Building Biosafety and Biosecurity across Public Health Laboratories

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Association of Public Health Laboratories
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Objectives

• APHL Overview and our role in Biosafety and Biosecurity
• APHL Biosafety Community of Practice
• Unmet Biosafety and Biosecurity Needs identified
• Ideas/Concerns for the future
About APHL

- A non-profit, non-governmental US based organization
- Over 900 members from state and local public health laboratories, state environmental and agricultural labs and others federal agencies and academic institutions.
- Advocates at the national level to shape public health policy and to secure increased support and resources for member labs
- Provides training, model practices, technical assistance domestically and internationally
Committees (many have subcommittees)

- Public Health Preparedness and Response
- Environmental Health
- Environmental Lab Science
- Finance
- Food Safety
- Global Health
- Infectious Diseases
- Informatics
- Newborn Screening and Genetics in Public Health
- Knowledge Management
- Laboratory Systems and Standards
- Local Laboratory Committee
- Workforce Development
- National Legislative Review Work Group
- Biosafety and Biosecurity
Biosafety Cooperative Agreement Overview

- May 2015: APHL was awarded a $2.2 million CoAg by the Centers for Disease Control and Prevention (CDC) for Domestic Laboratory Biosafety for Ebola and other Highly Infectious Diseases.
- Funded for three years (May 2015 - May 2018)*
- Linked to the $21 million funding opportunity awarded to 62 PHLs via the Epidemiology and Laboratory Capacity for Infectious Diseases (ELC) Ebola Supplemental project B-Enhanced Laboratory Biosafety and Biosecurity Capacity.

*One Year Extension to 2019
Biosafety Charge

• Serve as Subject Matter Expert (SME), providing guidance and support for public health labs (PHLs)

• Coordinate national efforts to improve biosafety in PHLs and support outreach to clinical laboratories
**APHL Major Biosafety and Biosecurity Accomplishments**

**Biosafety Community of Practice**
- Two CoLABorate Platforms (250+)
- BSO Peer Network (50+ PHLs Paired)
- Biosafe360 Program (200+)
- Technical Skills Building Workshops/Webinars (50+)
- Leadership Development Workshop Series (34 PHLs with 37 BSOs)

**Biosafety and Biosecurity Committee**
- Subject Matter Expertise
- Consultations with PHLs

**Biosafety and Biosecurity Partners Forum**
- Awareness at the National Level

**Clinical Laboratory Biosafety**
- Biosafety Practices and Needs in Clinical Laboratories Survey
- Biosafety Forums: Public Health Laboratory Outreach, Clinical Laboratory Engagement and Needs
- Biorisk Management Workshop

**CULTURE OF BIOSAFETY CHANGE**
- Hire Biosafety Officers
- Provide Training and Tools for BSOs (Risk Assessments, Workshops and Biosafety Checklists)
- Build a Community of Practice
- Provide training and resources for Clinical Labs
- Continue assisting PHL and Clinical Labs
Biosafety and Biosecurity ColLABorate

Communities

• **Biosafety and Biosecurity Community**
  - Currently includes PHLs BSOs (~140), Biosafety Outreach Officers, and other pertinent Biosafety personnel

• **Laboratory Biosafety and Biosecurity Community**
  - Currently includes PHLs BSOs (~190), Biosafety Outreach Officers along with clinical laboratory staff
  - Public Health Lab - 65
  - Private Clinical Lab - 115
  - National Organization - 10
  - Federal Agency - 1
Public Health Laboratory Biosafety Officer (BSO) Technical Knowledge in 2015
Workshop Series

  - Recognizing the needs of the newly hired BSOs, APHL convened regional workshops to provide training on biosafety and biosecurity fundamentals
  - Two day technical workshops were held at 4 state and local PHLs: MA, HI, FL and Los Angeles County
  - 51 BSOs from 47 PHLS
  - Core Curriculum: **Risk Assessments, Biosafety Competencies, Biosecurity, Donning and Doffing, Components of a Biosafety Plan, Decontamination, Engineering Controls, Outreach to Sentinel Clinical Labs, Buying into Biosafety, Ethical Issues, Leadership in Biosafety**
Workshop Series

• Leadership Workshop Series (2017 – 2018)
  ➢ Due to an ever changing and increasingly complex environment, PHLS need biosafety leaders who embrace change, manage people and processes efficiently and anticipate future needs.
  ➢ 37 BSOs from 34 PHLs
  ➢ Goal: Shape BSOs into future leaders within the laboratory system.
  ➢ 4 day leadership workshops were held at 3 state PHL: HI, FL and AZ
DEMOGRAPHICS
Leadership Workshop Participants’ Takeaways

“I plan to use RACI charts in project management areas in the workplace. This will help with defined roles and responsibilities.”

“Helped focus the biggest challenges facing BSOs and provided opportunities to network and build relationships with peers.”

“The SOCO training was very effective in identifying communication strengths and weaknesses.”

“The past few days rejuvenated the passion for the safety of our employees and community that lay dormant for the past few years.”
BSO Peer Network Program

Deliverables: Peer Network Posters, PowerPoints, Trip Reports and Lab Culture Podcast

The Network utilizes a twinning concept, pairing BSOs from two PHLs who alternately visit the other’s institution. Laboratories are paired based on responses to an application.
Community of Practice Takeaways

1. Highly successful workforce development tool
2. Provided BSOs exceptional training and tools where they can perform their duties effectively
3. Network of biosafety professionals in both PHLs and clinical laboratories where they can interact daily, monthly and in person
4. Created a highly engaged community of biosafety professionals
5. Plan to continue to evolve and build this community
Building Biosafety Awareness

• Advocacy: need continued federal funding
• Connection with Academia: Biosafety Curricula

➤ Kirkwood Community College
Building Biosafety Awareness

- Biosafety Month

WEBINAR

Biosafety: Out of the Box!
Thursday, October 31, 2019 | 2:00 – 3:00 pm ET

APHL Celebrates Biosafety and Biosecurity Month Photo and Success Story Contest

Win 2 coach airline tickets on Delta to anywhere in the continental US!

Biosafety Officer Spotlight Series

Peter Davis
Responsible Official/BT Coordinator/Biosafety Officer
Colorado Department of Public Health and Environment

When you were a kid, what did you want to be when you grew up? Well the first thing I ever remember wanting to be was a stegosaurus. But realistically (or unrealistically) a professional athlete.

How did you come to work in a public health lab and in the field of biosafety and biosecurity? I was shadowing physicians before going to medical school and generally, they didn’t seem happy with their careers. Several of them directly recommended not following in their footsteps. I then took a job in toxicology at the Colorado Department of Public Health and Environment. I then was promoted into a safety position, then the EOC grant provided funding and I was awarded the position of biosafety officer for our laboratory.

What do you like most about being a Biosafety Officer? Supporting the staff. Doing what I can to provide them the tools to help themselves, but assist them when a need develops.

What is a challenge you face as a Biosafety Officer? A lack of authority makes implementation and behavior correction difficult for laboratory workers and research scientists.

Biosafety Forum: Public Health Laboratory Outreach Clinical Laboratory Engagement and Needs

Focus: Discuss the current and unmet biosafety needs and challenges of both public health and clinical laboratories, define a successful outreach program and discuss solutions to enhance biosafety.
Biosafety Forums: Public Health Laboratory Outreach, Clinical Laboratory Engagement and Needs

Forum locations:
• Minnesota Department of Health Public Health Laboratory
• Hawaii State Laboratories Division
• North Carolina State Laboratory of Public Health
• California Department of Public Health State Public Health Laboratory

| 84 clinical laboratory representatives | 28 hosting PHL representatives | 12 local PHL representatives (CA forum) | 5 APHL staff | 6 CDC staff (5 DLS, 1 DPEI/ELC) | 1 Retired LabCorp Participant |

Biosafety Forums: Public Health Laboratory Outreach, Clinical Laboratory Engagement and Needs

Focus:
1. Describe Laboratory biosafety successes and unmet needs.
2. Define outreach and characteristics of a model outreach program.
3. Participate in an affinity exercise and perform a root cause analysis to capture and prioritize laboratory biosafety needs
Biosafety Forums: Public Health Laboratory Outreach, Clinical Laboratory Engagement and Needs

Top Successes: Policies and Procedures, PPE
Lacking Dedicated BSO
Biosafety Forums: Public Health Laboratory Outreach, Clinical Laboratory Engagement and Needs

Characteristics of a Successful Outreach Program: Face-to-face and networking and the availability of training and access to resources

- Positive Biosafety Culture
- Standardization
- Compliance/Buy-In
- Sustainable Program
- Dedicated BSO
- Leadership Buy-in
- Training/Resources
- Partnership with PHL and Hospitals
- Site Visits
- Face to Face/Networking/Communications
Biosafety Forums Continued

Challenges and Needs: Training and Resources, Workforce, and Lack of a Dedicated BSO followed by Leadership Buy-In and Improvement in Workflow, Facilities, and their Infrastructure

Clinical Laboratory Prioritization of Needs
(Total Possibly Score=28)
## Solutions

<table>
<thead>
<tr>
<th>Identified Needs</th>
<th>Proposed Solutions</th>
</tr>
</thead>
</table>
| **Training & Resources** |  • Develop round robin trainings focused around various LAI case studies intended for all laboratory staff in biosafety to have a larger audience and to gain more buy-in.  
  • In order for staff to have the opportunity to receive trainings, participants stressed to schedule trainings either at the start of the day or during lunch break hours.  
  • Establish a routine for rounding where bench staff would be able to communicate with upper management on potential training opportunities along with implementing biosafety and biosecurity meetings between staff  
  • Cross train laboratory staff so they can become familiar with multiple roles in the workplace. Participants recommended using a train the trainer approach along with including show and tell learning to showcase how laboratory staff perform specific testing safely.  
  • Identify all the training needs from laboratory staff and review resources that were available to them online through organizations such as APHL, CDC and PHLs to review the remaining training gaps. Once these gaps are identified, the laboratory can develop specific trainings. |
| **Workforce (turnover & retirement)** |  • Participants recommended convening career days at local high schools to recruit possible laboratory staff along with recruiting through the state Medical Technician and Medical Laboratory Technician programs.  
  • Participants also recommended partnering with clinical laboratory science schools to train students on the potential hazards in the workplace and to become familiar with best practices to reduce the risk of LAIs.  
  • Participants recommended including biosafety discussions during monthly staff meetings to address safety as a daily priority in the laboratory workplace.  
  • Working with academic institutions and national organizations to build biosafety in current graduate, undergraduate and professional development curricula and to promote the value of biosafety to the emerging workforce. |
| **Lack of a dedicated BSO** |  • Human Resources should develop a position description for BSOs and distribute across jurisdictions to hire and fill the BSO position. APHL mentioned they have developed a competency based BSO position description that is housed on their biosafety website (www.aphl.org/biosafety) which attendees can utilize. The BSO should also report directly to the laboratory director to influence buy-in from staff. |
Training and Resources Needs Identified

- Risk Assessments
- Packaging and Shipping
- BSL-2&3 Practices

9a. If public health laboratory training was available to you at no cost, would you choose the following areas/topics?

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Risk Assessment</td>
<td>89.8%</td>
<td>439</td>
</tr>
<tr>
<td>Biosecurity Plan</td>
<td>87.1%</td>
<td>426</td>
</tr>
<tr>
<td>Certification in packaging/shipping of IATA Division 6.2 infectious substances (Category A)</td>
<td>84.9%</td>
<td>415</td>
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<tr>
<td>BSL-2 safe practices (fundamentals of biological materials safety practices, excluding bloodborne pathogen training)</td>
<td>80.8%</td>
<td>395</td>
</tr>
<tr>
<td>Continuous Quality Improvement (review, improvement, and implementation)</td>
<td>76.5%</td>
<td>374</td>
</tr>
<tr>
<td>Select Agent Regulations</td>
<td>76.3%</td>
<td>373</td>
</tr>
<tr>
<td>Emergency Management and Response</td>
<td>75.3%</td>
<td>368</td>
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</table>

9. Has your staff received training on the following topics?

<table>
<thead>
<tr>
<th>Question</th>
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<th>n</th>
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</thead>
<tbody>
<tr>
<td>Sharps Hazard</td>
<td>99.6%</td>
<td>487</td>
</tr>
<tr>
<td>Bloodborne Pathogens</td>
<td>99.4%</td>
<td>486</td>
</tr>
<tr>
<td>Personal Protective Equipment (PPE)</td>
<td>99.2%</td>
<td>485</td>
</tr>
<tr>
<td>Spill Prevention, Control, and Countermeasure</td>
<td>97.5%</td>
<td>477</td>
</tr>
<tr>
<td>Chemical Hazards</td>
<td>95.9%</td>
<td>469</td>
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<tr>
<td>Biological Safety Cabinets (BSCs) and other Engineering Controls</td>
<td>92.6%</td>
<td>453</td>
</tr>
<tr>
<td>BSL-2 safe practices (fundamentals of biological materials safety practices, excluding bloodborne pathogen training)</td>
<td>91.6%</td>
<td>448</td>
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<tr>
<td>Regulated Waste Management</td>
<td>90.8%</td>
<td>444</td>
</tr>
<tr>
<td>Emergency Management and Response</td>
<td>90.2%</td>
<td>441</td>
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<tr>
<td>Continuous Quality Improvement (review, improvement, and implementation)</td>
<td>90.2%</td>
<td>441</td>
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<tr>
<td>Certification in packaging/shipping of IATA Division 6.2 infectious substances (Category A)</td>
<td>89.4%</td>
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<tr>
<td>Decontamination</td>
<td>87.5%</td>
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<tr>
<td>Biological Risk Assessment</td>
<td>69.3%</td>
<td>339</td>
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<tr>
<td>Select Agent Regulations</td>
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<tr>
<td>Biosecurity Plan</td>
<td>64.6%</td>
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<tr>
<td>BSL-3 safety practices</td>
<td>44.4%</td>
<td>217</td>
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<tr>
<td>Safe Handling and Use of Cryogenic Liquids</td>
<td>30.5%</td>
<td>149</td>
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Unmet Needs and Issues across Laboratories

• Dedicated Biosafety Officers
• Clinical laboratory biosafety practices
• Lack of biosafety buy in from leadership
• Biosafety not seen as a priority across laboratories
• Hands on training
  – Risk Assessments
• Mentorships across laboratories
• BSL-2&3 Practices
Mentorships across laboratories

• In person site assessments with four US-Affiliated Pacific Islands PHLs
  – FSM, Guam, Northern Marianas Islands, American Samoa
  – Included Virtual Leadership Exercise with Safer Behaviors
  – Utilized BBC membership
  – Provided summary reports for APHL and CDC
  – Invited staff to attend Biorisk Management Workshop
Hands on training/Risk Assessment

• Colter Instructional Design Series
• Biorisk Management Workshop
  – PHL and Clinical Lab Attendees
BSL-2&3 Practices

- Eagleson BSL-3 Seminar Series
  - BSL3 Facilities: Design and Operation, Advanced BSL3 Practices and Procedures
  - 18 PHL staff
Unmet Needs and Issues across Laboratories

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- Mentorships across laboratories
Concerns for the Future

- Sustainable Federal Funding
- BSOs leaving for other biosafety careers for private/academic institutions
  - Other bench role duties at PHL
  - Loosing subject knowledge
- Relationships built across laboratories
- Are we prepared for the next Ebola?

10. Based on the training and knowledge of your laboratory staff, do you believe they are prepared to respond to an emerging threat comparable to Ebola Virus Disease?

<table>
<thead>
<tr>
<th>Answer</th>
<th>%</th>
<th>n</th>
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<tbody>
<tr>
<td>Yes</td>
<td>60.5%</td>
<td>296</td>
</tr>
<tr>
<td>No - Please provide a brief explanation as to why staff are not prepared to respond to an emerging threat</td>
<td>39.5%</td>
<td>193</td>
</tr>
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</table>

Explanations included lack of specific knowledge and training on how to respond to an emerging threat, institutions not having the proper resources including facilities, equipment and staff necessary, and lack of documented laboratory procedures. Individual responses are on file with APHL.
Thank you!

Questions?

Michael.Marsico@aphl.org and biosafety@aphl.org