



Risk Assessment Flow Chart

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company,
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under contract DE-AC04-94AL85000.

Risk Assessment Model for handling Biological Material/Agents

Does the biological agent cause disease in humans, animals, or plants?

NO

No need to conduct a formal risk assessment

YES

Does the biological agent cause disease in healthy adults (human or animals) or have a notable impact on the community or the environment?

NO

Conduct only a basic review of procedure to insure mitigation measures are adequate

YES

Does the biological agent impact the plant population?

YES

Define risk to plant community in direct region of laboratory

YES

Does the biological agent impact the animal population?

YES

Define risk to animal community in direct region of laboratory

YES

Does the biological agent impact the human population?

YES

Define risk to humans working in the laboratory, around the laboratory and those who live and/or work in direct region of laboratory

For each defined risk:
Plant, Human, Animal

Define factors
about the biological agent which scale the
consequence of disease to each population



Biological Agent Factors
Agent Characteristics (allergenic,
carcinogenic, toxin production,
abortogenic)
Morbidity (Duration of illness,
severity of illness, duration of
infection, sequelae)
Mortality (untreated mortality)
Treatment options (diagnostic tests,
anti-microbials, vaccines)

Define factors
about the biological agent which scale the
likelihood of infection to each population



Biological Agent Factors
Route of Infection
Infectious Dose
Stability
Existence of prophylaxis

For each research project:
Accidental exposure risk to individuals performing direct manipulation of the agent

Define factors about the research which scale the likelihood for exposure

Laboratory Factors

Inhalation potential (aerosol generating procedures, animal, experiments)

Percutaneous or direct contact potential (animals, needles, other sharps, splashes and spills)

Ingestion potential (splashes)

Quantity and Quality of infectious material

Define factors about the research which **reduce** the likelihood for exposure

Biosafety Measures

Management oversight

Primary Containment

PPE

Procedural/administrative

For each research project:
Risks to human, animal, and or
plant communities of accidental
exposure

Define factors
about the research which scale the
likelihood for exposure

Define factors
about the research which **reduce** the
likelihood for exposure

Laboratory Factors

Inhalation (contaminated air entering
clean space)
Percutaneous (contaminated animals
or sharps entering clean space)
Contact (contaminated solids/liquids,
animals or people entering clean
space)
Ingestion (contaminated solid/liquid
entering clean space)
Quantity and Quality of infectious
material

Biosafety Measures

Management oversight
Secondary Containment
Procedural/administrative

Risk of theft of biological material
from laboratory for malicious use

Define factors
about the potential adversaries to the
laboratory

Define factors
about the laboratory which can **reduce** the
potential of the adversaries to acquire the
biological agent

Adversaries

Insiders with direct access
Insiders without direct access
Visitors
Outsiders with criminal intent
Outsiders with terrorist intent

Biosecurity Measures

Management oversight
Physical security
Personnel security
Transport security
Material control
Information security

BIOSAFETY RISK
For each defined risk:
Plant, Human, Animal

Score
likelihood of infection to
the individual or community

Score
likelihood for exposure

Score the measures to
reduce the likelihood for exposure
(subtract this score from the likelihood for exposure score)

Score
consequence of disease
the individual or community



Overall score of likelihood of
exposure and likelihood of infection
via that exposure

Overall score consequence of
disease

BIOSECURITY RISK
For each defined risk:
Plant, Human, Animal

Score
likelihood of infection
of the community

Score
the potential adversaries means, motive to
steal from the laboratory

Score the factors
about the laboratory which can **reduce** the
potential of the adversaries to acquire the
biological agent

Score
consequence of disease
to the community

Overall score of likelihood of targeting
and theft of a biological agent from
the laboratory

Overall score consequence of
disease

RISK
For each defined risk (biosafety and biosecurity):
Plant, Human, Animal

Overall score of likelihood



Low

Moderate

Moderate

Overall score consequence of disease

Low