



Unpeeling the Analysis Myopia

1st International One Health Congress
14-16 February 2011, Melbourne Convention Centre, Victoria, Australia.

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Warning!!!!

- I'm a practitioner of the dismal science
- I do believe that economics can provide some insights if applied correctly.
 - But there is a lot of badly applied economics

Outline

- Potential limitations on vision
- SPS, economics & One-Health
- The Import Risk Assessment procedure
- Unpeeling the economic myopia
- Concluding comments

So What are the Issues

- Only talking about Australia here! But..
- One health must be aware of issues outside the identified trilogy (human, animals & wildlife)
- Economics could offer some insights but they need to understand the complex issues
 - Lack of people, limited experience & challenge them

Limitations on vision

- How does disease management operate within & how is it influenced by domestic & international policy
- Lets look at Sanitary and Phytosanitary Agreement, Economics & One-Health
 - Apples from NZ.

Sanitary & Phytosanitary Agreement

- SPS when you can *scientifically* prove that the risk of changes in importation policy is unacceptable on economic, environmental or human grounds
- If you can not scientifically prove this risk, then it's deemed a technical barrier to trade

SPS, Economics & One-Health

- Economic issues with SPS & One-Health
- Trade liberalisation (Economic, 1st & 2nd Round)
 - Benefits are predominately private for a few, little public benefits
 - Costs are both private (but generally not the same group who benefited) & public (insurance agent)
 - Issue: Low probability but potentially irreversible outcomes (Risk & Uncertainty)

SPS, Economics & One-Health

- SPS & One-health (Economic, 1st & 2nd Round)
 - Food safety
 - Changes to production systems
 - Impacts on AMR
 - Zoonosis implications
 - Environmental complications
 - Lots of other stuff I don't know about

Economic Limitations

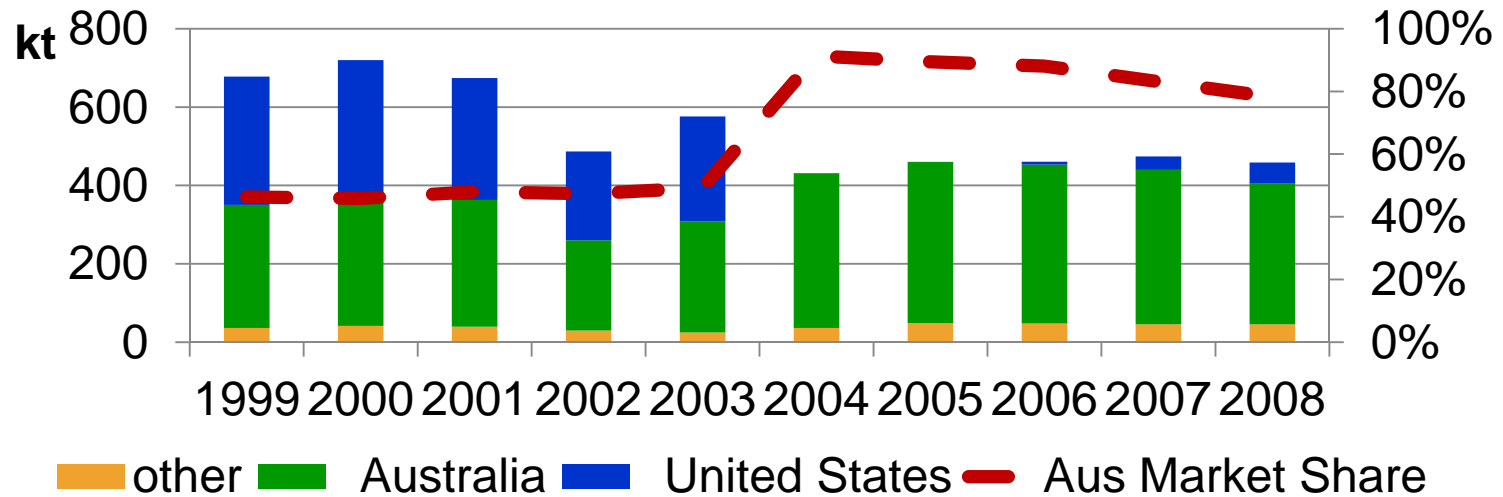
- Application
 - Private (industry reps)
 - Public (few people do this over a long time)
 - Academic (papers not reality)
- Theory
 - Financial impact not return on capital
 - Partial equilibrium (1 disease & 1 commodity)
 - Farming & integrated systems (what are these?)

Risk, Uncertainty & Reality

- Impacts on humans, environment & the economy could range from negligible to catastrophic & irreversible.

How catastrophic?

Total Japanese Beef & Veal Imports by Country



Data Adapted from ABARE 2007, 2009

- USA domestic market

What does it mean for society

- Food safety, CODEX (MRL)
- Chinese melamine milk scandal
 - 6 babies died & 300,000 sick from kidney stones
 - \$200 million in Investment lost
 - This was passed back to NZ dairy producers in reduced prices
- Diseases
 - Vectors (preventing new ones)
 - Single vector all it requires (Dengue fever in NT)
http://www.theaustralian.com.au/national-affairs/lone-mozzie-blamed-for-dengue/story-fn59niix-1225909616089?from=public_rss
 - Diseases themselves (bird flu & swine flu)

Environmental Impacts

- Sharp & sudden species shock:
 - Geographical isolation = no natural resistance
 - Pilchards (1995, 1998) (60% of stocks in SA & WA)¹
 - Future resilience to other shocks
- Eradication not always possible
- Costs (\$ = ????????, biodiversity loss)

¹ <http://www.environment.gov.au/soe/2001/publications/theme-reports/coasts/pubs/part06.pdf>

NZ Apples, Fireblight & System

- Streptomycin used to control Fireblight
- Streptomycin deregistered for use in ag in 1999
- Why? Japanese market rejection of beef in 1991
- If fireblight breaks out in Aus, emergency provision to use streptomycin

Antibiotics Animal & Humans

- JETACAR report 1999
- Agricultural antibiotics are of low importance for humans (not perfect)
 - ceftiofur: a 3rd generation cephalosporins
- Infections in Aus hospitals cost \$1B/yr
 - AMR is @ least \$250 m/yr

Zoonosis & AMR

- C. difficile: two detections in Aus last year (Melbourne & Sydney)
- How we use antimicrobials in humans & animals could affect
 - Wildlife
 - international markets
 - Social change

Systems & Pest Management

- Pest Management 101
- Economic Injury v Economic Thresholds
 - Stern *et al.* (1959): Injury = point at which pests start causing impact
 - Headley (1972): Threshold = point at which cost of control equal benefit from control
- Carlson (1970): Pay off matrix = states of nature

Systems & Pest Management

- Greater understanding of issues
 - When we tweak something there is a flow on
 - CODEX, MRL levels
 - Greater info better the decision (negate externalities)
- Removal of quarantine benefits a group
- A biosecurity outbreak impacts on individual, society, environment. So who pays?

State Contingent Approach

- States are a mutually exclusive set of descriptions used to detail an issue ($s = 1..n$)
- This specification negates uncertainty
- Specify management response to disease outbreak
- Can collapse states dependent upon management options

State Contingent SPS

- Issue here is biosecurity/food safety issue
 - Binary choice Yes/No.
- If No, then Benefits of trade liberalisation are.
- If yes, can apply Carslon (1970) pest management payoff matrix.
 - Management response (i.e. eradication v control) subject to biosecurity state of nature (distribution and density)

IRA Pay off Matrix

Distribution \ Density	Density		
	Low	Medium	Endemic
No Entry	\$100		
Local	\$100	\$50	\$30
Regional	\$20	-\$50	-\$80
National	\$0	-\$100	-\$200

- Really needs to head towards stochastic description of states

IRA Pay off Matrix

Distribution \ Density	Density		
	Low	Medium	Endemic
No Entry	40%		
Local	2%	5%	1%
Regional	5%	15%	5%
National	5%	13%	9%
Annual Value of Decision			\$3.3

Communication Vital

<http://www.news.com.au/couriermail/story/0,23739,22435449-953,00.html>
September 18, 2007 12:00am



Conclusion

- Lack of a consistently applied IRA procedure with economics that keeps failing to explain risk & uncertainty
- Little economic input into this area, could have significant issues in One-Health but...
- Have to understand system to unpeel the myopia
 - Domestic & international