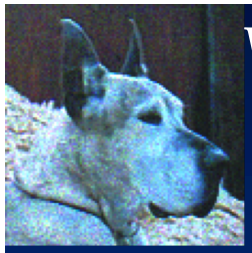


William Leiss & Associates Ltd.

The Risk Management Approach to Public Health Risks

William Leiss, O.C., Ph.D., FRSC

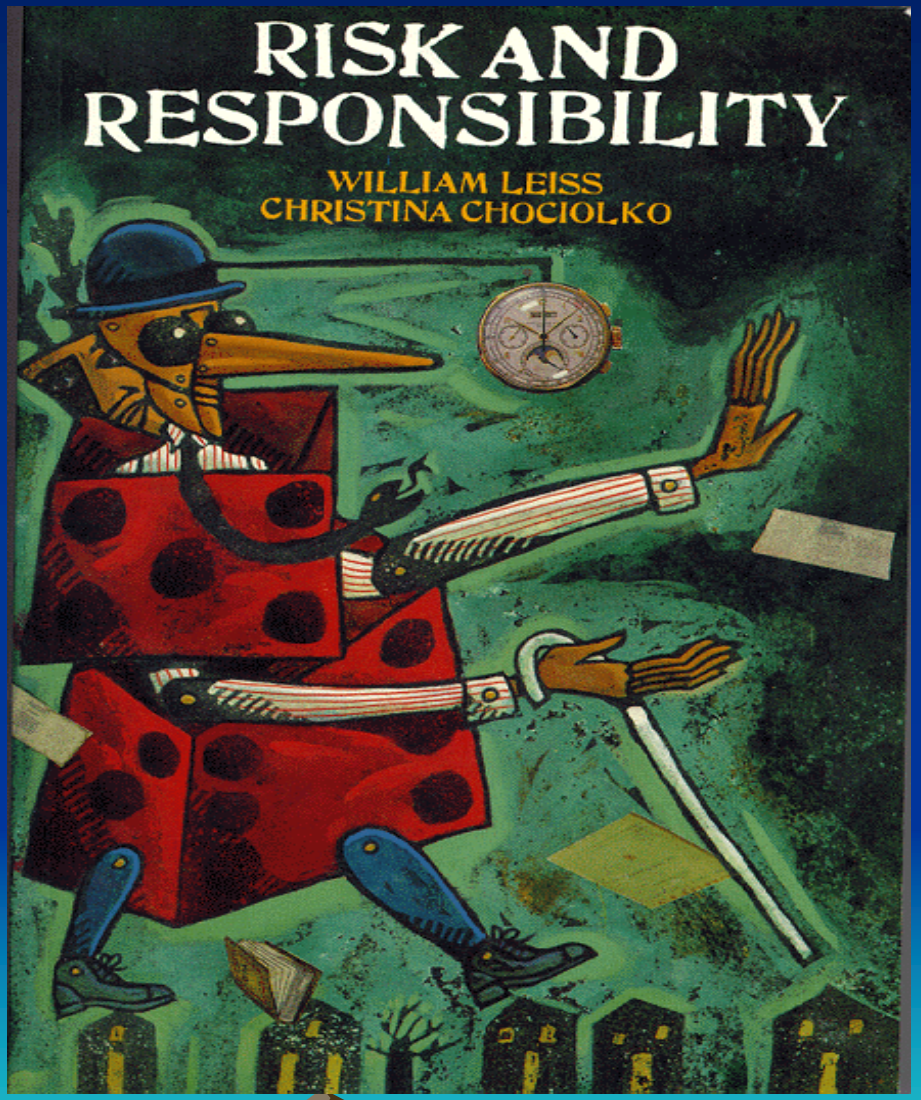
"Shifting Landscapes in Environmental Health:
Meeting the Challenge"
The Canadian Institute of Public Health Inspectors (Ontario)
69th Annual Educational Conference
17 September 2008, Mississauga

William Leiss - Profile

- Academic, writer, consultant since 1968
- http://www.leiss.ca
- wleiss@uottawa.ca
- Author/collaborator for 15 books and many essays and reports
- Working in the field of risk management & risk communication for 20 years
- Fellow, Royal Society of Canada

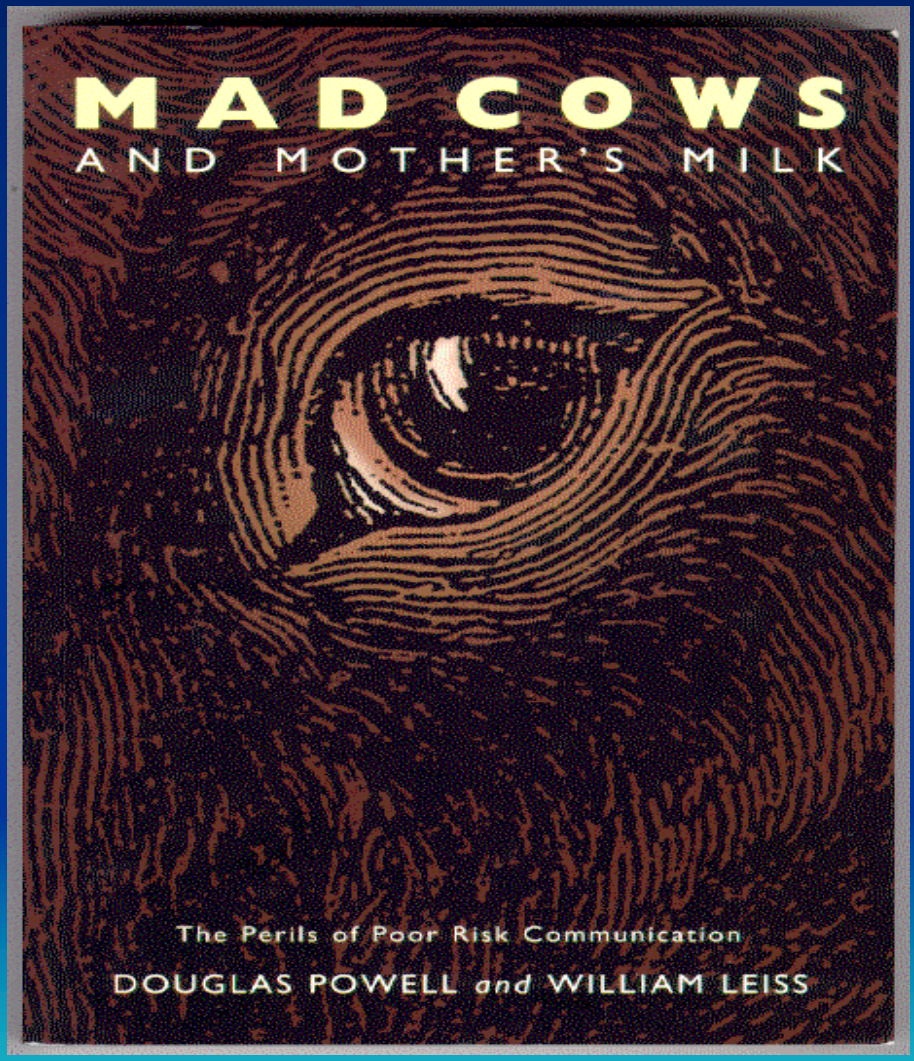
Books on Risk Issues (1)

In 1994 I published *Risk and Responsibility*, with lengthy case studies in pesticides, ALAR and apples, and EMF (electric and magnetic fields) risk



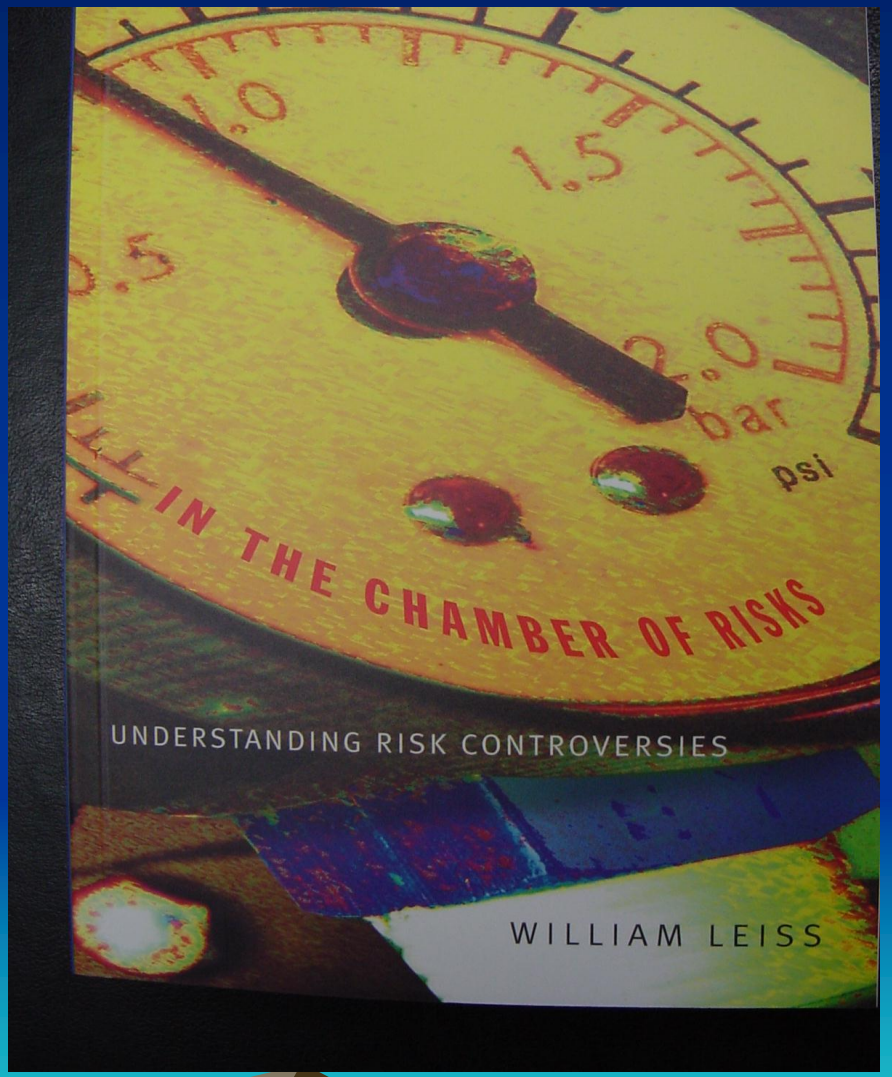
Books on Risk Issues (2)

- William Leiss and Douglas Powell, *Mad Cows and Mother's Milk: The Perils of Poor Risk Communication* (1997, enlarged edn. 2004)
- Mad cow disease, Kyoto Protocol, "hamburger disease" (E. coli), silicon breast implants, bovine growth hormone, genetically-engineering food crops and PCBs



Books on Risk Issues (3)

Professional risk managers in governments and industry often completely misunderstand the nature of the reactions of the public to risks. Then the chamber of risks can turn into a chamber of horrors for business and governments.



Themes for this Discussion

A. The Risk Management Approach
B. Cases (1): Listeria
C. Cases (2): Climate Change and Health
D. Cases (3): Mad Cows and Risks to Farmers
E. Cases (4): Nuclear Waste
F. Cases (5): "Body Burden" of Chemicals
G. Cases (6): Food Irradiation
H. Cases (7): West Nile Virus
I. Conclusions

What is Risk Management?

Effective risk management requires:

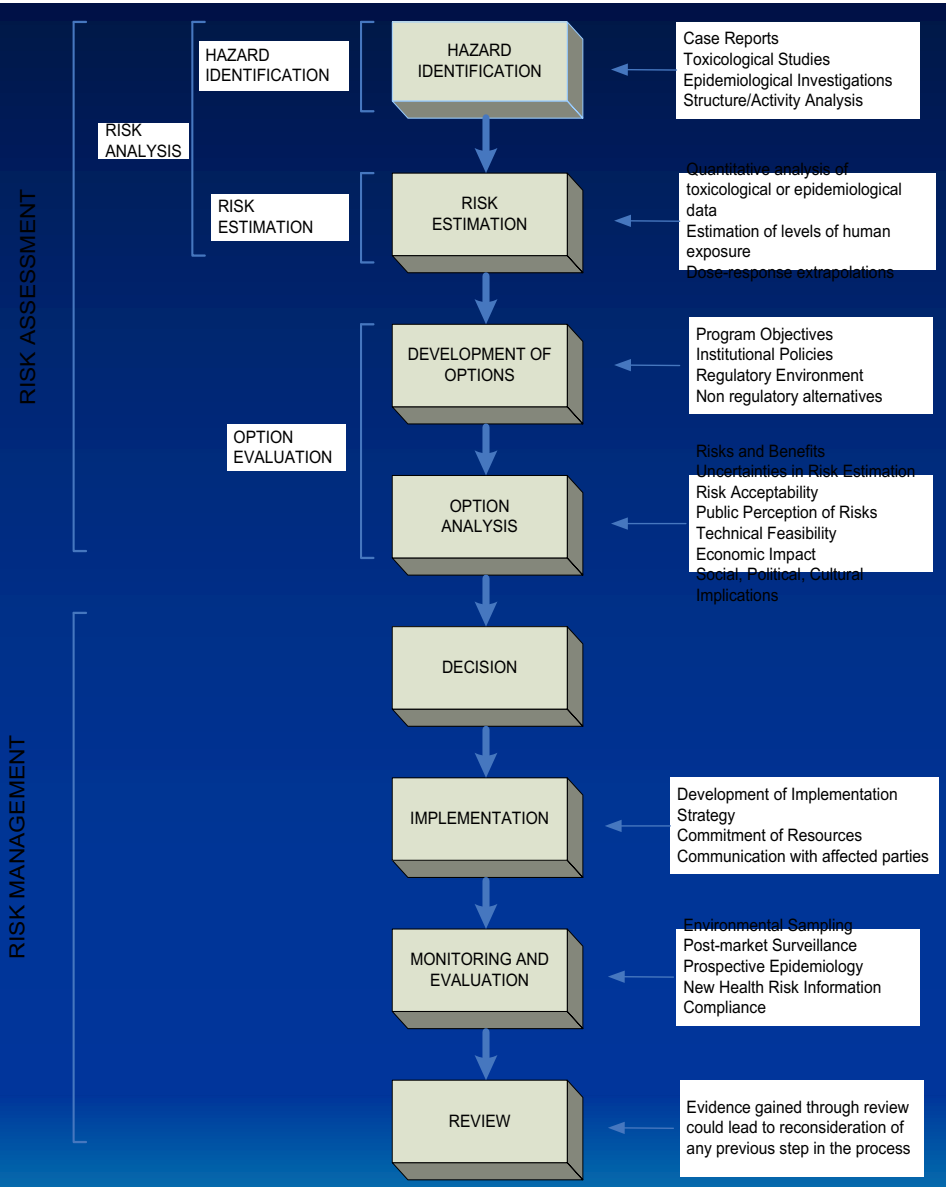
1. Assessing the dimensions of the problem;
2. Stating risk management objectives;
3. Specifying the "value at risk" in quantitative and qualitative terms;
4. Estimating probabilities of occurrences which can produce losses;
5. Identifying and costing risk control options;
6. Agreeing on a hierarchy of preferred solutions.

The Risk Management Approach (1)

1. Name the responsible entity and the roles of all major collaborating parties;
2. State the objective (e.g., ALARA);
3. Specify the decision sequence steps;
4. Identify the decision inputs;
5. Characterize the risk, including uncertainties, confidence levels, and need for precaution;

The Risk Management Approach (2)

6. Assess the potential consequences (harms);
7. Perform a formal risk estimation [R=P x C] and assign a risk class (level of severity);
8. List the available risk control options, including feasibility, cost, public perception, other factors;
9. Evaluate options against objectives in the light of the risk estimation;
10. Make a decision, ideally with an explicit rationale.



A Model for risk assessment and risk management

A. The Risk Management Approach (3)

- Risk management is "the attempt to anticipate and prevent or mitigate harms that may be avoidable."
- Risk:
  - The chance of loss or harm;
  - "Measurable uncertainty."
- Anticipate:
  - Don't wait until after the disaster occurs;
  - Depending on the type of event, sometimes we can forestall the adverse event entirely, at other times we seek to reduce the scope of the future harmful consequences.

The Risk Management [RM] Approach (4)

- Anticipate (continued):
  - This is the precautionary principle, which is built into RM, and is not an add-on;
  - Rio Conference, 1992: Where there are threats of irreversible and serious harms, and incomplete knowledge, take cost-effective steps for risk reduction.
- Prevent: For drinking water, effective risk control measures will stop pathogens from causing harm.
- Mitigate: Reduce the scope of the potential harm.

The Risk Management [RM] Approach (5)

- "Harms that may be avoidable":
  - We can never forecast just how well prevention or mitigation will work, except for very well described risks, but good estimation can be done.
- The general theme of this presentation:
  - Build public trust in science-based RM where it is done well;
  - Participate in criticizing instances of poor RM and in correcting those mistakes.

The Challenge: Decision Credibility

- One of the most significant weaknesses in risk management decision-making to date is that,
  - Whereas the decision inputs are clearly specified, the decision itself is a "black-box" operation;
  - In other words, the "decision algorithm" is neither stated nor defended.
- Another significant weakness is lack of transparency and disclosure of key information to the public, preventing stakeholders from contributing to informed discussions of good practices—and bad.

Case: Listeria (1)

"I'm glad we got hold of it early and now we'll take serious steps working with the feds to put it behind us."

Dalton McGuinty (Aug. 23)

"The fact that it actually moved along, got investigated, ended up at CFIA and others finding samples that were positive in the food was actually quite fast in terms of how these things could progress."

Robert Clarke, ADM, PHAC (Aug. 23)

"While this situation is tragic, it is important to note that this is an example of where our surveillance system worked."

Tony Clement, Minister of Health (Aug. 24)

"It's necessary to reform and revamp our food-and-product-inspection regimes after some years of neglect."

Prime Minister Stephen Harper (Aug. 26)

Case: Listeria (2)

"We have an unwavering commitment to keeping your food safe, with standards well beyond regulatory requirements."

Michael H. McCain, President & CEO, Maple Leaf Foods (Aug. 25)

- The statement that company standards exceed government regulatory requirements sounds like good news, but is it, really? Even if true, it is, in fact, *irrelevant*.
  - Either the company's own standards are far from adequate, since they cannot protect against fatality risk for consumers, or
  - Our federal regulatory requirements are so pathetic that they're not worth the paper they're written on,
  - Or both.
- And on the statement by Minister Clement: If this is an example of how well the system worked, we should all hope we never see a failure.

Listeria (3)

The "transparency" lie (Globe and Mail, 30 August):

- "We have a commitment to transparency."
  – Paul Mayers, President, CFIA
- In 2007, CFIA's director of meat programs, B. Anderson, wrote to the FDA, trying to get FDA to soften the language of its general statement on sub-performance in *19 out of 20* Canadian facilities audited by FDA [i.e., to add "spin"];
- The *only* reason we know the above is because the FDA was naughty and published Anderson's complete letter;
- Canada terminated its rankings of plants this year, at the behest of The Canadian Meat Council, because the reports were made public, resulting in "negative" media coverage.

Case: Listeria (4)

A litany of risk management errors:

1. Inexcusable delays in surveillance regimes;
2. Delayed public notification of risk;
3. Confused explanation by the company of why its own protective procedures failed;
4. *Totally* confused explanations by the federal government agencies about differences between U.S. and Canadian standards;
5. To date, no explanation by our governments about why their own regulatory standards failed to protect the public.

Case: Climate Change and Health

Likely to be one of the most significant risks over the long term, and yet, during the Summer of 2008:

- In the U. S., there was much publicity about political interference in the preparation and release of a major EPA/climate science study of these risks;
- In Canada, the federal government was trying to "hide" its similar report by Health Canada, so that a blogger had to post the PDF file on his own website, since it couldn't easily be found on Health Canada's.

Case: Mad Cows and Risks to Farmers

Catastrophic consequences for Canadian beef farmers, starting in 2003, both in economic and social terms:

- Canadian farmers did not receive a timely warning about the risk of BSE in their herds, even though the federal authorities knew it was serious in 1994;
- Federal authorities never ran a border-closing scenario in the years before 2003, so they never had any idea of what the consequences might be;
- The main risk-control measure (the feed ban) was utterly mismanaged: most of Canada's BSE cases are "BABS" ("born after the ban").

Case: Nuclear Waste (1)

For Ontario in particular, given how much we depend on nuclear power, finding an adequate solution for storing the waste is imperative:

1. So far we've been trying for 30 years, and even if all goes well from now on, it will be another 30 years or more before a facility is ready;
2. We now know what solution to implement (deep disposal, probably in the Canadian Shield);
3. The process to find a "willing host community" for the facility is just beginning.

Case: Nuclear Waste (2)

4. Determined opposition is to be expected; e.g., Greenpeace has promised "the battle of the century" against the long-term-disposal plan.
5. The waste will have to be moved, from where it is now stored (at reactor sites), along a selected transportation corridor.
6. We all have an interest in trying to ensure that future debates about implementation of the current plan are conducted in a mutually respectful and "reasoned" manner.

Case: "Body Burden" of Chemicals (1)

- In 2005 Environmental Defence tested the blood and urine samples of 11 men and women volunteers, including wildlife artist Robert Bateman. A total of 88 chemicals, including PCBs, flame retardants and insecticides, were found.
- Lab tests showed a total of 60 chemicals, with an average of 44 found in each volunteer, some in trace amounts.
- Sophisticated laboratories can now find traces of more than 250 substances ranging from metals to pesticides to dioxins. These toxins accumulate in our fat cells and are best detected in breast milk.

Case: "Body Burden" of Chemicals (2)

- In 2007, four federal politicians agreed to have the tests done: "The results show that all four politicians had a cocktail of chemicals in their bodies and that the group had a remarkably similar burden to each other. John Godfrey's results showed the highest number of pollutants, at 55, followed by Tony Clement and Jack Layton both with 54 each and Rona Ambrose with 49." [Remarkably, they are all—apparently—still alive.]

- Should the average citizen worry about this?
  - Almost certainly not: The major risk factors for the leading causes of premature mortality (heart disease, cancer) are not trace chemicals;
  - Detection technologies can measure concentrations of chemicals in bodily fluids at lower and lower levels (one part per billion or trillion), and potentially even lower.

Case: Food Irradiation

- US FDA approved irradiation of beef in December 1997, requiring labeling; extends approval to fresh spinach and iceberg lettuce (August 2008);
- Health Canada, irradiation of beef:
  - Technical assessment completed, 2000;
  - Draft Proposal 2002, public debate in 2003.
  - Nothing since that time.
- It may possibly help in the control of listeria.
- Why is it impossible to make any further progress in discussing and debating this issue in Canada?

Cases (7): West Nile Virus

This would appear to be a notable success story in recent years (after 2002):

1. Good risk control measures in urban areas;
2. Good disease surveillance in birds;
3. Effective risk communication;
4. High levels of risk awareness and personal risk control actions;
5. Precautionary steps for blood collection in high-risk areas of the country.

Conclusions (1)

1. Generally, governments and industry today know –in theory—how to make appropriate risk management decisions;
2. A new international standard (ISO 31000) is almost ready, and this may help;
3. Alas, there is still wide variation among cases as to how well the RM rules are applied;
4. Mismanaging risks can have *catastrophic* consequences (mad-cow, listeria in Canada) for industry and the public.

Conclusions (2)

5. In the most recent case (listeria), both industry and government are guilty of misleading, confusing, and contradictory statements over the course of the public discussion of this outbreak.
6. The delay in informing the public that a meat recall was under way is unconscionable.
7. In the Canadian system as a whole, there is still a lamentable lack of transparency, full disclosure, and accountability; the "shared responsibility" system does not appear to make overall safety better, and indeed may be making it worse.