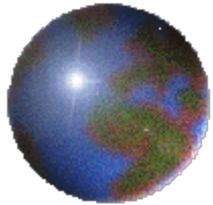


Interface Between Public And Environmental Health Regimes: Which Paradigm And In Whose Best Interests?

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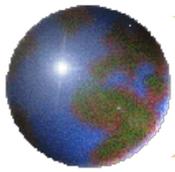
Under Western Skies 3

Intersections of Environments, Technologies, and Communities

Mount Royal University, Calgary, Alberta, Canada

September 9-12, 2014





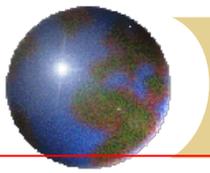
DISCLOSURE - May 9, 2014

Alberta Energy Regulator (AER) Proceeding No. 1769924

into Odours and Emissions in the Peace River Area, Alberta, Canada

This work was prepared under contract to a participant in the Inquiry, but my report was not presented as evidence or discussed at the hearing. My client has provided me with approval to publish in the interest of advancing the discussion with respect to health science.





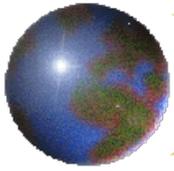
Epidemiology – an applied science

→ The study of the **distribution** and **determinants** of disease; the science that bridges toxicology to evidence-based health policy

→ Our focus in epidemiology is on **community** health; on the *prevention* of disease, disability and premature death in communities

→ We study health problems with a view to developing **policy interventions** to correct the problem

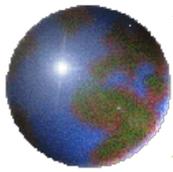




A real-world problem

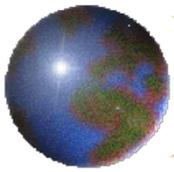
- ✦ **Baytex** and four other companies use a method of heating bitumen in above-ground tanks to extract oil, and residents have complained of odours, feeling sick, and other issues from living near the site. The Baytex tanks use open venting.
- ✦ **Shell** decided in advance not to contest the health complaints.

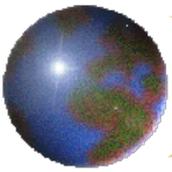




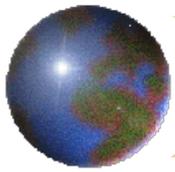
Baytex Reno Field, Peace River Alberta







Brian Labrecque and his cousin Alain Labrecque left their homes near Peace River because of fumes from bitumen processing they say are causing their health problems

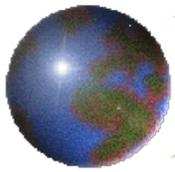


My task was to ...

... evaluate two independent health risk assessment reports commissioned by the AER for the hearing:

- **one that adopted linear reductionist methods (by Davies)**
- **the other that used more of a post-normal science approach (by Sears).**



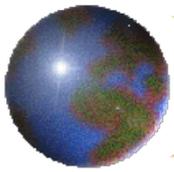


Epidemiology-Core Values/Mission

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... maintain, enhance, and promote health in communities worldwide ... work to protect the public health interest above any other interest ...





Yet, we know that

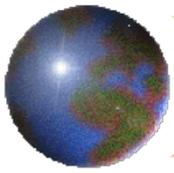
“Industry’s offensive against the regulation of health and safety hazards uses academics to downplay or deny the seriousness of the hazards...”

Clayson and Halpern

J. of Public Health Policy

September, 1983



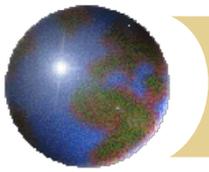


On Corporate Ethics and Environmental Pollution

“Corporations create 80% of our GNP. They, of all entities working, have the most potential for good or evil in our society.”

Judge Miles W. Lord, 1982





→ There are many **competing interests** in the work done by epidemiologists

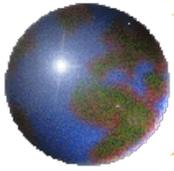


TEFLON?...
LINKED TO BIRTH
DEFECTS?

DON'T WORRY,
THE ACCUSATION
WON'T STICK.



MAGS
Edmonton
Journal



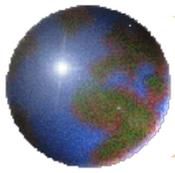
Distinguish between

“(Honest) *INCOMPETENCE*”

VS.

“(Deliberate) *MISCONDUCT*”

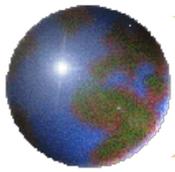




Classical techniques that skew results: from biased methods to junk science

- **Under-powered studies**
- **Inadequate follow-up methods**
- **Inadequate follow-up time**
- **Contaminated controls**
- **Unbalanced discussion**
- **Selective disclosure of competing interests**
- **Linear-reductionist quantitative methods without post-normal qualitative approaches to complement them**

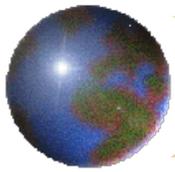




Classical techniques that skew results: biased/selective interpretation

- **Mechanistic information is ignored for inferring effects**
- **Exaggerated differences are made between human and toxicology studies, the insistence being on separating effects seen in animals from effects in humans**
- **The fact that molecular structures predict hazard potential is ignored**

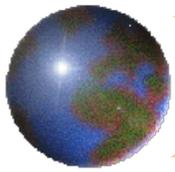




Techniques that skew policy

- **The insistence on first demonstrating effects in local populations of exposed people despite demonstrated effects in humans elsewhere**
- **The failure to make explicit the implicit value judgements that go into deciding appropriate standards of evidence for drawing policy-relevant conclusions (i.e., supressing dominant interests and values)**

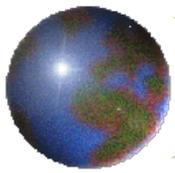




Problem definition

Epidemiology is, more and more, recognizing the need for new methods and concepts in order to contribute usefully to studies relating to complex environmental interactions ...





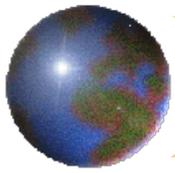
Newtonian vs. Complexity Paradigms

19

- ⊕ **Reductionism vs. Holism**
- ⊕ **Predictability vs. unpredictability**
- ⊕ **Linear vs. non-linear**
- ⊕ **Uncertainties acknowledged**
- ⊕ **Deterministic vs. non-deterministic**
- ⊕ **System equilibrium vs. instability**

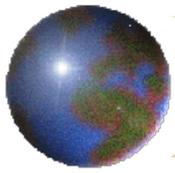
Newtonian assumptions hardly ever apply in the real world





- ✚ **The Dominant Paradigm**
- ✚ **The Contextual Narrative**
- ✚ **The Role of Impartial Science in the Public Interest**

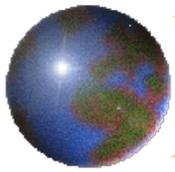




Post-Normal Science Toolkit–8 tools ²¹

- ✦ **Integrated Assessment**
- ✦ **Participatory methods**
- ✦ **Integrated Scenario Analysis**
- ✦ **Ecological Footprint Analysis (EFA)
and Disaggregated EFA**
- ✦ **The DPSEEA model**
- ✦ **Product Life-Cycle Analysis (PLCA)**
- ✦ **I=PAT**
- ✦ **Kuznets curves**

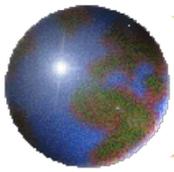




⊕ **A structured process of dealing with complex issues, using knowledge from various scientific disciplines and/or stakeholders, such that integrated insights are made available to decision-makers”**

— Rotmans, 1998

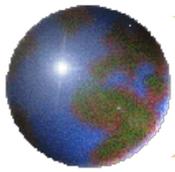




❖ **Policy exercises and focus groups linked to ‘post-normal science’ (Functowicz and Ravetz, 1994)**

❖ **Involvement of relevant stakeholders**



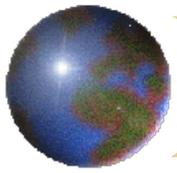


Summary

Integrated Assessment: Interdisciplinary approach provides understanding of cross-linkages and pathways under complexity

Participatory Methods: Provide a mechanism for broadening our understanding of complex issues

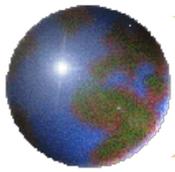




Conclusions

The complexity, post-normal quantitative and qualitative approach taken by Sears - as opposed to the **liner-reductionist, quantitative approach of Davies - is more credible, especially in light of the failure of Davies' predictive modelling to bear out that which happens in the real world.**

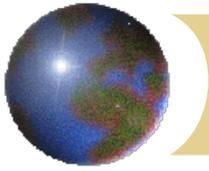




Main messages

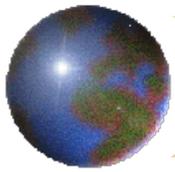
- **The scientific paradigm used in risk assessment can pit industry against regulatory frameworks. Which paradigm is correct?**
- **Both the traditional quantitative approaches, as well as qualitative, post-normal, integrative approaches are equally valid approaches in applied science.**
- **It is the dominant narrative that needs to change if public health is to be protected through policy interventions.**





Discussion





Recommendations

- 1. Improve basic ecological, economic, sociological, geopolitical, and systems-thinking in the education of students of epidemiology.**
- 2. Insist on qualitative, as well as quantitative, approaches when any attempt is made to address complex problems that involve health and multiple stakeholder interests.**

