

# Field Biosecurity – Focus on MC&A, Transport and SOPs

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## *Student Guide*





Welcome to Field Biosecurity!

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**Introductions**

- Instructors
- Students
  - Your name?
  - Where are you from?



Slide 2



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# Action Plan

By the end of this lesson, I would like to:

KNOW		FEEL		BE ABLE TO DO	
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*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



**Key Messages**

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- The same frameworks for approaching risk management in laboratories can be utilized in the field including performing risk assessment.

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- Biosecurity risk mitigation in the field places special emphasis on material control, transport security and standard operating procedures.

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**Biorisk Management: the AMP Model**

**Biorisk Management =  
Assessment, Mitigation, Performance**

Slide 5

BEP

The slide features a light blue background with a faint world map. A central dark blue box contains the text 'Biorisk Management = Assessment, Mitigation, Performance'. The acronym 'AMP' is highlighted in red in the title and the text box. Logos for BEP and another organization are in the bottom right corner.

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**Key Components of Biorisk Management**

🔑 **Biorisk Assessment**

- Process of identifying the hazards and evaluating the risks associated with biological agents and toxins, taking into account the adequacy of any existing controls, and deciding whether or not the risks are acceptable



Slide 6

Define Biorisk Assessment:

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**Key Components of Biorisk Management**

🔑 **Biorisk Mitigation**

- Actions and control measures that are put into place to reduce or eliminate the risks associated with biological agents and toxins



Slide 7

Define Biorisk Mitigation:

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**Key Components of Biorisk Management**

**⚠ Performance**

- The implementation of the entire biorisk management system, including evaluating and ensuring that the system is working the way it was designed. Another aspect of performance is the process of continually improving the system.



Slide 8



Define Performance:

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**Lab and Field Biosecurity**

**Group Activity:**

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

**In your small groups**, spend **10 minutes** listing as many differences as possible. Write each difference on a sticky note and place them on your flip chart.

Slide 9

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

Slide 10




**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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**Lab and Field Biosecurity**

**Question:**  
How could these **differences** (and others you came up with) affect **biosecurity** in the field?



Slide 12



What is unique about field Biosecurity?

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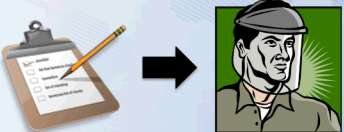
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### Introduction to Biosecurity Risk Assessment

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.

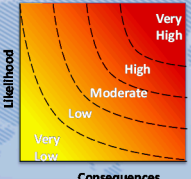


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### Biosecurity Risk Assessment

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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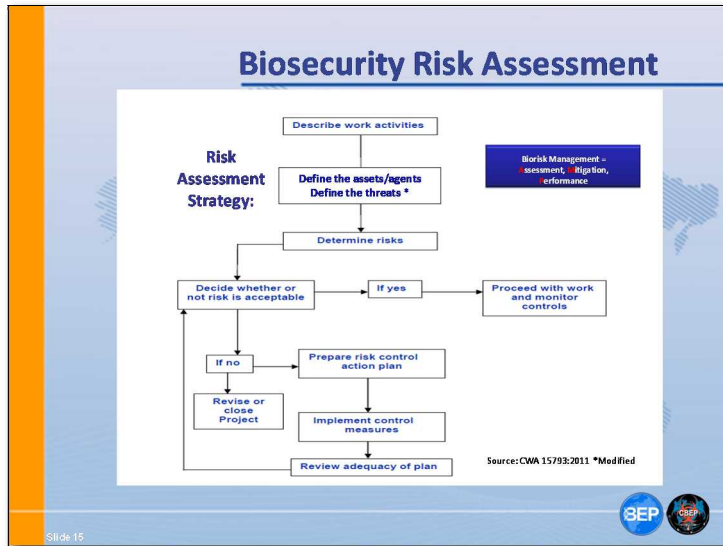
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### Biosecurity Risk Mitigation

There are two main topics of Biosecurity Risk Mitigation

- 1) Material Control & Accountability
- 2) Transport 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

	Material Control & Accountability	Transport Security
Definition		
Examples		



**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.



Slide 24

**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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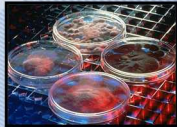
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### Material Control & Accountability

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 stool samples, at the site of a suspected outbreak of *Vibrio cholera*.

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 clinic where you will keep your equipment and plan to store samples. You expect to be in the field 5 days.



**MC&A Scenario**

**Group Activity:**

In your groups, please spend **15 minutes** to develop a **Biosecurity MC&A Plan** for this scenario.

Be sure to identify the **Material** you will be protecting, how you will **Control** the material and how **Accountability** will be used as a risk mitigation measure.

**Outline** your MC&A Plan on your flip-chart and be prepared to report to the class.

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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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### Shipping Risk Mitigation Group Activity - Expected Responses

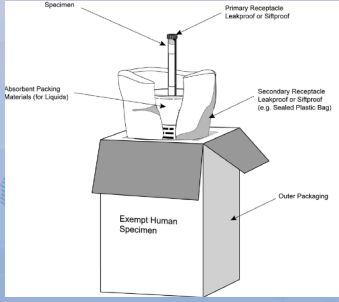

- Engineering Controls**
  - Packaging, marking/labeling, and documentation
  - Package security
- Administrative Controls**
  - Authorizing shipments
  - Material Transfer Agreements
  - Import and Export licenses
  - Carrier selection and requirements
- Practices and Procedures**
  - Training
  - Tracking of materials

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### Principles of Packaging

- ✓ Must be designed to withstand damage and prevent leakage during transport
- ✓ Must be labeled in a manner to alert carriers of hazards
- ✓ Must have documentation to alert operators and emergency responders to hazards and allow for appropriate response in event of leakage/damage

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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 Security

**Group Activity:**

Your team must send 10 sample vials suspected of containing multidrug resistant *Mycobacterium tuberculosis* to the area's state diagnostic laboratory.

Spending 15 minutes to develop a procedure for securing the sample during transport (including documentation). Then act it out with the receiving lab. Remember, you'll be receiving samples too!

Consider how might you apply Physical Security, Personnel Management, and Material Control & Accountability to the sample of valuable biological material on the move?

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Transport Procedure:

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## Standard Operating Procedure Pattern

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



**Transport Security**

**Discussion:**



How do you secure biological materials in the field during transport?

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## Field Biosecurity

## Field Biosecurity Risk Mitigation Strategies

### Biosecurity Risk Mitigation


There are two main topics of Biosecurity Risk Mitigation

- 1) Material Control & Accountability
- 2) Transport 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

	Material Control & Accountability	Transport Security
Definition		
Examples		

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**Final Review**

**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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**Key Messages**

- The same frameworks for approaching risk management in laboratories can be utilized in the field including performing risk assessment.
- Biosecurity risk mitigation in the field places special emphasis on material control, transport security and standard operating procedures.

Slide 4



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