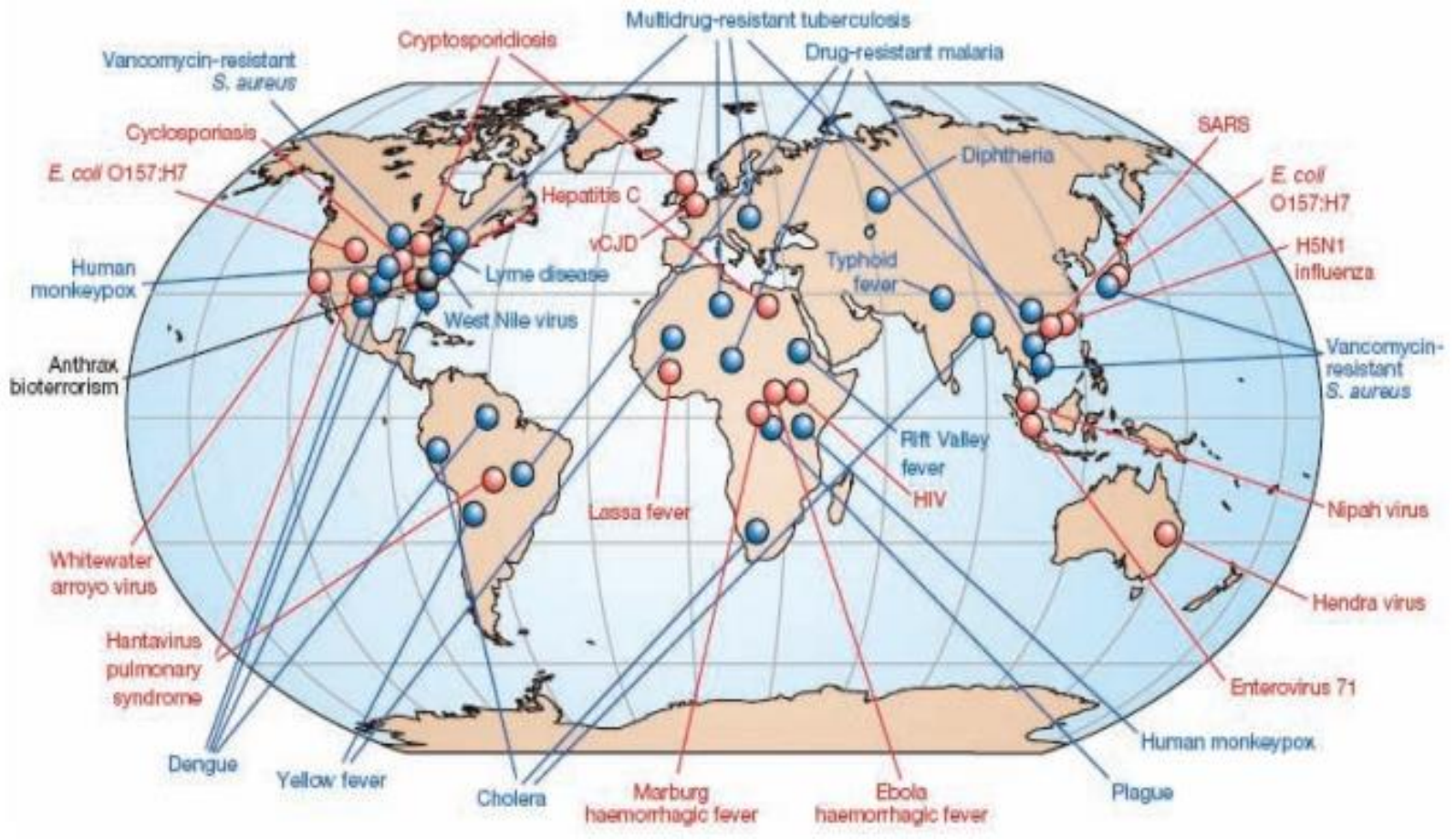
Biosafety Training

Because it Matters

Dana L. Swenson, Ph.D.

Emerging and Re-Emerging Infectious Diseases



Nature. 2004 Jul 8;430(6996):242-9.
The challenge of emerging and re-emerging infectious diseases.
Morens DM[1], Folkers GK, Fauci AS

Global BSL-4 Laboratories

Open Source Information - 2011

Expansion of BSL-4 Laboratories in the United States

Sector	Before 1990	1990-2000	2001-2007	Total
Federal Government	2	1	6	9
Academic	0	1	3	4
State	0	0	1	1
Private	0	1	0	1
Total	2	3	10	15

Source: GAO analysis

What Do We Need Now?

Highly Competent Workers

How Do We Get There?

Training

For those of you who don’t think we need training,
I’ll explain why it is important

Why Is Training Important?

Instill confidence in the public and counterbalance fear of BSL-4 operations

i.e. NEIDL – 5 years and still not open

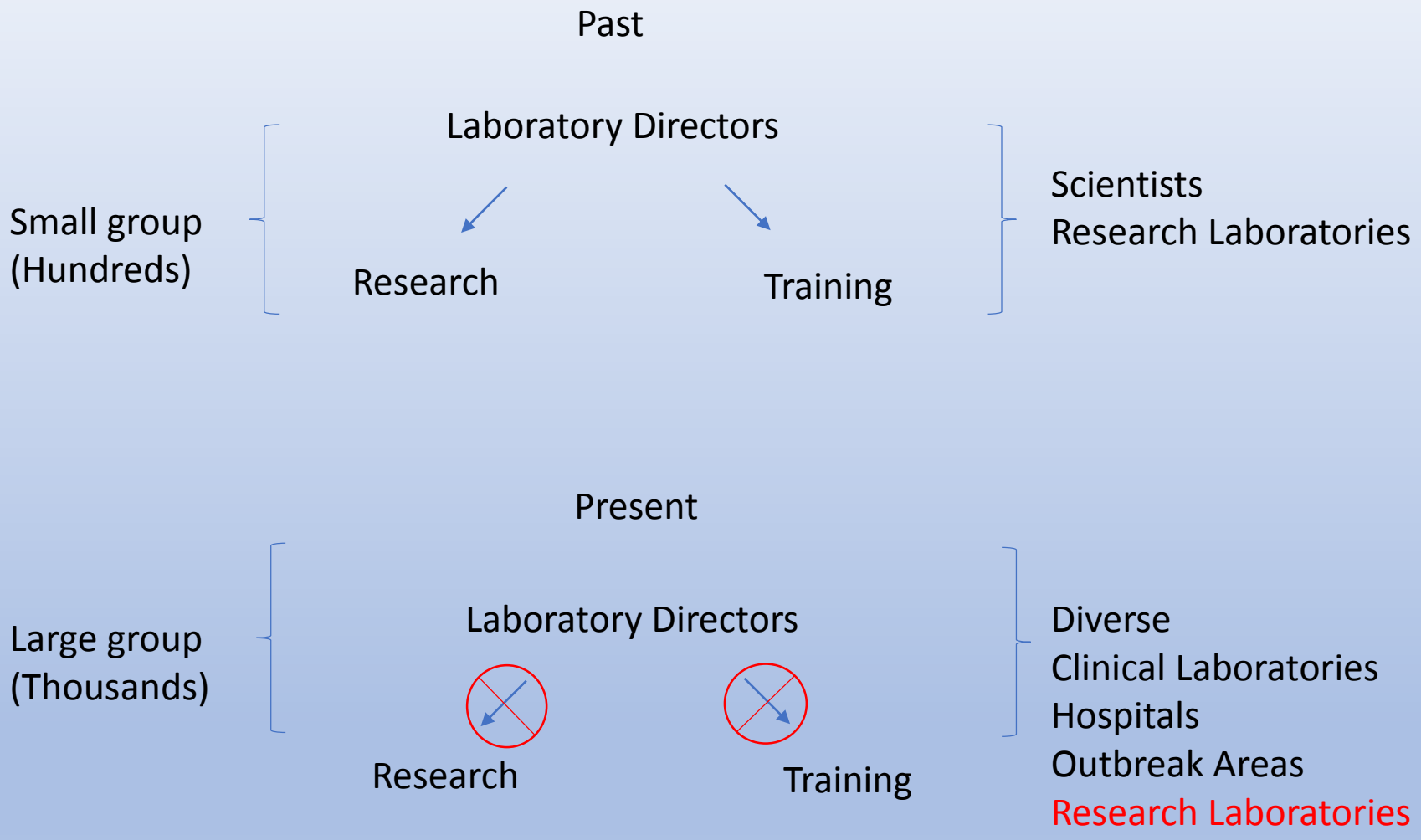
Instill confidence in policy makers

i.e. fewer regulations that hinder the ability of scientists to cope with emerging diseases and threats

Instill confidence in scientific staff

i.e. BSL-4 laboratory is an environment where they will be protected and can do their work safely

Training


Past
Laboratory Directors
Small group
(Hundreds)
Research
Training
Scientists
Research Laboratories
Present
Large group
(Thousands)
Laboratory Directors
Research
Training
Diverse
Clinical Laboratories
Hospitals
Outbreak Areas
Research Laboratories

Elements of Training

Theoretical Training

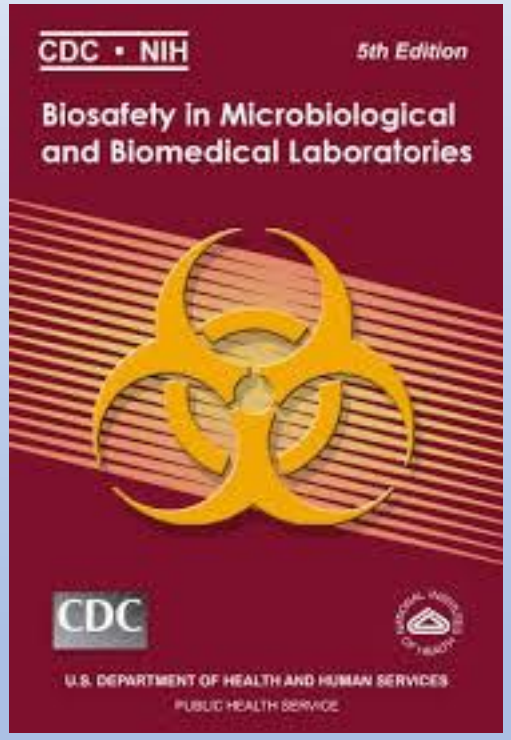
Practical Hands-on Training

Mentored On-the-Job Training

Theoretical Principles

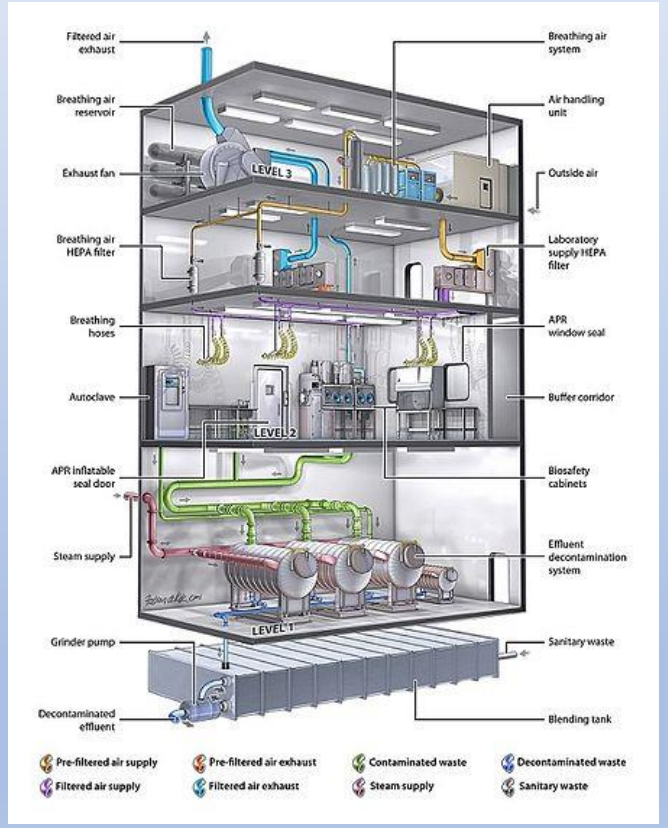
What?

Principles of Biocontainment



BMBL 5th Edition (~400 pages)

BSL-4 Engineering



Additional Information

Facility Specific Documents

Standard Operating Procedures (~100 pages)

Emergency Operating Procedures (~100 pages)

Animal Care Operating Procedures (~100 pages)

Theoretical Principles

How?

Total: 300-400 pages of documents

Time: 1 – 2 weeks

Elements of Training

Theoretical Training

Practical Hands-on Training

Mentored On-the-Job Training

Practical Hands On Training

Where?

BSL-4 Laboratory

When the facility is down for maintenance

Pro: Specific facility where they will do their work
Low risk environment

Con: May be difficult to plan for “new hires”
Full functionality may not be available

When the facility is “hot”

Pro: Specific facility where they will do their work
Interact with co-workers and see work flow

Con: All training is done in “hot” lab
Consequences of mistakes could be high

Training Laboratory

Pro: Low risk environment
Dedicated facility

Con: May not have facility specific equipment or same work flow

Practical Hands-On Training

What?

- Engineering aspects of facility
- Care and use of protective suit
- How to enter and exit the suite
- How to use the chemical decontamination shower
- How to manage air supply
- How to work in a biosafety cabinet
- Waste management
- Use of autoclaves or other equipment
- General decontamination procedures
- Emergency response

Practical Hands-On Training

How?

Situations which are practical

- Care and use of positive pressure suit
- How to use the chemical decontamination shower
- How to manage air supply
- Entry and exit of suite

Practical Hands-On Training

How?

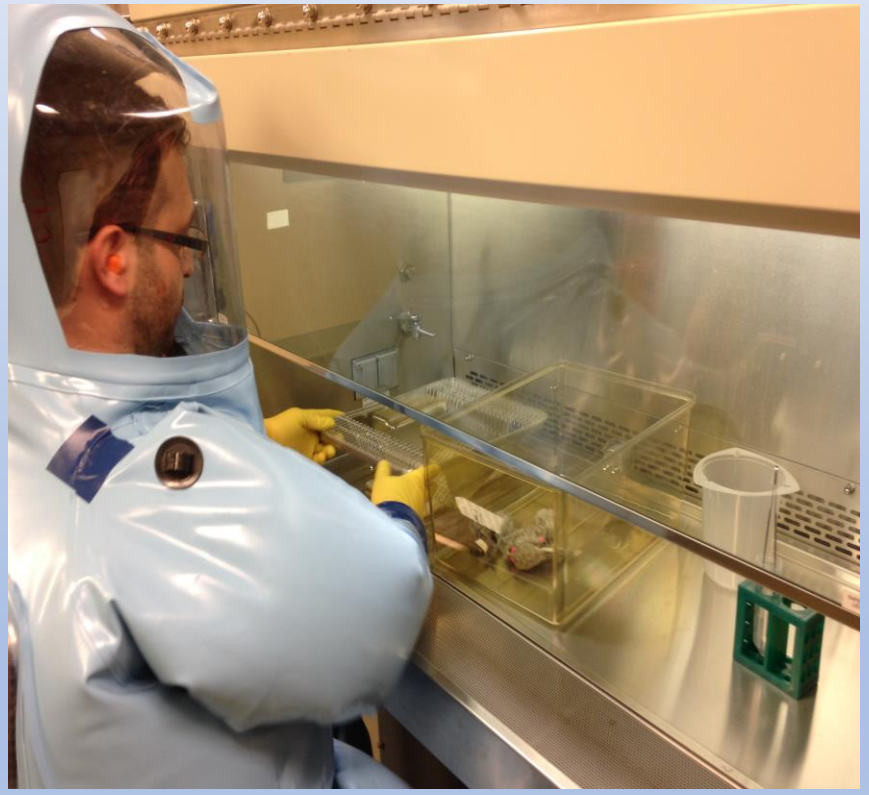
Situations which integrate new ideas with existing knowledge

- How to work in a BSC
- Waste management
- General decontamination

Practical Hands-On Training

How?

Alternate activities to fit specific needs



- How to work in a BSC
- Waste management
- General decontamination
- Use of other equipment

Practical Hands-On Training

How?

Situations which are problem centered

- Emergency response

Time: 1 day to 3 weeks

Elements of Training

Theoretical Training

Practical Hands-on Training

Mentored On-the-Job Training

Mentored Training

- A mentor is assigned
- Introduced to working with live pathogens
- Defined parameters must be achieved and documented
- Extensive experience working in the facility
- The length of time for this stage is undetermined and based upon several factors including the skills of the person and the ability to master procedures necessary for work

Time: 4 – 12 weeks

Elements of Training

Theoretical Training

Time: 1 – 2 weeks

Practical Hands-on Training

Time: 1 day to 3 weeks

Mentored On-the-Job Training

Time: 4 – 12 weeks

Why Is Training Important?

Ebola Researcher in Germany Is Isolated After Needle Puncture
March 17th, 2009, 10:05 AM

Ebola Researcher in Germany Is Isolated After Needle Puncture

Researcher in isolation appears healthy despite possible Ebola exposure

February 21, 2004 | By Scott Shane | Scott Shane,SUN STAFF

Russian scientist dies of Ebola after lab accident

Filed Under: Ebola; VHF
May 25, 2004

The New York Times

C.D.C. Closes Anthrax and Flu Labs After Accidents

By DONALD G. McNEIL Jr.JULY 11, 2014

Science AAAS

White House orders biosafety review at federal labs

By Jocelyn Kaiser | Aug. 28, 2014 , 5:00 PM

Why Do We Do All of This?

To protect the worker
To protect the environment
To protect the public

The very definition of biosafety

Because it Matters