

RESPONSE BY THE NUMBERS:

THE NATION'S PUBLIC HEALTH LABORATORIES PROTECT THE COUNTRY



2011 APHL All-Hazards Laboratory Preparedness Report

June 2011

Acknowledgements

1. North Carolina State Laboratory of Public Health's Bioterrorism & Emerging Pathogens (BTEP) Unit: *Strategic Planning for Response to Public Health Threats* (page 10)
2. Nuclear Chemistry Laboratory (NCL) at New York State Department of Health (NYSDOH) Wadsworth Center: *Exercising Radiological Preparedness* (page 12)
3. Biodefense Laboratory at New York State Department of Health Wadsworth Center: *All-Hazards Response Training* (page 14)
4. Colorado Department of Public Health and Environment Laboratory: *Protecting the Public: Laboratory Calms Fears* (page 17)
5. New Hampshire Public Health Laboratories, State Division of Public Health Services: *Drum Circle + Abdominal Pain = More than Just Funky Beats* (page 20)
6. Virginia Division of Consolidated Laboratory Services (DCLS): *Partnerships and Response Across State Lines* (page 21)
7. Laboratory Response Network (LRN) Program Office, the CDC's Public Health Informatics and Technology Program Office (PHITPO): *LRN Laboratory Information Management Systems Integration Pilot Project* (page 22)
8. Laboratories Division, Hawaii Department of Health: *Trouble in Paradise* (page 28)
9. William A. Hinton State Laboratory Institute, Massachusetts Department of Public Health: *Chemical Threat Response in Action* (page 29)

Images on the cover, from left to right: laboratory scientist conducts testing for potential agents of biological/chemical terrorism; in preparation for a major storm, emergency officials convene in a regional medical operations center in Texas; first responders at the scene of an incident involving hazardous materials.

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I. Executive Summary

The Association of Public Health Laboratories (APHL) is the voice of the nation's state and local governmental laboratories that perform testing of public health significance.

From the local to the national level, APHL diligently works to ensure that laboratories are included in relevant discussions and well-represented on preparedness issues. On an annual basis, APHL assesses the capacity and capability of state public health laboratories (SPHLs) to prepare for and respond to all-hazards threats including: intentional and natural biological, chemical and radiological threats; disease outbreaks; disasters and food emergencies. This annual survey, covering the period from August 10, 2009 through August 9, 2010, provides a glimpse of the laboratories' preparedness, and identifies areas for improvement. In the winter of 2010, the survey was distributed to the public health laboratories in all 50 states and the District of Columbia (DC), and a 100% response rate was achieved.

State public health laboratories remain integrated into the larger national response architecture. The laboratories' efforts continue to be defined by rapid and accurate testing, but it is the outreach efforts—such as delivering trainings, developing exercises, and sharing information and technical expertise—that have made these public health laboratories a critical partner in response. Creating and developing the infrastructure and preparedness networks took many years and is still a work in progress, but the payoff is a system that can truly respond to any threat. The value of this system is demonstrated daily by a myriad of events, ranging from routine cases to the more exotic, such as anthrax and sulfur mustard gas. However, this system has not been immune to the receding economy, and holes are beginning to widen.

This year's data continues to show a mixed bag of successes and concerns, and points towards a set of potential breaking points. On one hand, states continue to have highly skilled staff, perform thousands of tests, deliver hundreds of trainings and continue to expand relationships with preparedness partners. On the other, the skilled workers are being asked to combine their positions and duties, new testing equipment purchases are dwarfed by high maintenance costs, the number of trainings offered have declined from previous years, and a significant gap remains in the coordination of electronic data messaging between networks. Laboratories are fortunate to have men and women willing to sacrifice income and work long hours because they care about the lab's mission—but soon, even this dedication will not be enough. Similar to an art gallery containing various types of expression, each laboratorian brings a unique perspective and skill set towards preparedness and response.

APHL calls for continued and increased funding support for public health laboratories to ensure sustainability of a robust laboratory response network, capable of protecting the nation from deadly threats. Investing in laboratories is a sound strategy that will pay for itself in the long-term. The cost to sustain a high functioning laboratory system is far less than the price of starting over if an event occurs; and the losses will not only be monetary, but more importantly, irreplaceable human capital.

II. Introduction, Background and Methods

INTRODUCTION

The world of public health preparedness and response comprises numerous local, state, federal and non-federal entities. Each partner has their own sphere of responsibility and unique challenges; yet without the combined efforts of each working in concert, the system falters and the greater public may suffer as a result.

In this report, APHL paints the picture of laboratory preparedness, demonstrates the vital role of these professionals in the larger response, and illustrates how various components of the laboratories contribute to response to public health threats.

Suspicious samples don't come in gift wrapped boxes with instructions on what tests to run, and they don't always arrive from trusted sources such as law enforcement, hospitals, Hazardous Materials teams (HazMat) or Civil Support Teams (CSTs). All of this means that laboratories must have sample management plans, conduct outreach and training, and of course, have equipment and skilled workers to be able to carry out the necessary testing and data messaging. This delicate balancing act requires many moving parts and is built upon the backbone of both internal and external communications. Uncertain funding from the state and federal levels has made this task increasingly difficult, but the dedicated men and women staffing the nation's laboratories have persevered.

The term "preparedness" is somewhat of a misnomer in that it insinuates preparing for events before they occur. Currently, the system is geared towards preparing for incidents that have already happened. The 2001 anthrax attacks are a prime example; the majority of funding for laboratories to

gain capability to test for anthrax happened only after these attacks. Funding and interest are often dictated by what is commonly referenced as the disease du jour. Focusing attention on the latest emergency has many benefits but, ultimately, is a Band-Aid philosophy. Would you only care about fire proofing your house after a recent fire? What if resources are tight and this is the only improvement that can be made? Is this approach responsible if the house is in Tornado Alley or along a hurricane pathway? Continuing to perpetuate this mistake is illogical and irresponsible; in the immortal words of George Santayana, "those that don't learn from history are doomed to repeat it."

Given the current economic climate, creating a system that can quickly adapt to the next unknown threat regardless of its origin serves a larger purpose and ultimately moves preparedness towards proactive behavior. The nation's public health laboratories foresaw this downfall and have made it their mission to establish all-hazards preparedness and response protocols as much as possible.

Annually, APHL collects survey data from the state public health laboratories (SPHLs) to capture a snapshot of national laboratory preparedness as well as to assess progress made since the inception of the CDC Public Health Emergency Preparedness (PHEP) Cooperative Agreement. Throughout this report, key data elements from the 2010 survey are paired with real-life examples from laboratorians to paint the complete picture of preparedness and response across the nation. Complete aggregate survey assessment results are available online at http://www.aphl.org/aphlprograms/phpr/ahr/Documents/PHPR_2011_AllHazardsWhitePaper.pdf

II. Introduction, Background and Methods

BACKGROUND



Bacillus anthracis culture. Photo provided by the New Hampshire Public Health Laboratory, Division of Public Health Services.

Public health laboratory preparedness activities have been funded on a limited basis since 1999. Following the terrorist attacks of 9/11 and the subsequent anthrax attacks, Congress authorized supplemental funding via the Public Health Emergency Preparedness (PHEP) Cooperative Agreementⁱ to support nationwide preparedness in state and local public health departments. The PHEP Cooperative Agreement is administered by the Centers for Disease Control and Prevention (CDC); thus CDC serves as the primary mechanism for funding state and large local jurisdictions in their efforts to prepare for and respond to public health threats. In 1999, CDC, the Federal Bureau of Investigation (FBI) and APHL formed the Laboratory Response Network (LRN)—the nation’s premier system for identifying, testing and characterizing potential agents of biological and chemical terrorism. With limited funding, the CDC initially supported a small number of laboratories for biological terrorism preparedness and even fewer (only five laboratories) for chemical terrorism preparedness.

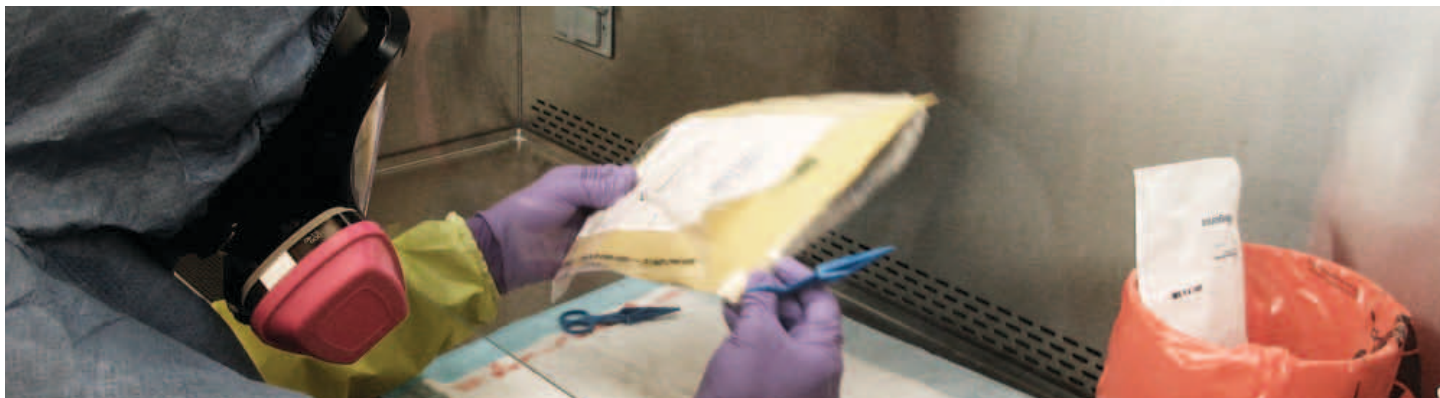
The PHEP Cooperative Agreement initially focused the majority of resources, time and money on bioterrorism preparedness. In 2002, the CDC determined a hazard gap

existed and expanded funding for the LRN for Chemical Terrorism Preparedness (LRN-C). CDC created plans to build a radiological preparedness component to the LRN, (the LRN-R); however, funding never became available. A more detailed explanation of the Laboratory Response Network can be found on the CDC website.ⁱⁱ

In 2004, the CDC expanded the Cooperative Agreement’s scope to include all-hazards preparedness, recognizing the need to further broaden the focus of public health preparedness.ⁱⁱⁱ No specific funding, however, was allocated to this change in scope. “All-hazards” refers to any public health emergency including biological, chemical, radiological or nuclear. It could involve naturally-occurring incidents such as the H1N1 pandemic, natural disasters such as Hurricane Katrina, and accidents such as an overturned chemical tanker. The challenge is formidable, and the mission is vital. SPHLs must develop and maintain the ability to continuously prepare for and respond to all-hazards threats.

II. Introduction, Background and Methods

METHODS



Chemical Terrorism Letter. Photo provided by the Minnesota Department of Health, Public Health Laboratory.

APHL collected data in the winter of 2010 during its Fourth Annual All-Hazards Laboratory Preparedness Survey. This survey covers the 12-month period from August 10, 2009 to August 9, 2010, representing the CDC PHEP Cooperative Agreement Fiscal Year (FY) 2009, also known as Budget Period 10. SPHLs reported on their capability and capacity to respond to biological, chemical, radiological and other threats, such as pandemic influenza. Reports and briefs from previous all-hazards, biological and chemical threat laboratory preparedness surveys are available online at <http://www.aphl.org/aphlprograms/phpr/ahr/pages/default.aspx>

The 2010 All-Hazards Laboratory Preparedness Survey generated a 100% response rate, with 51 responses received from the 50 SPHLs and District of Columbia (DC) public health laboratory. For the purposes of this report, the term “states” or “state public health laboratories” will refer to all respondents, including DC. Data were collected using mrlInterview, a Web-based survey tool and data repository. Results were coded for entry into SPSS for Windows Version 15.0.

Descriptive statistics were gathered for all variables. Aggregate survey assessment results for all questions are available online at http://www.aphl.org/aphlprograms/phpr/ahr/Documents/PHPR_2011_AllHazardsWhitePaper.pdf

Results are reported in five categories: workforce, planning and exercises, outreach and training, public health response and funding.

While this year’s all-hazards report did not contain a section dedicated to radiochemistry capability, other sections of this report, such as workforce, include results related to this important area. Additional information on radiochemistry testing capabilities can also be found in the 2009 APHL All-Hazards Laboratory Preparedness Survey Data White Paper available online at: <http://www.aphl.org/aphlprograms/phpr/ahr/Documents/APHLAllHazWhitePaperEPR.pdf>

III. Findings

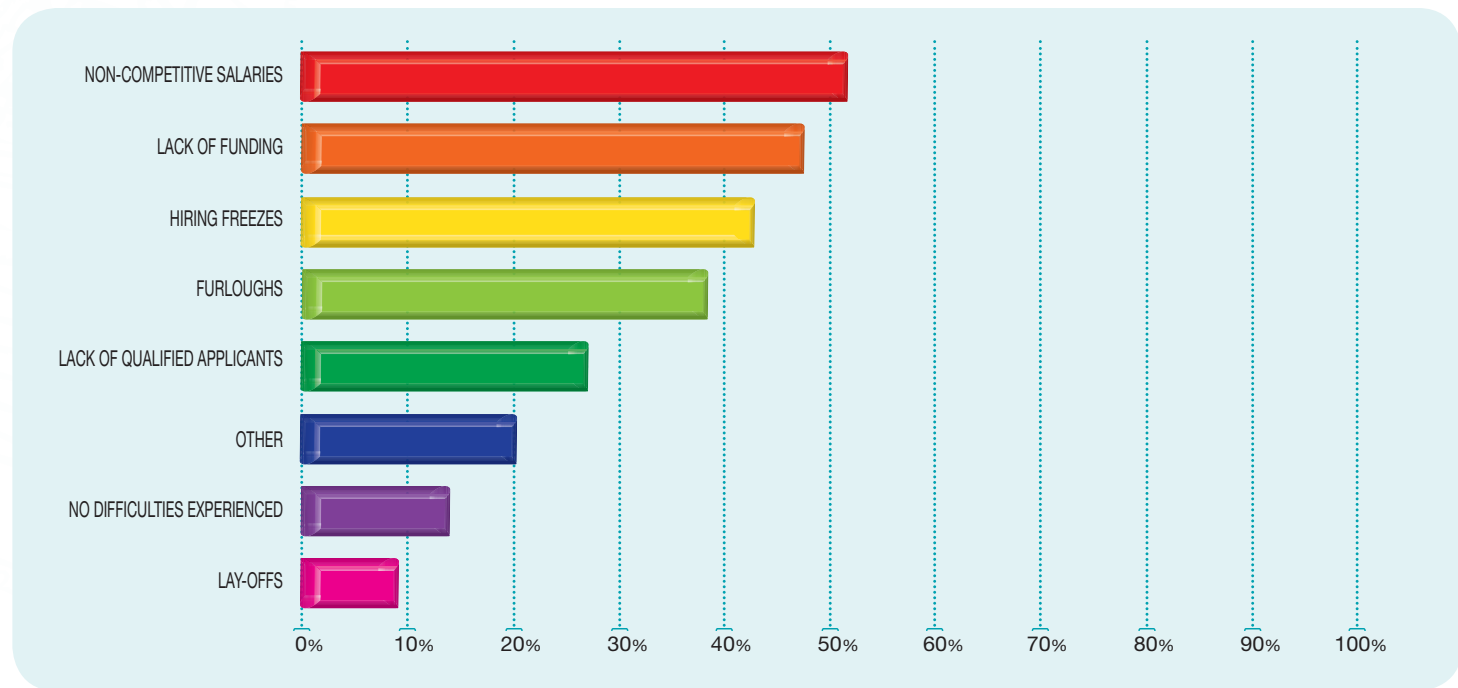
Following are key findings from the 2010 APHL All-Hazards Laboratory Preparedness Survey.

WORKFORCE

A painting would not exist without a painter, and the same can be said of the laboratory's response without staff. While the workforce is just one corner of the canvas, educated and trained laboratorians are essential to a high functioning laboratory. As with many public health professions these days, impending retirement of a significant portion of the workforce is a major threat. This is particularly worrisome for public health laboratories since they require a highly-skilled and well-trained workforce. States are also grappling with the economic downturn and are forced to leave positions unfilled during mandated hiring freezes. This means that the pipeline of potential workers is steadily declining.

The majority of SPHLs, 23 (52%), cited non-competitive salaries as the main workforce barrier in FY09. Figure 1 illustrates the top factors affecting workforce. Also, the numbers of mandatory furlough days are increasing across the US, and this is impacting public health laboratories more than ever. The number of states who named furloughs as a major workforce barrier increased from 32% in FY08 to 39% in FY09.

Figure 1. Workforce Difficulties Affecting SPHLs' Ability to Carry Out Preparedness Activities



III. Findings

WORKFORCE (CONTINUED)

In the world of preparedness, it is essential to have enough staff to work during an emergency. Most states, 47 (92%) have enough staff to respond to an infectious disease outbreak such as the 2009 H1N1 pandemic. States indicated they have sufficient staff to work 12-hour days to respond to an emergency for up to eight weeks. In the economic climate of hiring freezes and furloughs, this demonstrates the dedication of public health laboratorians to protecting the health of their fellow citizens. For example, during the 2009 H1N1 pandemic, many laboratories were able to meet testing demand only because scientists from other areas in the laboratory helped process samples. Imagine if more than one emergency event, such as pandemic influenza and a major foodborne disease outbreak, occurred at the same time—laboratories would be stressed beyond their limit.

Having enough trained scientists is not the only factor when responding to a significant event. A training coordinator as well as bioterrorism (BT) and chemical terrorism (CT) preparedness laboratory coordinators are essential positions for response. These positions work together to provide training to clinical laboratories and other first responder partners, and to conduct outreach. They are often the first points of contact in an emergency and provide a coordinated response to public health threats. In order to save money or work around a hiring freeze, many states have chosen to combine these positions. Twenty-four SPHLs (78%) reported combining the first responder coordinator with other functions, 37 (72%) combined it with the state

training coordinator, 34 (66%) with the hospital liaison, and 24 (47%) with the assistant chemical threat laboratory coordinator. Fewer states have full-time BT and CT laboratory coordinators than they did in FY08, with an eight percent and two percent decrease in BT and CT coordinators respectively. While sometimes it may make sense to combine these positions, particularly for smaller laboratories, it can add significant stress on the laboratory's overall workforce.

Another area where there is a significant gap in workforce is radiochemistry. There are only a few programs in the nation to educate and train radiochemists, and fewer students are choosing this field of study. The majority of public health laboratories do not have a trained radiochemist: 47 (92%) have zero full-time radiochemists, and 46 (90%) have zero part-time radiochemists.

Workforce challenges—including recruiting, hiring and retaining highly skilled scientists necessary to run and maintain the laboratory operations—continue to plague the public health laboratories. Investing in laboratory workforce development programs, enhancing recruitment tactics and providing training opportunities for existing laboratorians are key elements to ensure a well-oiled pipeline of highly skilled and qualified workers.

III. Findings

PLANNING AND EXERCISES



Training exercise at the USPS Cedar Rapids Processing and Distribution Center. Local Linn County Public Health, local fire department and USPS participate in the Biohazard Detection Systems Drill. Photo provided by the University of Iowa Hygienic Laboratory.

Planning, drills and exercises, training and outreach are equivalent to the primary colors of a color wheel. When combined in proper proportions, they create an adaptable system that anyone can appreciate. For example, the value of training and outreach diminishes without proper plans or exercises. Finding the correct balance is difficult, but the “artists” in the nation’s public health laboratories have cultivated this ability over the years. A well-executed response only occurs because of tireless efforts and tenuous planning.

Having plans in place is the equivalent of having the proper supplies—such as brushes, paint and a canvas—but if the plans aren’t exercised or the art supplies not maintained, the results will not be ideal. A continuity of operations plan (COOP) serves as the plan to which laboratories turn when disaster strikes—ranging from sick employees to large-scale power



First responders demonstrating emergency practices, using a decontamination shower. Photo from istockphoto.com.

outages and major events—to maintain vital laboratory functions. Laboratories continued to have a solid foundation of planning, and all 51 (100%) SPHLs have continuity of operations plans (COOP). The number of SPHLs with a laboratory-specific COOP increased: in FY09, 30 (60%) states had a laboratory-only COOP, compared to 27 (54%) in FY08. More importantly, state public health laboratories exercised their continuity of operations plans: 30 SPHLs (59%) tested their COOP in FY09 to ensure it was operational. A COOP is one of many plans that SPHLs have in place. Other laboratories develop specific plans for ongoing management and response to threats. For example, the North Carolina State Laboratory of Public Health developed a strategic plan for the Bioterrorism and Emerging Pathogens Unit (See page 10).



BTEP Unit participating in a tabletop exercise. Photo provided by the North Carolina State Laboratory of Public Health.



Strategic Planning Poster. Photo provided by the North Carolina State Laboratory of Public Health.



BTEP Unit taking a break to pose for a picture. Photo provided by the North Carolina State Laboratory of Public Health.

STRATEGIC PLANNING FOR RESPONSE TO PUBLIC HEALTH THREATS

In 2010, the North Carolina State Laboratory of Public Health's Bioterrorism & Emerging Pathogens (BTEP) Unit developed a strategic plan and quality improvement initiatives to guide their activities for the next three years. The strategic plan and quality improvement initiatives help to unify the activities of 12 BTEP team members, located in four geographically separate facilities, toward their stated goals.

The mission of the BTEP Unit is to maintain laboratory capacity for the detection of biological weapons and emerging infectious diseases, and to act in a manner that strengthens crisis response. Performance goals include:

- Sustain readiness through laboratory operations, emergency drills, and 24/7 capacity;
- Assure that BTEP has the infrastructure and resources (e.g., staffing, equipment, supplies, communications, and laboratory information management system) to accomplish its mission;
- Maintain a technically competent staff through mandatory participation in a structured training program;
- Meet regulatory compliance by achieving required laboratory certifications;
- Strengthen the bond between the BTEP Unit and its partners by exercising and improving upon an established outreach program.

Input for development of this strategic plan came from the BTEP Unit team members, management and 29 partner organizations including public health, hospital, commercial laboratories and law enforcement agencies from federal, state, and local jurisdictions. Questions focused on the BTEP Unit's strengths, weaknesses, opportunities and threats. External analysis combined with an internal assessment formed the foundation for the next step: Quality Improvement Initiatives (QIIs). Objectives addressed analytically-identified gaps or critical processing points that could dramatically affect the team's functionality. Having QIIs not only assisted the BTEP team in monitoring and improving its own performance, but also engaged key BTEP partners (epidemiologists, preparedness staff, and FBI), better connecting them to the laboratory's efforts.



BTEP Unit working diligently to develop strategic plans. Photo provided by the North Carolina State Laboratory of Public Health.

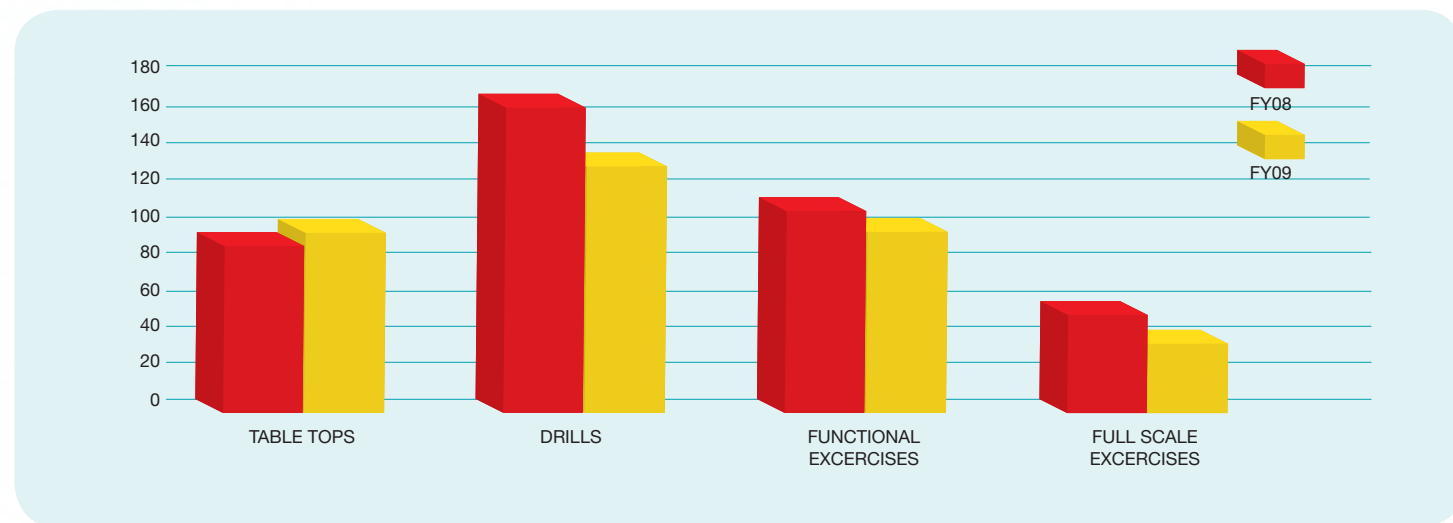
III. Findings

PLANNING AND EXERCISES (CONTINUED)

State public health laboratories are on the frontline protecting the nation. To ensure that they are able to respond to all threats, these laboratories perform drills and exercises both within their laboratory as well as multi-jurisdictionally with key partners. As shown in Figure 2, laboratories participated in an impressive amount of table-tops, drills and functional and full-scale exercises; however, a troubling trend can be seen from FY08 to FY09. Laboratories noted that preparedness exercises are expensive, resource intensive and difficult to plan and produce. With the combination of key positions noted earlier and reduced funding to support exercises, laboratories continued to see a decline in developing and implementing these exercises. This type of decline is indicative of the difficult decisions occurring at the state level due to funding cuts.

Beyond LRN exercises, SPHLs are tested frequently because they are members of multiple laboratory response networks, such as the Food Emergency Response Network (FERN),^{iv} which was developed by the US Department of Agriculture (USDA) and Food and Drug Administration (FDA). The goal of FERN is to integrate the nation's food testing laboratories at the local, state and federal levels into a network that is able to provide a coordinated response to food contamination events involving chemical, biological and/or radiological threats (See page 12).

Figure 2. Number of Preparedness Exercises Conducted or Participated in by SPHLs, FY09 vs. FY08



EXERCISING RADIOLOGICAL PREPAREDNESS

As part of the Food Emergency Response Network (FERN) MENU2010 radiological emergency exercise, the Nuclear Chemistry Laboratory (NCL) at the New York State Department of Health (NYSDOH) Wadsworth Center prepared and shipped 729 samples to FDA. The exercise, designed as a consensus study, provided FERN with an estimation of capabilities across a range of food testing methods and target analytes. This exercise posed a limited challenge to FERN by simulating radiologically contaminated food as realistically as possible.

The concept began during the 2009 FERN National Training Conference and brought together five Food and Drug Administration (FDA)-funded public health laboratories (MD, NY, TX, WA, WI) and other partners. Overall, MENU2010 involved 35 laboratories in the US and four international laboratories concerned with the radiological safety of food.

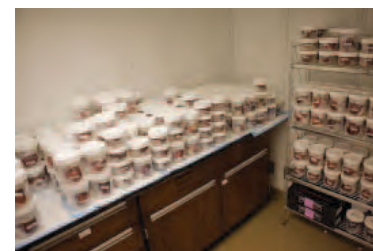
Wadsworth's NCL coordinated the technical program and radioactive sample preparation

laboratories, which included spiking powdered milk, powdered Tang fruit drink, apples, and packaged tuna with I-131, Sr/Y-90, Cs-137, Am-241, Pu-239, Pu-242, and an unrevealed additional gamma emitter. Staff members organized and participated in several workshops to ensure that communication with participating laboratories was smooth and that sample preparation, sample analysis, and result reporting mechanisms were satisfactory and that participants finalized their after-action reports.

A considerable amount of work went into this exercise, and results were important tools to improve the nation's ability to respond to radiation incidents such as the one occurring in Japan. Their innovative approach evidences the growing public safety partnership between federal, state, local jurisdictions, and educational institutions. Successful completion of this exercise has resulted in a second challenge for FERN radiological laboratories this year as RadEx2011 to be organized by FDA and Winchester Engineering and Analytical Center (WEAC).



Preparing apples for leaching studies to measure atmospheric deposition



Samples stored in a walk-in refrigerator prepared for packaging and shipping



Tuna samples being spiked with Plutonium

Photos provided by APHL staff.

III. Findings

OUTREACH AND TRAINING



Iowa 71st CST participating in a joint laboratory exercise. Photo provided by University of Iowa Hygienic Laboratory.

As mentioned, plans and exercises are just one color on the color wheel. Integration within the broader response community represents yet another hue. To ensure that response is efficient, laboratories and first responders need to work jointly to share information: the better the connection, the stronger the overall response.

States continued to work well with first responders, and 46 SPHLs (90%) provided outreach to their HazMat, CSTs or local fire or law enforcement. Several areas improved from FY08, with four additional states providing proficiency testing and five more providing sampling kits to first responders. One area where laboratories declined was in providing training: five SPHLs (10%) did not offer training to first responders this year. The top three reasons for this include: they did not believe it was the responsibility of the SPHL to provide this training, there was a lack of funding, and a lack of national guidance. Recognizing this gap, APHL recently took several steps, which include releasing

guidance on screening unknown non-clinical samples, creating brochures connecting the first responder community with laboratories, delivering joint trainings with CSTs, and working to improve connections. More information on biological and chemical laboratory outreach to first responder groups can be found online at <http://bit.ly/k1RR18> and at <http://bit.ly/hbqhMr>.

As laboratories continue to develop training programs for first responders and other partners, they must also work to ensure the readiness of their own teams. Leading the way in providing a unique all-hazards training is the New York State Department of Health (NYSDOH), Wadsworth Center's Biodefense Laboratory (See page 14).

ALL-HAZARDS RESPONSE TRAINING

The NYSDOH Wadsworth Center's Biodefense Laboratory received a two-year grant from the Department of Homeland Security (DHS) to develop and deliver training focused on enhancing public health laboratories' ability to respond to uncharacterized threats. Between January 2009 and December 2010, seven courses were offered free of charge to laboratorians and facility engineers. In total, 45 individuals from 15 different states and territories participated in these courses. APHL provided travel scholarships to several participants to support attendance for these classes.

The first course, "All-Hazards Emergency Response Training for Laboratory Personnel," targets laboratory staff performing the hands-on testing of unknown environmental samples such as threat letters with powders or liquids. This course was designed as a highly intensive, hands-on 5-day training session where participants were allowed to work with simulated chemical and radiological threats, process threat samples within a Class III glovebox, and become familiar with the EPA All-Hazards Receipt Facility Laboratory Methods.

The second course, "All-Hazards Receipt Facility Training for Engineering & Support Personnel," provided detailed guidance on designing all-hazards laboratories with emphasis on the requirement for additional heating, ventilating and air conditioning (HVAC) safe guards. Most laboratories are under the false assumption that all-hazards screening can be safely conducted in a standard BSL-3 biological laboratory. However, in order to provide adequate safety to laboratory staff, support personnel within the building and the surrounding community, Carbon-theta filtration is required in addition to the standard high efficiency particulate air (HEPA) filtration systems found in most public health laboratories. This course provided engineering and facilities staff with guidance and feedback on their site-specific questions and provided extensive "lessons learned" from the Wadsworth Center's Facilities and Engineering division who integrated the stand-alone facility at the Wadsworth Center in 2006.

Although funding for this national training program has ended, the Wadsworth Center's Biodefense Laboratory will continue to offer these classes once per year, in response to continued interest from the public health community. More information on this training is available online at: www.wadsworth.org/testing/biodefense/training.html.

III. Findings

OUTREACH AND TRAINING (CONTINUED)



Agents of Bioterrorism Laboratory Training for Sentinel Laboratories sponsored by the Texas laboratory and the NLTN. Photo provided by the Texas Department of State Health Services, Laboratory Services Section.

In addition to samples collected by first responders, public health laboratories routinely receive thousands of samples from sentinel clinical laboratories. These laboratories are typically hospital or large commercial laboratories and they make up the largest tier of the LRN. In FY09, 43 SPHLs (84%) provided training for sentinel clinical laboratories, which was slightly lower but comparable to FY08 training numbers. While there are declines in training figures, the total amount of training courses remains impressive. Overall, the amount of trainings produced by the 43 SPHLs was 487 classes for rule-out testing, packaging & shipping or biosafety that reached more than 6,200 laboratories. To maintain national preparedness built over the last decade, it is critically important that these training and outreach efforts continue to be prioritized at the state level.



Hawaii Department of Health Public Health Laboratory staff leading a joint training with HAZMAT and First Responders. Photo provided by Hawaii Department of Health Public Health Laboratory.

Communication between SPHLs, sentinel clinical laboratories and first responders remains vital. Learning the name of your partner should not happen during an event; this creates the potential for significant testing delays and much worse. The Health Alert Network, a CDC-sponsored program, provides vital health information and the infrastructure to disseminate it at the state and local levels. In addition to this network, SPHLs rely heavily on faxes, blast emails, and recently, messaging via social media networks to provide information to partners. In FY09, SPHLs sent a total of 1,923 messages, which is a slight decrease from last year when they sent 2,293 messages. Messages were focused on outbreaks including H1N1, routine requests and training events. These communications enable public health laboratories to maintain working relationships with sample submitters and ensure that correct information is exchanged pre-event, during the event and post event.

III. Findings

PUBLIC HEALTH RESPONSE



Emergency operations staff in Texas prepare for a major storm. Photo provided by APHL staff.

Preparedness exercises, ongoing outreach and training serve an important planning and readiness purpose; however, SPHLs put their training into action daily through real-life responses. During FY09, state public health laboratories responded to *Salmonella* and *E. coli* outbreaks, a series of *Bacillus anthracis* cases, a slew of white powder letters, and began recovering from the 2009 H1N1 pandemic. During this time period, the world also saw severe winter weather, floods, fires and volcano eruptions. Public health laboratorians either stepped aside from their daily testing demands to help other areas or were themselves directly affected by these disasters at home or in their communities.

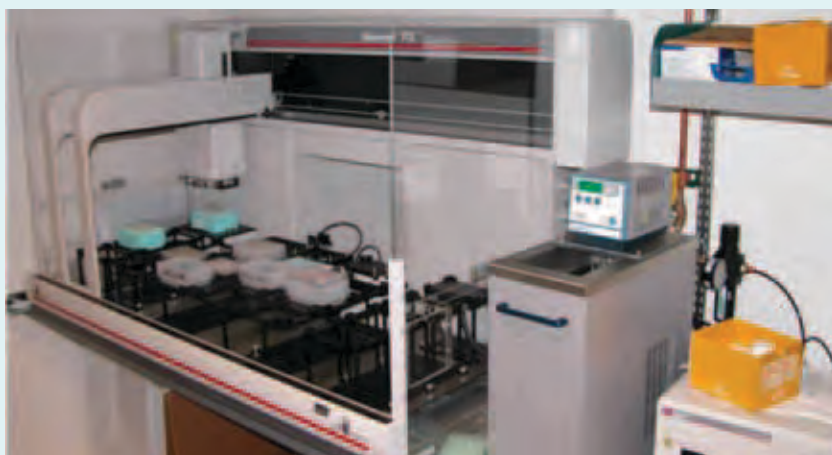
An example of response in action is the Colorado Department of Public Health and Environment Laboratory's response to an unknown threat letter. The capability they built over the past ten years allowed them to assist the FBI in an investigation, which calmed the fears of the government, especially those who opened the letters (See page 17).

PROTECTING THE PUBLIC: LABORATORY CALMS FEARS

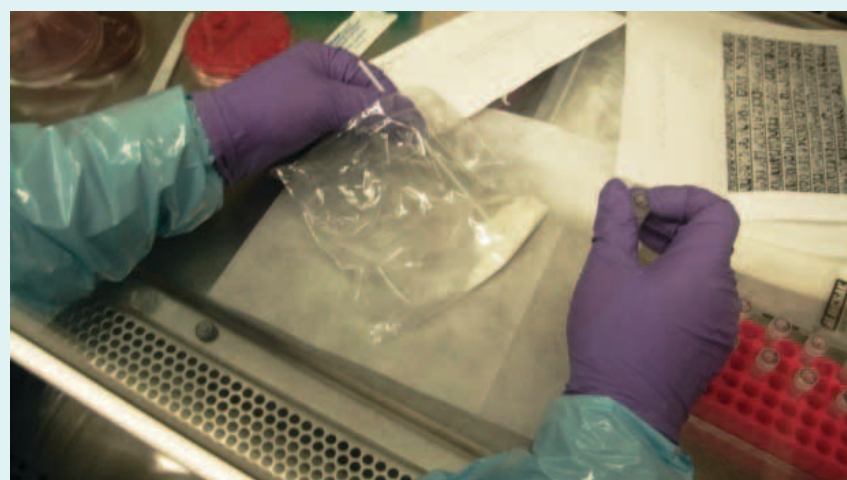


As an LRN facility, the Colorado Department of Public Health & Environment (CDPHE) Laboratory had previously tested several opened threat letters; but in early 2010, they became part of an investigation led by the US Postal Inspection Service and the FBI involving four unopened letters addressed to a foreign embassy in Washington, DC.

For years, someone continuously sent threatening letters containing white powders to US Congressmen, state and federal agencies, private and public institutions and embassies abroad and in the US. The investigation led to a suspect living near Denver, CO, who—while under surveillance—dropped four letters into a curbside mailbox.



Photos provided by the Colorado Department of Public Health & Environment Laboratory



The FBI advised the CDPHE Laboratory that there would be four letters to test, with the caveat that the letters were unopened and, according to postal regulations, required approval by the recipient to be opened. Complicating matters, the intended recipients worked at a foreign embassy in Washington, DC. Given the time zone difference, the FBI was unable to contact embassy staff for approval to open the letters. Early the next morning, the FBI delivered the pre-screened letters with the instructions to open the letters from the bottom, not the sealed top, to preserve potential evidence from the suspect licking the adhesive on the letter seal.

Using LRN methods, the highly skilled laboratorians ruled out biological select agents and returned the letters to the FBI for forensic testing and use as evidence in an upcoming prosecution. This story provides a good example of an LRN laboratory participating in an international investigation involving the cooperation of several federal agencies and representatives of a foreign government. The laboratory's role in this response was critical to quickly rule out potential threats and quell the ongoing fear of embassy and other governmental officials.

Pictured clockwise from top left:

Entrance to the CDPHE Laboratory Services Division facility. This is the designated site in the state of Colorado for the FBI and other first responders to deliver specimens for select agent testing.

Scientist opening a threat letter inside a biosafety cabinet and collecting powder for testing. This activity is conducted inside a secure BSL-3 laboratory, with mandatory use of PPE, including respiratory protection.

Instruments used to process and detect DNA in specimens to determine if biological select agent microorganisms and toxins are present. The process is called PCR—polymerase chain reaction.

III. Findings

PUBLIC HEALTH RESPONSE (CONTINUED)

Across the nation, state public health laboratories received nearly 2,000 clinical, 1,336 environmental (non-clinical), and 146 food samples and performed more than 5,000 tests using LRN methods. These samples were tested for biological, chemical and radiological threats as shown in Figure 3. A bulk of the environmental samples came from threat letters alone with 551 total, which demonstrates the atmosphere of constant threat.

Figure 3. Number of Samples tested by SPHLs for Biological, Chemical or Radiological Threat Agents

SAMPLE TYPE	BIOLOGICAL THREAT ANALYSIS	CHEMICAL THREAT ANALYSIS	RADIOLOGICAL THREAT ANALYSIS	OTHER THREAT ANALYSIS
CLINICAL SPECIMEN	1813	184	0	1447
ENVIRONMENTAL SPECIMEN	1130	281	7	6
FOOD SPECIMEN	51	115	0	0

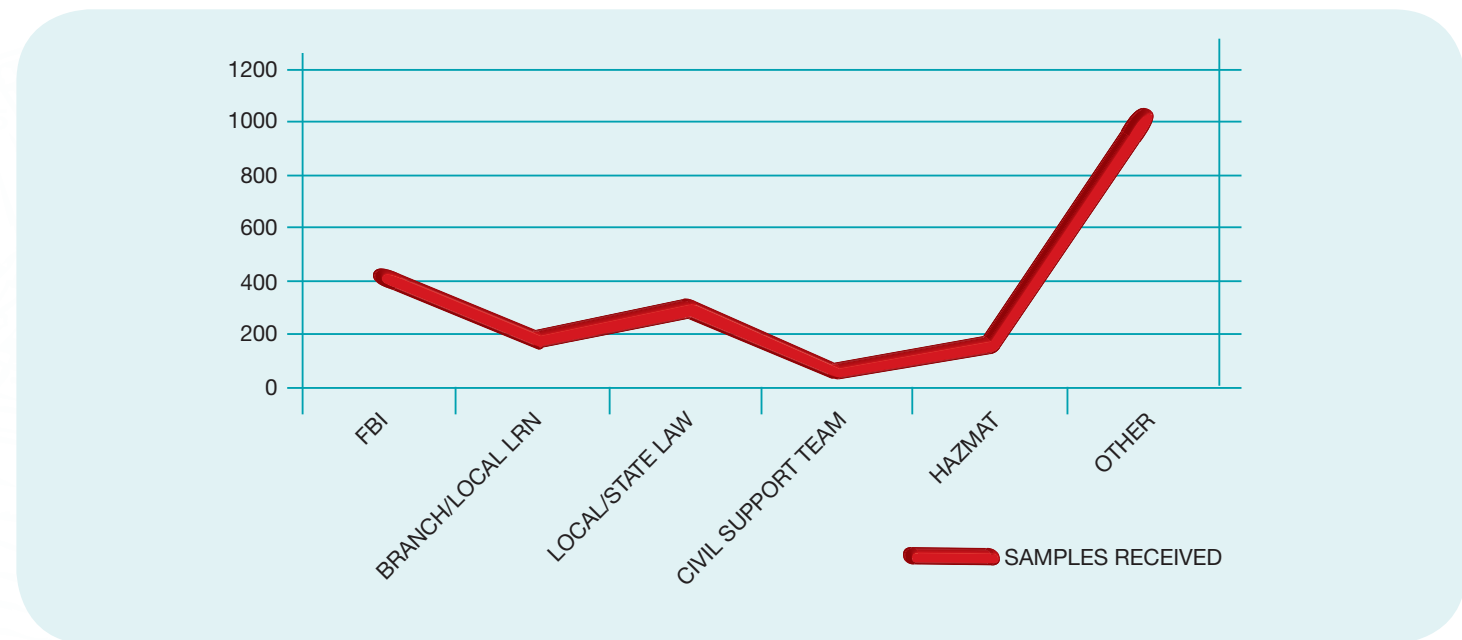
These numbers illustrate the constant real-world testing of the system as well as the importance of public health laboratories in protecting the nation. SPHLs received samples from multiple partners (See Figure 4). Laboratories continue to work closely with law enforcement and FBI partners, supporting public health investigations. The large number of other submitters came from sentinel clinical laboratories and other network partners such as USPS, academic institutions and environmental agencies.

III. Findings

PUBLIC HEALTH RESPONSE (CONTINUED)

Of course, many of the daily activities of the SPHLs are not isolated to one state or agency. In New Hampshire, what started as an afternoon get-together for drumming and food quickly turned into a large-scale anthrax event (See page 20). This story highlights the value of the LRN beyond terrorism, as many of the threat agents are actually naturally occurring and endemic in regional portions of the US. Similarly, the Virginia Division of Consolidated Laboratory Services illustrates the importance of collaborating within the network when responding to an event (See page 20).

Figure 4: Number of Unknown Samples Received by SPHLs from Partners



DRUM CIRCLE + ABDOMINAL PAIN = MORE THAN JUST FUNKY BEATS



New Hampshire State Public Health Laboratory. Photo provided by the New Hampshire State Public Health Laboratory.

On December 24, 2009, a 24-year-old woman from New Hampshire complained of gastrointestinal pain and was sent to a local hospital, where clinical history and blood culture led to suspicion of a *Bacillus anthracis* infection. Later, she was transferred to a referral hospital in Massachusetts where the diagnosis of gastrointestinal anthrax was made when the William A. Hinton State Laboratory Institute, Massachusetts Department of Public Health identified *Bacillus anthracis* in the patient's blood culture. The department notified the New Hampshire Department of Health and Human Services, CDC, and the FBI.



Drums collected from the investigation scene. Photo provided by the New Hampshire State Public Health Laboratory.

The resulting investigation involved state, local and federal agencies. The New Hampshire Department of Health and Human Services notified surrounding states and began an investiga-

tion that focused on answering critical questions, such as the source of infection, the patient's risk factors, the mode of transmission, finding those potentially exposed, and preventing further illness. They discovered that a day before symptom onset, the patient participated in a drumming event at a community organization's building where animal-hide drums of multiple ages and origins were played. The drums became the focus of the investigation because of two previous cases of anthrax infection related to drums in New York City in 2006 and in Connecticut in 2007.

Phase one of laboratory testing centered on the drums used at the event and the building where the event took place. The New Hampshire Public Health Laboratories (NH PHL), State Division of Public Health Services conducted qualitative testing of the 54 drums and 6 environmental samples collected by the NH National Guard's 12th Civil Support Team from the test site. Three positive samples (two from drum heads and one composite sample of electrical outlets in the main drumming room) were identified, which suggested that aerosolization of spores from drumheads may have occurred.

The second phase of testing sought to provide limited spore surface contamination data to

better characterize exposure pathways to the case patient. The NH PHL worked closely with the NH Department of Environmental Safety, EPA, National Institute for Occupational Safety and Health (NIOSH), CDC and NH Department of Health and Human Services to develop a sampling plan. The LRN reference level procedure was considerably more labor intensive than the procedure used in phase one with only 10-20 samples processed per day. The NH PHL quickly determined that additional laboratory resources would be needed in order to produce timely results for the 74 samples scheduled to be collected. In addition, 11 drums from the community were brought to a sampling site for testing. The NH PHL called upon its partners in the LRN for assistance. Members of the LRN throughout the region responded by offering testing support. CDC identified and contacted several laboratories: the New York City Public Health Laboratory, the Virginia Division of Consolidated Laboratory Services, and the Connecticut Department of Public Health, Division of Laboratory Services. These laboratories were selected because they had participated in validating the semi-quantitative method, agreed to accept samples and have demonstrated continued vigilance to the LRN mission.

On January 7, 2010, samples were collected and immediately distributed to the four public health laboratories. Within one to two days, results—including samples testing positive for *B. anthracis*—were available. Using the LRN results, the investigative team determined that there were low levels of *B. anthracis* spore contamination.

This multi-agency collaboration is a good example of the LRN's mission in action. Having the LRN and its built-in, highly-adaptable platform in place allowed for laboratories to lead a quick, efficient, and coordinated response.

III. Findings

PARTNERSHIPS AND RESPONSE ACROSS STATE LINES

One of several states to assist in the anthrax drum circle event, the Virginia Division of Consolidated Laboratory Services (DCLS), is no stranger to lending a helping hand, as it was also one of several states to perform surge testing during H1N1 for the Texas SPHL. As noted in the New Hampshire Story, the DCLS was selected, in part, because it participated in multi-center validation studies. The Virginia laboratory also continually tests their own systems, participating in and hosting their own full-scale exercises. Other internal quality control measures include the development of after-action reports, where response activities are evaluated and critiqued and improvements made to enhance the efficiency of the entire system.

Exercises and real events provide time-sensitive critical data needed to appropriately respond to a local or national emergency, or to validate a protocol for emergency use. This experience was tested during H1N1 outreach, when potential roadblocks were identified surrounding electronic data messaging, which eventually led to system-wide improvements to bi-directional data transfer between multiple public health agencies. Similarly, working with New Hampshire on the drum case provided the VA DCLS the unique opportunity and challenge of identifying *Bacillus anthracis* from environmental samples that were cultured in the presence of a sea of environmental microbes.

PUBLIC HEALTH RESPONSE (CONTINUED)

These stories demonstrate that extensive partnerships within and between SPHLs, first responder and sentinel clinical laboratory communities serve as the base of preparedness and response. This already “warm base” enables public health laboratories to rapidly respond to all threats without having to build infrastructure and recruit highly skilled staff during an event. However, with travel, training and outreach funding being cut, these partnerships remain at risk.

An overlooked and underappreciated aspect of response is electronic data messaging or laboratory results reporting.

Timely testing is only valuable if results are shared with partners rapidly. Electronic data messaging is an essential laboratory tool that is beginning to take necessary leaps forward. APHL is leading efforts, such as the Public Health Laboratory Interoperability Project (PHLIP), which aims to establish reliable laboratory data exchange between state public health laboratories and the CDC by fostering collaboration in information technology and laboratory science.⁹ APHL is also working closely with the CDC LRN Program Office to improve information technology infrastructure at the state and local levels and, thus, enhance electronic data messaging (See Page 22).

LRN LABORATORY INFORMATION MANAGEMENT SYSTEMS INTEGRATION PILOT PROJECT



In early 2010, APHL partnered with the Laboratory Response Network (LRN) Program Office, the CDC's Public Health Informatics and Technology Program Office (PHITPO), and three state public health laboratories in a unique LRN Laboratory Information Management Systems Integration (LIMS*i*) pilot project. State public health laboratories in Virginia, Idaho and Massachusetts modified their LIMS—implementing the necessary message structure for all LRN biothreat agents—to support the direct electronic exchange of secure data with CDC, thereby eliminating the need for the existing system, LRN Results Messenger, and its attendant double data entry.

The state public health laboratories worked with the CDC LIMS*i* and LRN Results Messenger/Viewer Developer Teams to ensure that data could be transmitted to CDC from the laboratory securely and according to vocabulary and

messaging standards. Achievement of this milestone ensures that LRN reference laboratories no longer need to perform double data entry, which strengthens the laboratories' capability to support rapid emergency response and data dissemination.

The aggressive LIMS*i* schedule culminated in presentations at the 2010 LRN National Meeting in San Diego in October. The successes of the Virginia Division of Consolidated Laboratory Services, Idaho Bureau of Laboratories and the William A. Hinton State Laboratory Institute, Massachusetts Department of Public Health were highlighted in a plenary session on data exchange, as well as during a more informal roundtable session titled *LRN LIMS Integration: Tools and Resources for Successful Interoperability*. In both sessions, consultants and staff from all three of the laboratories presented their experiences and findings for the benefit of the LRN audience. The success of the three pilot laboratories resulted in a second phase of LIMS*i* projects, engaging several additional laboratories in configuring their LIMS and standing up related infrastructure according to LIMS*i* specifications.

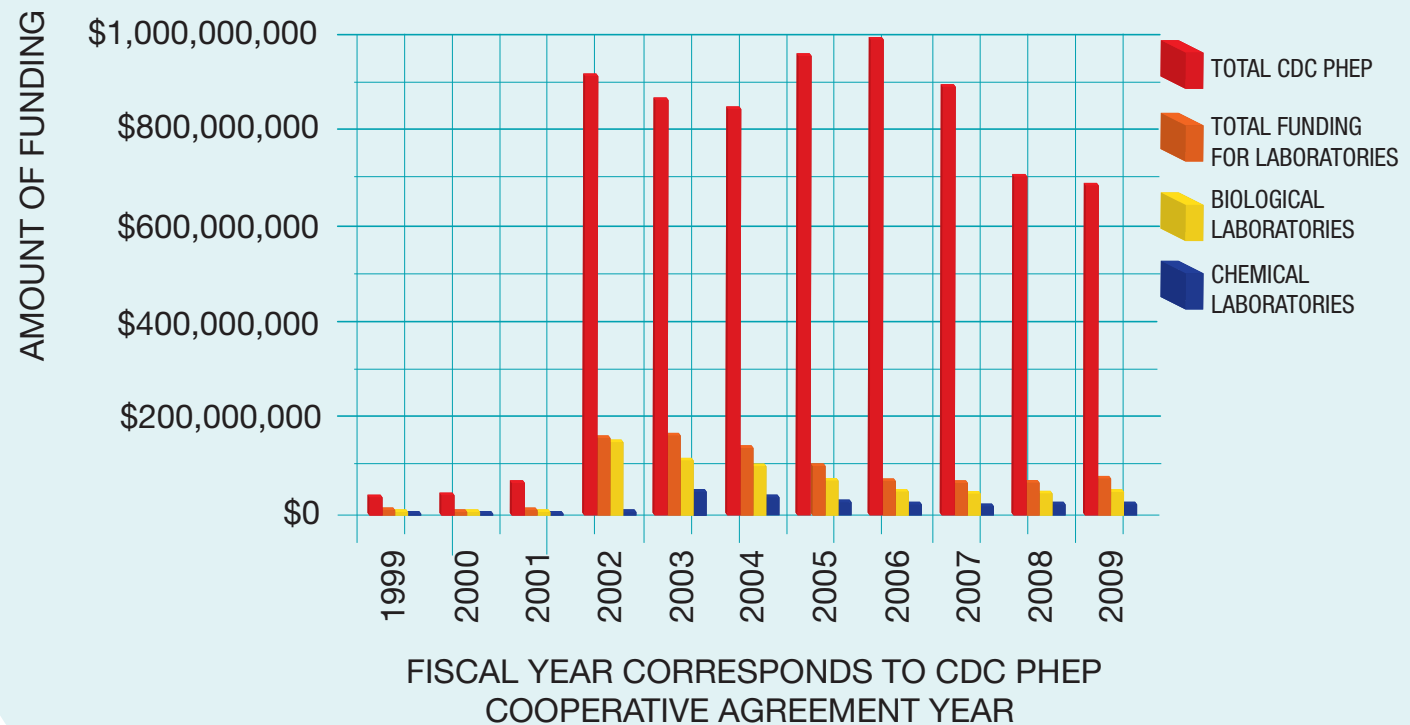
III. Findings

FUNDING

Biological Threat Laboratory Preparedness

Funding is the driving force behind a sustainable system capable of responding to all threats. The CDC Public Health Emergency Preparedness (PHEP) Cooperative Agreement, the main funding source for state and local public health laboratories, has swiftly declined since its high mark of nearly \$1 billion in 2002. Biothreat laboratory funding has mirrored the overall decline in PHEP and is down to \$51 million, which is only 7.4% of the FY09 total of \$688,914,546.^{vi} A new five-year PHEP Cooperative Agreement covering 2011-2015 could further diminish the funding that trickles down to the laboratories. Figure 5 depicts the PHEP funding picture for laboratories from FY99 to FY09.

Figure 5: FY99 – FY09 CDC Public Health Emergency Preparedness Funding for Biological Threat and Chemical Threat Laboratory Activities



III. Findings

FUNDING

Figure 6. Allocation of CDC Public Health Emergency Preparedness Funding for State Public Health Laboratories for Biological Threat Preparedness

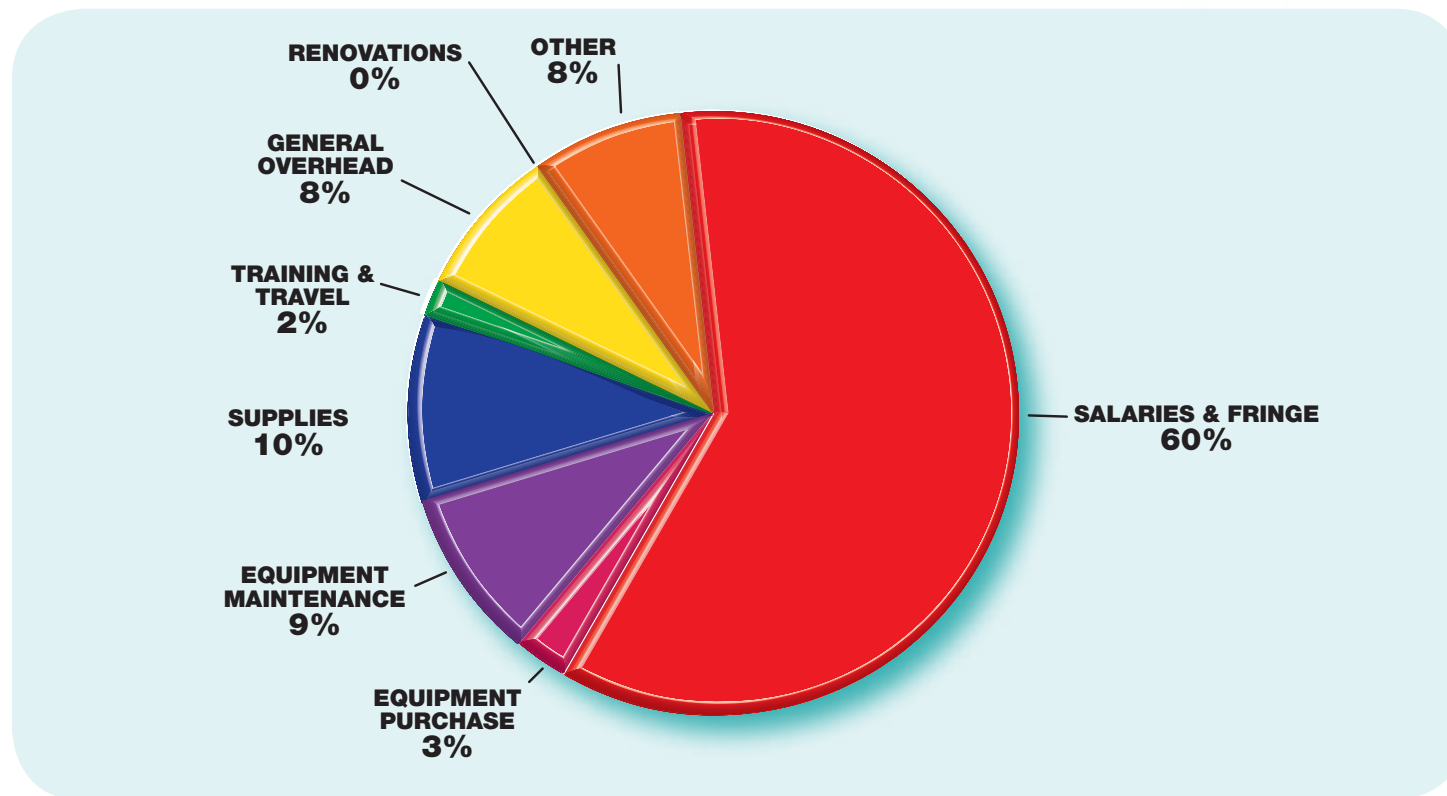


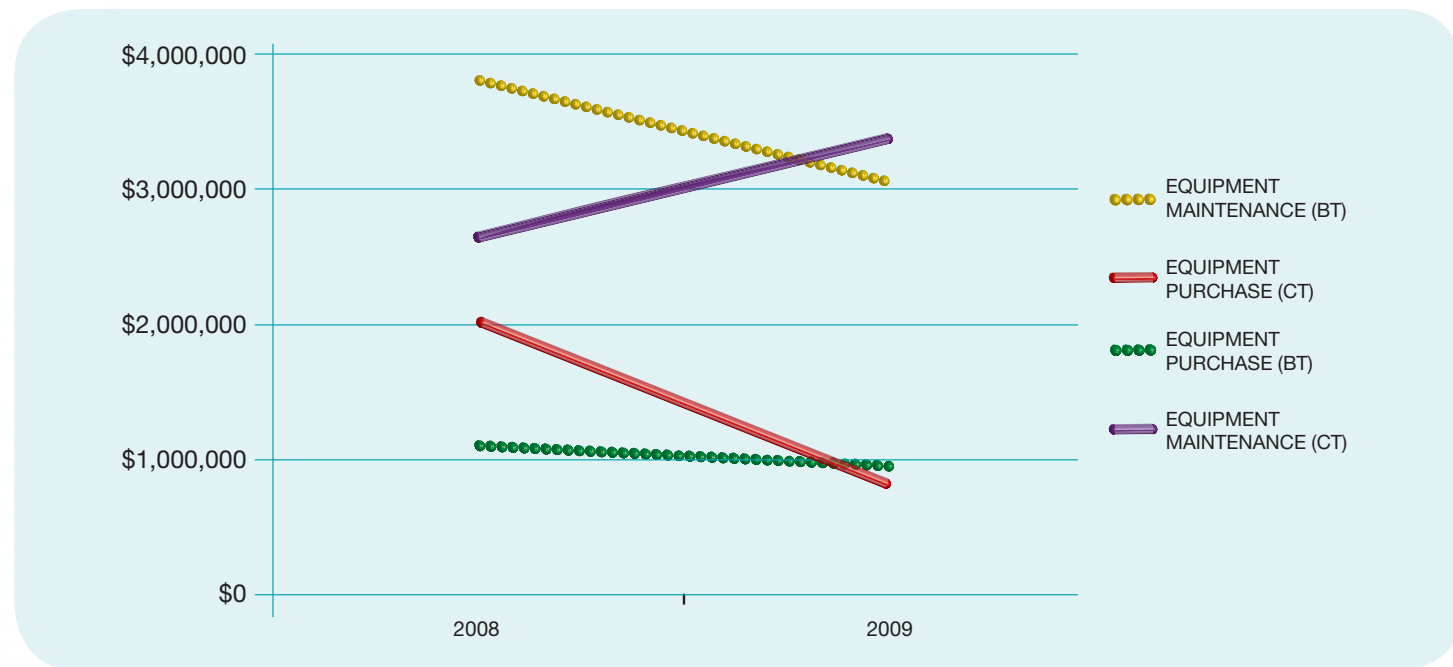
Figure 6 shows the allocation of the CDC PHEP funding to state public health laboratories serving as reference laboratories in the LRN for Biological Terrorism Preparedness (LRN-B). Of note, maintenance costs continued to outpace the money spent on purchasing new equipment. The ratio is slightly better with approximately \$3 dollars of maintenance to every \$1 dollar of new equipment in FY09, compared to the 4 to 1 ratio in FY08

(Figure 7). This does not mean that laboratories have only outdated equipment; but in reality, it means that laboratories are having to make difficult decisions and sometimes that comes down to using older equipment, cutting staff or reducing training.

III. Findings

FUNDING (CONTINUED)

Figure 7. Equipment Maintenance and Purchase Costs by Fiscal Year



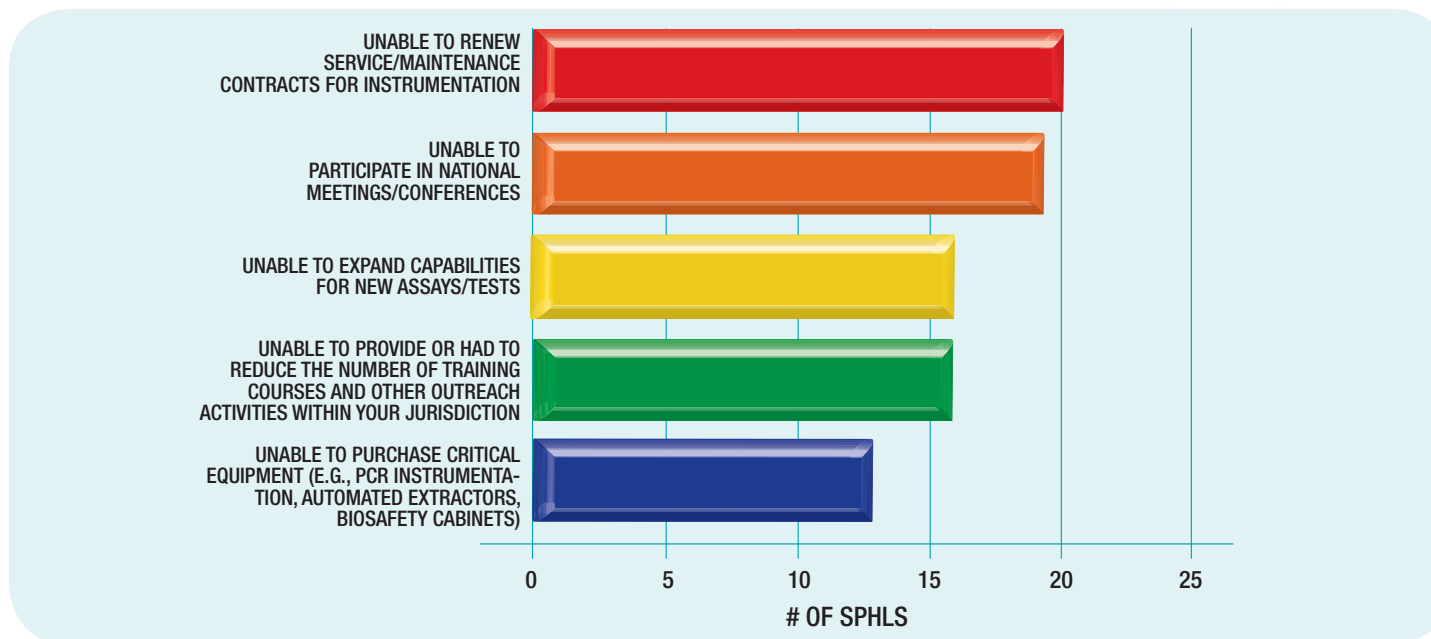
The second item of interest is the training budget. As discussed in this report, training is of the utmost importance to ensure a competent work force ready to respond to all public health threats. However, in FY09, a low average of approximately \$13,000 (2%) was spent per laboratory on training. Laboratories have been resilient and adopted novel web-based training methods; however, as overall funding continues to decline, it appears training is among the first areas to suffer. Figure 8 illustrates the impacts of ongoing funding declines

for these laboratories. Inability to renew service/maintenance contracts and participate in training courses were two of the impacts of funding cuts most cited by laboratories. Of the 41 SPHLs facing cuts, 20 (49%) reported they were unable to renew service/maintenance contracts, and 16 (39%) were unable to provide or had to reduce trainings and outreach.

III. Findings

FUNDING (CONTINUED)

Figure 8. Impact of Funding Cuts on Biological Threat Preparedness Programs in SPHLs



Some SPHLs also received funding via state general funds and other non-CDC federal grants and initiatives for preparedness activities. In FY09, five SPHLs self reported receiving a total of \$1.1 million from their state general funds. This is a significant decline from the \$2.2 million that eight SPHLs received in FY 08. This state funding is important because it is often used to fill in gaps where CDC PHEP funding is stretched too thin. However, as many states are faced with economic crises, state funding support for public health laboratory preparedness and response will continue to decline.

Laboratories also received funding from sources normally reserved for a specific purpose such as food testing or critical infrastructure protection. Fourteen SPHLs (27%) received a total of \$3.31 million from non-CDC sources. Of the \$3.31 million,

the Food Emergency Response Network (FERN) provided \$2.3 million, the Department of Health and Human Services (HHS) Assistant Secretary for Preparedness and Response (ASPR) provided \$510,000 and the Department of Homeland Security Urban Area Security Initiative provided \$500,000. One state via a contractual arrangement with their Pollution Control Agency received \$200,000 in DHS funding. This additional funding further expands the capabilities of the laboratories, but it isn't a stable funding source that can be counted on from year to year.

State public health laboratories continued to provide support to other LRN laboratories within their jurisdiction. Sharing funds with these additional laboratories increases the capacity of the network and removes the testing burden from one centralized laboratory. In FY09, SPHLs provided a total of \$6 million to

III. Findings

FUNDING (CONTINUED)

other laboratories within the state (Figure 9). Additionally, a total of 25 SPHLs (49%) provided some support to their sentinel clinical laboratories. To support the sentinel laboratories, 18 (72%) of the 25 total SPHLs reported the use of HHS/ASPR Hospital Preparedness Program funds and 13 SPHLs (52%) used CDC PHEP funding. Direct support of funding and indirect support of training and guidance helps ensure the overall strength of the LRN, and even more broadly, the public health system.

The Hawaii Public Health Laboratory provided a real-life example of operational difficulties due to funding cuts. Their story is somewhat unique due to their geographical challenges, but it highlights many of the issues faced by their counterparts in other states (See page 28).

Figure 9. State Public Health Laboratories' Funding Support for Other Jurisdictional Laboratories

NUMBER OF SPHLs	FUNDING AMOUNT	LABORATORY TYPE
6	\$2,900,000	LOCAL PUBLIC HEALTH
5	\$2,500,000	BRANCH SPHLs
5	\$222,000	CLINICAL
5	\$193,000	VETERINARY
1	\$105,000	FOOD
1	\$57,000	AGRICULTURAL



Mark Nagata, BT Microbiologist, performing Bio-plex assay.



Remedios Gose, BT Sr. Microbiologist, performing a PCR assay.



Cheryl-Lynn Daquip, FERN FSIS Microbiologist, performing a norovirus extraction.

Photos provided by the Hawaii Public Health Laboratory.

TROUBLE IN PARADISE

Finding a state facing difficulties is as easy as throwing a dart at the map of the US. The state public health laboratory located in Honolulu, Hawaii, is a prime example of the nationwide struggle. Hawaii faces unique issues due to its geography, location and size.

Funding cuts and budget shortfalls underlie most of the state's issues. However, it isn't just decreasing funds, but rising costs leading to the problems. Since 2008, Hawaii state employees have been on mandatory furloughs for two days each month, which meant the federal grant money they saved during the furloughs was sent back to the original funders. Funding reductions also led to lost staff and vacancies. Public Health Laboratory Director Dr. A. Christian Whelen now wears the hats of part-time public health administrative officer, laboratory manager, budget/contracts manager, building supervisor and also leads Information Technology efforts.

Due to furloughs and funding reductions, laboratory capacity is threatened and has caused Dr. Whelen to make tough decisions to carry out essential testing. Laboratory leadership has made difficult choices to continue lab services over fixing/maintaining equipment vital to the laboratory buildings, such as HVAC units. General laboratory capacity has been lost, and preparedness activities have only been saved by PHEP funding. Given the uncertainty of the next round of federal budgets and the already proposed cuts to the PHEP Cooperative Agreement, this is a

recipe for disaster. Even if the money coming in remains stable, increasing costs of facility rental, grounds maintenance and utilities threaten to make life more difficult for the Hawaii Public Health Laboratory.

Living in a vacation destination has its share of ups and downs. Staff are not complaining about the location of the facilities, but it is the wonderful location that brings its own share of issues. Hawaii has approximately 1.3 million residents, but averages a whopping 7 million tourists. The added complication of frequent travel between surrounding island communities brings an ever present increased risk for disease spread. Being that the island is located in the middle of the Pacific Ocean also causes its own obstacles because it is difficult to receive assistance or surge capacity from other public health laboratories in the LRN. Also, as seen during the Tsunami of March 2011, climate changes and Mother Nature can drastically affect this population.

On the bright side, the remaining laboratory staff are dedicated to the public health mission and island residents. Also, because it is a close knit community, private, military and corporate laboratories have formed a strong bond to offer each other assistance and share limited staff. The laboratory has been able to partner with the Department of Defense for surge testing and has become a central testing station for other Pacific islands. So, for now, Hawaii, like the other 49 states, is hanging on.



III. Findings

FUNDING (CONTINUED)

Chemical Threat Laboratory Preparedness

Chemical threat (CT) preparedness often takes a back seat to biological threat preparedness in the minds of policy makers and the public in general. This ideology exists because a memorable chemical terrorism event has not occurred, while chemical threats happen all over and in many ways. While biological threats have well-defined symptoms and illness onsets, chemical threats are exceedingly vague: chemical threats can cause acute effects, or they may take years to cause noticeable

harm or they may mimic other illnesses such as the flu or a heart attack. Due to the nature of chemical threats, it is even more important to be able to detect their presence early. The following story from Massachusetts illustrates an efficient response to a chemical exposure event (See below).

CHEMICAL THREAT RESPONSE IN ACTION

In June 2010, the William A. Hinton State Laboratory Institute, Massachusetts Department of Public Health confirmed human exposure to sulfur mustard, (a chemical warfare agent), providing valuable information to clinicians for patient treatment and to health officials for decontamination, food protection and remediation.

A fisherman dredging for surf clams 19 miles offshore came in contact with the mustard when a leaking, torpedo-shaped metal canister came up along with the catch. The liquid breached his protective clothing, causing blisters on his forearm and leg. Symptoms also included

shortness of breath, which led the sentinel hospital to contact the laboratory's 24/7 phone to report the incident and request assistance. Five hours after receiving the clinical specimens, the laboratory confirmed the presence of sulfur mustard.

This response demonstrates the ability of the public health laboratory (a member of the LRN-C) to respond to chemical incidents with relevant information for patient management and public health decision-making.

III. Findings

FUNDING (CONTINUED)

State public health laboratories testing for chemical threats received a total of \$4.5 million from their respective states to support chemical threat preparedness activities in FY09. While this represents an approximate \$1 million increase from FY08, more than 74% of laboratories received *no funding* from their state for chemical threat preparedness and response activities.

The PHEP cooperative agreement is the main source of funding for most of the SPHLs testing for chemical threats. In FY09, SPHLs received a total of \$24.6 million from the CDC PHEP Cooperative Agreement (Figure 5). The LRN-C laboratories are broken down by levels, ranging from 1 to 3, and based on testing capability with Level 1 having the highest capability. Of total PHEP funding, the ten Level 1 LRN-C laboratories received \$7.2 million as outlined in the PHEP Cooperative Agreement, laboratories received \$14.9 million for LRN-C Level 2 activities, and laboratories received \$2.5 million for LRN-C Level 3 activities. While the total PHEP funding difference between FY08 and FY09 is not significant, laboratories are being pressured to take on more tasks each year without any additional funds, which is not a sustainable business model. Because public health scientists remain committed to their work and mission, they continually step up to the plate to take on new challenges while managing to maintain their routine testing.

Every laboratory needs supplies; SPHLs testing for chemical threats are no exception. In fact, these laboratories require many types of sophisticated instrumentation. With new technology, comes a price—not only does that include the purchase

price, but it also includes the cost to maintain the equipment. Figure 7 illustrates the increasing cost of CT equipment maintenance. It is estimated that 30% of the original cost of an instrument goes to maintaining that instrument on a yearly basis. If an instrument costs \$200,000, then the laboratory must pay approximately \$60,000 for maintenance each year.

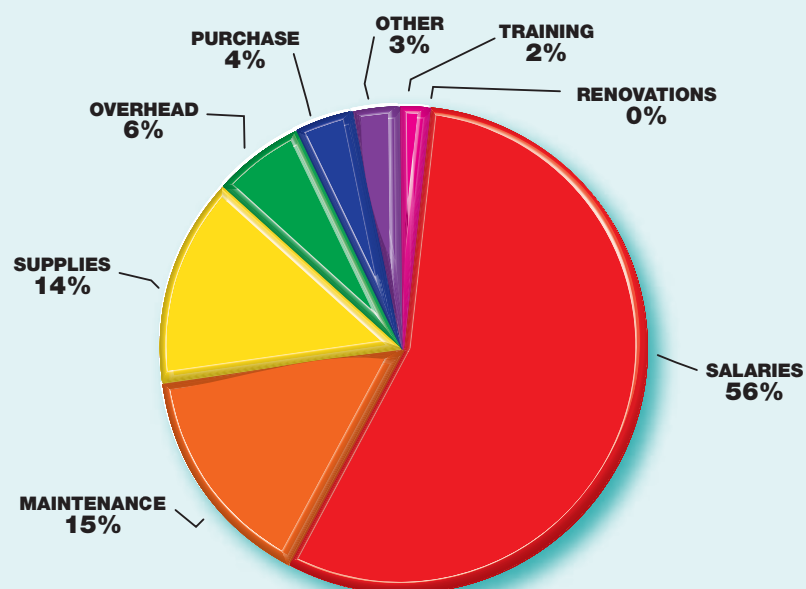
As emergency response laboratories, state public health laboratories testing for chemical threats must pay for a maintenance agreement that includes 24/7 service calls. If instrumentation goes down during an emergency, they can have it back online as quickly as possible with this type of agreement. Several laboratories experienced this situation during a recent exercise in the Fall of 2010, when instruments failed and they requested a service call. Because they had agreements in place, despite the instrumentation failure, they were able to complete the exercise in a timely manner, testing 5,000 samples (500 per laboratory) in less than one week.

In addition to expensive equipment and maintenance, the cost to employ educated chemists continues to grow. The majority (\$12.5 million) of CDC PHEP funding covered salaries and overhead, while more than \$7 million went to equipment, maintenance and supplies (Figure 10). These amounts are very similar to what chemical threat laboratories spent in FY08, probably due to the fact that funding remains relatively flat.

III. Findings

FUNDING (CONTINUED)

Figure 10. Allocation of CDC PHEP Funding for SPHLs for Chemical Threat Preparedness



In addition to CDC PHEP funding, seven laboratories (13%) received limited federal dollars from agencies such as the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA).

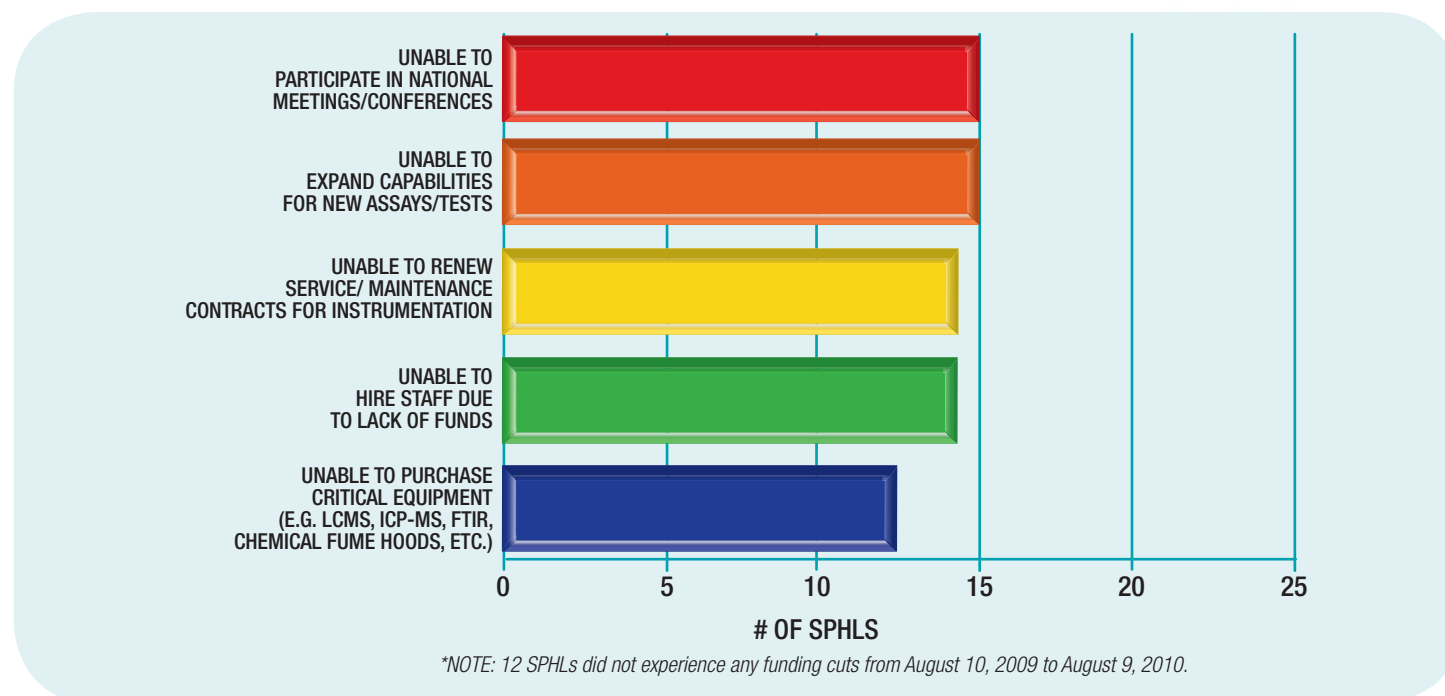
Funders often expect laboratories to expand capability; but because the funding is limited, laboratories must use existing resources (such is the case with staffing, for example). The chemical threat laboratories experiencing funding cuts in FY09 reported several impacts (Figure 11).

The CDC continues to expand their methods for the LRN-C laboratories, yet many states were unable to expand their testing capability or purchase equipment to take on the new methods. Travel to conferences and instrument maintenance were also affected in FY09. There were slight changes from FY08, but overall, the same issues were among the top funding impacts in FY09.

III. Findings

FUNDING (CONTINUED)

Figure 11. Impact of Funding Cuts on Chemical Threat Preparedness Programs in SPHLs



Those state public health laboratories not experiencing as many workforce challenges work with CDC to use PHEP funds to expand capability. Many states, (i.e., 38, or 75%), added one or more chemical threat methods. One state hired personnel for the chemical threat laboratory and another purchased needed

equipment. A smaller number of states, (i.e., 12, or 24%) maintained their chemical capability, while one laboratory dropped from a Level 2 to a Level 3 status.

CONCLUSION

Public health laboratories remain at the center of the response framework, acting as the glue that connects hospitals, large clinical commercial laboratories and first responders to experts at the state and federal levels. While laboratories serve as vital orchestrators of these activities, they are not acting in a vacuum. Without first responders and hospitals, samples would not reach the laboratories; without laboratories, identification of threats would not occur; without knowing what the threat is, countermeasures and policy decisions cannot be made; and, without policy decisions (such as funding allocations), none of rapid response is even possible.

When most people imagine laboratories, they only think about the testing. But as this report has shown, laboratory duties encompass much more: performing outreach, providing training, organizing drills and exercises, and reporting results to drive treatment and other response decisions. With federal and other local funding support, state public health laboratories have created a warm base, ready to respond to the next threat. These proactive steps before an event occurs allows for a swifter response to daily challenges as well as rare large-scale events—and in the process, save lives. Recently though, this critical foundation of preparedness is beginning to suffer and is close to a breaking point.

This year's data demonstrated several areas of success as well as challenges to maintain or improve ongoing activities during times of uncertain funding, low wages and vacancies

in the public sector. While none of the response partners are immune from the national economic downturn, laboratories are being hit especially hard. APHL has been collecting information both anecdotally and through formal surveys (additional information can be found online at <http://www.aphl.org/policy/Pages/recession.aspx>), which demonstrates that funding remains stagnant while laboratories' responsibilities increase. The year's survey data further illustrate that priorities, such as outreach and training stand at a critical juncture: laboratory leadership are faced with daily decisions on whether or not to continue these programs, have functional equipment or retain staff. The dedication of the laboratory community to a greater cause serves as a finger plugging the dam, but resiliency will fade. The true value of public health laboratories will not be seen until they can no longer persevere.

Mirroring the dedication of the laboratorians, APHL continues to work with state and local public health laboratories as well as federal agencies to call attention to these issues. APHL delivers solutions that work, including providing guidance, best practices, web-based trainings and regular communications via social media tools. But without both moral and monetary support, the picture of an all-hazards public health response will always remain an unfinished masterpiece.

REFERENCES

- ⁱ CDC Public Health Emergency Preparedness (PHEP) Cooperative Agreement; Office of Public Health Preparedness and Response (OPHPR); Funding Guidance and Technical Assistance to States available at: <http://www.bt.cdc.gov/cdcpreparedness/coopagreement/index.asp>
- ⁱⁱ CDC: the Laboratory Response Network, Partners in Preparedness, available at: <http://www.bt.cdc.gov/lrn/>
- ⁱⁱⁱ CDC: Office of Public Health Preparedness and Response, Archive: Funding and Technical Assistance, available at: <http://emergency.cdc.gov/cdcpreparedness/coopagreement/archive/index.asp#fy04>
- ^{iv} Food Emergency Response Network, available at: <http://www.fernlab.org/>
- ^v APHL: Public Health Laboratory Interoperability Project (PHLIP), available at: <http://www.aphl.org/aphlprograms/informatics/collaborations/phlip/Pages/default.aspx>
- ^{vi} Centers for Disease Control and Prevention, Public Health Emergency Preparedness Cooperative Agreement Program Announcement AA154 – FY 2009 (Budget Period 10), available at: http://www.cdc.gov/phpr/documents/FinalPHEP_BP10_Guidance_508_Version.pdf

State public health laboratories collaborate with multiple partners to form a well-defined system for responding to all-hazards threats.

