Disease Risk Analysis

From Frustration to Fruition

Tiffany Wolf

Veterinary Population Medicine

University of Minnesota

What is wrong with this picture?

Florida Panther PHVA Workshop

Gainesville, FL: 31 October - 2 November 1989

"Disease epidemics are possible, … but we have no data that would allow estimation of the probability."

"… Thus, we have omitted any consideration [of disease] … from our modeling."

"It is unlikely that the subspecies would survive a catastrophe that caused substantial mortality."

What is Risk?

- Describing or characterizing risk
  - Likelihood of the occurrence of an adverse event.
  - Measurement (qualitative or quantitative)

- RISK = Likelihood X Magnitude

Many TYPES of questions of risk……

….everyone wants a ‘risk assessment’

Disease Risk Analysis Policy Questions

- What is the risk of diseases being transmitted between NHP and people at temples in SE Asia?
- What is the risk of introducing disease through the reintroduction of wildlife reared in zoos/sanctuaries into natural habitat?
- What is the risk of taking fish from the wild as brood stock for aquaculture?
- What is the risk of moving avian diseases around through large scale poultry or pet trade?
- What are the disease risks of having a captive monkey?

Risk Analysis
Perception vs. Reality

- Description = What are the risks (likelihood and mag)?
- Evaluation = Do they actually matter?
  - How much do they matter? At what point does it matter?
- There are different levels of acceptable disease risk!
  - Zero risk does not exist and should not be considered in a rational situation!
- How do I answer these questions for my program/boss or politician?

Home

OFFICE INTERNATIONAL DES EPIZOOTIES

Organisation mondiale de la santé animale World organisation for animal health
Organización mundial de sanidad animal

Site map [Español] [Franç

News flash	| OIE | Animal Health Status | Diseases | Standards | Publications | Databases | Press | Events |
Publications	| New publications | Standards | Periodicals | Thematic publications | Reports | Prices | Distributors | Order | On line |
Periodicals	| Disease Information | Bulletin | World Animal Health | Review |
Review	| Overview | Issues | Instructions to Authors |

Risk analysis, animal health and trade

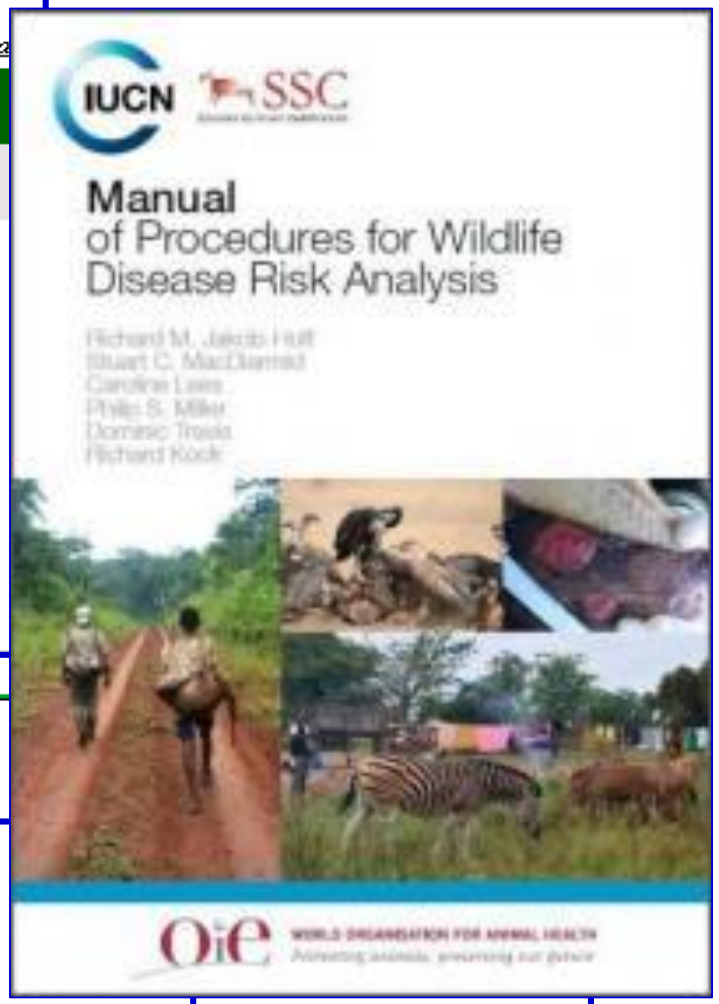
***Scientific and Technical Review*, Vol. 12 (4), December 1993**

A valuable decision-making tool is now being used in the field of animal health. This issue of the *Scientific and Technical Review* introduces that tool – risk analysis.

Risk Assessment Frameworks

A General Framework for Animal Health Risk Assessment (Document #3)

Including
Within A



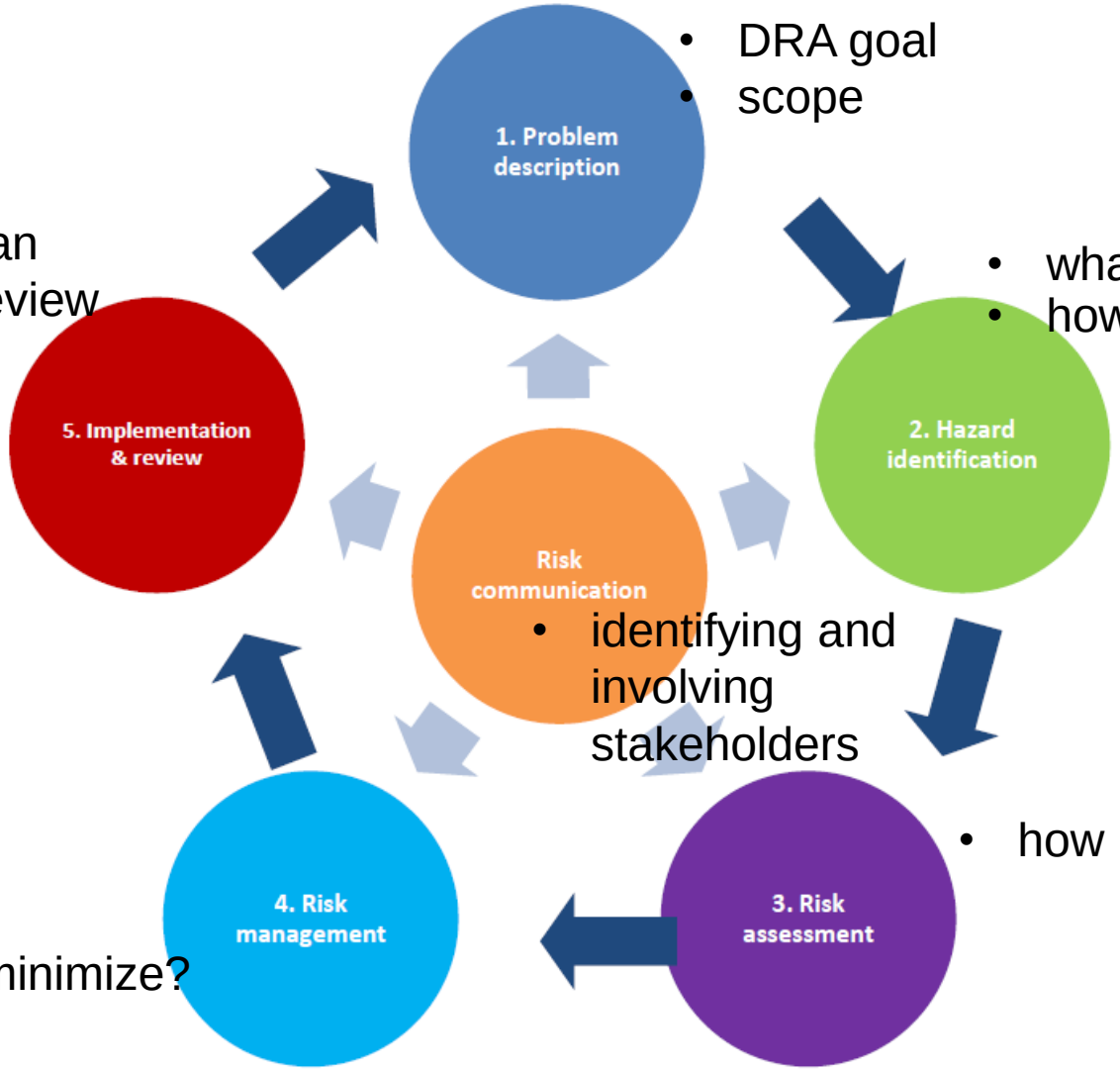
United States Animal Health Association

1998 Committee Reports

Report of the USAHA Committee on Foreign Animal Diseases

Risk Assessment in International Trade

IUCN: Disease Risk Analysis



- DRA goal
- scope

- what can go wrong?
- how can it go wrong?

- how likely is it?

- how minimize?

- formulate a plan
- monitor and review

- identifying and involving stakeholders

Problem Description

Question: what is the risk of the spread of an emerging infectious disease from wildlife in the park to humans?

- Outline the context of the problem
- Formulate the question
  - Needs specificity
- Identify the goal of the DRA
  - State assumptions and limitations
- Specify the acceptable level of risk

Hazard ID: What and How

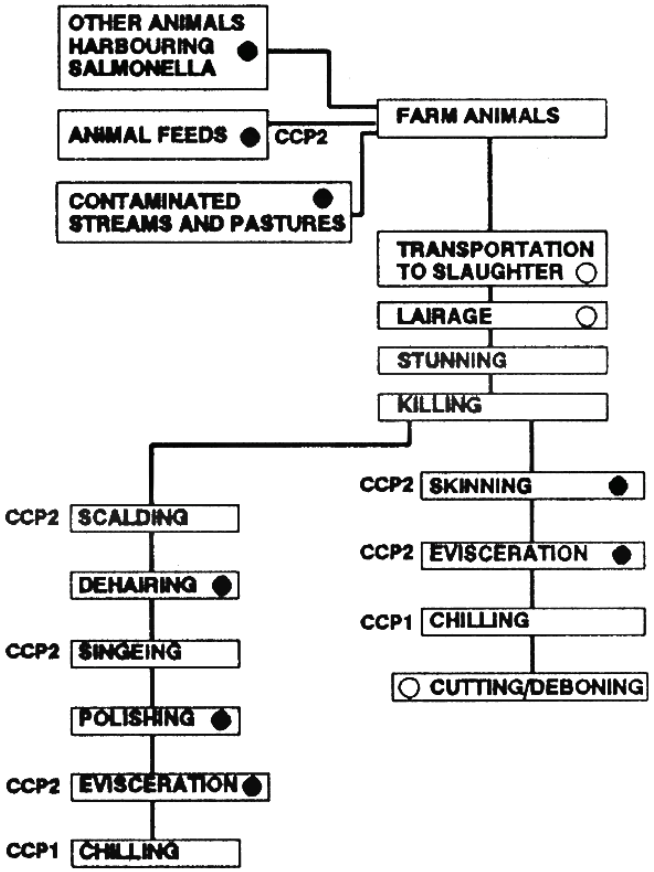
- Disease Ranking
  - A method of listing all diseases potentially important to the question or issue
  - Cannot assess all possibly important diseases
  - Criteria for ranking
- Pathway Analysis
  - Diagram the question
  - Identify areas where disease risk increases or decreases (critical control points)
  - Identify data needs for CCPs

Risk Assessment

- Release/Entry
  - Likelihood of agent being released from infectious individual into environment where it may or may not survive to remain infectious
  - fluids, soil, air, droplets, direct contact
- Exposure
  - Likelihood of susceptible (or not) individuals being exposed to the agent from wherever it was released
- Consequences
  - What happens after they are exposed

Connecting the Question to a Model

- Pathway characterization
  - Diagram the question
- Areas where disease risk increases or decreases (critical control points)
  - Become variables/parameters in the model
- Also helps to refine question and modeling tools needed



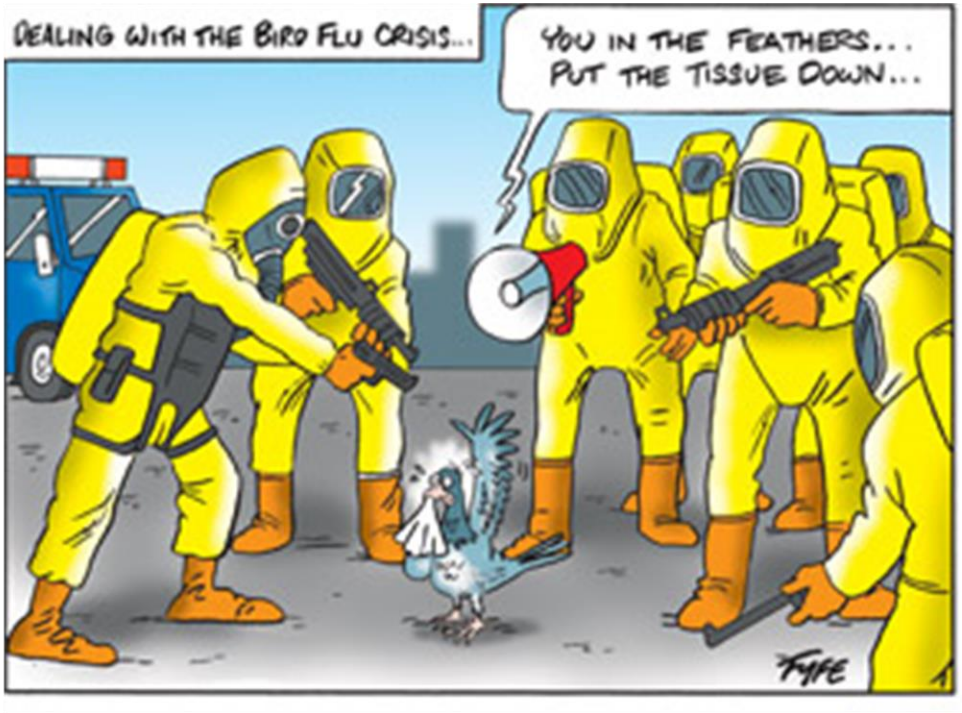
Risk Management

- Where along the pathway can we decrease likelihood or consequences?
- How?
  - Screening
  - Vaccination
  - Treatment
- These can be tested using the same model

https://www.britannica.com/science/hemolymph

Implementation and Review

- Review of results
  - Report input
- Policy recommendations
- Ongoing monitoring and surveillance
- Update model as new data is acquired
  - iterative process!



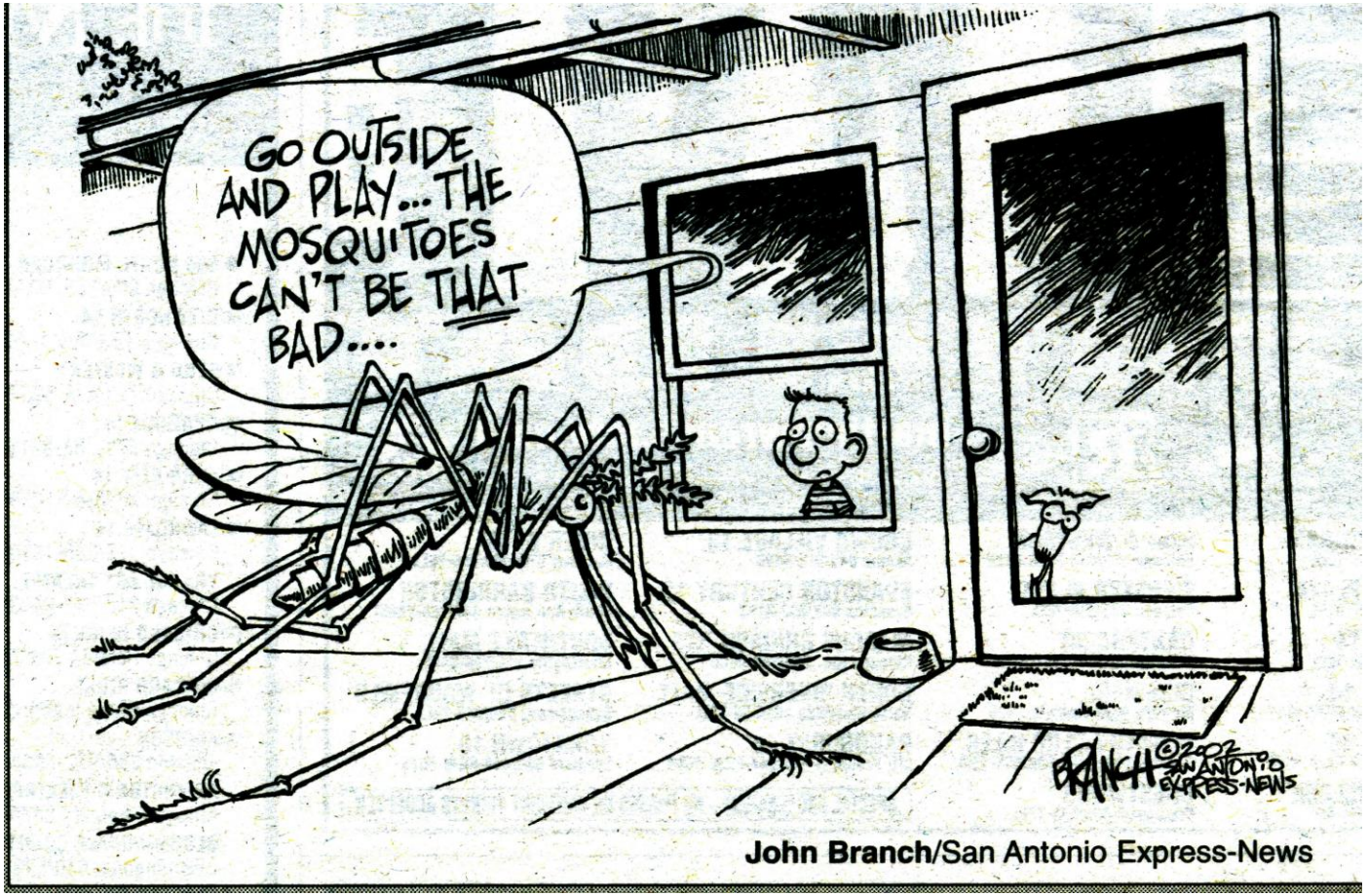
Risk Communication

- Wildlife are special case
  - Extreme lack/uncertainty of data
  - Often difficult to collect and takes a lonnnng time
- Managers and politicians may be uncomfortable with the lack of disease data to support decisions
- Must engage stakeholders throughout the process

Summary

- Science –based process to support policy or management
- Inherently systems-based and multidisciplinary
- Goals of DRA workshop
  - Learn the jargon
  - Practice the process (at least the first half)
  - Understand how science can help inform policy

Thank You


GO OUTSIDE AND PLAY... THE MOSQUITOES CAN'T BE THAT BAD....
BRANCH ©2002 SAN ANTONIO EXPRESS-NEWS
John Branch/San Antonio Express-News