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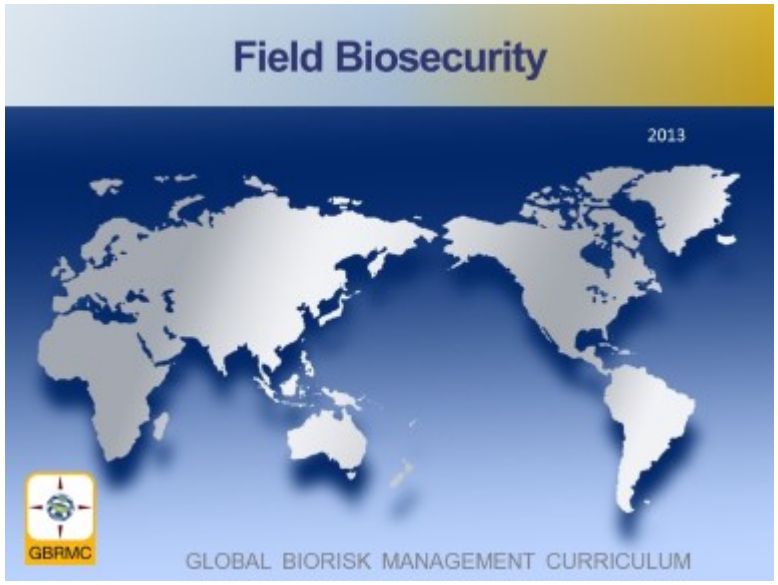
Field Biosecurity

Student Guide

2013

GLOBAL BIORISK MANAGEMENT CURRICULUM


Field Biosecurity
2013
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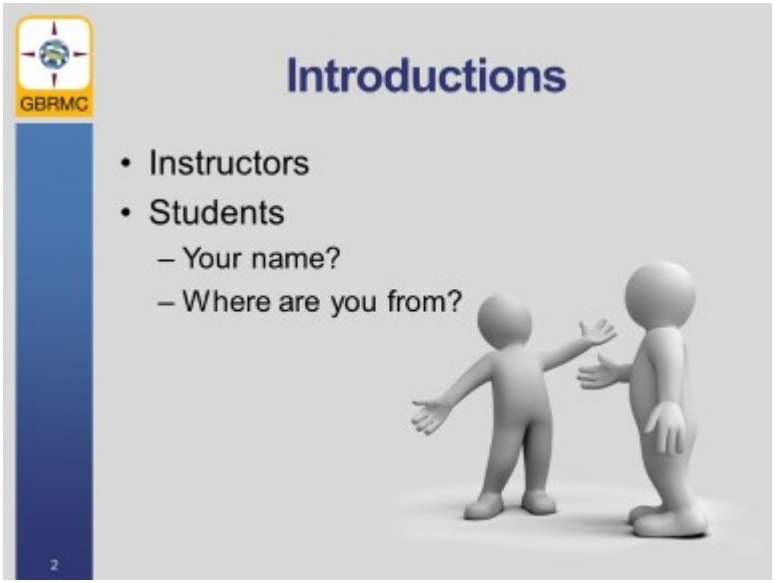
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Introductions
• Instructors
• Students
– Your name?
– Where are you from?
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Action Plan

By the end of this lesson, I would like to:					
KNOW		FEEL		BE ABLE TO DO	

Your learning doesn't stop with this lesson. Use this space to think about what else you need to do or learn to put the information from this lesson into practice.

What more do I need to know or do?	How will I acquire the knowledge or skills?	How will I know that I've succeeded?	How will I use this new learning in my job?

Use space on back, if needed

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Key Messages

- Field work with pathogens and toxins is very different from laboratory work – security is also different in the field versus the laboratory.
- Many laboratory biosecurity measures can be modified and adapted to field work.
- The same frameworks for approaching risk management in laboratories can be utilized in the field.
- Biosecurity risk mitigation in the field places special emphasis material control and accountability as well as personnel reliability.
- Security awareness is crucial in field biosecurity.

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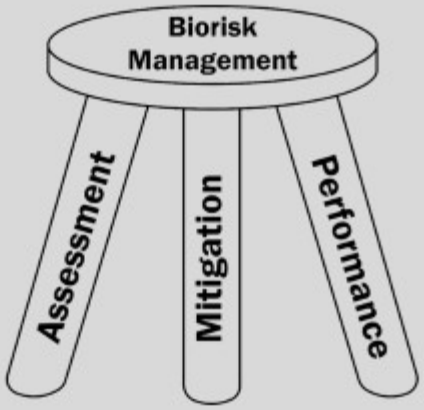
Biorisk Management: the AMP Model



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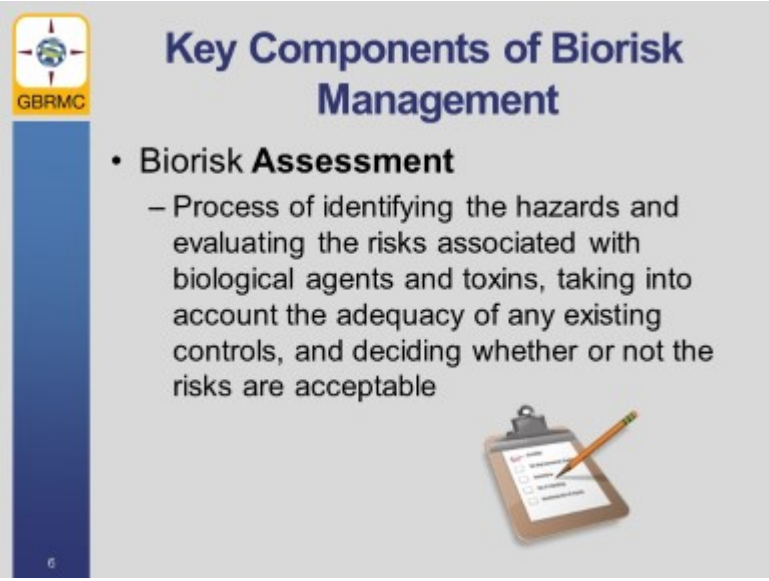
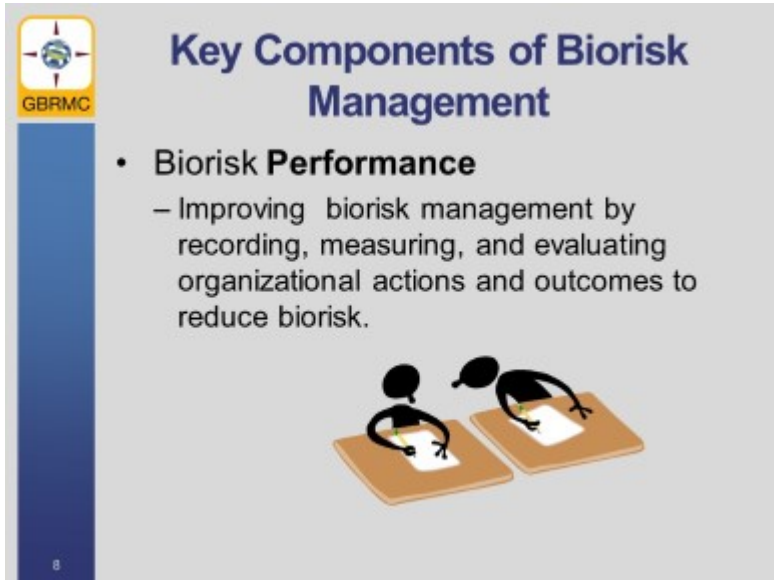
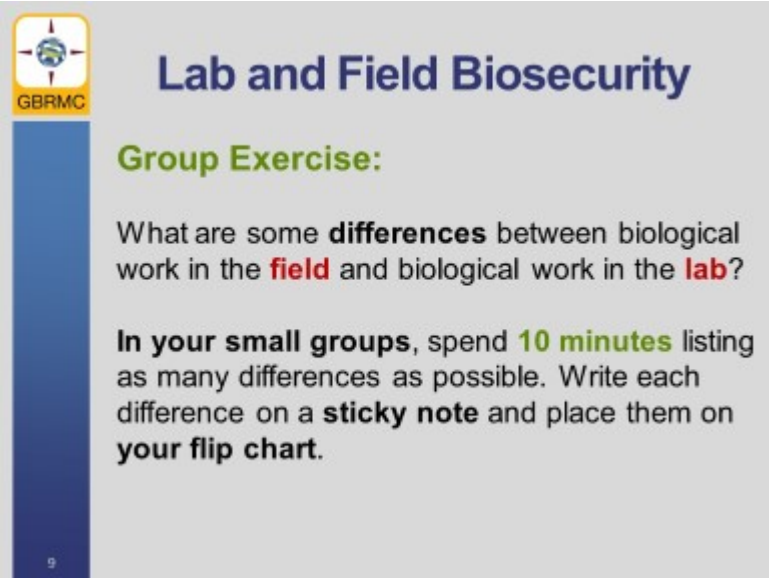


Define Biorisk Assessment:

Define Biorisk Mitigation:



Define Performance:

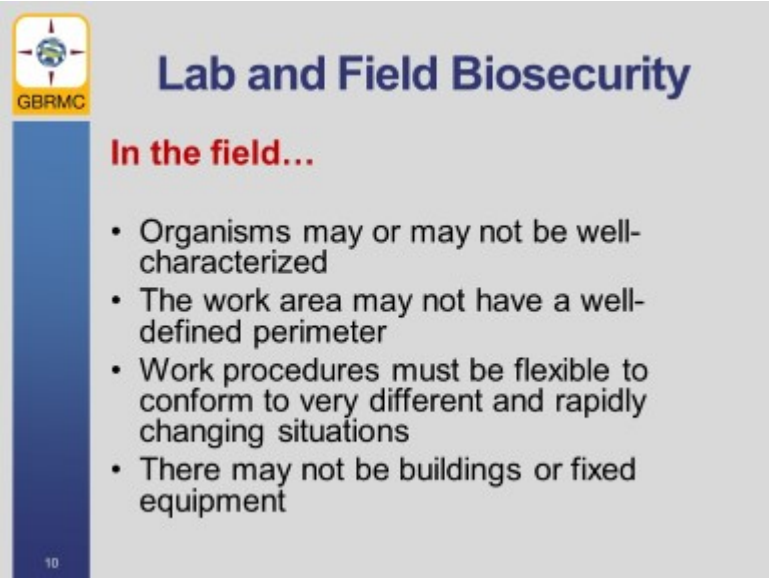


What are some differences between biological work in the field and biological work in the lab?

Are the conditions more mutable in the lab or the field?

Which of these unpredictable conditions might concern you?

How may this present a challenge to Biosecurity?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Lab and Field Biosecurity
In the field…
• Organisms may or may not be well-characterized
• The work area may not have a well-defined perimeter
• Work procedures must be flexible to conform to very different and rapidly changing situations
• There may not be buildings or fixed equipment
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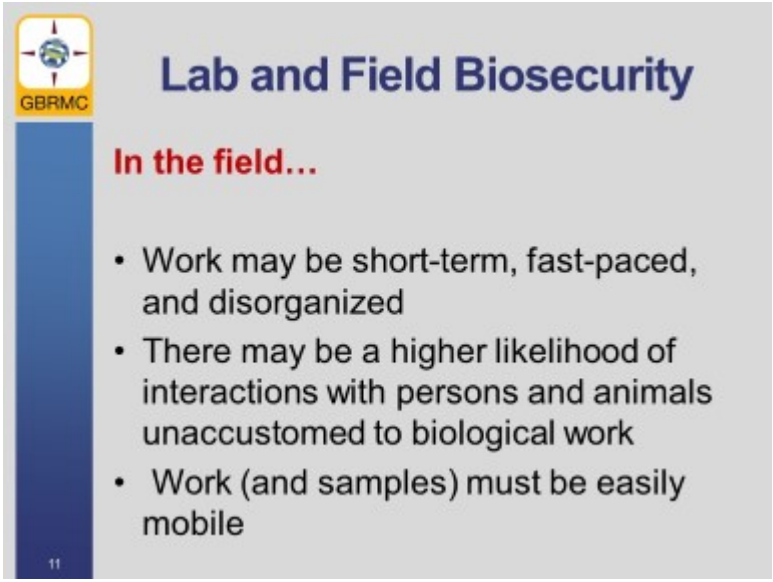
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Lab and Field Biosecurity
In the field…
• Work may be short-term, fast-paced, and disorganized
• There may be a higher likelihood of interactions with persons and animals unaccustomed to biological work
• Work (and samples) must be easily mobile
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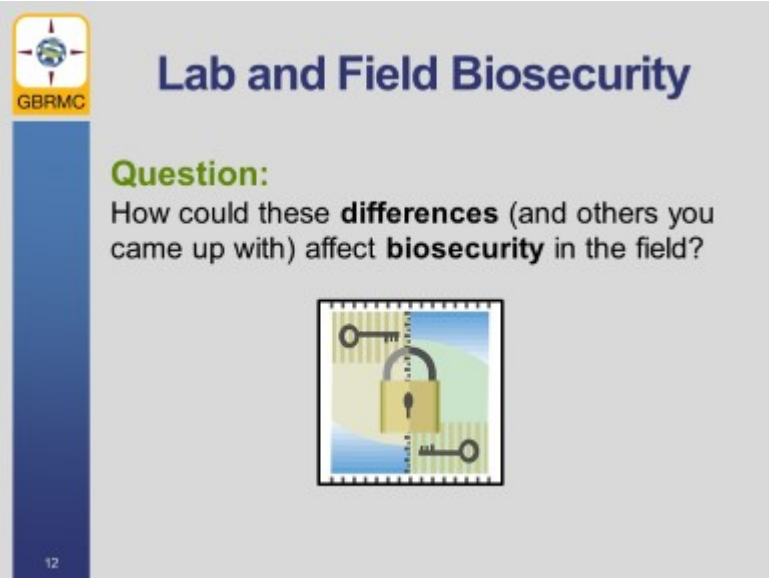

What is unique about field Biosecurity?

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Introduction to Biosecurity Risk Assessment

A **field biosecurity risk assessment** allows an institution or laboratory to determine the relative risk of security threats and/or vulnerabilities in the field to help **guide risk mitigation decisions** so these are targeted to the most important risk.

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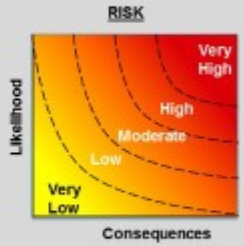
Biosecurity Risk Assessment

In a **Field Biosecurity Risk Assessment**, we are concerned with **intentional adverse events** involving disease agents and/or their products isolated from the field.



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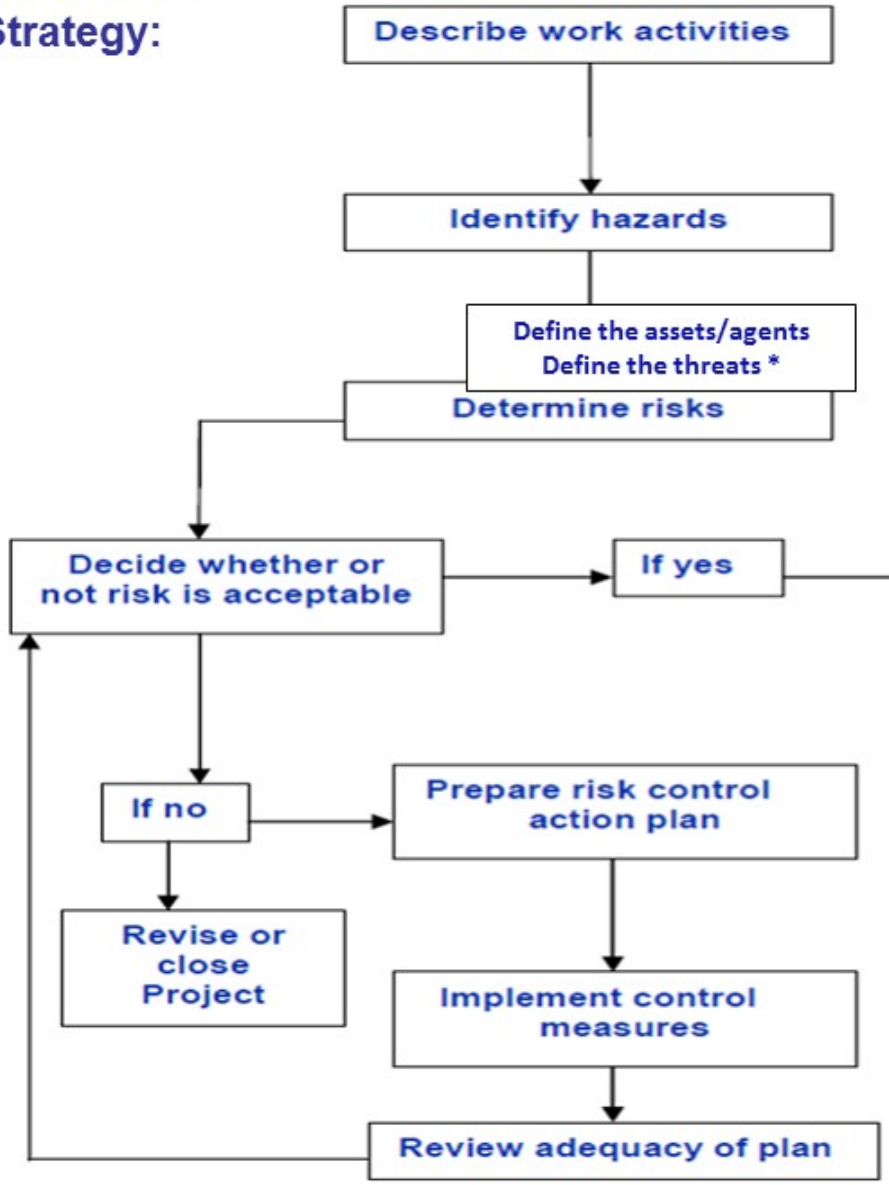
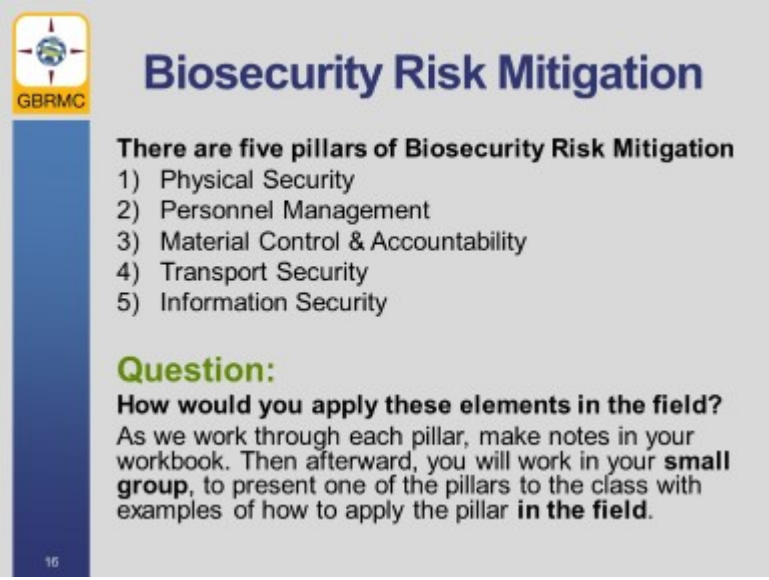
Risk Assessment Strategy:



Biorisk Management = Assessment, Mitigation, Performance

Source: CWA 15793:2011 *Modified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Biosecurity Risk Mitigation
There are five pillars of Biosecurity Risk Mitigation
1) Physical Security
2) Personnel Management
3) Material Control & Accountability
4) Transport Security
5) Information Security
Question:
How would you apply these elements in the field?
As we work through each pillar, make notes in your workbook. Then afterward, you will work in your small group, to present one of the pillars to the class with examples of how to apply the pillar in the field.
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Biosecurity Risk Mitigation – Field Examples

	Physical Security	Personnel Management	Material Control & Accountability	Transport Security	Information Security
Definition					
Examples					

Slide 17

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Physical Security

The first "pillar" is **Physical Security**

Physical Security is the assurance of safety from physical intrusion

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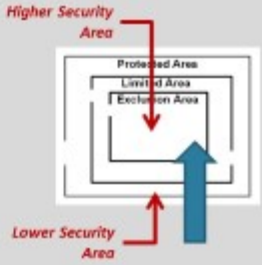
Physical Security

An important concept in **Physical Security** is the concept of **Graded Protection**. This is based on the idea that different areas in the field will have different **levels of security** based on risk.

Graded Protection is manifested in concentric rings of increasing security spanning **from outside to inside** the protected area.



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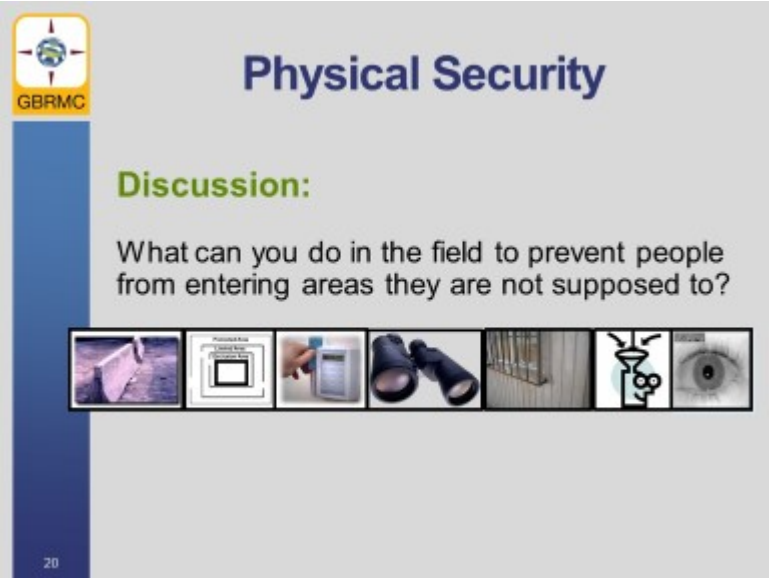
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Physical Security
Discussion:
What can you do in the field to prevent people from entering areas they are not supposed to?
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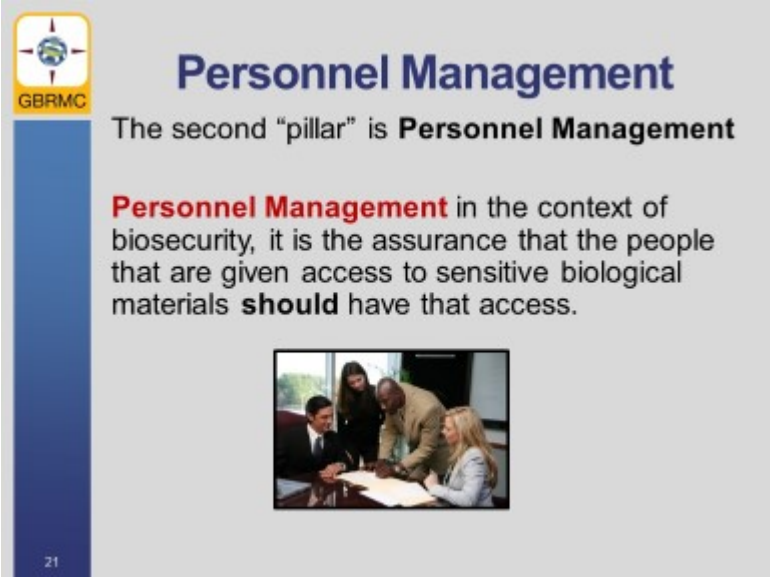
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Personnel Management
The second "pillar" is **Personnel Management**
Personnel Management in the context of biosecurity, it is the assurance that the people that are given access to sensitive biological materials **should** have that access.
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Personnel Management

The Objectives of a Personnel Management Program are to:

Understand that human factors can significantly impact the success of biorisk management.

- To reduce the risk of theft and fraud
- To reduce the risk of scientific misconduct
- Etc..

To support the procedural and administrative access control requirements

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Personnel Management

Discussion:

What can you do in the field to promote a secure work environment in terms of human performance?

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Material Control & Accountability

The third "pillar" is **Material Control & Accountability**

Material Control & Accountability is the assurance that there is an awareness of what exists in the field, where it is, and who is responsible for it.

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Material Control & Accountability

The Objective of **MC&A** is to:

- **Ensure the complete and timely knowledge of:**
  - **What materials exist**
  - **Where the materials are**
  - **Who is accountable for them**
- **Objective is NOT to detect whether something is missing.** This could be impossible. The objective is to create an environment that discourages theft and misuse by establishing oversight.

Question:

Why might MC&A be *particularly* important for field biosecurity?

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Material Control & Accountability

Key Issues in **MC&A**

- What materials are subject to MC&A measures?
- What operating procedures are associated with the materials?
  - **Where can they be stored and used?**
  - **How are they identified?**
  - **How is inventory maintained?**
- What records need to be kept for those materials? What timeliness requirements are necessary for those records?
- What does accountability mean?
- What documentation and reporting requirements?

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Material Control & Accountability

Material Control & Accountability

Question:

What Material should we keep track of in the Field?

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Material Control & Accountability

Material **Control** & Accountability

- **Control is either…**
  - Engineered / Physical (Locks)
  - Administrative (Chain of Custody)
- **Containment is part of material control**
  - Containment During Transport / Freezer / Ampoule
- **Procedures are essential for material control**
  - For both normal and abnormal conditions

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Material Control & Accountability

Material Control & **Accountability**

All material should have an associated "accountable person" who is ultimately responsible for the material.

- The person best in a position to answer questions about the associated material
- Not someone to blame!
- Ensure that no material is "orphaned"

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Material Control & Accountability

Scenario:

Your team of 3 researchers and 12 assistants is in the field collecting fleas, ticks and dead rodents at the site of a suspected outbreak of *Yersinia pestis*.

You are working in a remote region, where petty crime is endemic and there has been some civil unrest involving separatist groups with ties to international terrorist organizations. However, your work site is located in an isolated wooded area. Your work area is very large and you have several vehicles and tents in one clearing where you will keep your equipment and plan to store samples. You expect to be in the field 5 days.

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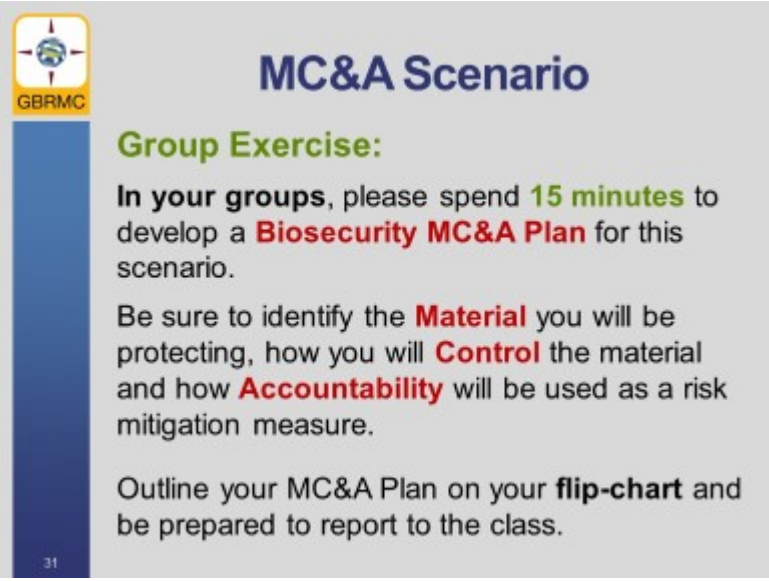

Biosecurity MC&A Outline:

Material:

Control:

Accountability:


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Material Control & Accountability
Discussion:
How is Material Control & Accountability implemented when you are working in the Field?
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Notes:

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Transport Security

The fourth "pillar" is Transport Security

Field Transport Security is the assurance that risk mitigation controls and processes are in place to protect biological materials during transport from the field to the laboratory.

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Transport Security

Transport Security

- Aims to reduce the risk of illicit acquisition of *high-risk* biological agents
- Relies on chain of custody principles and end-user agreements

Question:

Why might **Transport Security** be *particularly* important for Field Biosecurity?

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Transport Security

Chain of Custody (CoC)

Aims to protect sample by documenting…

- All individuals who have control of sample
- Secure receipt of material at appropriate location

Chain of custody documentation includes…

- Description of material being moved
- Contact information for a responsible person
- Time/date signatures of every person who assumes control

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Transport Security

External Carrier

If using an external carrier, the same procedures used for securing materials for transport out of a laboratory should be employed in the field, whenever possible.

Field Personnel

If field personnel will be transporting samples, internal guidelines for doing so, in many ways similar to the requirements for MC&A in the field, should be developed to ensure samples are moved securely.

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Transport Security

So, we want to keep our high-risk samples secure during transport. What should you do?

- Require a responsible authority to pre-approve all transport
- Advise eligible receiving party of transport
- Document transport in lab records
- Ensure only trustworthy people handle the samples
- Physically secure samples in transit with special packaging and/or locks
- Control movements and document in delivery records
- Use timely shipping methods
- Maintain a Chain of Custody
- Request notification of receipt

Other ideas?

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Transport Security

For Example: **When Transporting..**

Moderate risk agents…

- Internal transport personnel screened
- Recipient screened for legitimacy
- Safe receipt notification

High risk agents…

- Moderate plus
  - Chain of custody
  - Physical controls on storage containers

A proper **Risk Assessment** can help determine transport security needs

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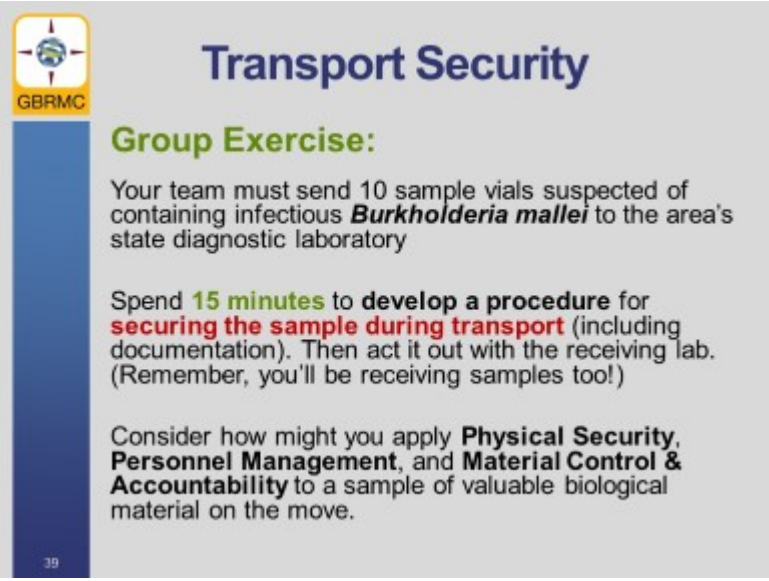

Transport Procedure:

Standard Operating Procedure Pattern

Conditions		
Who should use the SOP?		
When should it be used?		
Why should the SOP be used?		
Where should it be used?		
Context		
Input(s):		
Output:		
Preparation:		
Actions: What steps must be taken to move from the input to the output?		
Step 1		
Step 2		
Step 3		
Step 4		
Step 5		
Documentation		
Cross-references		
Regulatory dependencies/sources		


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Transport Security
Discussion:
How do you secure biological materials in the field during transport?
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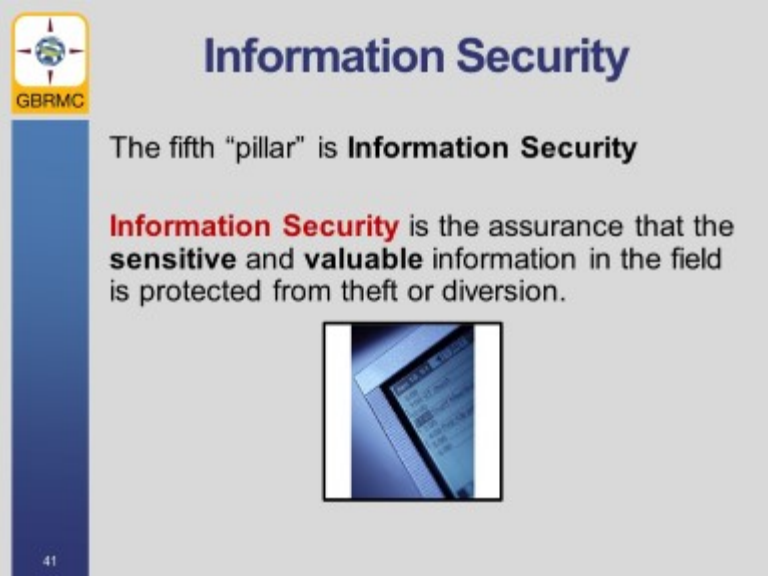
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Information Security
The fifth "pillar" is Information Security
Information Security is the assurance that the sensitive and valuable information in the field is protected from theft or diversion.
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Information Security

The Objective of **Information Security** is to:

- **Protect information that is too sensitive for public distribution**
  - Label information as restricted
  - Limit distribution
  - Restrict methods of communication
  - Implement network and desktop security
- **Biosecurity-related sensitive information**
  - Security of dangerous pathogens and toxins
    - Risk assessments
    - Security system design
  - Access authorizations

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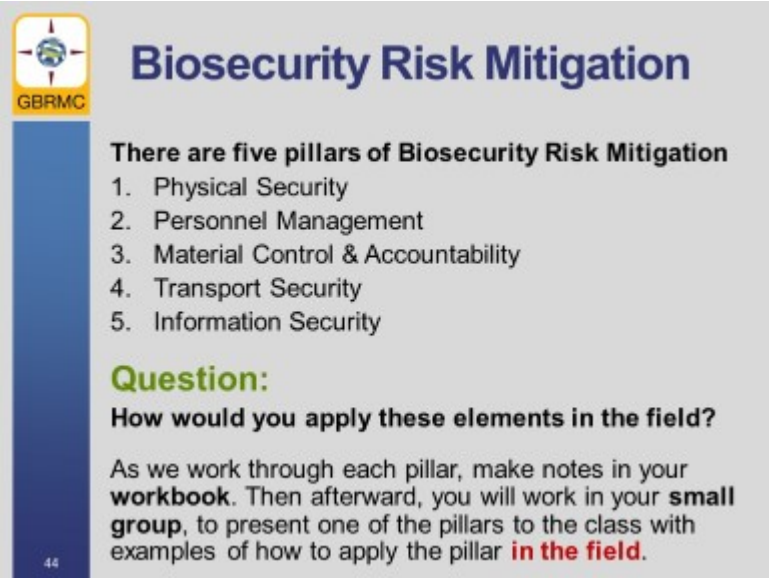
Information Security

Discussion:

How could information be secured in the field?

Slide 43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Biosecurity Risk Mitigation – Field Examples

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Definition					
Examples					

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Security Awareness

The final topic is **Security Awareness**

Security Awareness is general awareness of the proper security posture in the field, where the risks are, and what should be done.

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Security Awareness

For Example: **Security Awareness**

Most bioscience professionals are not accustomed to worrying too much about security, so appropriate security awareness may require a very difficult **cultural shift**.

Security Awareness in the Field will be easier to achieve if personnel trust that a **biosecurity risk assessment** is **accurate** and **robust**.

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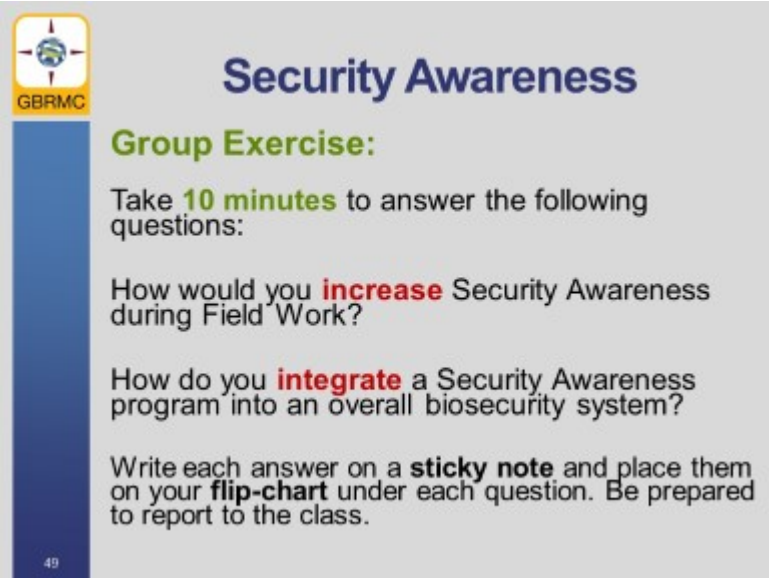
Additional examples of Security Awareness:



How would you increase Security Awareness during Field work?

How would you integrate a Security Awareness program into an overall biosecurity system?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Security Awareness
Discussion:
How might you promote a culture of increased security awareness in the Field?
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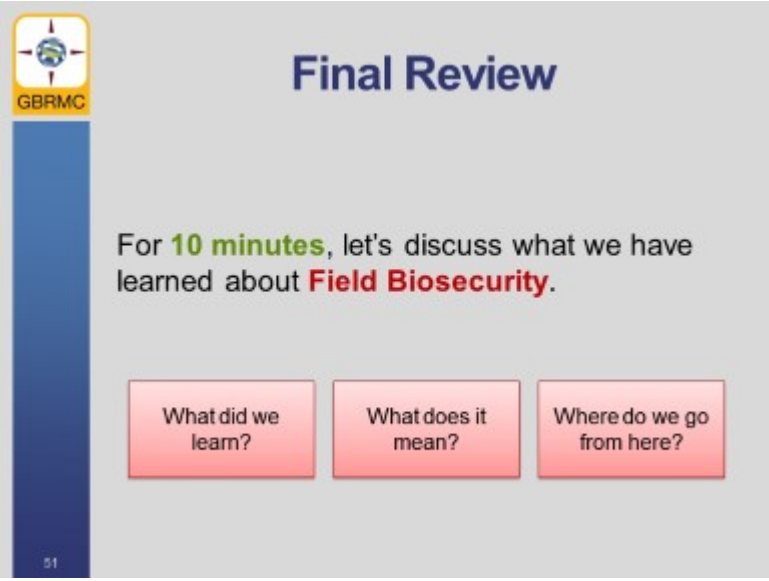
Notes: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Final Review
For 10 minutes, let's discuss what we have learned about Field Biosecurity.
What did we learn?
What does it mean?
Where do we go from here?
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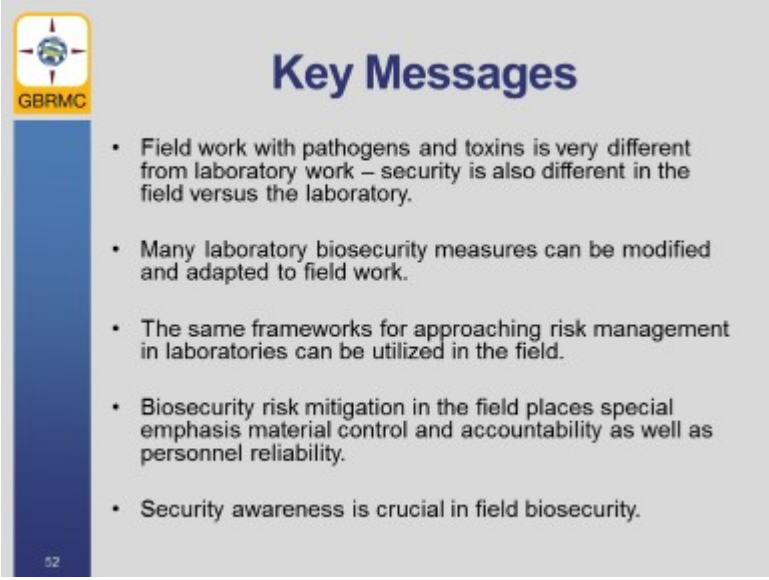
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