

**Project 18: Bioterrorism Case Study (von Winterfeldt and O’Sullivan)**

This project is developing new methods for assessing bioterrorism risks and evaluating policies for reducing the risks and consequences of bioterrorism attacks.

**Modeling Area:** Risk Management

**Principal Investigator:** Detlof von Winterfeldt

**Institution:** University of Southern California

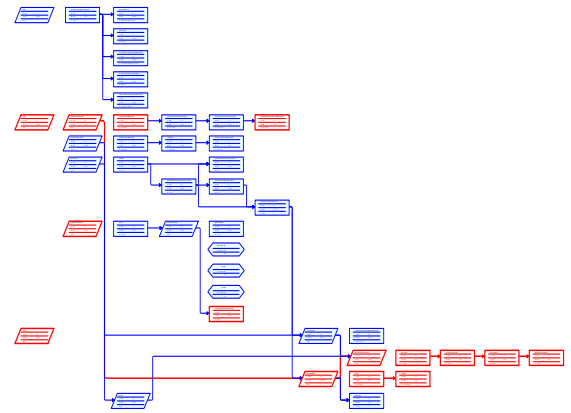
**Other Investigators:** Richard S. John, Terry O’Sullivan

**Student Investigators:** Heather Rosoff

**Brief Description:**

This project consists of several related activities for assessing the risks of bioterrorist attacks and for evaluating policies to reduce risks and consequences of such attacks. A major part of this project consists of developing tools for assessing terrorists’ motivations and capabilities regarding the use of biological agents.

Building on and collaborating with ongoing risk assessments at the National Biodefense Analysis and Countermeasures Center (NBACC) we will develop influence diagram tools and assess terrorists’ motivation and capabilities for five high-threat biological agents. We will also conduct a project risk analysis of an anthrax attack, similar to the one conducted previously for a dirty bomb attack. Furthermore, we will assist NBACC in the review and development of their risk assessment and economic analysis tools. Another project element involves assessing vulnerabilities and consequence management, specifically preparation and disaster/attack response capabilities, given that bioterrorism is difficult to prevent. This will be policy-based analysis that integrates with the other project components.



Schematic Representation of an Anthrax Attack Project

**Objectives and Technical Approach:**

This research will develop advanced methods for assessing the risks (threats, vulnerabilities and consequences) of biological attacks. We will use influence diagram techniques and probabilistic choice models to assess the terrorists’ assessment of the utility of using selected biological agents. This is an important input to assessing the probability that terrorists would select one of these agents. We will continue our project risk analysis approach to assess probabilities of success, if a terrorist group selects a particular agent, for example, anthrax. From the vulnerability and consequence perspective, public health risk will be analyzed by assessing system-level (local, state and federal) disaster preparation and response capabilities and policies, particularly as they exist in the context of the National Response Plan.

**Interfaces to other CREATE Projects:**

This work will maintain a close collaboration with the risk analysis and economics projects, as well as border security. The projects on emergency planning for medical supplies will provide an additional link to assessing policies for reducing consequences of biological attacks.

**Interfaces to non-CREATE Projects:**

The consequence modeling will largely be done in interactions with the NBACC risk assessment groups at Battelle Memorial Institute and at Sandia National Laboratories. Other collaborations

are with the California Department of Health Services to assess the costs and benefits of the Biowatch program and with the County and City of Los Angeles to improve medical supply storage and distribution. This project will also interact with FAZD Center; Minnesota Center for Food Protection and the START Center.

**Major Products and Customers:**

Customers: NBACC - Risk and economic assessments; California Department of Health Services - Assessment of the Biowatch program; LA County and City - medical supply storage and distribution.

Products: Models of terrorists' motivations and capabilities for biological attacks; project risk analysis models of an anthrax attack; models to optimize locations and distribution of medical supplies; cost-benefit analysis of the Biowatch program.

**Major Milestones and Dates:**

- O'Sullivan report on smallpox attacks -- June 2005.
- Review of NBACC's risk assessment models -- July, 2005.
- Preliminary models of terrorist's motivations and capabilities regarding 5 biological agents -- January, 2006.
- O'Sullivan chapter draft, "The 'forgotten' dimensions of homeland security: Natural disasters, biological terrorism, and comparative catastrophic risk," for proposed edited volume, *Homeland Security: The Strategic Quest* – February 2006.
- Preliminary project risk model for anthrax – March, 2006.
- Models for optimizing locations and delivery of medical supplies -- March 2006.
- Policy analysis/white paper on U.S. catastrophic infectious disease outbreak disaster preparation for bioterrorism and pandemic influenza – March 2006.
- Reports on the models describes above -- June 2006.