"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France

Rencontres scientifiques autour de deux projets de recherche :
Scientific meeting around two research projects:

GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)

Risk Communication

Outline

- Risk communication:
  - Risk communication is a component of risk analysis
  - Why is risk communication important?
  - Why is risk communication difficult?
  - Other problems in risk communication
  - How can we communicate more efficiently?
- Presentation of results

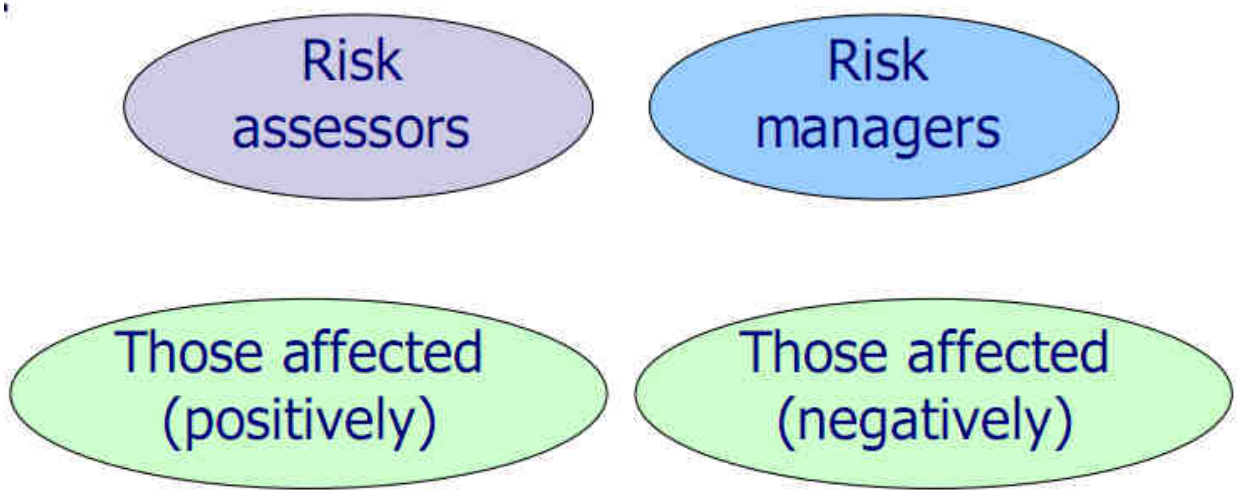
Risk communication as component of risk analysis

Components of Risk Analysis

Risk communication as component of risk analysis

- Risk communication: between whom?

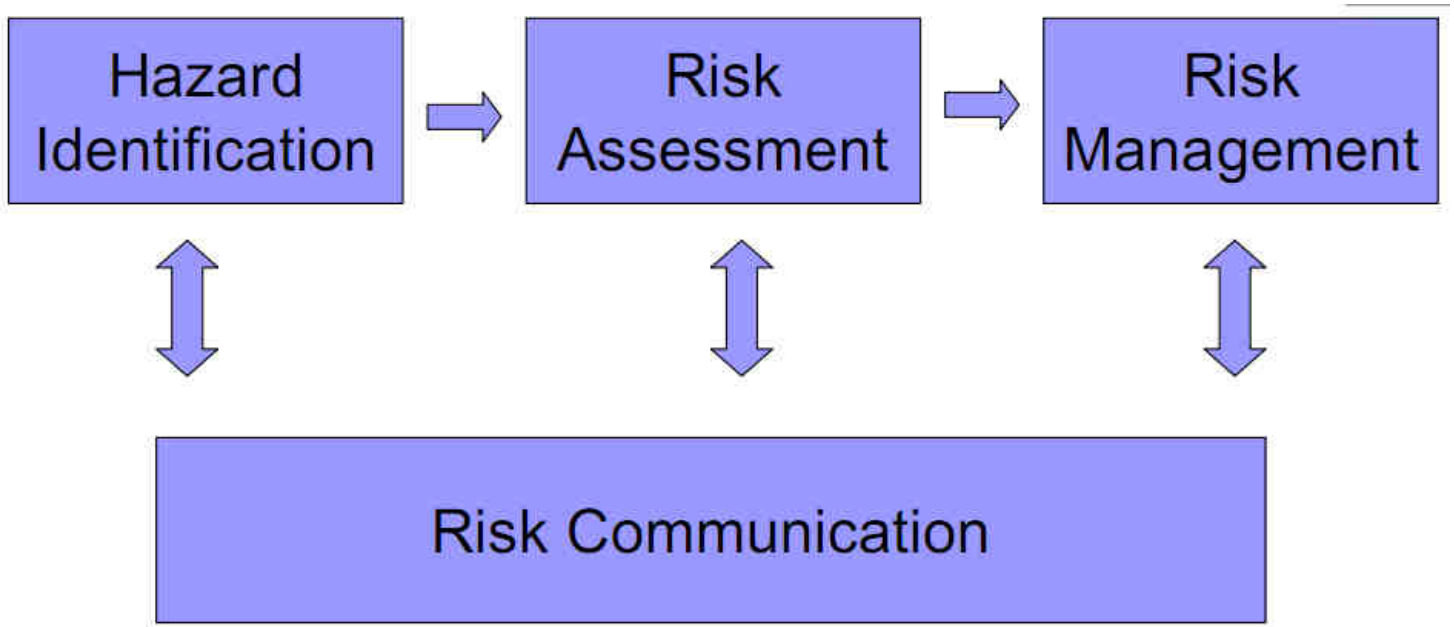
Information exchange between risk assessors, risk managers and those affected by both the risk and the decisions taken before the final policy decisions are taken..



Risk communication as component of risk analysis

- Risk communication: when?

Ideally at the beginning of the risk analysis to ensure that all stakeholders are provided with an opportunity to become involved in the process



OIE Animal Health Code

Risk communication as component of risk analysis

Components of Risk Analysis

Risk communication as a component of risk analysis is a interactive exchange of information and opinions concerning risk assessment and management between risk analysts and stakeholders.

Why is risk communication important?

- To avoid uncertain situations which raise concern
- To avoid information vacuum that may be filed by media or stakeholders group. Once established, public perceptions are difficult to reverse.
- To build or regain trust
- To achieve agreement and facilitate risk management

Why is risk communication difficult?

- Gap between risk perceived by experts and the public
- Difficulty in making probabilistic data understandable for the receivers – Mixed messages
- Effectiveness of risk communication requires trust

Why is risk communication difficult?

Gap between risk perceived by experts and the public

Studies conducted in the 80s showed the discrepancy between risk perceived by experts and the public, mainly in relation to nuclear power.

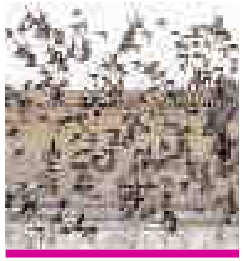


Table VI. Layperson and Expert Mean Ratings on Overall Risk Scale

Overall risk ratings	Layperson	Layperson ordering	Experts	Expert ordering
Depletion of ozone layer in atmosphere	5.67	1	5.31	3
Loss of plant and animal species	5.54	2	5.92	1
Decreased rainfall	5.45	3	4.65	9
Desertification (i.e., land becoming deserts)	5.20	4	5.12	5
Top-soil loss	5.19	5	5.15	4
Development of land for housing	5.18	6	5.69	2
Acid rain	5.14	7	4.85	6
More droughts	5.13	8	4.54	10
Pesticides	5.00	9	4.50	11
Extreme temperatures	4.84	10	4.46	12
Diseases	4.80	11	4.19	13
Nuclear power plants	4.77	12	3.58	17
Crop failures	4.67	13	3.62	16
Mining	4.56	14	4.77	8
More intense hurricanes	4.55	15	3.38	19
Frequent flooding events	4.36	16	3.65	14
Sea level rise	4.14	17	4.81	7
Increase in severity of winter storms	4.04	18	3.42	18
Increased rainfall	3.85	19	3.65	15
Volcanoes	3.70	20	2.96	21
Hunting of animals	3.66	21	2.96	22
Tourism and travel	3.37	22	3.04	20
More cloudy says	3.29	23	2.73	24
Fireplaces	3.18	24	2.54	25
Outdoor recreation	2.81	25	2.92	23

From: Jeffrey K Lazo, Jason C Kinnell, Ann Fisher (2000). Expert and Layperson Perceptions of Ecosystem Risk. Risk Analysis 20(2), 179-194

CIRAD

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Why is risk communication difficult?

Gap between risk perceived by experts and the public

Experts	**Public**
Based on risk assessment	Based on perceptions
Scientific	Intuitive
Objective	Subjective
Rational	Emotional
Average	Individual consequences
Probabilistic	Yes / No (lack of interest in technical complexity)

Divergence in risk perception between experts and public considered to be not as simple as initially thought.

Why is risk communication difficult?

Gap between risk perceived by experts and the public

Elements in risk perception (Paul Slovic):

- Unfamiliarity (new, unknown, emergent, future generations)
- Dread (fatal, I can be affected)
- Number of poeple exposed

Why is risk communication difficult?

Difficulty in making probabilistic data understandable for the receivers – mixed messages

- Difficulty in making probabilistic data understandable: wide variation in understanding of probabilistic information by individuals

- Differences in understanding of terminology by risk analysts and the public: dual meaning of terms (technical vs. colloquial) that may result in ‘mixed messages’ (Jardine and Hrudey, 1997):
  - Risk
  - Safety vs. Zero Risk
  - Association vs. Causation…

(Jardine C.G., Hrudey S.E. Mixed Messages in Risk Communication. 1997. Risk Analysis, 17: 489-498)

Why is risk communication difficult?

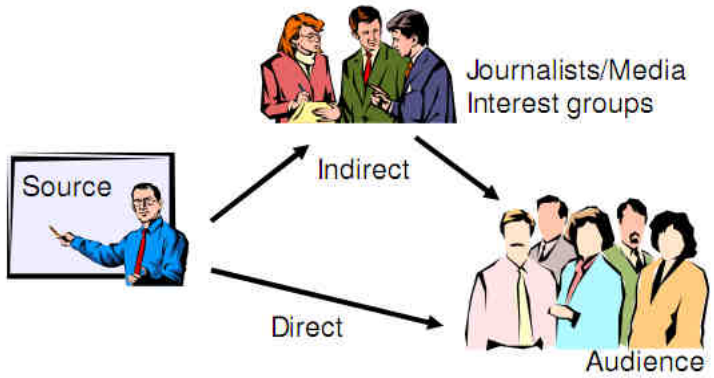
Effectiveness of RC requires trust

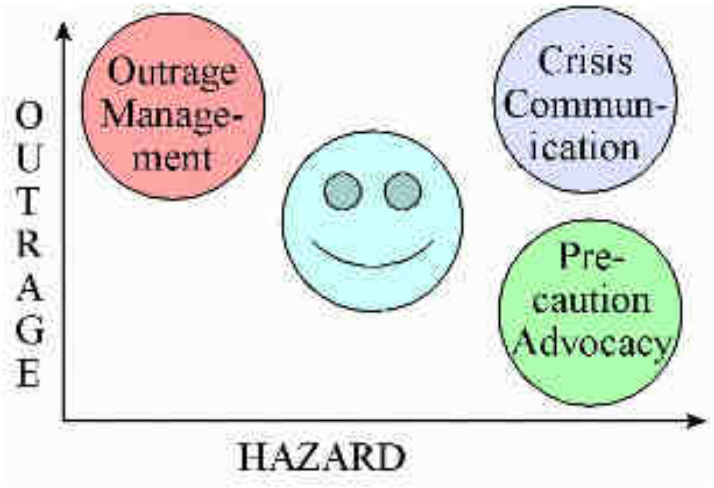
Trust → confidence in risk management → Acceptance of risk

Trust is fragile: negative events tend to be more visible and perceived as more credible

Other problems in risk communication

- Communicator: limited communication skills
- Channel: selective or biased reporting, emphasis on drama
- Receiver: outrage: risk = hazard + outrage (Sandman)





Sandman P.M. Responding to Community Outrage: Strategies for Effective Risk Communication. 1993. American Industrial Hygiene Association.
www.psandman.com

How can we communicate more efficiently?

Improve credibility

Demonstrate

- commitment
  - promise only what can be delivered
  - be helpful
  - be accessible
- competence
  - inform about experience, background and what you do not know
- openness
- empathy
  - listen and acknowledge people's feelings express your reactions or feelings

« Poeple don't care about what you know until they know that you care »

From Covello V. 1993. Risk communication, trust, and credibility. Journal of Occupational Medicine 35: 18-19 (January)

How can we communicate more efficiently?

Achieve Transparency

- RA to be well documented
- supported with references to scientific literature and other sources of information, eg. Expert opinion
- reasoned and logical discussion supporting conclusions and recommendations
- comprehensive documentation of all data, assumptions, methods, results and uncertainties

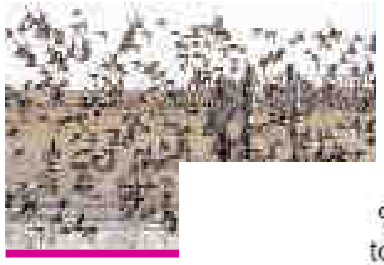
Presentation of results

- A risk assessment model will be useful only if:
  - It helps to answer the stakeholder's question
  - It is understandable
  - It can be checked/redone giving a similar answer

- Presentation of results is thus a crucial point in risk analysis

Reporting statistics

- Sofwares usually propose numerous stats:
  - Mean, median, mode
  - variance
  - Skewness, kurtosis
  - Targeted values and percentiles…
- Select only relevant stats for the model, useful to the reader
- Do not overdetail figures with obvious values
- Explain meaning to the reader
- Delete vertical scale in histograms if necessary



Model's structure diagram

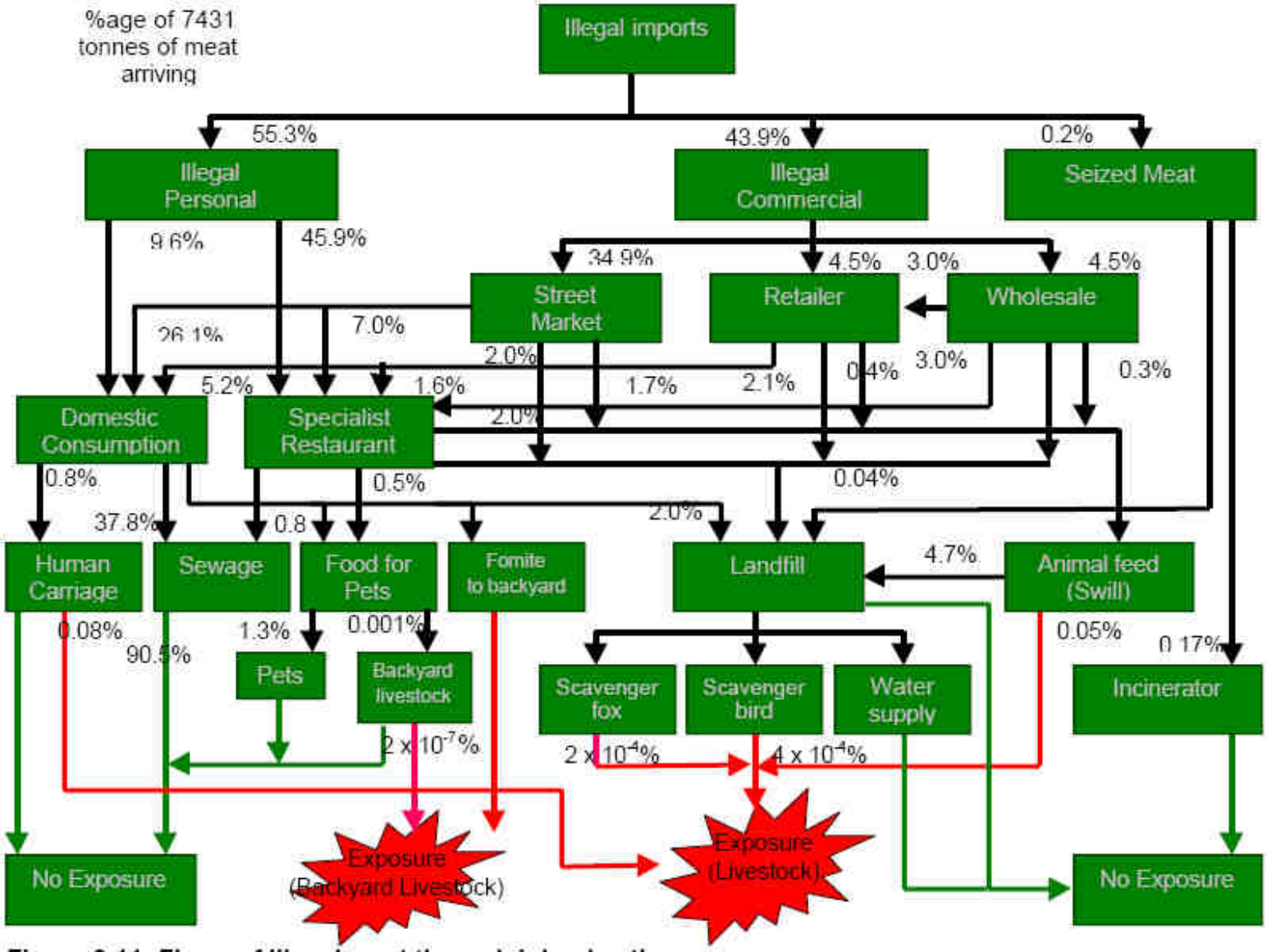


Figure 6-11: Flows of illegal meat through inland pathways

Key hypothesis numbered or underlined

Tableau 2 : Données de Dupont et al., (1995) et prédiction du modèle.

Oocystes ingérés	Nombre total de sujets	Sujets infectés	*Pr*(Infection) estimée	*Pr*(Infection) prédite	Sujets malades (cryptosporidiose)
30	5	1	0.20	0.12	0
100	8	3	0.38	0.34	3
300	3	2	0.67	0.72	0
500	6	5	0.83	0.88	2
1000	2	2	1.00	0.98	0
10000	3	3	1.00	1.00	1
100000	1	1	1.00	1.00	0
1000000	1	1	1.00	1.00	1

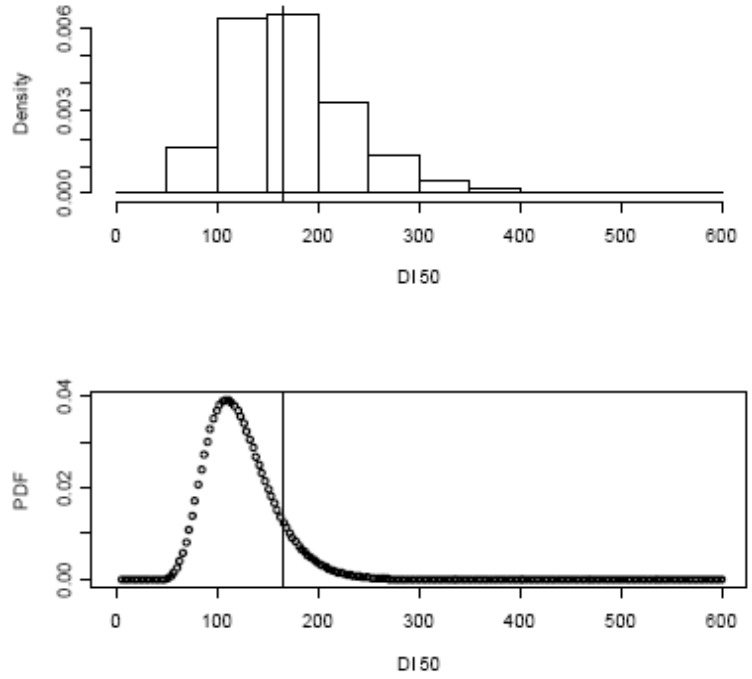
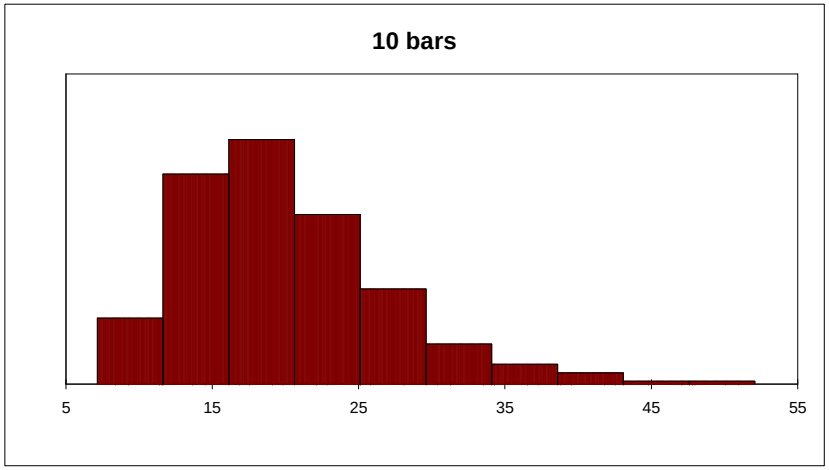
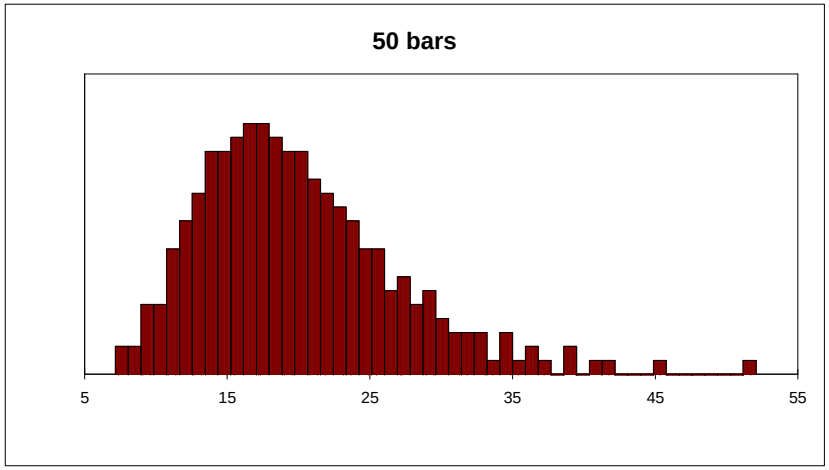
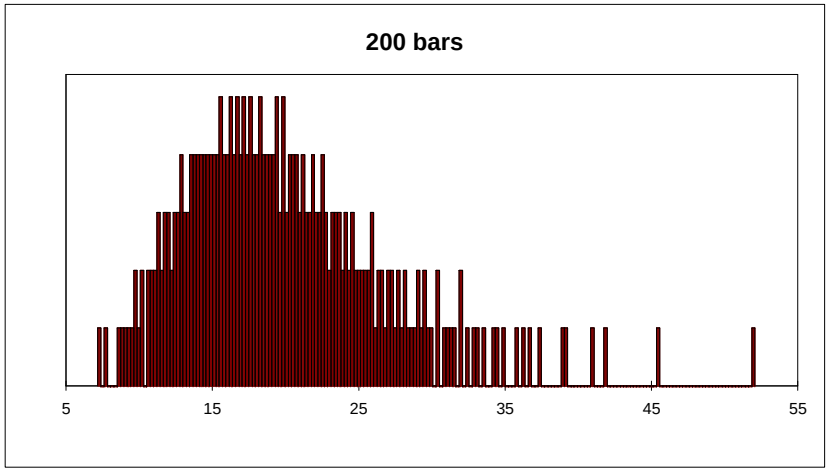


Figure 4 : Comparaison de la distribution de confiance du paramètre de la loi dose-réponse DI_{50} obtenue par « bootstrap » (haut, loi empirique, 10 000 jeux « bootstrap ») et par la technique du maximum de vraisemblance (bas) sur les données de Dupont *et al.*, 1995

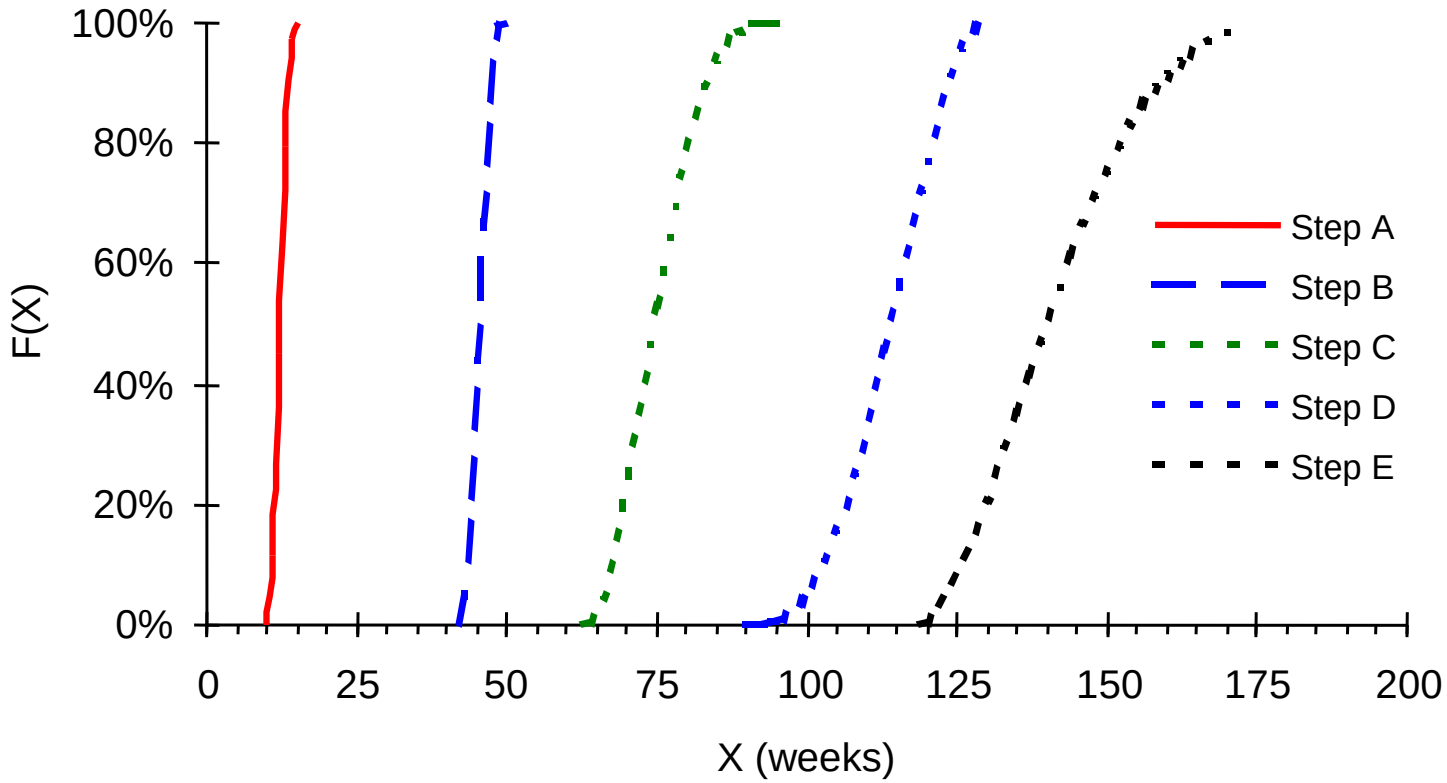
Careful: too much info kills the info!



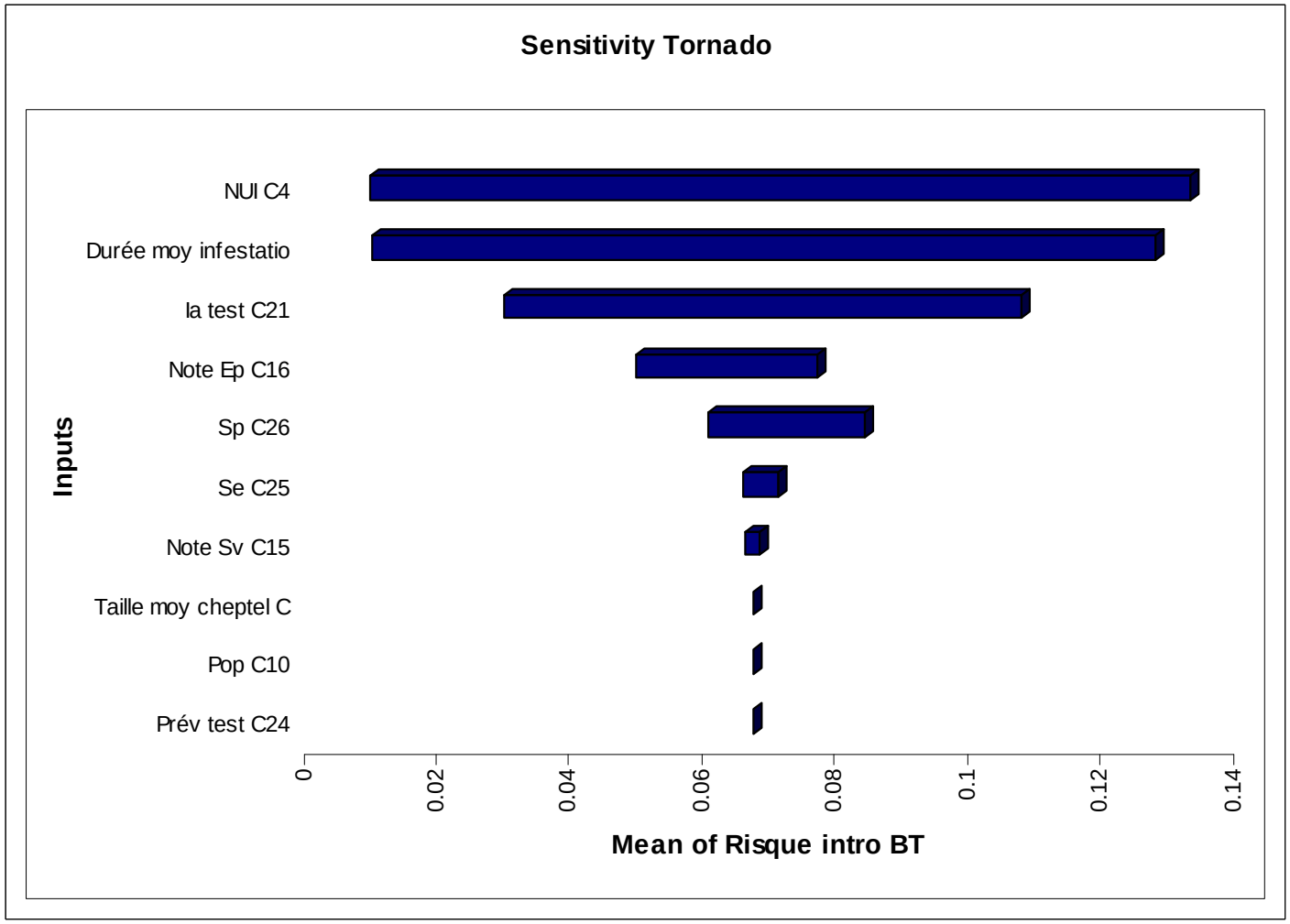




Cumulated distributions may help showing the risk construction or comparing various options…



Tornado graph (sensitivity analysis) shows which input distribution influences the output uncertainty



Risk management as a component of risk analysis

Based on the results of the risk assessment and the judgement of the ‘risk managers’ decisions are taken and policy is formulated.

The objective is to reduce different risks to the level accepted by society.

Risk management is the process of weighting policy alternatives in consultation with all interested parties considering risk assessment and other factors (relevant for the health protection of consumers and for the promotion of fair trade practices).

A functionnal separation between risk assessment and management is needed

Precautionary principle

- Emergency risk management
  - When significant imminent risk is likely
  - When evidence is not available to assess appropriate risk management
  - Shifts burden of proof to hazard creator
- Conditions
  - Only temporary measures
  - Review when new evidence becomes available
  - Proportionate, consistent, targeted, transparent
  - Non-discriminatory