SAND2011-0755P

Biorisk Mitigation

Biorisk Management =
Assessment, Mitigation, Performance

International
BIOLOGICAL THREAT REDUCTION

Review

- What did you learn yesterday? What was new?
- What new insights do you have from yesterday's material? What are the implications of that learning?
- What will you do with this information when you go home? What will you change at your institute?

Group Exercise 1, Step 1

Using your risk assessment for the HIV scenario, identifyseveral different risk mitigation measures

- for safety
- for security

Use a *post-it note* for each mitigation measure you identify

Report on your answers to the class

Group Exercise 1, Step 2

How would you categorize these mitigation measures?

Report on your answers to the class

Mitigation Control Measures

- Engineering Controls: Physical changes to work stations, equipment, materials, production facilities, or any other relevant aspect of the work environment that reduce or prevent exposure to hazards
- Administrative Controls: Policies, standards and guidelines used to control risks
- Practices and Procedures: Processes and activities that have been shown in practice to be effective in reducing risks
- Personal Protective Equipment: Devices worn by the worker to protect against hazards in the laboratory

Group Exercise 1, Step 3

Place your *post-it notes* in the appropriate columns on the flip chart:

Engineering Controls	Administrative Controls	Practices and Procedures	Personal Protective Equipment (PPE)

Report your results to the class

Group Exercise 1, Step 4

Considering these mitigation control measures:

Engineering/Administrative/Practices & Procedures/PPE

- Identify their advantages and disadvantages

Report your findings to the class

Advantages/Disadvantages

Control Measure	Advantages	Disadvantages
Engineering	Efficient, eliminates hazard	Cost, complexity
Administrative	Authority approach	Indirect approach, primarily addresses the human factor
Practices & Procedures	SOP based (standardized approach)	Training and supervision requirements
PPE	Ease of use, relative cost	Does not eliminate hazard, PPE fails exposure happens, uncomfortable, limits ability

Group Exercise 1, Step 5

Considering these mitigation control measures:

Engineering/Administrative/Practices & Procedures/PPE

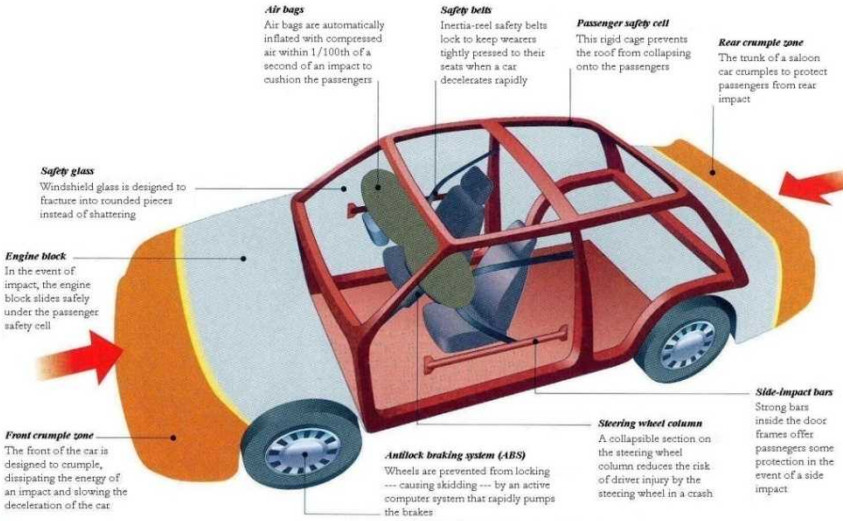
- Prioritize the four types of controls from the perspective of effectiveness

Most Effective 1 2 3 4 *Least Effective*

Record your findings on *post-it notes*

Report your findings to the class

Car Safety vs. Motorcycle Safety



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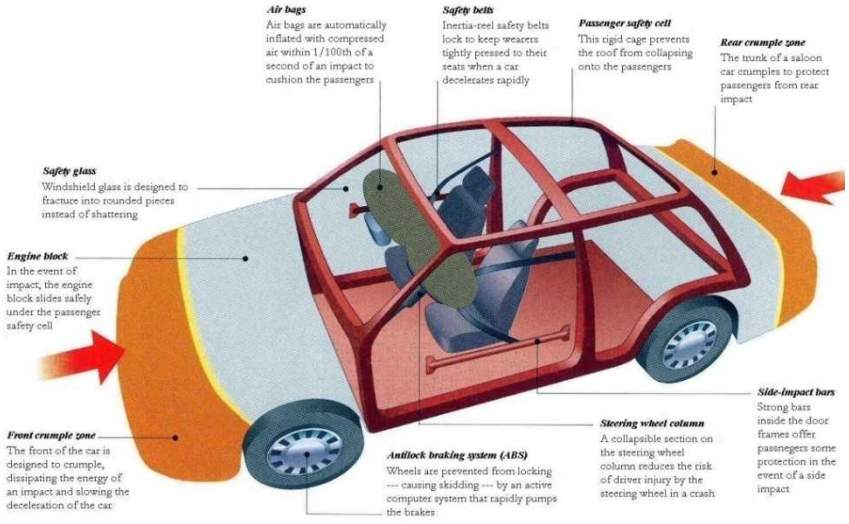
Car Safety vs. Motorcycle Safety



- Car safety is all about engineering systems

- Motorcycle safety is all about PPE

Hierarchy of Controls (HOC)

- Elimination or Substitution
- Engineering Controls
- Administrative Controls
- Practices and Procedures
- Personal Protective Equipment

Control methods at the top of the list are in general more effective and protective than those at the bottom.

Group Exercise 2

In your groups, using risk the HIV scenario, reassess the risks by implementing the mitigation measures identified in Exercise 1

- Biosafety
- Biosecurity

Use theBioRam software to do the new assessments.

Document the new results on your charts

Report to the class on risk reduction and mitigation effectiveness

Mitigation measures most affect which side of the risk assessment equation?

Substitution
(using different materials) affects what side of the risk assessment equation?

Elimination

(not doing the intended work)
does what to the risk?

Implementing Mitigation Measures

Ideally, you should first consider elimination or substitution

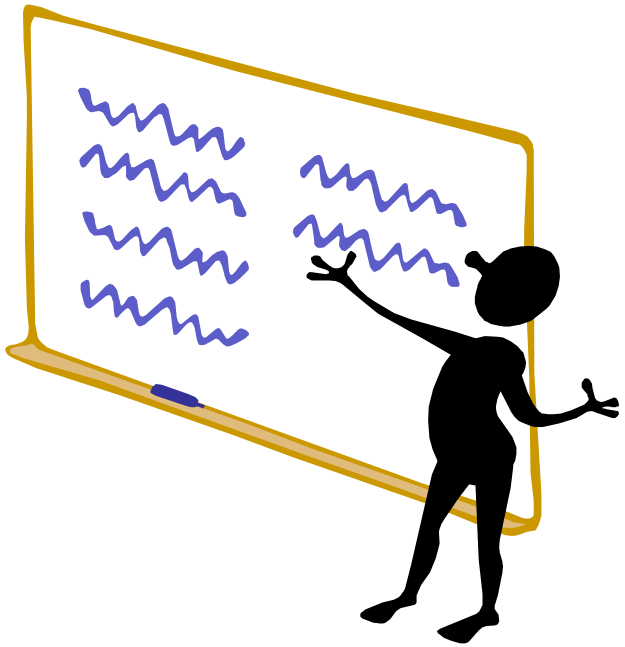
A combination of control measures should be used based on their effectiveness and your ability to implement them

- 'acceptable risk'

The "Wow" Effect

A robust methodological approach to risk mitigation gives you the ability to:

- Justify decisions
- Evaluate the impact of certain risk mitigation decisions
- Compare the cost effectiveness of various risk mitigation decisions



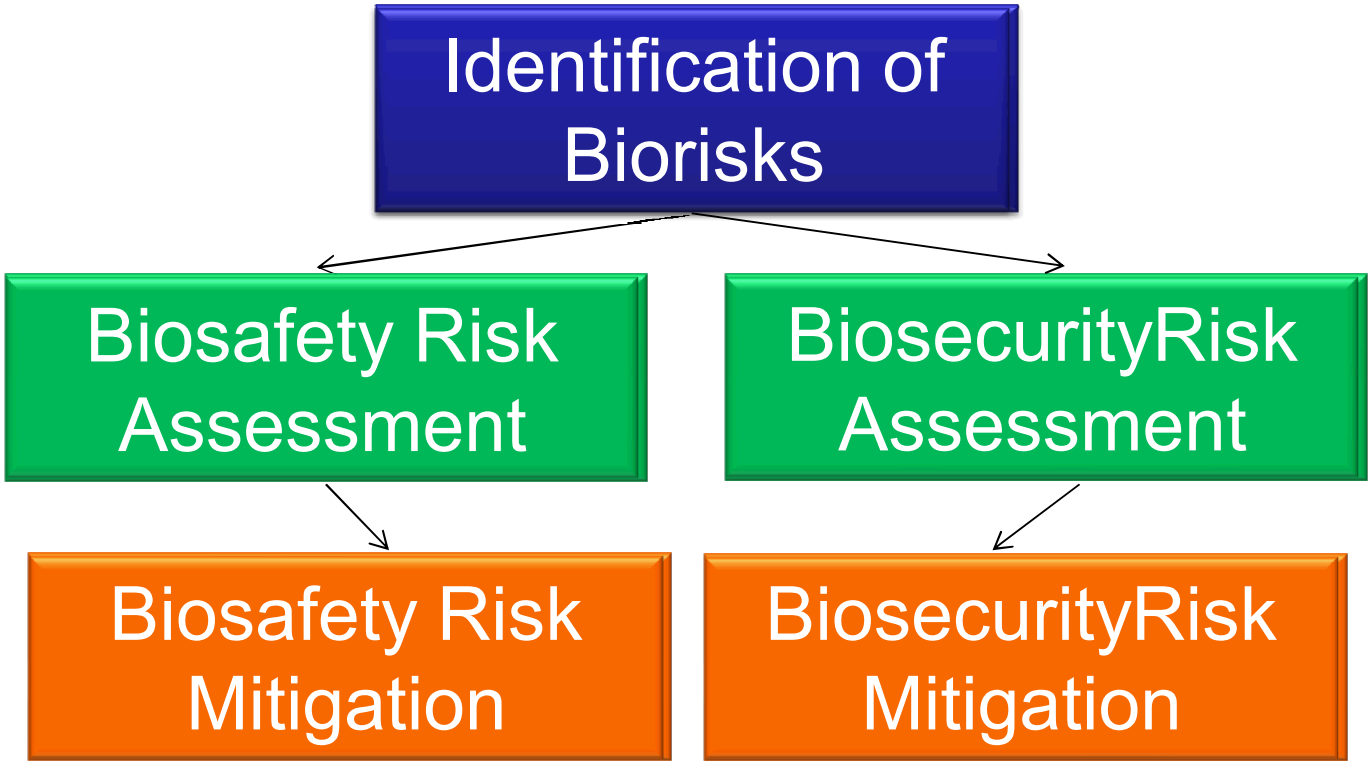
Biorisk Management

Biorisk Management = Assessment, Mitigation, Performance

Risk identification
Hazard/threat identification
Likelihood evaluation
Consequences evaluation

Elimination or Substitution
Engineering Controls
Administrative Control
Practices and Procedures
Personal Protective Equipment

Identification of Biorisks



Summary

- Four categories of mitigation control measures
  - Engineering Controls
  - Administrative Controls
  - Practices and Procedures
  - Personal Protective Equipment
- Implementing mitigation controls
  - Should first consider elimination or substitution
  - A combination of control measures should be used based on their effectiveness and your ability to implement them
  - Should be based on the results of the risk assessment, and should give a “wow” effect