Laboratory Leadership Service: Fostering a Culture of Safety through Risk Management Training and Practice

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Learning Objectives

1. Describe the biosafety learning competencies of the Laboratory Leadership Service (LLS)
2. Evaluate the LLS risk management training process
3. Explain how the LLS improves laboratory safety in public health laboratories


DELL
KleenGuard
A60

LLS program's competency domains.

Laboratory Safety has

3 subdomains

Potential Hazards, Hazard Controls and Administrative Controls.

Laboratory Safety has

18 competencies

describing knowledge and skills.

Laboratory Safety has

67 sub-competencies

defined at four levels from beginner to expert.

Overview of Domain safety competencies and skills

Sub-domain	Assess risks
Competency	Evaluate controls
Sub-competency	Describe hazards

Overview of Domain safety competencies and skills

Sub-domain	Assess risks
Competency	Evaluate controls
Sub-competency	Assess hazards

LLS safety curriculum includes both **didactic sessions** and experiential training.

Hazard Mitigation

Safety Regulations

Biorisk Management

Select Agents & Toxins

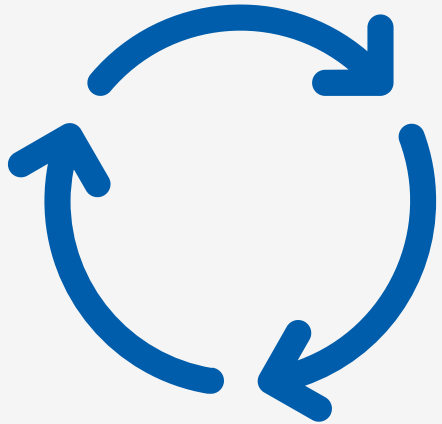
Disinfection & Decontamination

LLS safety curriculum includes both didactic sessions and **experiential training.**

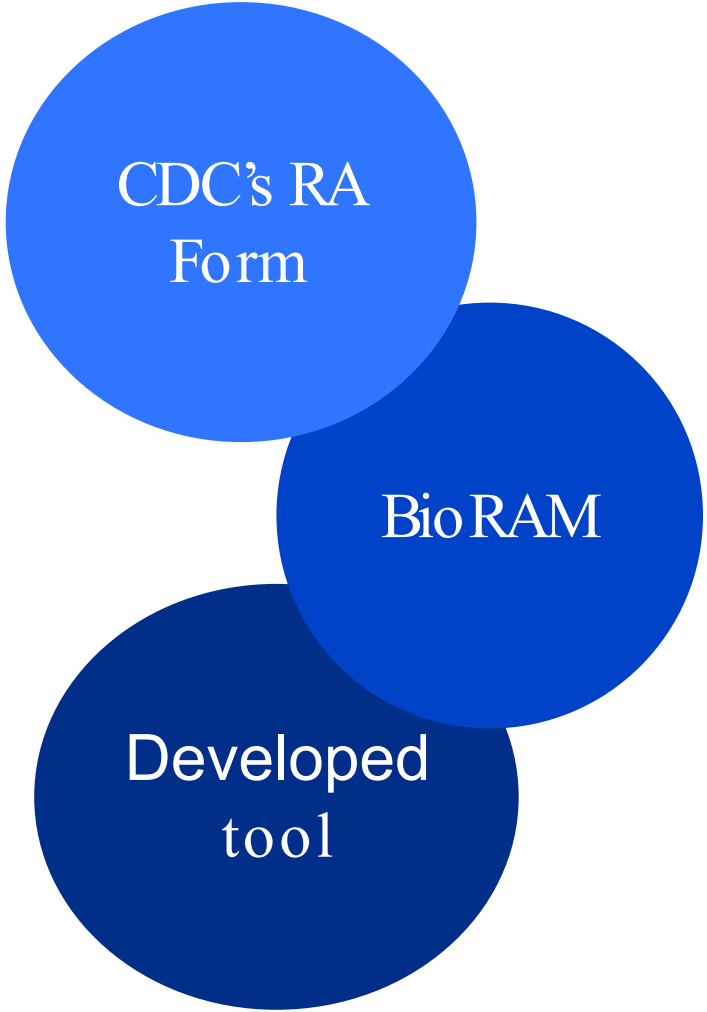
Safety risk assessments

Safety Risk Assessments: 6 Step Process

1. Define process and procedures
2. Identify hazards
3. Characterize risks
4. Propose mitigations strategies
5. Communicate results
6. Continual review and assessment



LLS fellows use 3 methods to assess risks.



Using numerical scores to prioritize risks.

Likelihood	Negligible (1-2)	Minor (3-4)	Serious (5-6)	Critical (7-8)	Catastrophic (9-10)
	Consequence				
Frequent (9-10)	9 to 20	27 to 40	45 to 60	63 to 80	81 to 100
Probable (7-8)	7 to 16	21 to 32	35 to 48	49 to 64	63 to 80
Occasional (5-6)	5 to 12	15 to 24	25 to 36	35 to 48	45 to 60
Remote (3-4)	3 to 8	9 to 16	15 to 24	21 to 32	27 to 40
Improbable (1-2)	1 to 4	3 to 8	5 to 12	7 to 16	9 to 20

Low (1-20)

Moderate (21-40)

High (41-100)

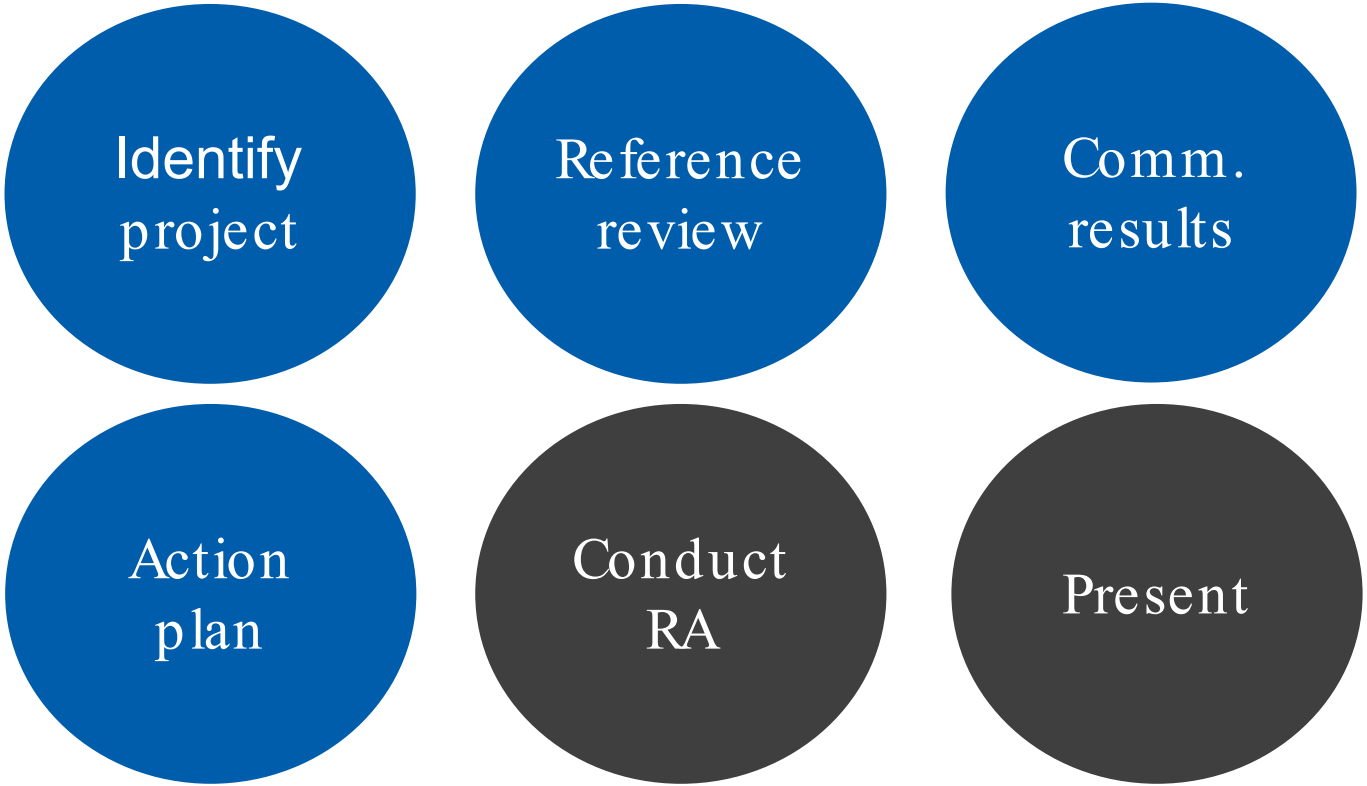
LLS use rubrics as evidence-based way to measure learning outcomes and describe what "completed successfully" looks like.

Dimension	Level 1	Level 2	Level 3	Level 4
Identify project				
Review references				
Conduct Risk Assessment				
Communicate Results				

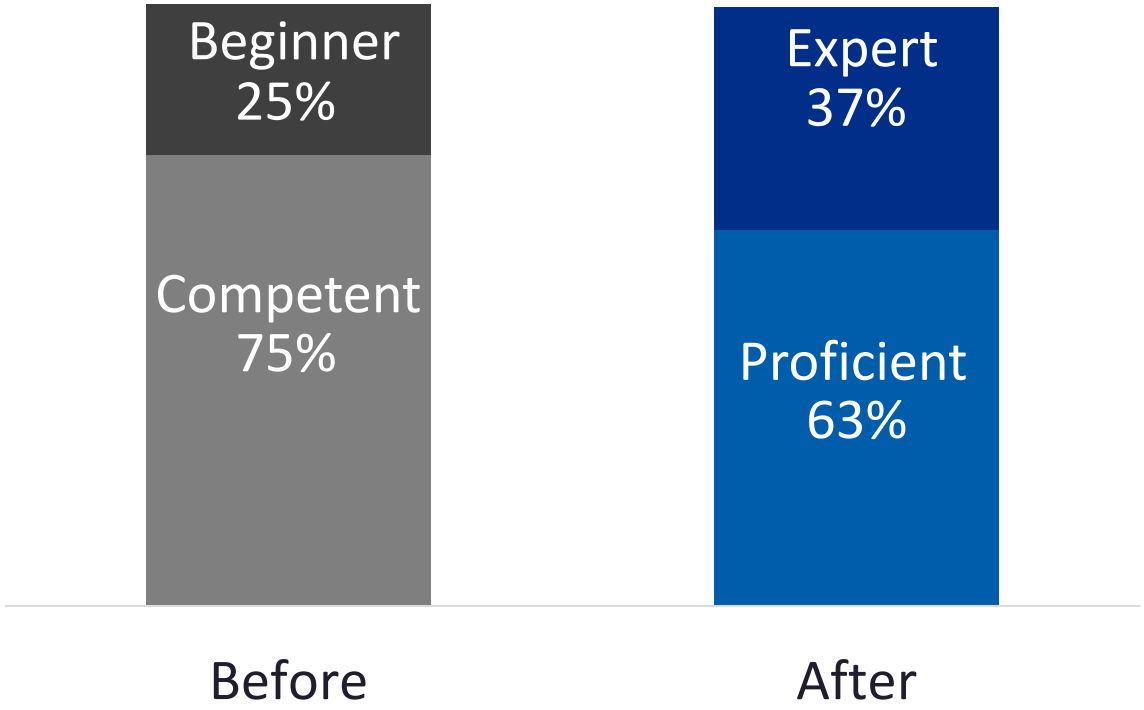
A rubric objectively assesses fellows' skills and competency for conducting safety risk assessments.

Dimension	Level 1	Level 4 Fully Competent
Identify project	**Does not** identify a project **or** identifies an irrelevant project.	Engages colleagues to identify the risk assessment project through an organized, documented process.
Conduct risk assessment	Does not describe methods or describes inappropriate methods.	Describes with **sufficient clarity and detail** the methods for selecting appropriate model(s) **and** for collecting, organizing, and analyzing risk data.

Based on supervisors feedback, LLS fellows were fully competent in 4/6 domains.



All fellows in the class of 2016 showed an increase in competency acquisition for domain safety.



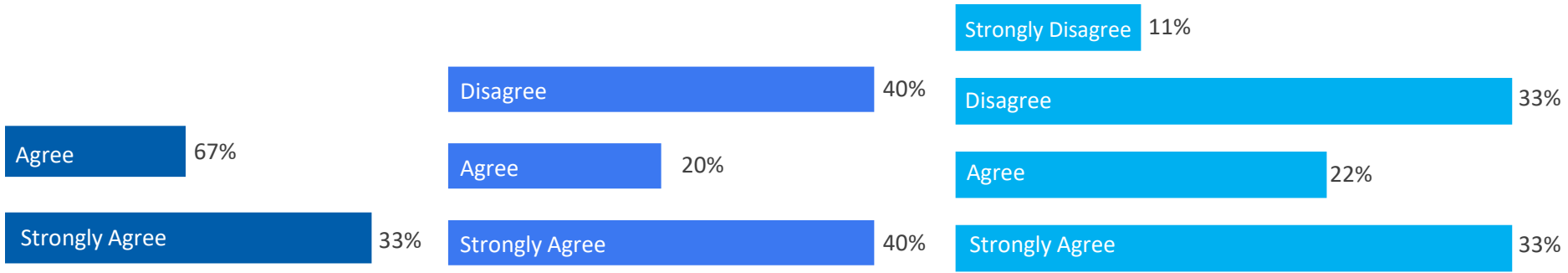
Impact of Training

1. Conducts comprehensive risk assessment

2. Improves laboratory safety

3. Fosters community of practice

LLS supervisors for the class of 2015, 2016 & 2017 mostly agree that hosting an LLS fellow has changed the way their team approaches safety.



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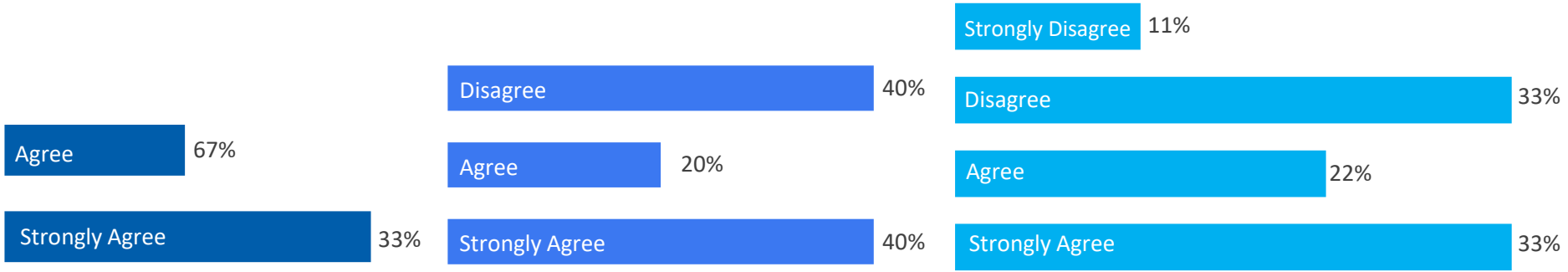


2015

Risk Assessments

2016

Safety Glasses

2017

Waste Decontamination

“Fellow received LaSSI award to provide data driven recommendations and improve lab safety. **This really changed the way we approach lab safety.** Instead of relying on experience or limited data published for other pathogens, this is the first time we started a project to provide data for lab safety recommendations.”

2016 LLS Supervisor

Thank You!

LLS Fellows/Alumni
LLS Supervisors
Ren Salerno
Aufra Araujo
Paul Meechan
Caitlin McColloch

Additional Slides

Risk Analysis

105

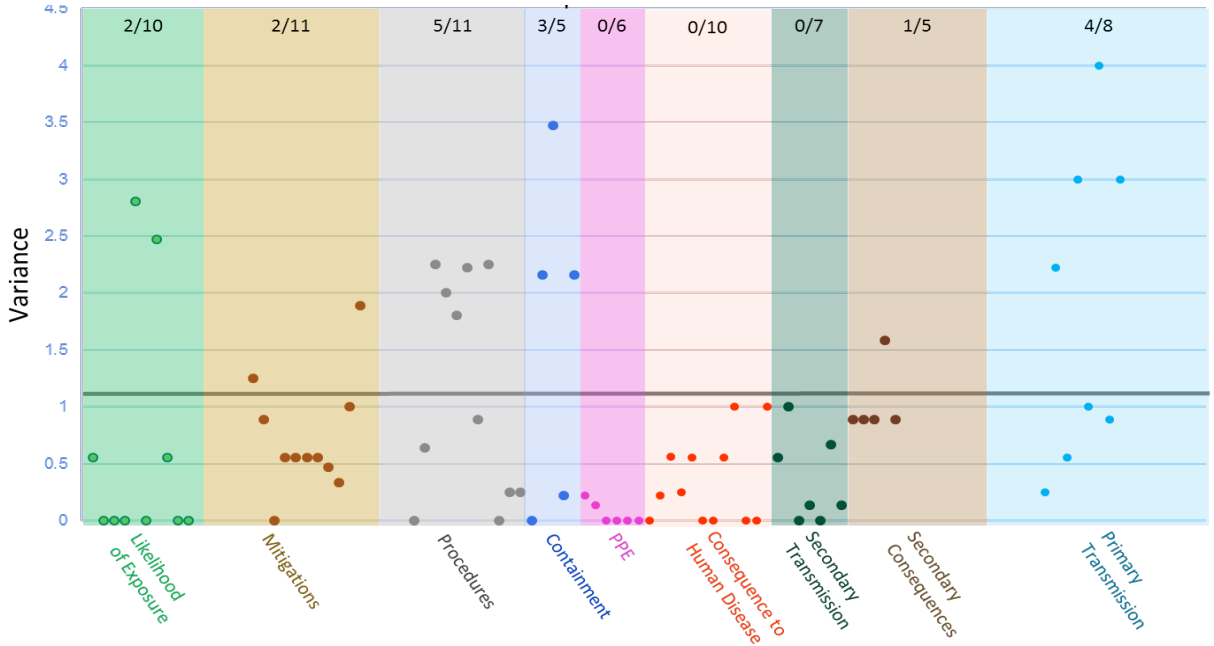
Questions Survey

40%

Variance in 3 categories

7

Elements of Concern



Risk Assessment Questionnaire

Risk Assessment Questionnaire

Objective: Document current processes in the lab to identify inconsistent methods and areas of improvement.

Please take a few minutes to fill out this survey and submit your answers **anonymously**.
Please print and place in folder on door of Room 2224 by 6 pm 10/14/2016
Thank you for your participation.

Storage and Handling of Stock Bacterial Isolates

1. How often do you have trouble finding isolate stocks in storage freezers?

☐ Never ☐ 1X per week ☐ 1X per month ☐ Other
(Specify):_____

2. How often have you found an opened or damaged isolate stock vial in a storage freezer?

☐ Never ☐ 1X per month ☐ 1X per 3 months ☐ 1X per 6 months ☐ 1X per year

☐ Other (Specify):_____

Please list a detailed order of steps for how you cleaned or sterilized…

1. The opened or damaged isolate stock?
2. The storage freezer (if applicable)?

3. How often have you found a bacterial isolate stock located outside the storage freezer?

☐ Never ☐ 1X per month ☐ 1X per 3 months ☐ 1X per 6 months ☐ 1X per year

☐ Other (Specify):_____

Working with Bacterial Isolates

4. When working in a BSC, how often have you spilled bacterial cells suspended in Tris solution?

☐ Never ☐ 1x per 10 suspensions ☐ 1X per 25 suspensions ☐ 1X per 50 suspensions
☐ 1X per 100 suspensions ☐ Other
(Specify):_____

How did you clean the spill in the BSC? Please list a detailed order of steps used.

5. When performing a bacterial lysis for genomic DNA extraction, at what step(s) do you remove the bacteria from the BSC? For each step, indicate…

1. The general lysis procedure used (e.g. for crude bacterial preps, PCR, DNA extraction for NGS, etc.)
2. The status of the bacteria (suspension, colonies, etc.)
2. The reason you removed the suspended bacterial cells from the BSC

6. After lysing cells, at what point do you consider the bacteria to be inactive and safe to open on the benchtop? Please indicate why you consider the suspension inactivated.

7. How often do you vortex or centrifuge a bacterial suspension before the cells are lysed?

Vortex: ☐ Never ☐ Occasionally ☐ Sometimes ☐ Always
Centrifuge: ☐ Never ☐ Occasionally ☐ Sometimes ☐ Always

8. When removing a supernatant off live, pelleted bacteria, how do you dispose of the supernatant (liquid waste)? Please list a detailed order of steps taken.