Risk assessment a tool for science based decisions

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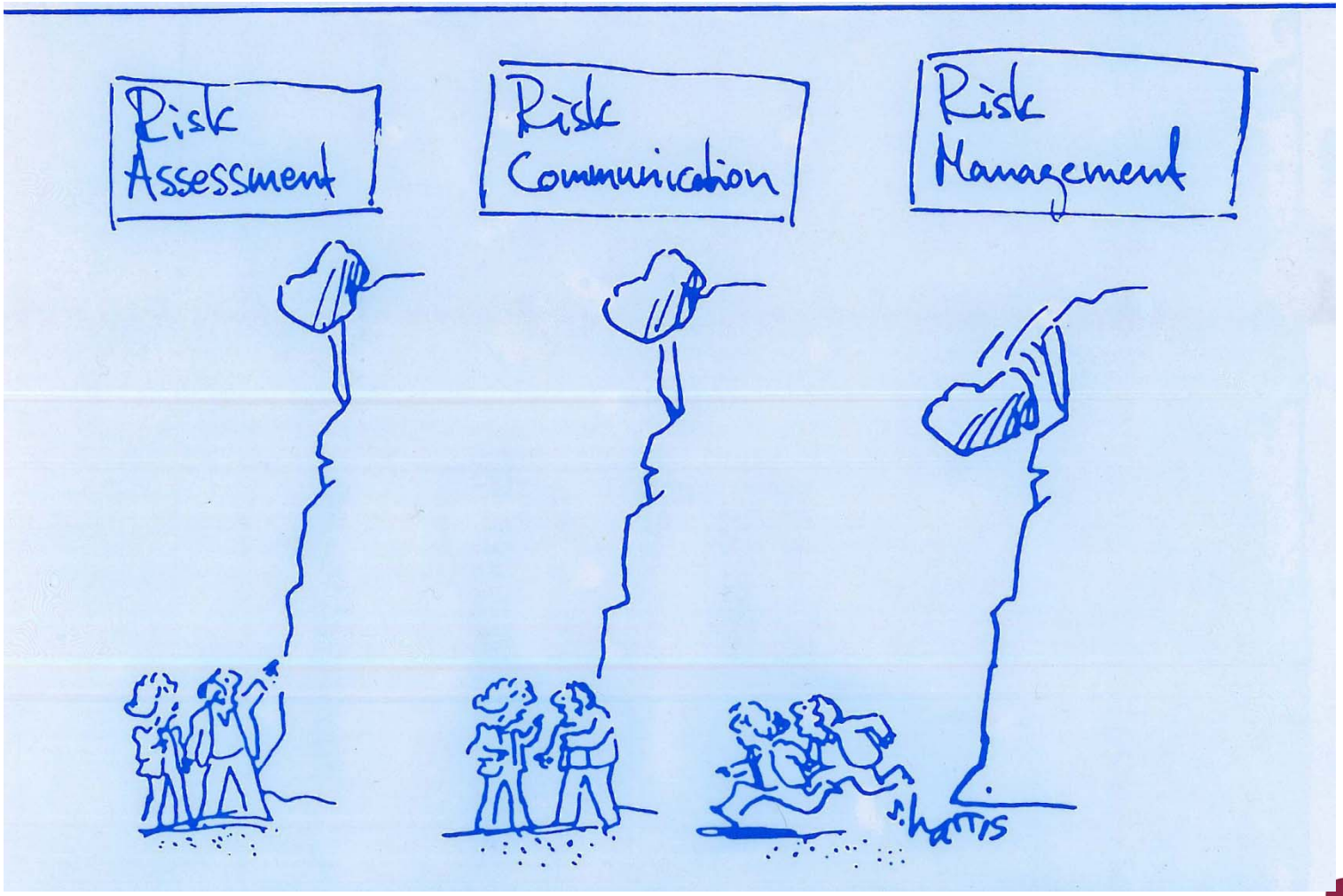
Outline

- Risks - different perspectives
- Purpose of assessment is management
- Qualitative vs quantitative vs benefit cost
- Final remarks - future wishes

Risk – different perspectives gives different answers

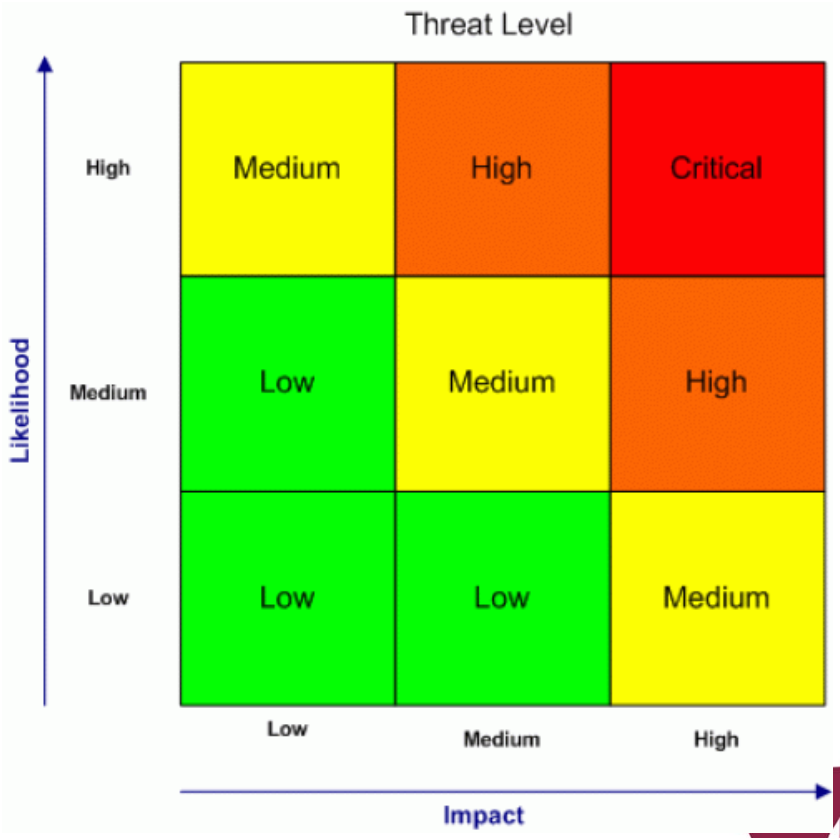


Assessment + Communication = Management

Risk assessment

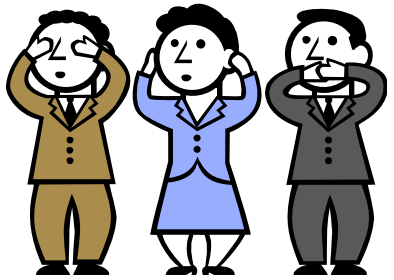
- Product of probability and consequences
- Hard part is communication
- Difficult
  - negligible probabilities and catastrophically large consequences
  - Systemic risks or domino effects

A simple model

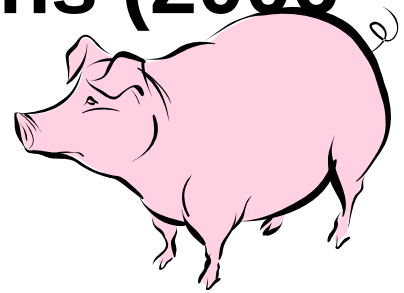


Risk communication

- Most important part of risk assessment
- Does anybody listen?
- Does risk managers hear the same message that you try to tell them?
- How to communicate uncertainty, black swans, negligible probabilities and huge consequences as risks .



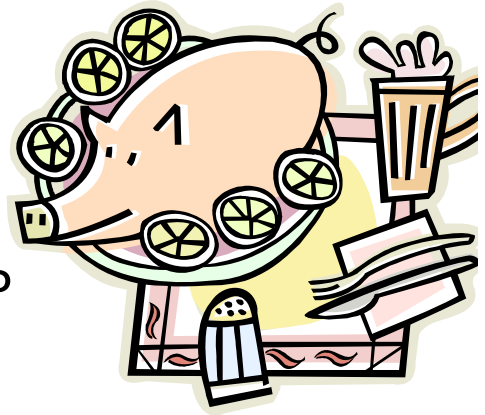
Qualitative vs quantative assessments Salmonella in pigs - EFSA opinions (2006 and 2010)



- **Qualitative assessment**
  - Risk assessment and mitigation options of *Salmonella in pig production", The EFSA Journal (2006), 341, 1-131*
- Pork, after eggs and poultry meat, a major source of human foodborne salmonellosis
- All serovars possible hazard for public health
- No universal mitigation option capable of eliminating *Salmonella entirely*
- Control *preventive* actions throughout food chain

Qualitative answers

- Prevent
  - introduction of *Salmonella into the herd,*
  - *in-herd transmission,*
  - increase of the resistance to the infection.
- transport-lairage
  - by separation of batches,
  - Good Hygiene Practices (GHP)
- Slaughter and dressing
  - Hazard Analysis and Critical Control Points (HACCP) principles in association with GHP
  - avoid direct or indirect faecal/intestinal contamination of carcasses.
  - Logistic slaughter is a further option for reducing the pathogen load on the carcasses



Qualitative answers post harvest

- Meat/carcass decontamination may be considered
- Risk mitigation during processing requires maintenance of the cold chain and the application of the so-called “hurdle concept” and the implementation of GHP and the principles of HACCP.

Quantitative answers

Quantitative Microbiological RiskAssessment of *Salmonella in slaughter and breeder pigs. EFSA Journal 2010;8(4):1547.*

- 10-20% of human *Salmonella infections attributable to* pigs
- An 90% reduction lymph node prevalence comparable reduction in the number of human cases
- Hierarchy of control measures suggested
  - a high prevalence in breeder pigs to be addressed first,
  - followed by control of feed
  - then control of environmental contamination.

Quantitative answers – pre-harvest

- Breeder pigs are *Salmonella-free*
  - *Reduction of 70-80% in high PV MSs*
  - *Reduction of 10-20% in low PV* MSs
- *Salmonella-free feedstuffs,*
  - *Reduction of 10-20% in high PV* MSs
  - Reduction of 60-70% in low prevalence MSs can be foreseen;
- Biosecurity of pig herds *(i.e. rodents and birds)*
  - *a reduction of 10-20% in all MS*

Quantitative answer post harvest

- A reduction of **two logs (99%) of *Salmonella* numbers** on contaminated carcasses would result in more than **90% reduction of the number of human salmonellosis cases** attributable to pig meat consumption.

Benefit cost analysis Salmonella control EU

http://ec.europa.eu/food/food/biosafety/salmonella/docs/fattening_pigs_analysis_costs.pdf

- BCA **did not show an economic benefit** from any intervention.
- Sensitivity analyses did not change the results markedly
  - However, a sensitivity analysis based on optimistic assumptions of a reduction of 6% in human health losses and a 6% constant rate of reduction in pigs affected by *Salmonella, did show a* ***small positive B/C ratio 1.07 and an NPV of €21 million.***

Final remarks – future wishes

- Risk assessments good way of summing up our knowledge and lack thereof
- Quantitative analyses more precise answers – but prone to errors
- In future
  - Integrate benefit cost analyses in the risk analysis process
  - Robust tools such as risk ranking - quicker answers
- Wish – integrate Codex and OIE outlines for risk analysis