Risk Assessment Methodology for Bioscience Facilities

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Biological Weapons Nonproliferation and Biodefense Objectives

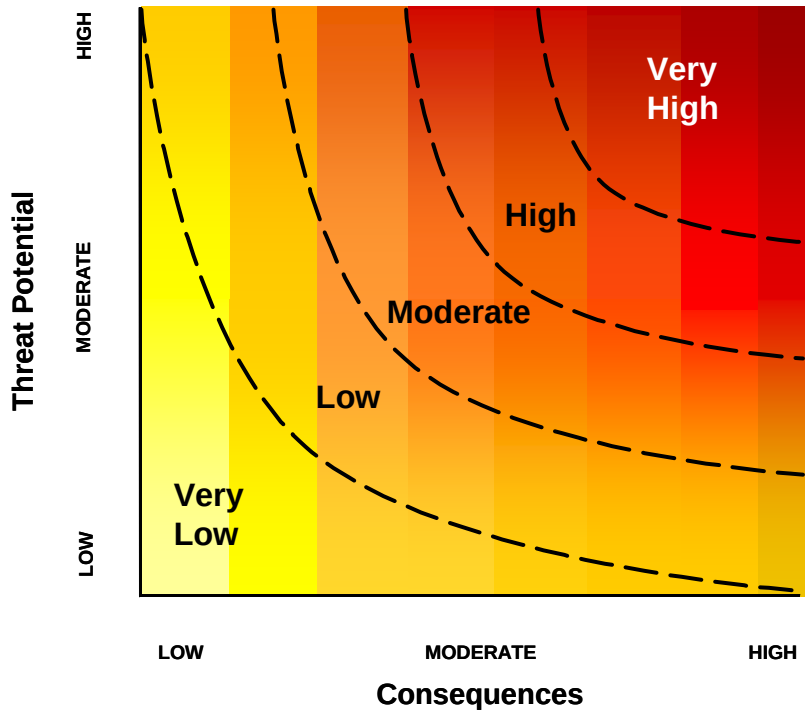
- **Biological Weapons Nonproliferation (BWNP)**
  - **An international strategy designed to prevent the acquisition, use, and spread of biological weapons**
  - **Improved BWNP measures reduce the *threat* of a biological weapons event**

Smallpox vaccine

- **Biodefense**
  - **A domestic strategy to improve the ability of the US to respond to bioterrorism after it has occurred**
  - **Improved biodefense measures reduce the *consequences* of a biological weapons event**

Biological Facility Risk Assessment

- **Biological Facility Risk**
  - An expression of the relationship between Threat Potential and Consequences for a particular event
    - Example Event: theft and subsequent use of biological material as a weapon
  - Expert judgment contributes significantly to the analysis
  - Uncertainty inherent in the process



- **Threat Potential**
  - An estimate of the degree to which a particular adversary is willing and able to execute a particular event

- **Consequences**
  - An estimate of the magnitude of a successfully executed event in deaths, illness, economic loss, symbolic and functional impacts

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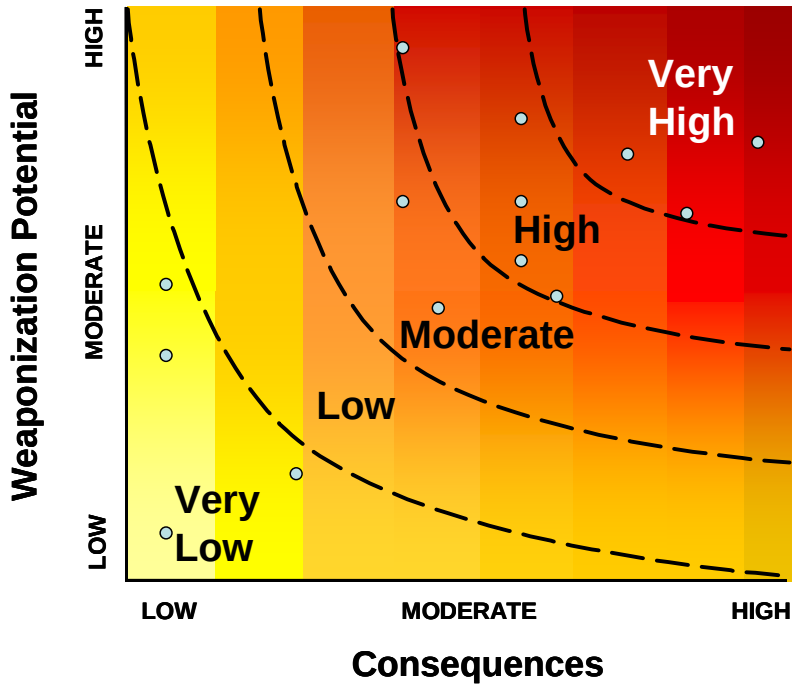
Threat Potential

- **Motive**
  - **Asset Attractiveness**
    - **How well does the acquisition or sabotage of the asset achieve the adversary's objective, or lead to achieving the adversary's objective?**
- **Means**
  - **Capability**
    - **Does the adversary have the skills, knowledge, and tools necessary to conduct the attack/meet the objective?**
- **Opportunity**
  - **Environment**
    - **Is the adversary active in the area?**
    - **How recently have they acted in ways that may be threatening?**
    - **Has there been any indication of targeting?**
- **Precedent**
  - **Has the same agent been used as a weapon before?**
  - **Has the same agent been enhanced for use as a weapon before?**
  - **Has the same agent been stolen from a laboratory?**

Asset Attractiveness

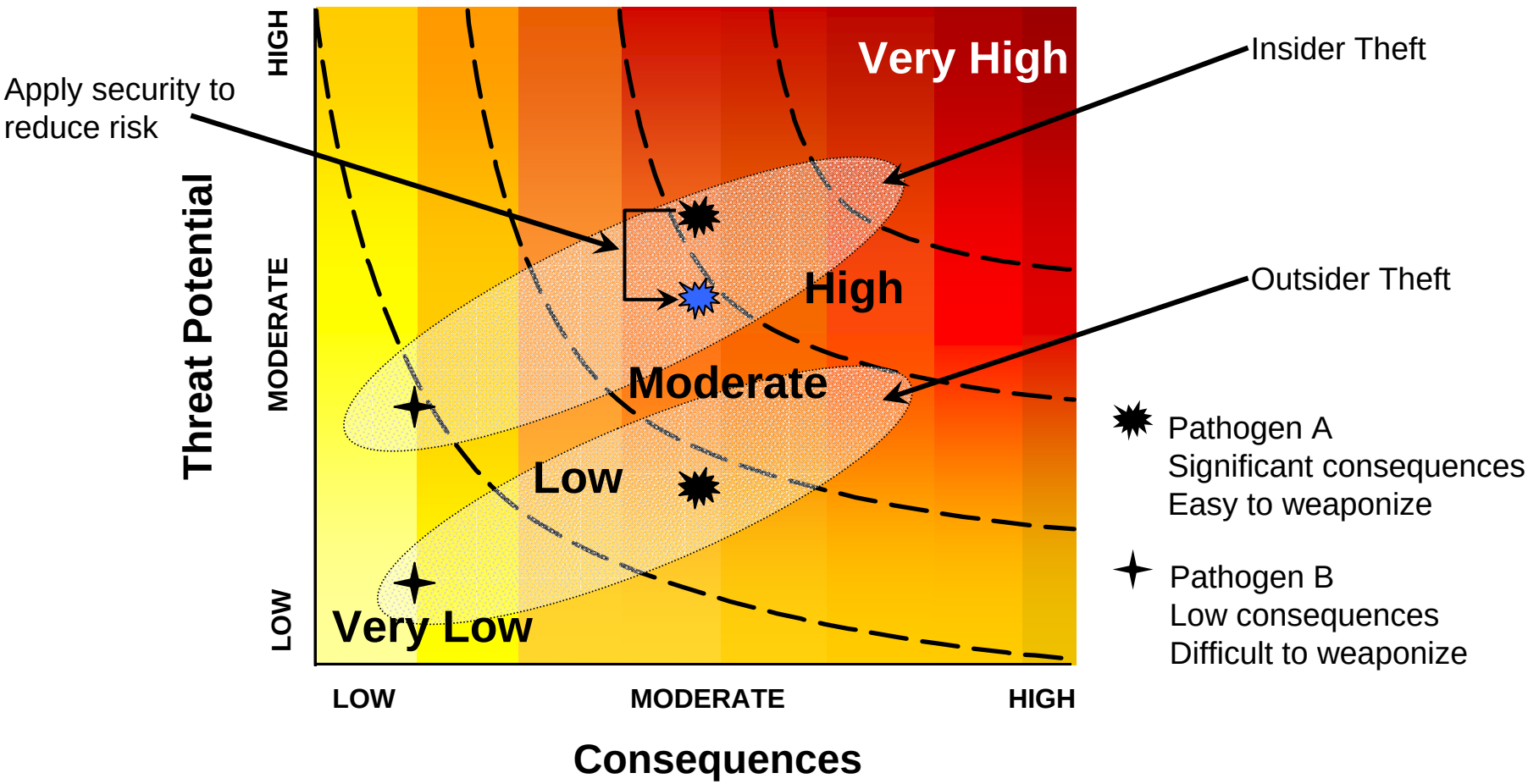
- **Biological Agents**
  - **Weaponization Potential**
    - Availability
    - Ease of production
    - Ease of handling
    - Ease of packaging
    - Modes of dissemination
    - Stability
  - **Consequences**
    - Contagiousness
    - Genetic engineering
    - Incubation period
    - Medical effects (morbidity and mortality)
    - Potential to become endemic
    - Economic impact



- **Security Information or Systems**
  - May be targeted to facilitate gaining access to dangerous biological materials

- **Other Facility Assets**
  - May be targeted by political extremists, disgruntled employees, etc.

Biological Facility Risk
Insider vs. Outsider



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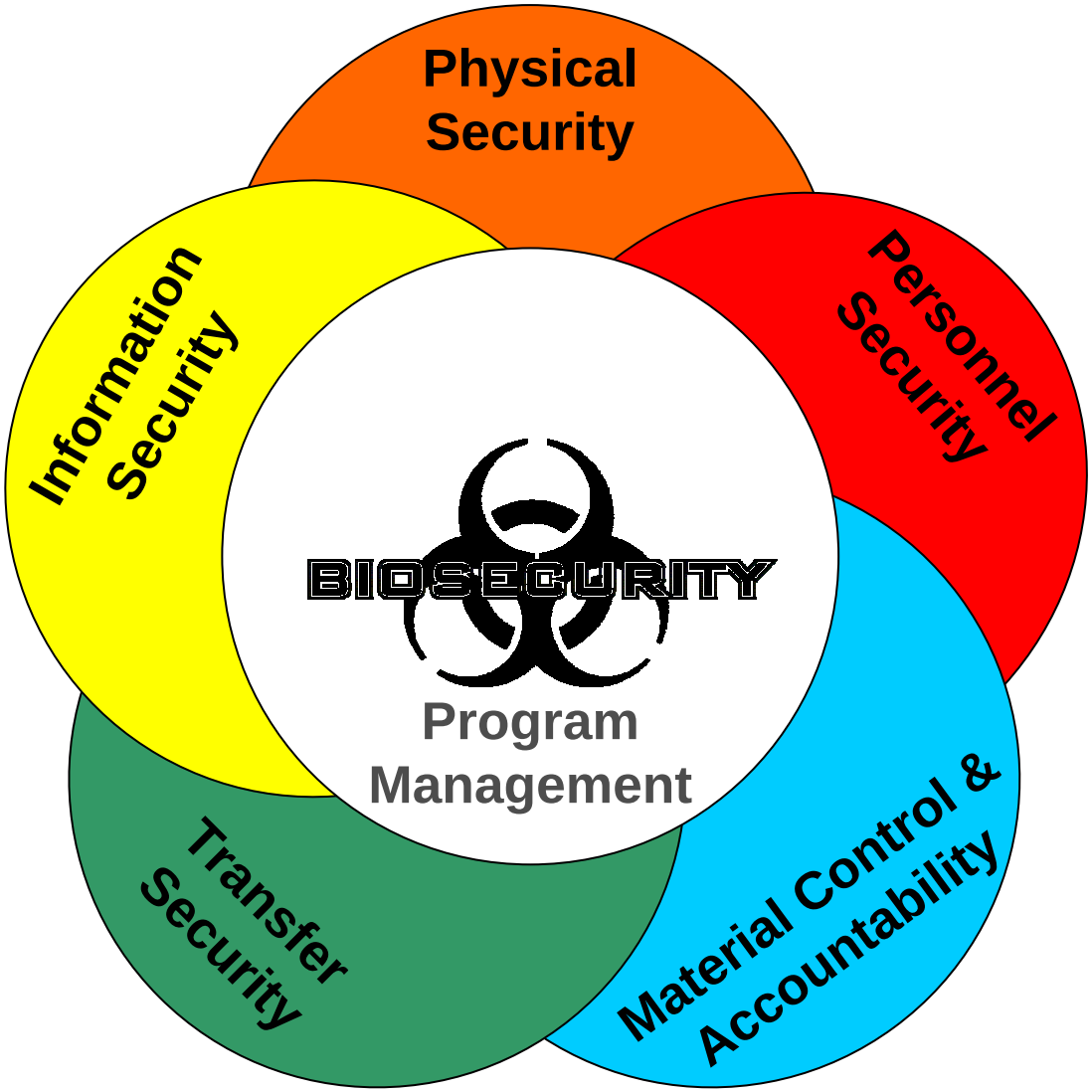
Threat Potential
Risk Mitigation Strategies



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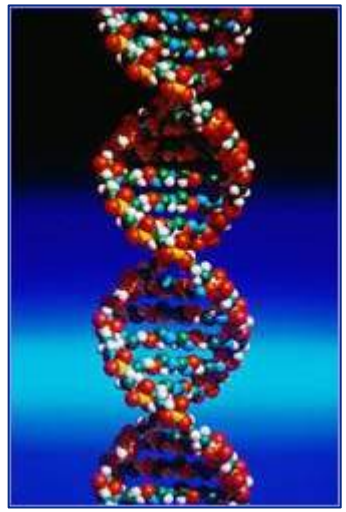
Conclusions

- International biological weapons nonproliferation efforts reduce the threat of bioterrorism
- One element of a comprehensive BWNP strategy is to reduce the likelihood that dangerous pathogens and toxins could be stolen from legitimate bioscience facilities worldwide
- Biological facility risk assessment provides an opportunity to concentrate resources on the highest risks
- Biological facility risk mitigation may be accomplished through an integrated biosecurity system that incorporates policies, procedures and equipment



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