laboratory capacity for biomonitoring at various levels of technological sophistication. The current expectation, said Miller, is that roughly $40 million in program funds will reach states by October 1, the beginning of the next federal fiscal year.

**Homeland Security Dollars “Do Double Duty”**

This investment in laboratory capacity will deliver a payback to the public far beyond the immediate goal of safeguarding human lives in the event of a CT attack. Shelley Hearne, executive director of Trust for America’s Health (which is launching an educational campaign on public health preparedness), noted that “homeland security dollars can and should do double duty to increase our ability to respond to a whole range of health risks from West Nile virus to cancer.”

Building laboratory capacity to identify toxic chemicals, she said, is useful not only for terrorism response, but to deal with industrial and transportation accidents involving chemical spills. Similarly, biomonitoring can be used to screen for human exposure to pollutants, pesticides and industrial toxicants. Hearne noted that biomonitoring has recently been used to determine that an unusual cluster of pediatric leukemia cases in Fallon, Nevada, may be linked to exposure to tungsten, a substance that “had not been on the public health radar screen.”

**Labs Support U.S. Economy**

The benefits of enhanced laboratory capacity also extend to the nation’s economic infrastructure. Gilchrist recalled an incident during the anthrax scare involving a small fortune of Iowa beef on a ship in the Orient. Japanese customs inspectors refused to allow the beef to be unloaded because of a white powder on the shipping cartons. Gilchrist’s lab was able to back-up the meat producers’ assertions that...
the powder was merely chalk used to write on the outside of the containers. Said Gilchrist, “The load of beef went to Japan.”

In another incident, the University of Iowa Hygienic Laboratory ruled anthrax out as a possible constituent of a white powder found on the assembly line of a local industrial plant. Grateful plant managers later reported that the lab saved the industry millions of dollars by averting a temporary shut-down of the assembly line.

These incidents demonstrate, said Gilchrist, that “the amount of money used to fund labs is well compensated just by what we save the economy.” She figured that roughly $16 million was invested in the nation’s public health labs at the time of the anthrax attacks. “We saved Iowa that much money probably,” she said.

Yet despite public health labs’ extraordinary performance during recent health emergencies, the overwhelming sentiment at the APHL CT meeting was that the level of response within the laboratory system is not nearly as good as it should be. Said Laessig, “We have a pretty good idea of what we need to do to get adequate capability. And we need these upgrades whether we have a weapons of mass destruction event or not.”

Federal Support
At the federal level, CDC is working to integrate national biomonitoring and tracking programs to serve as an example to state laboratories. States are optimistic that funding for biomonitoring will grow. The dual-use provision in legislation authorizing the chemical terrorism program may free up some resources.

Federal support for environmental public health tracking continues. NCEH recently awarded grants to 20 state and local health departments and three schools of public health to initiate a national environmental health tracking network. For the list of funded programs, see www.cdc.gov\nceh\tracking.

State Involvement
States are collaborating across agencies to link health tracking and biomonitoring. In Michigan, the Bureau of Laboratories is partnering with the Bureau of Epidemiology to define state and regional priorities, including risks associated with industrial and agricultural environmental exposure, exposure of minority and child populations, technical feasibility and laboratory capacity development. In New York, staff from the biomonitoring program participate in workgroups for the environmental health tracking program. These workgroups are investigating if and how biomonitoring could be used to derive exposure data that could be linked with environmental and/or health data. And in Montana, the state medical officer is both a member of the biomonitoring “core team” and the lead person on the state’s tracking grant.

CDC to Publish Biomonitoring RFA on April 1st
CDC will publish the program announcement (RFA Number 03-034) for the next, “implementation” phase of biomonitoring grants in the Federal Register.

Environmental Health

Biomonitoring, Health Tracking Advance on State, Nat’l Agendas

**Biomonitoring:** Assessment of human exposure to chemicals present in air, water, soil, dust, food or other environmental media via measurement of chemicals or chemical metabolites in human specimens such as blood or urine.

**Health Tracking:** Collection, integration, analysis and interpretation of data on environmental hazards, exposure and potentially related health effects.

**APHIL/CDC Meeting**
The fields of biomonitoring and health tracking are becoming linked after years of separation. Health tracking examines the data that biomonitoring provides, but until now there has been little communication between the Epidemiology and Laboratory departments responsible for this work. Yet progress was evident at a January 8th meeting co-sponsored by APHL and CDC’s National Center for Environmental Health (NCEH). Florida, California, New Hampshire and the Upper Midwest Consortium — all recipients of planning grants through CDC’s biomonitoring program — reported on their activities. Proceedings will be available on the APHL Web site and in print this spring.
Biomonitoring, continued from page 7

on April 1st. States should submit a letter of intent by May 1st and an application by June 30th. CDC will sponsor a pre-application teleconference on April 9th. For further information, see the program announcement or contact Jennifer Liebreich, APHL senior manager of environmental health, 202.822.5227 ext. 236.

This phase of the program will be administered through a cooperative agreement with CDC in contrast to a grant. CDC will work closely with states to select methods, train staff, implement program plans and provide technical consultants.

APHL expects the April 1st announcement to include:
- **Eligibility:** State public health labs funded during the first phase may apply individually or as members of new or existing multi-state consortia. Labs not previously funded may apply by joining a consortium with currently funded states.
- **Award:** A total of $5 million will be available with individual awards ranging from $200,000 per laboratory to $3 million per consortium.
- **Budget/Funding:** The initial budget period will be 18 months, funding periods will extend over five years.

States will be able to use their award for demonstration projects or pilot studies. For example, a state could elect to integrate biomonitoring and health tracking data in order to profile environmental illness at the state and local level. The scope could be broadened with the addition of national data. Currently APHL and CDC are developing a brochure to articulate the connections between biomonitoring and health tracking.

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### Lifetime Achievement Award

Nominations for APHL’s Lifetime Achievement Award are due on March 14, 2003. Contact Emily Mumford, emumford@aphl.org, with questions or requests for forms.

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### EID Fellows Showcase Research

**Kelly Felkey** gave an oral presentation at the Virginia branch of the American Society of Microbiology (ASM) in November 2002: “Current Detection Methods for West Nile Infection in Virginia Residents.” Felkey, a Class VIII fellow at the Virginia Division of Consolidated Laboratory Services in Richmond, also assisted in the malaria investigation involving residents of northern Virginia.


Class V International EID Fellow **Ivan Kuzmin** traveled to Oaxaca, Mexico in November 2002 to attend the XIII International Meeting of Rabies in the Americas. He presented the poster “Bat lyssairuses in Central Asia: New Evidence for Genus Diversity and Potential Significance for Public Health.” Kuzmin works in the Rabies Section of CDC’s Division of Viral and Rickettsial Diseases in Atlanta.

Class VIII Research Fellow **Vincent Hill** spoke at the 2002 American Water Works Association (AWWA) Water Quality Technology Conference in Seattle, WA on “Molecular Detection of Norwalk Viruses in Drinking Water by Filtration-Elution Methods Using an Alternative Amino Acid Eluent.” Hill is posted at the Virginia Division of Consolidated Laboratory Services in Richmond.

**Sarah Levin** presented a poster, “Serotype Distribution of Haemophilus influenzae Carriage Isolates from a Rural Alaska Village: Comparison on Antisera- and PCR-based Typing Methods” at the September 2002 Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) in San Diego, CA. She also submitted this work to the *Journal of Infectious Diseases*. Levin recently completed her training fellowship at CDC’s Arctic Investigations Lab and the Alaska
Department of Health and Social Services in Anchorage.

Twelve EID fellows attended the 51st annual American Society of Tropical Medicine and Hygiene (ASTMH) conference in Denver, CO in November 2002. **Amanda Loftis** presented the poster, “Quantitative PCR Assay for the Detection of *Ehrlichia chaffeensis* in Ticks and Tissue samples.” Loftis is a Class VII research fellow working in CDC’s Division of Viral and Rickettsial Diseases in Atlanta. Class VII Training Fellow **Rebecca Levine** gave a presentation in a symposium on GIS modeling of arthropod disease vectors entitled “GARP: A Spatial Modeling Tool for Predicting the Potential Distributions of Mosquitoes of Medical Importance.” Levine works in CDC’s Division of Parasitic Diseases in Atlanta. **Maribeth Lovegrove** presented a poster entitled, “Assessment of Lymphatic Filariasis Transmission in Areas of Low Prevalence in Haiti.” She also attended a smaller meeting focusing on the development of antibody assays to detect exposure to filarial parasites, where she gave a brief presentation of her recent fieldwork in Haiti. Lovegrove is a Class VII training fellow working in CDC’s Division of Parasitic Diseases in Atlanta.

**Susan Wilson** recently traveled to Leogane, Haiti to work with the principle administrators of the filariasis elimination program. The program investigates the immunologic, clinical and subclinical responses of children living in a filariasis endemic area of Haiti. Wilson is a Class VIII training fellow working in CDC’s Division of Parasitic Diseases in Atlanta.

The University of Iowa Hygienic Laboratory in Iowa City is hosting two current EID training fellows, **Jeff Librant** and **Brenda Saldivar**. Both have recently enrolled in the university’s Management Series 2003 course, which provides leadership and management training. Their mentors arranged their participation, recognizing the role of APHL fellows in the future of the nation’s public health laboratories. Librant also mentors a junior high student on a research project at the laboratory and participates in the laboratory’s Student Grant Committee, which works to bring the university closer to the community.

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**West Nile Virus: A Fellow’s View From Louisiana**

Jessica Versage is a Class VIII training fellow at CDC’s Division of Vector-Borne Infectious Diseases laboratory in Fort Collins, Colorado.

As an Emerging Infectious Disease training fellow at the CDC/NCID/DVBLID, I had the opportunity to participate in the October 2002 West Nile virus serosurvey in Slidell, LA. The goal of the epidemiological survey was to determine the rate of West Nile virus infection in Slidell and use this information to control the spread of the virus. My main responsibility was to interview members of the community while my partner gathered blood samples. Everyone I interviewed knew someone who had been infected and was worried about the health of the community.

I was able to answer questions, provide advice on prevention strategies and share information about the virus. I felt that I was making a difference in a community that had been severely impacted by West Nile. I also enjoyed meeting and learning from the experience of other public health professionals, including EIS officers and Louisiana Office of Public Health personnel. This invaluable experience gave me insight into public health system operations, career opportunities, and the challenges and satisfactions of a public health career.
APHL's international EID fellows had a unique opportunity to collaborate on a World Health Organization (WHO) laboratory-strengthening course in Lyon, France. WHO's Office of Laboratory Capacity Development invited all five members of the 4th class of IEID fellows to act as faculty advisors in their November 2002 training course. The fellows were invited based on their experience in public health laboratory practice. Their invitation stated, “WHO is delighted to have the fellows participate as faculty in our program...your background and experience are an excellent match for promoting our program objectives.” Three of the five fellows traveled to Lyon to participate in the course. They gave presentations on their CDC research and projects at their home country institutions. These included:

- “Developments in determining resistance to anti-tuberculosis drugs”
  — Berrin Gencer, Turkey
- “Bacterial meningitis and PCR-based diagnosis methods”
  — Arijana Boras, Croatia
- “An overview of HBV infections and molecular tools for determining the epidemiology of HBV”
  — Vladimir Chulanov, Russia

The course offered an opportunity for the fellows to consult with each other and to meet laboratory scientists from around the world.

APHL staff conducted a site visit to the California Department of Health Services Laboratory in Berkeley, California, where two EID Class VIII fellows are posted at the Microbial Diseases Laboratory. Melanie Lo is working on a multi-center evaluation of the Sherlock® Mycobacteria Identification System (SMIS) for the identification of mycobacteria. She has already submitted an abstract on this work for the 2003 ASM general meeting. Lo’s host laboratory mentor is Ed Desmond. Nhi Khuong, whose mentor is Will Probert, is working on a project to amplify Borrelia burgdorferi genes for identification of host proteins involved in pathogenesis.
Infectious Disease

APHL, CDC Sponsor Conference on Laboratory Aspects of TB

APHL and CDC sponsored the 4th National Conference on Laboratory Aspects of Tuberculosis, December 10-13, 2002, in San Francisco, CA. Over 200 participants, including clinical and public health laboratorians, clinicians, and TB controllers, attended. Representatives of forty-six state public health laboratories benefited from travel support provided through the APHL/CDC cooperative agreement.

The need for improved collaboration between laboratory, TB control and health care providers was a major focus of this year’s conference. Laboratorians expanded their understanding of how clinicians and TB controllers utilize laboratory services and test results from Henry Chambers, Chief of Infectious Diseases at University of California, San Francisco School of Medicine, and Tanya Oemig, TB Program Director, Wisconsin Department of Health. Sarah Royce, Chief of the TB Control Branch, California Department of Health, discussed the TB:BT palindrome, examining the unique role of TB control and TB laboratories in recognizing and responding to unusual disease outbreaks.

Speakers from public health and clinical laboratories shared new ideas and suggested models for providing “Optimal Laboratory Services.” At this session, Eric Blank, Missouri State Public Health Laboratory Director, discussed APHL’s Task Force on the Future of TB Laboratory Services, which is developing recommendations to support TB elimination efforts in the United States. These recommendations take into account the declining incidence of TB and provide suggestions for alternative, innovative service models to meet the varying needs of different jurisdictions and populations. The Task Force will present its conclusions to the Advisory Council for the Elimination of TB, the APHL membership and partner organizations in the summer of 2003.

Global TB was another topic of interest. Michael Iademarco, NCHSTP/Division of TB Elimination, provided an overview of the global epidemiology of tuberculosis followed by Armand Van Deun, Mycobacteriology Unit, Institute of Tropical Medicine, Belgium, who discussed the recommendations on TB laboratory services from WHO and the International Union Against TB and Lung Disease. Finally representatives from state public health laboratories and CDC shared examples of international collaboration to improve laboratory services in resource-limited settings.

Also featured were the technical aspects of TB laboratory services. “Advances in Drug Susceptibility Testing (DST)” examined non-radiometric methods and new NCCLS recommendations. Similarly “New Technologies” explored the new Quantiferon assay for detecting latent infection, the use of molecular methods for detecting resistance, and enhanced detection and identification using NAAT, MIDI and HPLC. New methodologies for fingerprinting were reviewed by Thomas Shinnick, Chief of the Tuberculosis/Mycobacteriology Branch at NCID/CDC. Other technical sessions covered biosafety and packaging and shipping.

At a pre-conference, NLTN workshop, Glenn Roberts and Leslie Hall, both from Mayo Clinic, reviewed sequencing applications for identification of mycobacteria. Nancy Warren, Laboratory Corporation of America, and Beverly Metchock, CDC Tuberculosis/Mycobacteriology Branch, followed with interactive case studies on mycobacterial laboratory services.

PowerPoint presentations from the conference will be available on the APHL Web site in March.

LIMS

LIMS Requirements on Track

With their view fixed on the April deadline for delivering LIM system requirements, the collaboration of public health laboratories, APHL and the Public Health Informatics Institute successfully passed two critical milestones in early March. A small workgroup defined the business processes common
Collaboration Provides Opportunities for Learning

Sixteen public health laboratories are “project partners and contributing members,” along with APHL and the Public Health Informatics Institute, in the collaboration to develop LIM system requirements. The collaborative process has provided the individuals participating — two representatives for each partner — with new opportunities for learning.

Dick Jenny (NY), who participated in the second workgroup meeting on the business process definitions, and whose lab hosted the second site visit, says he wanted to participate in the project because he was “impressed with the seriousness with which the LIM system requirements project was developed and the resources brought together to make it happen.” In addition, he says, “It was a great opportunity to be ahead of the curve.”

Having participated in the business processes workgroup’s effort to define the business processes of a public health lab, he better understands the rationale behind them.

While he says “only time will tell” if the project will provide a solution to public health laboratories’ needs for a LIM system, he adds that he is now more confident that “we have the most viable options.”

Bob Bostrom (KS) also participated in the business process definition workgroup and was among those on site visits to the Virginia, New York and Marion County labs. Commenting on the Virginia visit, he notes, “It was very different from the usual lab visit, where we look at things like equipment, not business processes.” With the focus on business processes, he says, “You get a good overview of how things fit together in a laboratory.”

Jenny also says that the collaboration, by bringing together people from diverse labs, has allowed laboratory professionals to learn from one another. “It’s always helpful knowing other people have problems similar to your own and learning how they solve them.”

Defining Business Processes

A workgroup of individuals from three public health laboratories — Dariush Shirazi (IA), Bob Bostrom (KS), and Willie Andrews (VA) — took on the daunting project of defining the 16 basic business processes in November. Tom York (VA), Dick Jenny (NY) and Jay Lewis (WA) joined the group in January to complete the business process descriptions and workflow processes. The APHL MIS committee approved the processes in January.

16 Processes

The 16 processes are:

1) Laboratory Test Processing (Human and Environmental)
2) Test Scheduling
3) Proactive Sample Collection (Prescheduled Tests)
4) Specimen and Sample Tracking/Chain of Custody
National Laboratory Database: Are You Using It?

CDC, PHPPO, DLS in cooperation with APHL is developing a National Laboratory Database (NLDB) that allows focused, state-based queries of constituent clinical laboratories. This database is a valuable tool that can aid states in locating and characterizing clinical laboratories that support public health programs in each state or multi-state area. Its data is derived from the Centers for Medicaid and Medicare Services Agency’s CLIA databases, a comprehensive source since all laboratories performing clinical testing must be registered through CLIA.

NLDB data include basic demographic (name, address, phone number, type facility) and specialty information, including indication of testing for microbiology, hematology, chemistry and so forth. Using this database, state laboratory directors or their designees can identify laboratories registered to perform testing in a specific specialty. Such information is invaluable for designing surveys of laboratory practices, implementing training or proficiency testing programs, and locating the nearest referral center in response to inquiries from a constituent laboratory. Currently 21 users, operating in 18 state laboratory offices have dial-up and/or LAN access to the NLDB.

CDC DLS encourages all states to have at least one registered user. Applicants must obtain permission from their state laboratory director. Once permission is granted, authorization should be sent to Rex Astles (770.488.8052; JAstles@cdc.gov) or the NLDB System Administrator Janice Hall-Dean (770.488.8104; JHall-Dean@cdc.gov) who will assist with registration.
Newborn Screening

Tandem Mass Spec Workshop:
Testing for Newborn Health

“Newborn Screening by Mass Spectrometry was invaluable. It offered a wealth of information for laboratory scientists responsible for start up, routine testing and interpreting laboratory results. I highly recommend this course to fellow laboratory scientists who are at the beginning stages of bringing this technology into a newborn screening laboratory.”
- Eleanor Stanley, manager, metabolic unit, Michigan Department of Community Health.

In November and December 2002, representatives from nine state public health laboratories participated in “Newborn Screening by Tandem Mass Spectrometry: A Course in Understanding Issues and Interpreting Test Results.” The five-day, intensive workshop held at Duke and Baylor universities targeted primary operators of tandem mass spectrometers from states new to tandem mass spectrometry (MS/MS). Attendees were selected based on experience in validating instrument operations, establishing a plan for laboratory operation based on MS/MS and attendance at a manufacturer’s training course.

“I found the workshop very useful. The number of analytes and their interactions overlap are daunting.”
- David Sesser, microbiologist, newborn screening, Oregon Public Health Laboratory.

The workshop covered metabolic pathways and diagnostic metabolite evaluations in urea cycle disorders and amino-acids disorders, description of clinical response to abnormal MS/MS screening results, theory and practice of labeled internal standards, procedure for establishing cut-offs, review of manufacturer instruments, software and support, and related topics. Dr. Millington, Director, Biochemical Genetics Laboratory, Duke University, and Dr. Sweetman, Institute of Metabolic Disease, Baylor University Medical Center developed the curriculum and organized the workshop. Speakers included Dr. Roe of the Institute of Metabolic Disease, Baylor University Medical Center, and Gary Hoffman, Ph.D. of the Wisconsin newborn screening program, which was one of the first to implement MS/MS for newborn screening. In addition to lectures, participants discussed technical problems in setting up MS/MS screening and problem solving techniques.

What is a Tandem Mass Spectrometer?
A tandem mass spectrometer is a specialized instrument that detects molecules by measuring their weight (mass). Mass spectrometers measure weight electronically and display results in the form of a mass spectrum, a graph that shows each specific molecule by weight and how much of each molecule is present. Millington, Kodo, Norwood and Roe published the first report describing the potential of MS/MS in detecting diseases in newborn blood spots in 1990.

State public health laboratories use tandem mass spectrometers to screen thousands of infants for metabolic inborn errors and organic acidoses, using blood spots collected on filter paper. The application of tandem mass spectrometry has had a major impact on state laboratories newborn screening programs. Laboratories can now screen for a spectrum of diseases using multi-disease screening tests. This has led to early diagnosis of more children, including those from ethnic groups deemed susceptible to certain diseases.

“The logic of metabolic pathways makes perfect sense after participating in the workshop. I now understand why we monitor certain markers of disease and how a positive screen baby is referred to specific diagnostic tests. Learning about Wisconsin’s newborn screening program was a bonus. This is an established program with MS/MS screening and reporting in place.”
- Amy Hietala, research scientist, newborn metabolic screening, Minnesota Department of Health.

More MS/MS Workshops Coming
The NLTN, the CDC, HRSA and the National Newborn Screening and Genetics Resource Center co-sponsored the workshop. Since May 2002, 19
Building Expansion in PA

“It is truly an exciting time to be in public health — especially in the laboratory. After so many years in the background, our field is now at the forefront of peoples’ minds and thinking,” explained Dr. Bruce Kleger, Director of Pennsylvania’s State Health Laboratory. Between facility renovations and bioterrorism preparedness projects, the Pennsylvania laboratory is racing forward while juggling multiple initiatives.

But this is hardly new for the institution. Since its founding in 1906 at the University of Pennsylvania, it has adapted continually to meet new challenges and demands. Originally the lab concentrated in direct service. However, with the growth of reference labs and hospitals, it shifted its work to confirmatory testing. In 1999 with support from CDC, the laboratory became a bioterrorism facility, a focus that it has since expanded. “BT is a rapidly changing field because of new threats and political capabilities,” said Kleger.

The Pennsylvania laboratory is meeting these changes head on. One of Kleger’s employees was among the first Pennsylvanians to receive the smallpox vaccine. The lab was also chosen to conduct environmental testing for agents of bioterrorism as part of the federal government’s new Bio-Watch initiative. To accommodate this testing, the lab is expanding BSL capacity by 1000 square feet and upgrading its training facility to incorporate state-of-the-art technology. Additionally, the Allegheny County Health Department is opening a new laboratory in Lawrenceville, PA with Focus C funding.

Responding to new realities without sacrificing business-as-usual remains a major challenge. According to Kleger, “Twenty percent of the things we do now, we didn't do five years ago.” Bioterrorism response and emerging diseases such as West Nile have demanded much from the laboratory’s resources.

The lab performs approximately 180,000 tests each year for 100 different diseases from rabies to tuberculosis. It also serves as a regulatory agency, monitoring performance standards and licensing approximately 8,000 clinical labs in the Commonwealth.

Under the Bio-Watch program, CDC supplies people and equipment, and the laboratory space and technical know-how. The lab’s new assistant director, Nancy Warren, anticipates that it will have to modify procedures to meet its new obligations. “Testing requires seven-day coverage, so we will need to rearrange schedules here. However, many of the preparatory steps are still unclear to us at this time.”

Pennsylvania State Health Laboratory At-A-Glance

| Director: | Bruce Kleger, DrPH |
| Location: | Lionville, PA |
|           | (thirty miles west of Philadelphia) |
| Number of Labs: | 1 |
| Number of Staff: | 75 |
| BSL Rating: | 3 |
| LRN Rating: | Level C |

Other challenges include workforce and funding issues. “There are few people qualified to do this testing,” explained Kleger. And Pennsylvania’s governor is determined to watch the budget. Securing adequate funding will not be an easy task in the upcoming fiscal year.

While these challenges are significant, the laboratory has assets at its disposal. Kleger is proud of his team’s
ability to cope with a changing regulatory and technical environment. The lab plans to seek funding for chemical terrorism activities and to take on more regulatory responsibility with licensing of blood banks.

**Staff News**

Lucy Maryogo-Robinson is APHL's new Office Assistant. Lucy graduated in June 2002 from Ohio Wesleyan University with a BA in International Studies. Most recently, Lucy has been interning at NAFSA, the Association of International Educators. At NAFSA, she was responsible for monitoring legislation pertaining to international students and scholars.

Kathryn Pollenz began working at APHL in December 2002 as the Fellowship Program Assistant. Kathryn has a bachelor's degree in anthropology from James Madison University, with a concentration in premedical and health science studies. She interned at Children's Hospital in Boston, and recently completed ten months of service as a team leader with AmeriCorps, addressing areas of disaster relief, environment, education, unmet human needs and public safety. She will assist with the design and implementation of the EID and EHLS fellowship and traineeship programs.

**APHL Partners with CDC to Host Quality Institute Conference**

The Quality Institute Conference will convene April 13-15, 2003, at the JW Marriott Lenox Hotel in Atlanta, GA. The conference aims to assess the impact of healthcare system changes on laboratory services and patient safety. It will examine perspectives on patient safety from various sectors of healthcare. Register online at www.phppo.cdc.gov/mlp/qiconference/.

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

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To submit an article for consideration, contact Emily Mumford via email, emumford@aphl.org.