

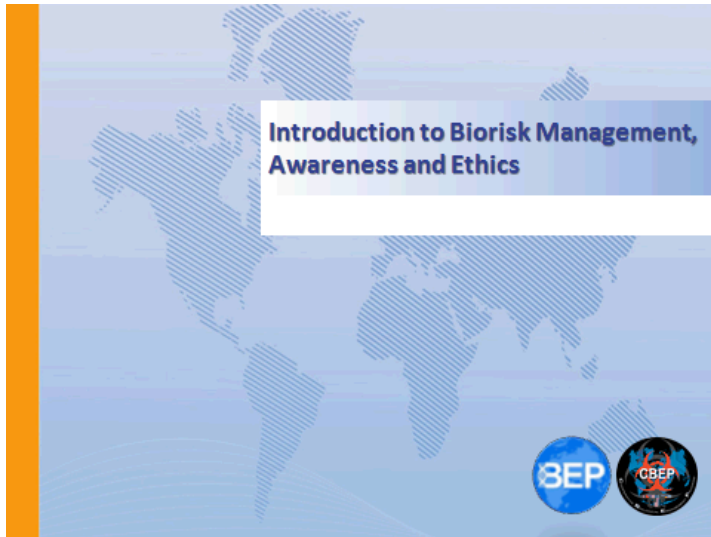
# Introduction to Biorisk Management, Awareness and Ethics

## *Student Guide*



***Introduction to Biorisk Management, Awareness and Ethics***

***Welcome & Introductions***



Welcome to Introduction to Biorisk Management, Awareness and Ethics!

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***Introduction to Biorisk Management, Awareness and Ethics***

***Welcome & Introductions***

**Introductions**

- Instructors
- Students
  - Your name?
  - Where are you from?
  - What do you hope to gain from the course?



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# Action Plan

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

KNOW		FEEL		BE ABLE TO DO	
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*Your learning doesn't stop with this course. Use this space to think about what else you need to do or learn to put the information from this course 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?



**Key Messages**

- Understand: biorisk, biosafety, biosecurity, biorisk management system
- To use AMP (Assessment, Mitigation, and Performance) as a simple model for managing biorisks
- Implementing a comprehensive biorisk management system is critical to reduce both the safety and security risks associated with handling, storage and disposal of biological agents
- Awareness of safety and security issues and measures along with effective hazard communication and proper ethical conduct are critical for biorisk management implementation.



Key Messages:

- Understand biorisk, biosafety, biosecurity and biorisk management system
- Know AMP
- Understand important components to implement biorisk management

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## ***Introduction to Biorisk Management, Awareness and Ethics***

### **Activity 1**

- Take 10 minutes to discuss and answer the following question:
- ***What are the risks of working in with biological materials?***
- Write down your answers and be prepared to report to the class



What are the risks of working with biological materials?

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# Introduction to Biorisk Management, Awareness and Ethics

**Definitions**

- **Laboratory biosafety:** containment principles, technologies, and practices implemented to prevent unintentional exposure to pathogens and toxins, or their unintentional release<sup>1</sup>
- **Laboratory biosecurity:** protection, control and accountability for valuable biological materials within laboratories, in order to prevent their unauthorized access, loss, theft, misuse, diversion or intentional release.<sup>2</sup>

<sup>1</sup>Laboratory biosafety manual, Third edition (World Health Organization, 2004)

<sup>2</sup> Biorisk management - Laboratory biosecurity guidance (World Health Organization, 2006)



Laboratory biosafety definition:

Laboratory biosecurity definition:

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***Introduction to Biorisk Management, Awareness and Ethics***



**Biorisk**

- The risk associated with biological materials in the laboratory
- Biorisk encompasses biosafety and biosecurity



Define Biorisk:

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## ***Introduction to Biorisk Management, Awareness and Ethics***

### **Activity 2: Step 1**

- Take 10 min to discuss and answer the following three questions:
  - *How do you identify these risks?*
  - *What are some things you can do to manage these risks?*
  - *How do you know that your risk management is working, and will continue to work?*
- Use post-it notes to write down your answers, one idea per note



How do you identify these risks?

What are some things you can do to manage these risks?

How do you know that your risk management system is working and will continue to work?

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## *Introduction to Biorisk Management, Awareness and Ethics*

**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



Define Biorisk Assessment:

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## *Introduction to Biorisk Management, Awareness and Ethics*

**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



Define Biorisk Mitigation:

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## *Introduction to Biorisk Management, Awareness and Ethics*

**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.



The illustration shows two stylized figures sitting at desks, working on documents. In the background, there is a faint world map. At the bottom right of the illustration, there are two circular logos: one with the letters 'BEP' and another with a globe.

Define Performance:

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## ***Introduction to Biorisk Management, Awareness and Ethics***

**Activity 2: Step 2**

- Let's get organized:
- Take the *post-it notes*, and place them under one of the following columns:

Assessment	Mitigation	Performance



Assessment

Mitigation

Performance

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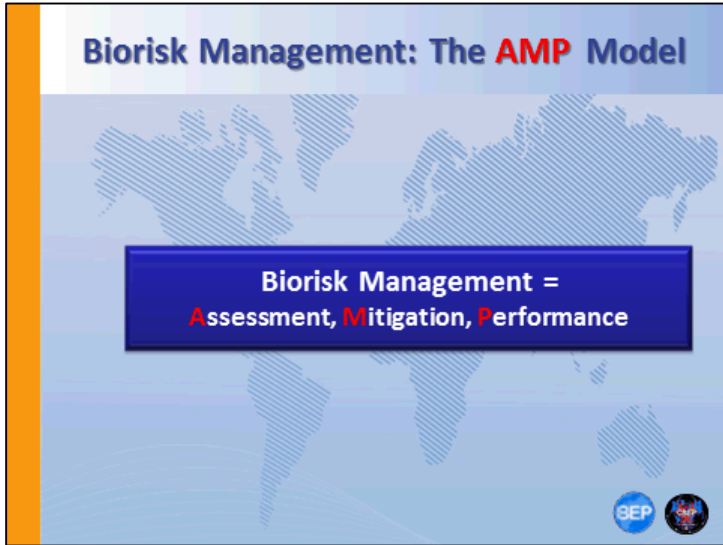
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*Introduction to Biorisk Management, Awareness and Ethics*



Define biorisk management system:

Describe an AMP model:

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## *Introduction to Biorisk Management, Awareness and Ethics*

**What do you about an "Unknown"?**

**Question:**


You are asked to **collect samples in the field.**

**What would you like to know about the sample before you work with it?**

Please spend **5 minutes** to discuss the question

**What would you do if the answer to most or all of your questions is, "I don't know?"**

**List the questions** you would ask about the sample in your workbook. Be prepared to report to the class.



You are asked to collect samples in the field.

What would you like to know about the sample before you work with it?

What would you do if the answer to most of your questions is "I don't know"?

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## Introduction to Biorisk Management, Awareness and Ethics

### Group Exercise

- Individually, carefully read the *Field Cataract University* exercise
- Split into groups
  - ✦ Identify **problems** with Biorisk Management. These problems could be associated with assessment, mitigation or performance
  - ✦ Use post-it notes, one for each problem
  - ✦ Place post-it notes on your flip chart
- How have these problems affected the university?
- Report out results to full group



Problems found in the biorisk management system of Cataract University:

- 1.
- 2.
- 3.
- 4.

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## Field Cataract University Scenario


Amil is a veterinarian and field epidemiologist from Cataract University. He routinely works in the field collecting diagnostic samples to send to the laboratory for analysis. He recently visited the emergency room with a serious skin infection on his neck. Doctors determined this infection was caused by *Bacillus anthracis* and started treating him with antibiotics. He is expected to make a full recovery. Meanwhile, there was an increase in suspected cases of anthrax in livestock in the region where Amil conducted his work. Amil's infection along with those in the livestock community concerns Amil, those who work with him and the media.

Amil was surprised to learn of this diagnosis because while he routinely investigates anthrax outbreaks in animals, he himself has never become infected. He is very experienced and has never had a problem before.

Upon learning of Amil's infection and recent string of anthrax outbreaks through the news, the lab director asked for a study to be done to determine what went wrong and whether or not Amil contracted the agent in the field and if there was any connection between Amil and the recent anthrax outbreaks.

Amil reported that he had been working with Barbara two weeks prior to isolate samples from a cow suspected of having an anthrax infection. During sample isolation, the cow became agitated and knocked Amil to the ground where he scratched his neck on a shrub branch. Barbara noticed that Amil was bleeding and immediately applied pressure to the wound to stop the bleeding. Both Amil and Barbara were wearing gloves to protect themselves from infection with anthrax. After Amil stopped bleeding, both went back to work to collect the samples.

After the samples were collected, Barbara wiped down the sample tubes with alcohol and placed them in a tube rack for Amil to label and prepare the samples for transport back to the laboratory. Amil was not wearing gloves during this process as he explained "I was not directly handling the agent and Barbara was wiping the samples down with alcohol so I did not think there was anything to worry about." Neither Amil or Barbara was aware of the fact that alcohol would have little effect on *Bacillus* spores.



The lab director suggested that all items associated with the field sample collection unit be swabbed for potential anthrax contamination. Sure enough, the tube rack was contaminated with a high level of anthrax bacteria. Barbara and Amil had used this same tube rack on the last set of outbreak investigations that included sample collection for other causative agents. Typically, they autoclave the rack every month or so to make sure it is clean and spray it down with alcohol in between outbreaks.

During this investigation Amil and Barbara learned that alcohol was not an appropriate decontamination technique for *Bacillus* spores. As a result they wanted to make sure all of their equipment and samples that they had been collecting were properly decontaminated. While they rummaged through the refrigerator where they routinely keep samples as the diagnostic tests are being run, they noticed that some of their samples were missing. No one is sure what happened to them. The custodian cleaned out the refrigerator the week before and may have inadvertently tossed them in the trash but he does not remember, or it is possible that a new laboratory staff member who just began work in the lab and may have misplaced the samples.

Now the investigation is complete and it was determined that Amil was exposed to Anthrax through the cut he got on his neck. In addition, it is likely that the contaminated tube rack may have contributed to additional anthrax cases that occurred after outbreak investigation in other livestock herds. While the livestock owners were waiting to hear back from the veterinarians about the test results they heard the news about Amil and became increasingly concerned that Amil may have contaminated their livestock, especially as without proper communication, the owners had not quarantined the animals accordingly and the anthrax infection spread to the herd and neighboring herds. This led to general unrest, anxiety and mistrust of the veterinarians at Cataract University.


Amil, was embarrassed that he ended up spreading the anthrax infection among the herds and vowed to himself to be more careful in the future. He figured that in time, the issue would blow over and resolve itself.

***Introduction to Biorisk Management, Awareness and Ethics***

***Review***

**Review**

- Biorisk Management = Biosafety + Biosecurity
- Biorisk Management System is a means to reduce Biorisk
- AMP = Assessment, Mitigation, Performance
- Awareness, ethics, communication, and incident response plans = complements to biorisk management system.



- Biorisk =
- Biorisk management system is...
- AMP =
- Management system complements are...

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