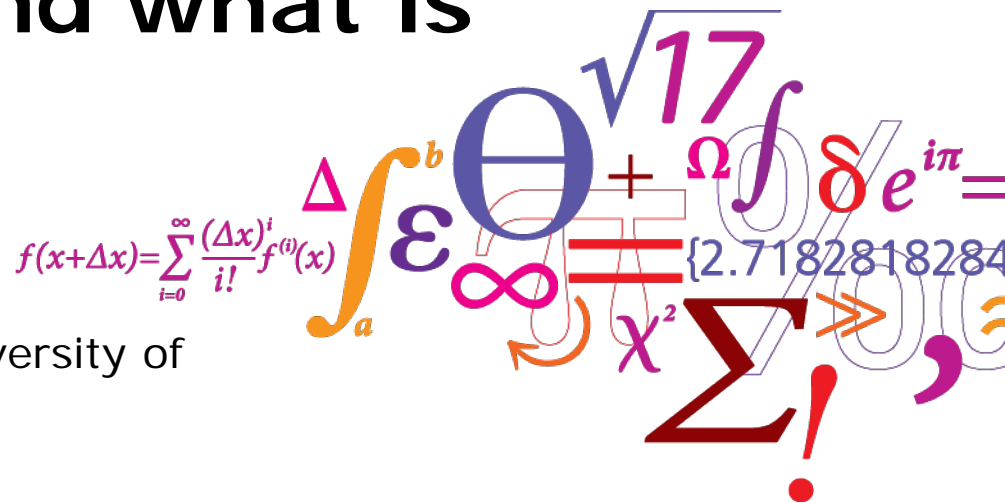


GMASSURE

What is risk and what is risk analysis?

Morten Poulsen, Technical University of Denmark



Aim of the session

- Understand the concept of risk analysis
- To get an introduction to the different components of a risk analysis
- Understand the difference between risk assessors and risk managers

Foodborne diseases - Hazards

Chemical hazards

- Environmental pollutions (e.g. lead, mercury)
- Production aids (e.g. pesticides, nitrate, cleaning materials)
- Compounds formed during cooking (acrylamide, mutagens)
- Naturally occurring toxins in food (e.g. lectin and solanine)
- Migration from plastic utensils and packaging material
- Allergens

Physical hazards

- Excrements from pests
- Metal pieces

Biological hazards

- GMO?!
- Bacteria, viruses
- Moulds, yeasts and algae
- Parasites

Problem and Solution

Problem

Food-borne diseases remains a real and huge problem causing great human suffering and significant economic losses

Solution (a part of!)

Risk analysis is a important discipline for reducing food-borne illness and strengthen food safety systems (definition)

Risk analysis - History

The Food and Agriculture Organisation of the United Nations (**FAO**) and the World Health Organisation (**WHO**) have played a leading role in the development of food safety risk analysis

About 20 years ago, the joint FAO/WHO recommended Codex Alimentarius Commission to include the principle of risk assessment and risk analysis in their decision-making process

FAO and WHO have developed a guide on how to perform risk analysis

Application of risk analysis

Applied in other disciplines



Engineering

Nuclear power plants

Chemical industry

Construction industry

Management and finances

Project management

Bank loans

Stock market

Insurance

Relatively new in
veterinary- and
food science

Characteristics of the hazard that have an influence on Risk Perception

Acceptable Risks:

Voluntary

Under your control

Clearly beneficial

Fairly distributed

Natural

Statistical

From a reliable source

Familiar

Unacceptable risks:

Involuntary

Controlled by others

Of little or no benefit

Unfairly distributed

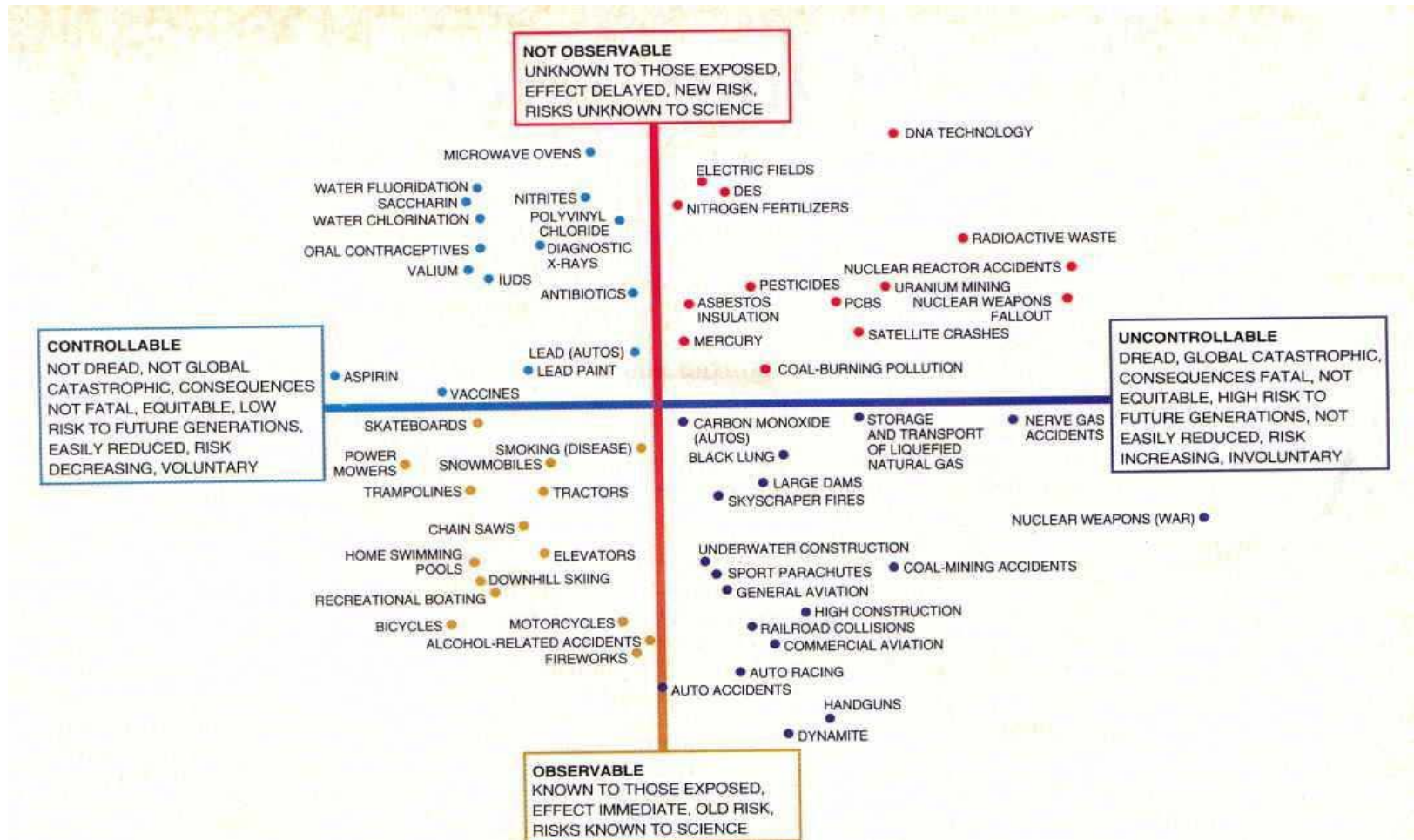
Man-made

Catastrophic

From unknown sources

Unfamiliar, exotic

Risk perception (>30 years old!)



RISK SPACE has axes that correspond roughly to a hazard's "dreadfulness" and to the degree to which it is understood.

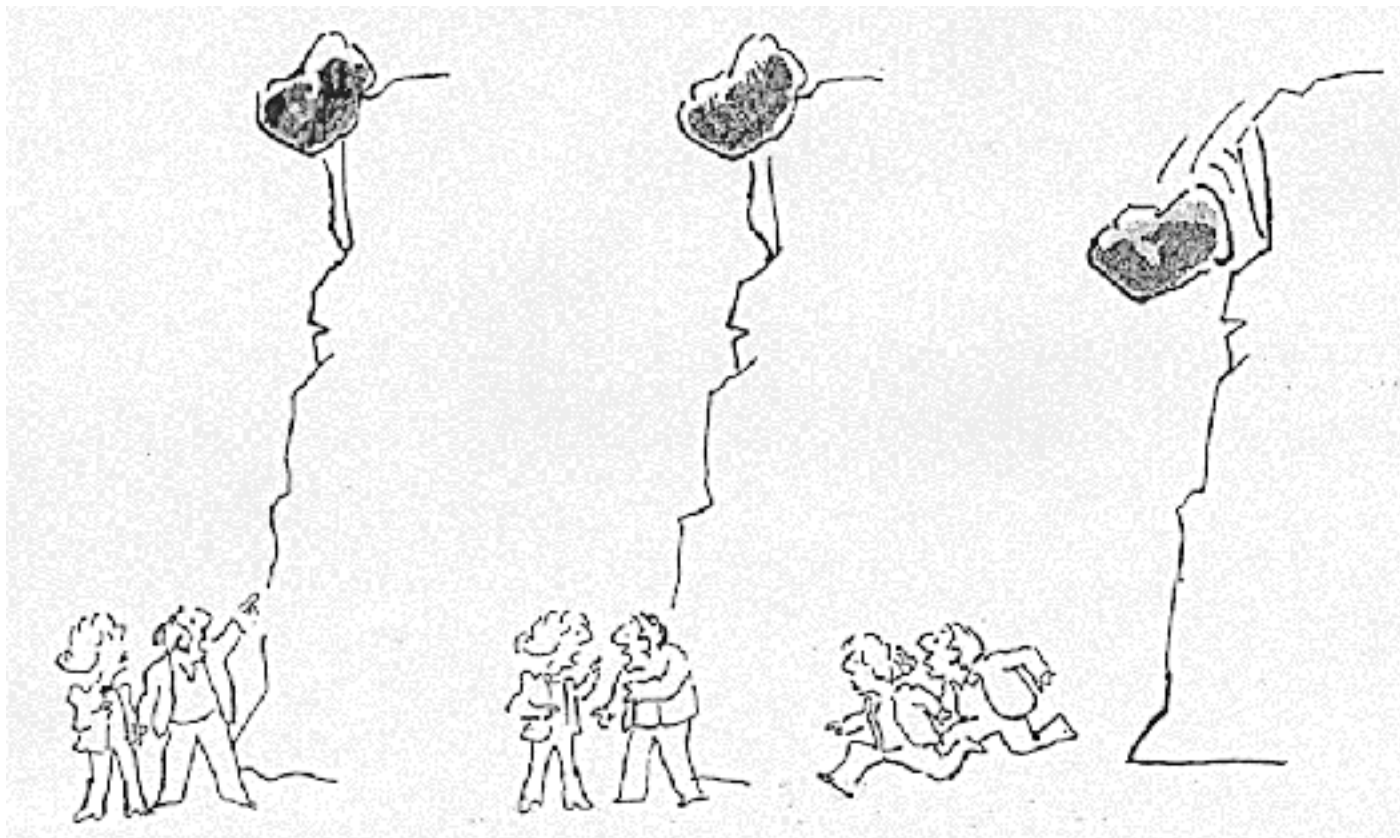
Risks in the upper right quadrant of this space are most likely to provoke calls for government regulation.

The 3 components of risk analysis

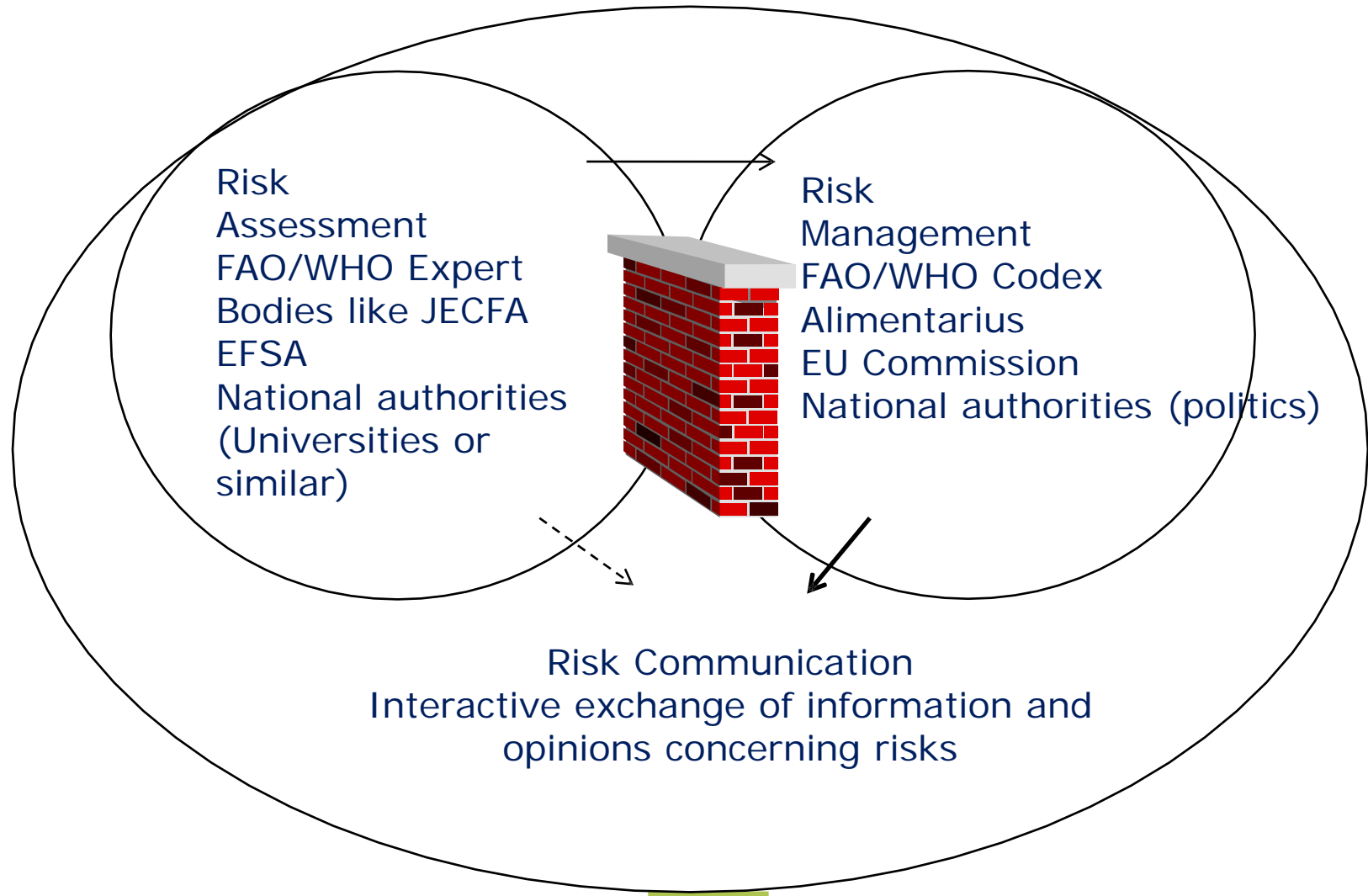
Risk assessment

Risk management

Risk communication



The 3 components of risk analysis



Objectives of Risk Analysis

- To examine the potential adverse health effects consequential to a hazard through a structured, systematic process
- To develop risk management options
- To evaluate the effect of different risk management options
- To facilitate interactive communication among all interested parties involved in the process
- To communicate the risk to risk managers and eventually the public

The consumer

- Want to have safe food
- Want to know what to do to prevent the risk
- Listen to the authorities (hopefully)

Food producer

- Are responsible for the safety of the food!!!
- Are responsible to produce food following the legislation
- Have financial interest in the food product

Risk assessor

- Perform an objective estimation of the risk to the consumer
- Risk assessors don't have to worry about the risk outcome and what to do about that (task of the risk manager)
- Risk assessors don't decide on what is an acceptable risk

Risk assessors

Based on science they:

- Estimate the internal exposure of a substance to an organism
- Describe adverse effects of a substance to an organism
- Set health based intake thresholds for humans
- Estimate human exposure (concentration in food and consumption of food)
- Conclude on the risk and the uncertainties

Risk managers

- Make up the laws and rules for the food industry
- Help the consumer to make their decision (consumer advises)
- Risk managers have to take into account risk assessments, EU legislation, other general rules for free trading (WTO), political considerations (others?)

Options for risk managers

- Maximum levels in food: Mercury in tuna, pesticides, pathogens etc.
- Monitoring: collection of data from member states
- Ban/approval system: Vet drugs, food add and pesticides
- Guidance to consumers: Behaviour in kitchen, consumption of certain fish, barbecuing
- Import restrictions (No trade barrier!)
- Early warning system RAPID ALERT

Quiz

Who are performing risk assessments world wide?

1. JECFA (WHO/FAO)
2. Codex Alimentarius (WHO/FAO)

Who are setting health based intake thresholds for lead?

1. Risk assessors
2. Risk managers

Who are setting maximum levels for pesticides in food?

1. Risk assessors
2. Risk managers

Who are giving advises to the consumer?

1. Risk assessors
2. Risk managers

What are you involved in?

Risk assessment, risk management, risk communication or a combination?

Thank you

Questions?