How disease ecology research influences infectious disease policy

Dr Craig Thornley

Principal Adviser Public Health; Ministry for Primary Industries

Disease Ecology and Pathogen Evolution Workshop, 10 June 2013

Growing and Protecting New Zealand

www.mpi.govt.nz

Overview

- **Some models of the role of scientific evidence in policy-making**

- **Where disease ecology research fits into the policy process**

- **An example: the campylobacteriosis story**

Definition: policy = commitment to a particular course of action with broad implications

Models of role of science in policy: #1

Decisionist model:
bureaucracy (& science) subordinated to
democratically-elected representatives

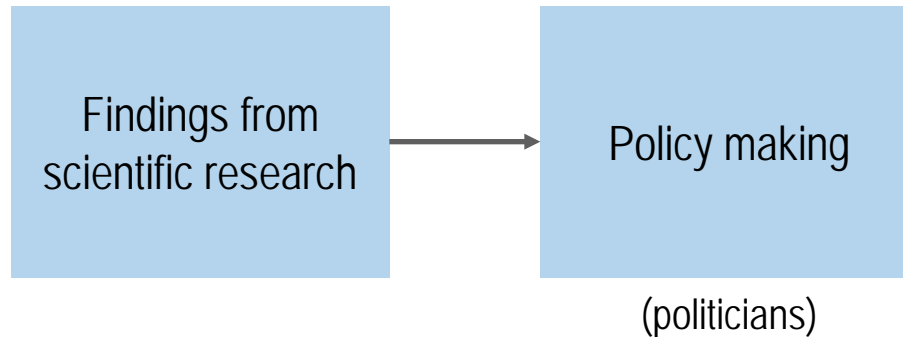reference: Millstone E. Research Policy 2009; 38: 624-636.
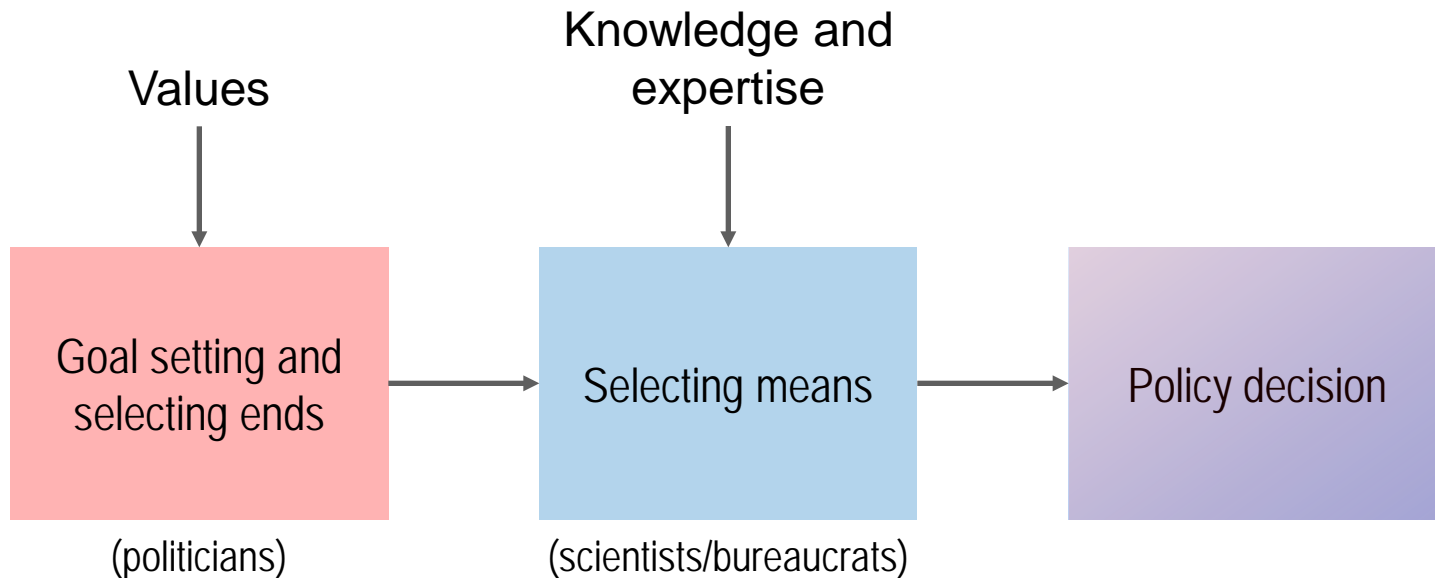
Difficulty with the decisionist model

In a rapidly changing society, goal setting requires scientific input

Models of role of science in policy: #2

**Technocratic/linear model:
policy should be allocated to
scientific and technical experts**

Findings from scientific research → Policy making

(politicians)

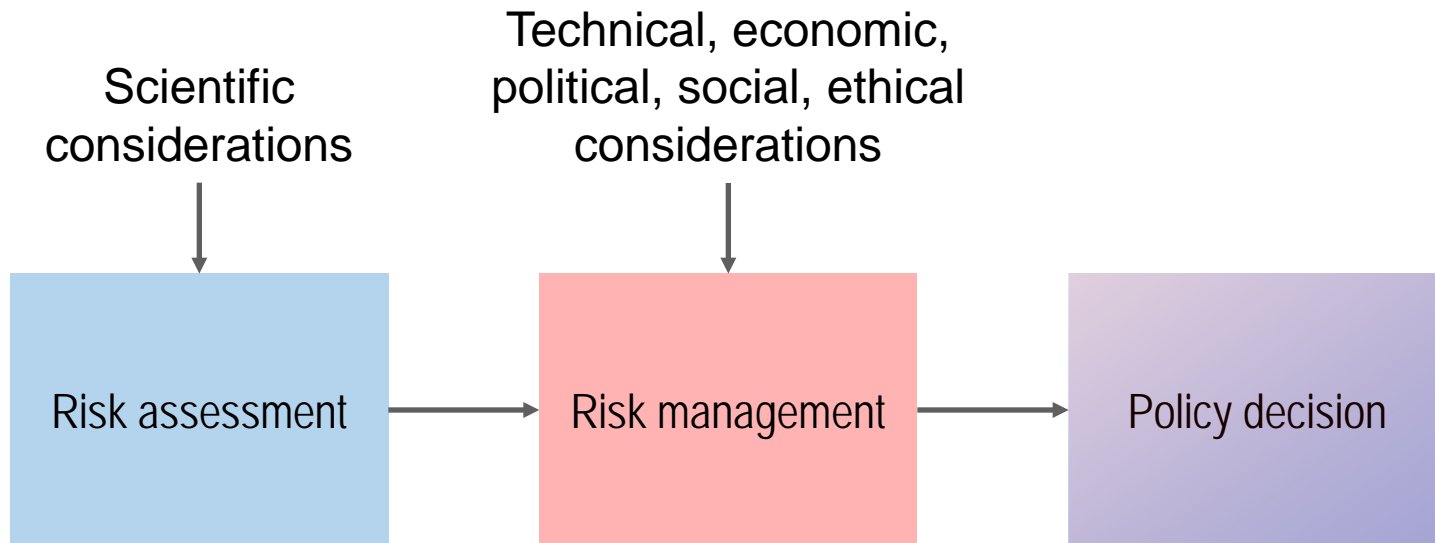reference: Millstone E. Research Policy 2009; 38: 624-636.

Difficulties with the technocratic model

- **Science may result in an assessment of probabilities, not absolute answers**
- **Adjudication of trade-offs between acceptable risks and anticipated benefits cannot be decided with facts alone**

Models of role of science in policy: #3

**Red Book model:
scientific risk assessment precedes
and is separate from risk management**

Scientific
considerations

Technical, economic,
political, social, ethical
considerations

Risk assessment → Risk management → Policy decision

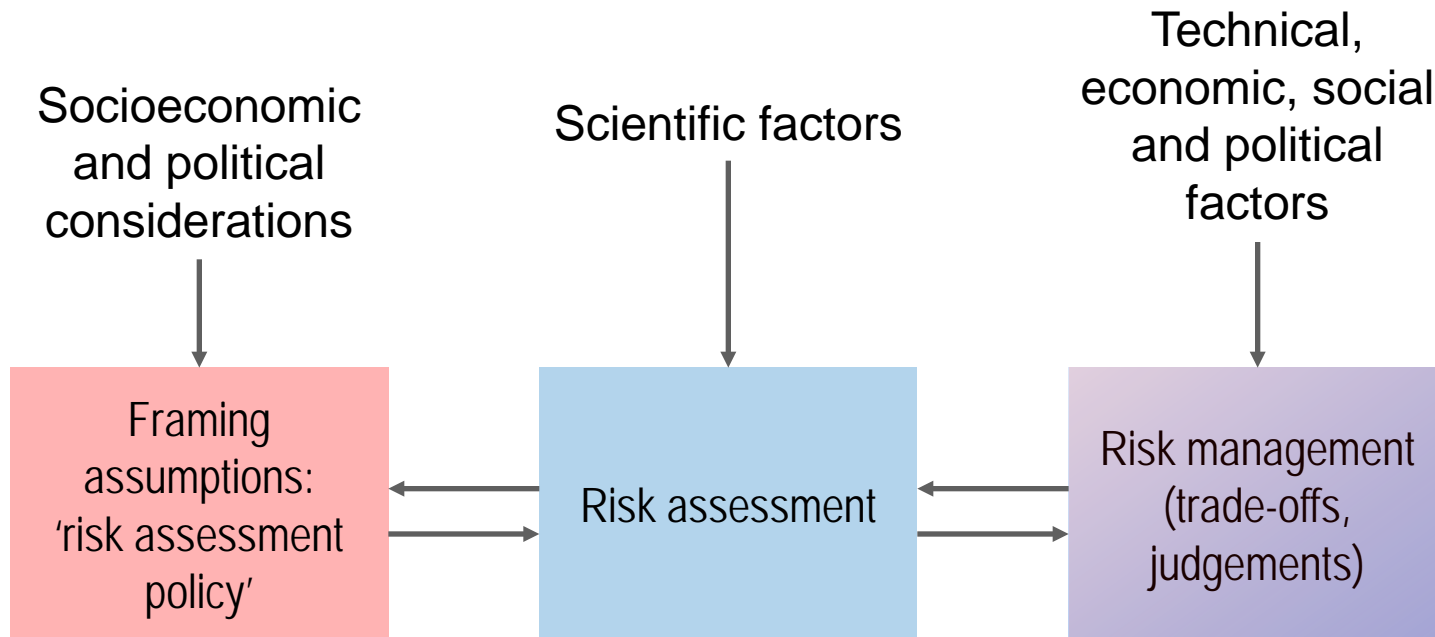Adapted from: Millstone E. Research Policy 2009; 38: 624-636.

Difficulties with the Red Book model

- **Suggests that scientific experts take responsibility for selecting policy ends and goals**
- **Scientific deliberation on risk in a policy-making context never works in a policy vacuum**

Models of role of science in policy: #4

Co-production model:
Political considerations both precede and follow science

Socioeconomic and political considerations

Scientific factors

Technical, economic, social and political factors

Framing assumptions: 'risk assessment policy'

Risk assessment

Risk management (trade-offs, judgements)

Adapted from: Millstone E. Research Policy 2009; 38: 624-636; Gluckman P, 2011

Inputs of disease ecology and pathogen evolution research into the policy process

Inputs to risk assessment

- Forecasting emerging risks

- Measuring size and distribution of impacts

- Identifying and partitioning sources and transmission pathways

- Determining interventions and estimating likely effect

Inputs to risk management

- Deciding on risk management actions

- Consultation with stakeholders: community, industry, international

- Gaining political approval

- Evaluating impact of interventions

The *Campylobacter* example: background

- **High and increasing levels of campylobacteriosis in New Zealand through 1980s-2000s**

- **Epidemiological studies in 1990s showed association with poultry, but with some ambiguous findings**

- **Lack of clarity of relative roles of transmission pathways**

The research initiative

- **Sentinel surveillance site established in Manawatu**
- **Collection of *Campylobacter* isolates from animal reservoirs, vectors, environment, human cases**
- **Systematic subtyping of isolates, followed by mathematical modelling**
- **Estimation of attribution of cases to reservoirs and poultry suppliers**

Research findings
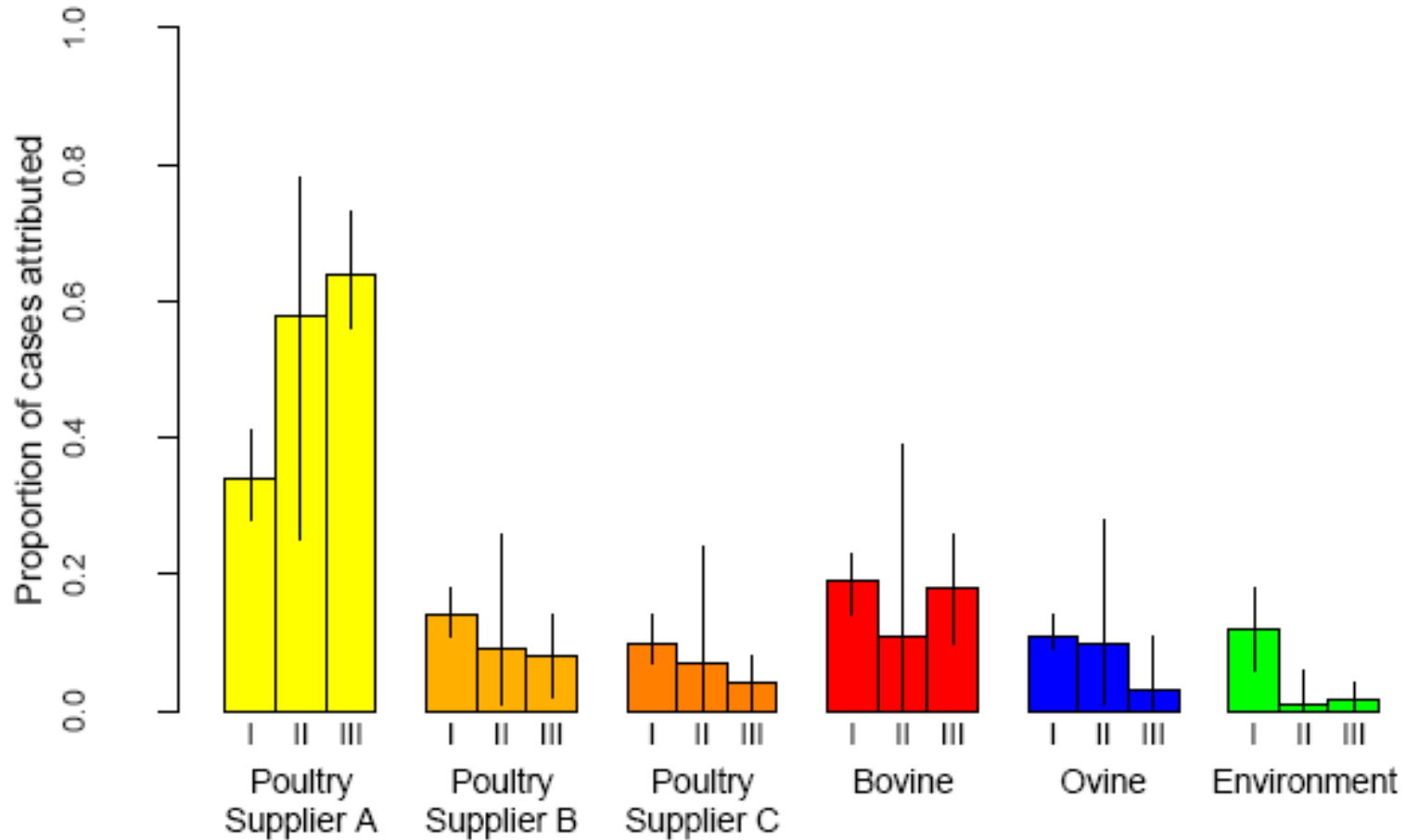
Mullner P, et al. Assigning the source of human campylobacteriosis in New Zealand: a comparative genetic and epidemiological approach. Infect Genet Evol 2009; 9: 1311-9.
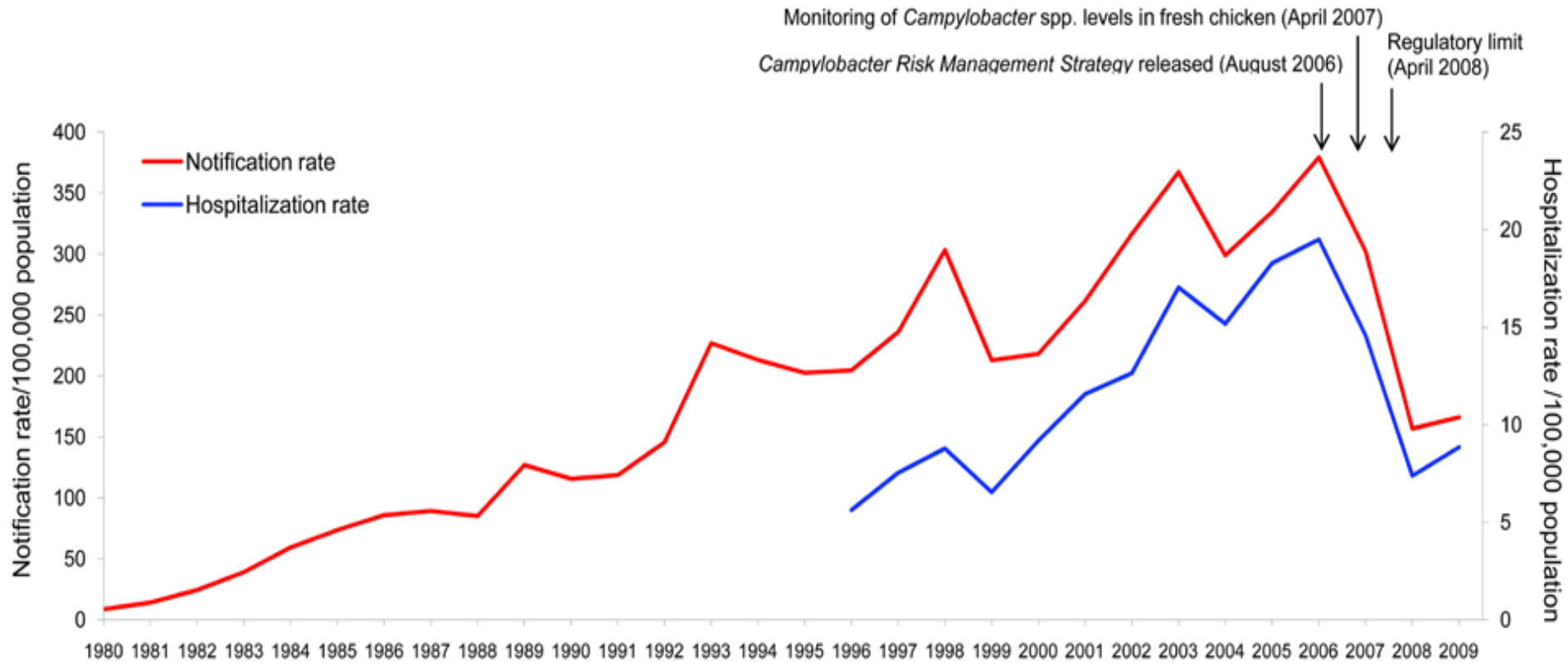
Science input to risk management

"I think at that point we realised that we were […] a big part of the problem …"

Poultry industry representative

"I think one of the realisations for me with [the attribution work] was that it wasn't necessarily outside influences of campy … it was the same strains going round and round […] and that is what lead us to take actions to break the cycle"

Poultry industry representative

Sears A. Campylobacteriosis in New Zealand: Describing the marked decline in notifications in 2007-2008 and discussing its possible causes. Unpublished MPH dissertation. Wellington: University of Otago, 2009.

Outcomes

Sears A, et al. Marked campylobacteriosis decline after interventions aimed at poultry, New Zealand. Emerging Infectious Diseases 2011; Jun: DOI: 10.3201/eid1706.101272

Summary

- **Science is but one contributor to the policy process**

- **Disease ecology and pathogen evolution research can have multiple inputs to both risk assessment and risk management**

- **The campylobacteriosis story is a good example of the value of this research in supporting the entire trajectory of the policy process**

Acknowledgements

Material on science and policy was drawn from writings by Prof Erik Millstone, Sir Peter Gluckman and Roger Pielke Jr

The campylobacteriosis attribution example was drawn from work by Nigel French, Jonathan Marshall, Petra Mullner, Tui Shadbolt, Simon Spencer, Ann Sears, Michael Baker, Steve Hathaway, Donald Campbell, Peter van der Logt, MidCentral Public Health, ^{m}EpiLab, MedLab Central, ESR, PIANZ, and many others.

Dr Craig Thornley, Principal Adviser Public Health, MPI
craig.thornley@mpi.govt.nz

Questions?