

# **Anticipating extreme crises and disruptions: Developing a National Risk Management Strategy**

ANU Institute for Climate, Energy & Disaster Solutions - April 13

Dr Paul Barnes

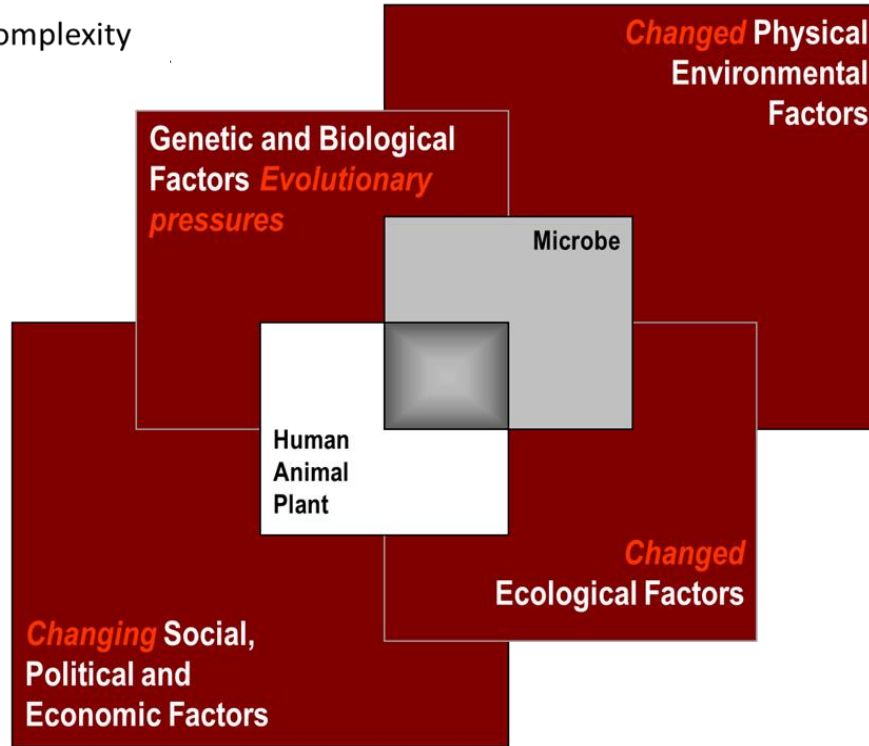


## Challenges of *thinking about* Risk

- Complexity
- Uncertainty
- Ambiguity

Misc. support images

**Biological Complexity**



Smolinski, M.S., Hamburg, M.A. & Lederberg, J. (Eds.)(2003

# Critical Questions about disruptive events

**What could happen?**

**How might [they] happen?**

**How might impacts be mitigated?**

# Definition of Risk (ANZS ISO 31000 )

[The] **effect of uncertainty on objectives**

But...

- **NOTE 1:** An effect is a deviation from the expected positive and/or negative.
- **NOTE 2:** Objectives can have different aspects (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product and process).
- **NOTE 3:** Risk is often characterized by reference to potential events and consequences or a combination of these.
- **NOTE 4:** Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood of occurrence.
- **NOTE 5:** Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of an event, its consequence, or likelihood.

# Challenge: Options for when data or explanatory frameworks don't help

		Knowledge about <u>Outcomes</u>		
		Continuum of Outcomes	Discrete set of Outcomes	Outcomes Poorly Defined
Knowledge about <u>Likelihoods</u>	Firm basis for Probability	Frequentist Distribution Functions	Discrete Frequentist Probabilities	<b>Ambiguity</b> Fuzzy Logic Sensitivity Analysis
	Shaky basis for Probability	Bayesian Distribution Functions	Discrete Bayesian Probabilities	
	<u>No</u> basis for Probability	<b>Uncertainty</b> <i>Scenario Analyses</i>		<b>Ignorance</b> <i>Apply Precaution</i>

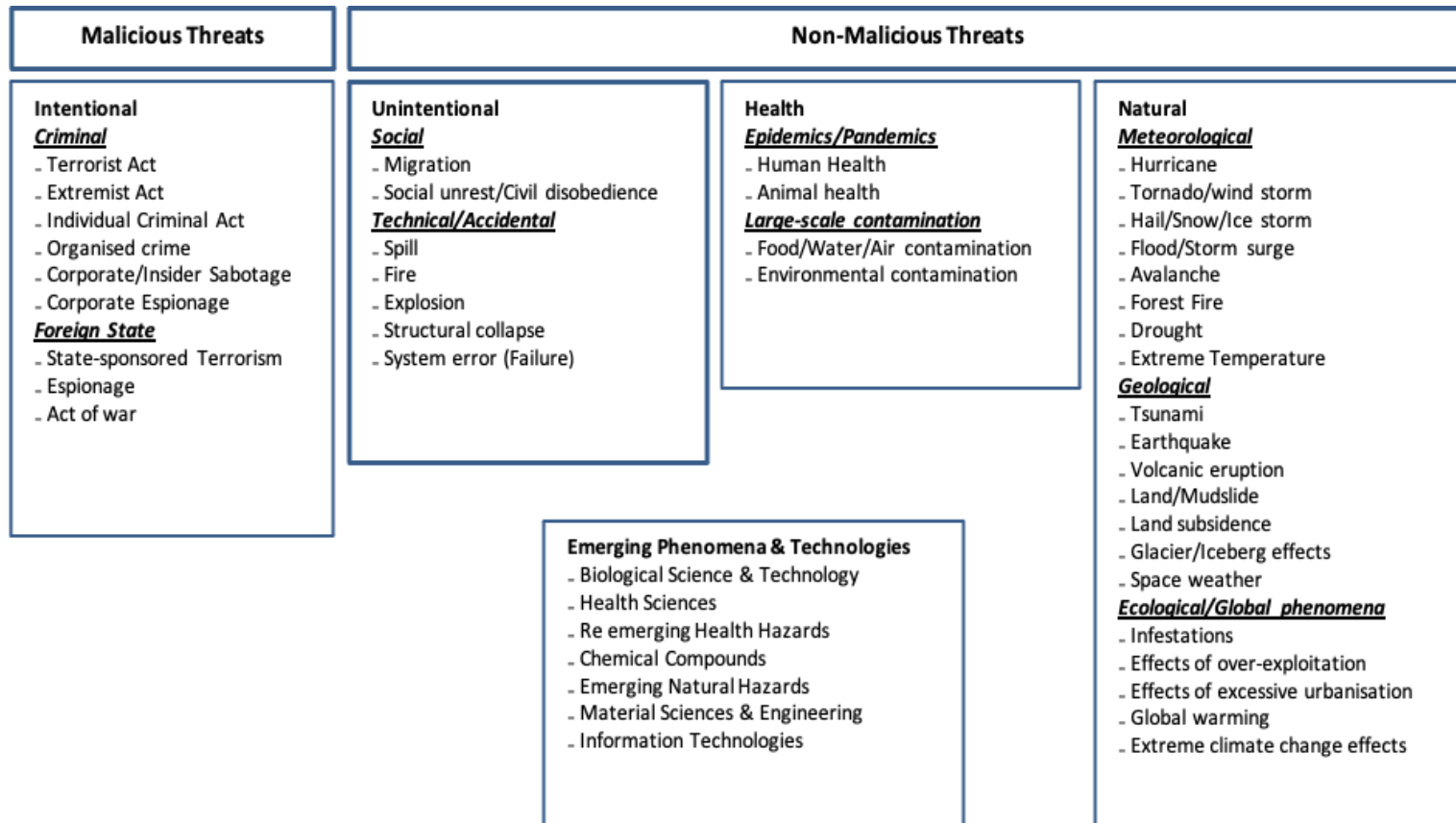
Andrew Stirling, A. (1999) On Science and Precaution, in the Management of Technological Risk, European Commission - JRC Institute Prospective Technological Studies Seville, European Commission Joint Research Centre, EUR 19056 EN.

## Seven practical application areas for *Risk* ..

	Actuarial	Toxicology Epidemiology	Probabilistic RA	Economics	Psychology	Social Theories	Cultural Theories
Base Unit	Expected Value	Modelled Value	Synthesised Expected Value	Expected Utility	Subjective Expected Value	Perceived fairness & Competence	Shared Value
Prime Method	Extrapolation	Experiments Statistics	Event & Fault Tree Analysis	Risk Benefit Analysis	Psychometrics	Surveys - Structured Analysis	In-depth Interpretive
Scope of Concept	Universal	Health & Environment	Safety, Construction Engineering	Universal	Individual Perceptions	Social Interests	Cultural Clusters
Major Application	Insurance	Health & Protection of Environment	Safety Engineering	Decision Making	<ul style="list-style-type: none"> <li>• Policy Making &amp; Regulations</li> <li>• Conflict Resolution (Mediation)</li> <li>• Risk Communication</li> </ul>		
General Function	Risk Sharing	<b>Early Warning</b>		Resource Allocation	Individual Assessment	Fairness, equity, societal acceptance	Cultural Identity
		Standard Setting	Improving Systems				
Social Function	Assessment		Risk Reduction & Policy Selection (Coping with Uncertainty)		Political Legitimation		



# Challenge: What should we be worried about?



## So what might a Risk Mgt Strategy enable Australia to do?

Mintzberg\* suggested in 1994 that strategic thinking is more about **synthesis** - *connecting the dots* - than **analysis** - *finding the dots*.

... strategy as a pattern in a stream of decisions .. with .. plans developed for the future .. linked with .. evolved patterns out of the past

Revisiting an earlier idea ...

### What could happen?

- Has it happened before? Under what conditions could [it] happen again?

### How might [they] happen?

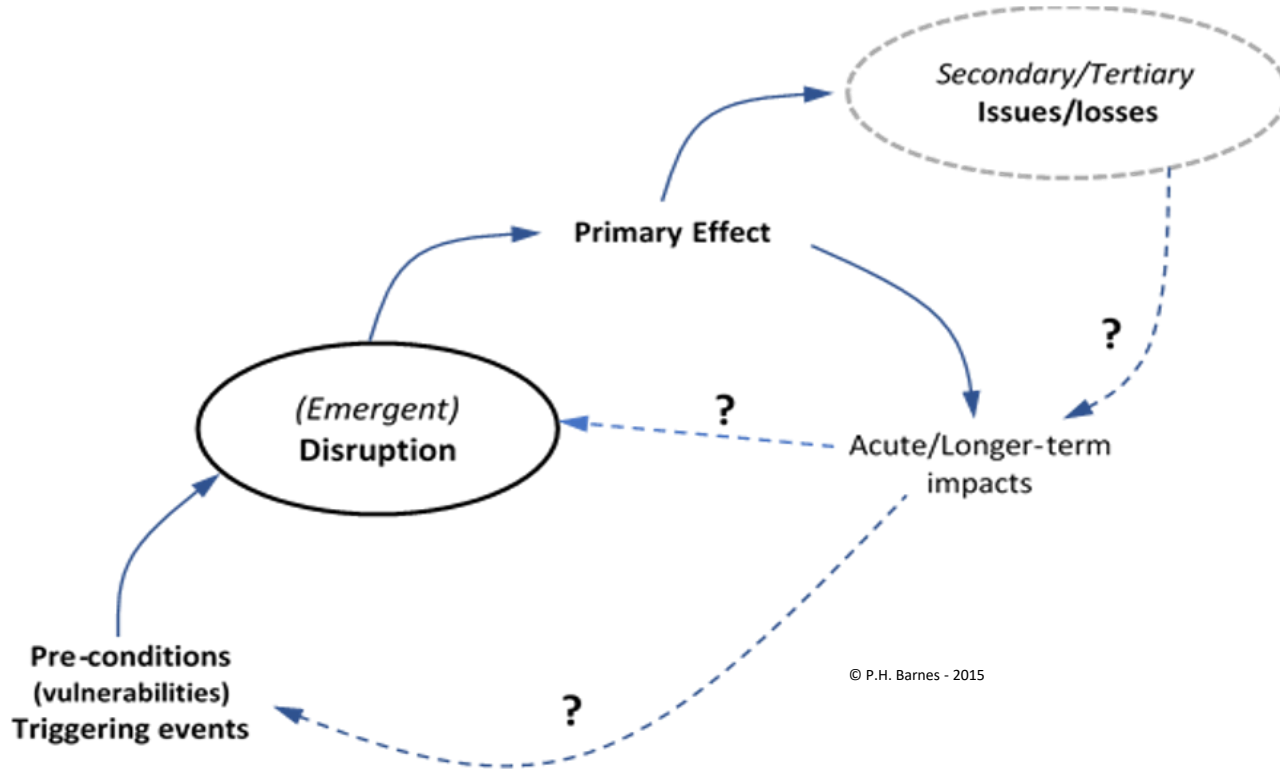
- Do direct or in-direct causal conditions exist that increase a likelihood soon or in the future?

### How might impacts be mitigated?

- Are the skills required for intervention understood?

- Are the required capability & capacities known (know-able) & accessible?

# Cascading & Cumulative Impacts



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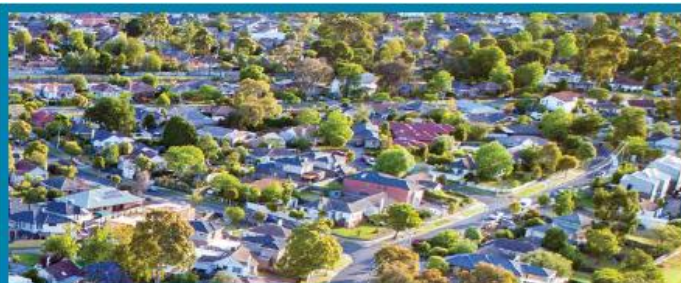


## STRONG AND SECURE

A Strategy for Australia's National Security



Australian Government  
Department of the Prime Minister and Cabinet



## National Disaster Risk Reduction Framework

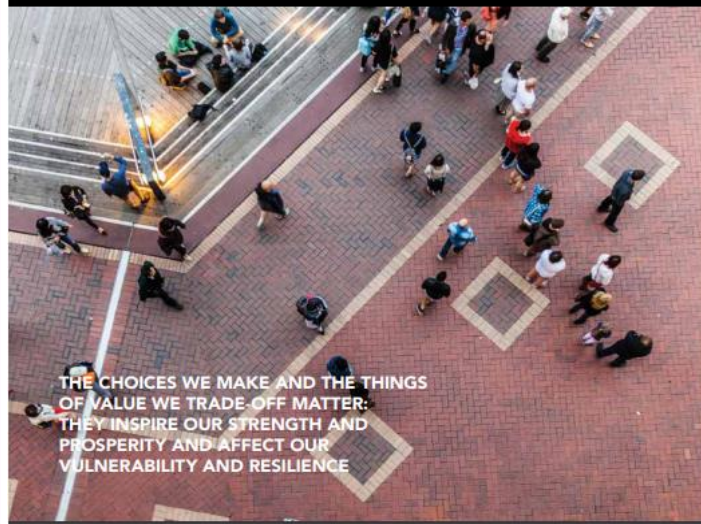


National Resilience Taskforce



## PROFILING AUSTRALIA'S VULNERABILITY

The interconnected causes and cascading effects of systemic disaster risk



THE CHOICES WE MAKE AND THE THINGS OF VALUE WE TRADE-OFF MATTER: THEY INSPIRE OUR STRENGTH AND PROSPERITY AND AFFECT OUR VULNERABILITY AND RESILIENCE

# What can be learned from International practices ?



Cabinet Office

## National Risk Register Of Civil Emergencies

2017 edition



National Risk Register

1



## National Risk Assessments

A CROSS COUNTRY PERSPECTIVE



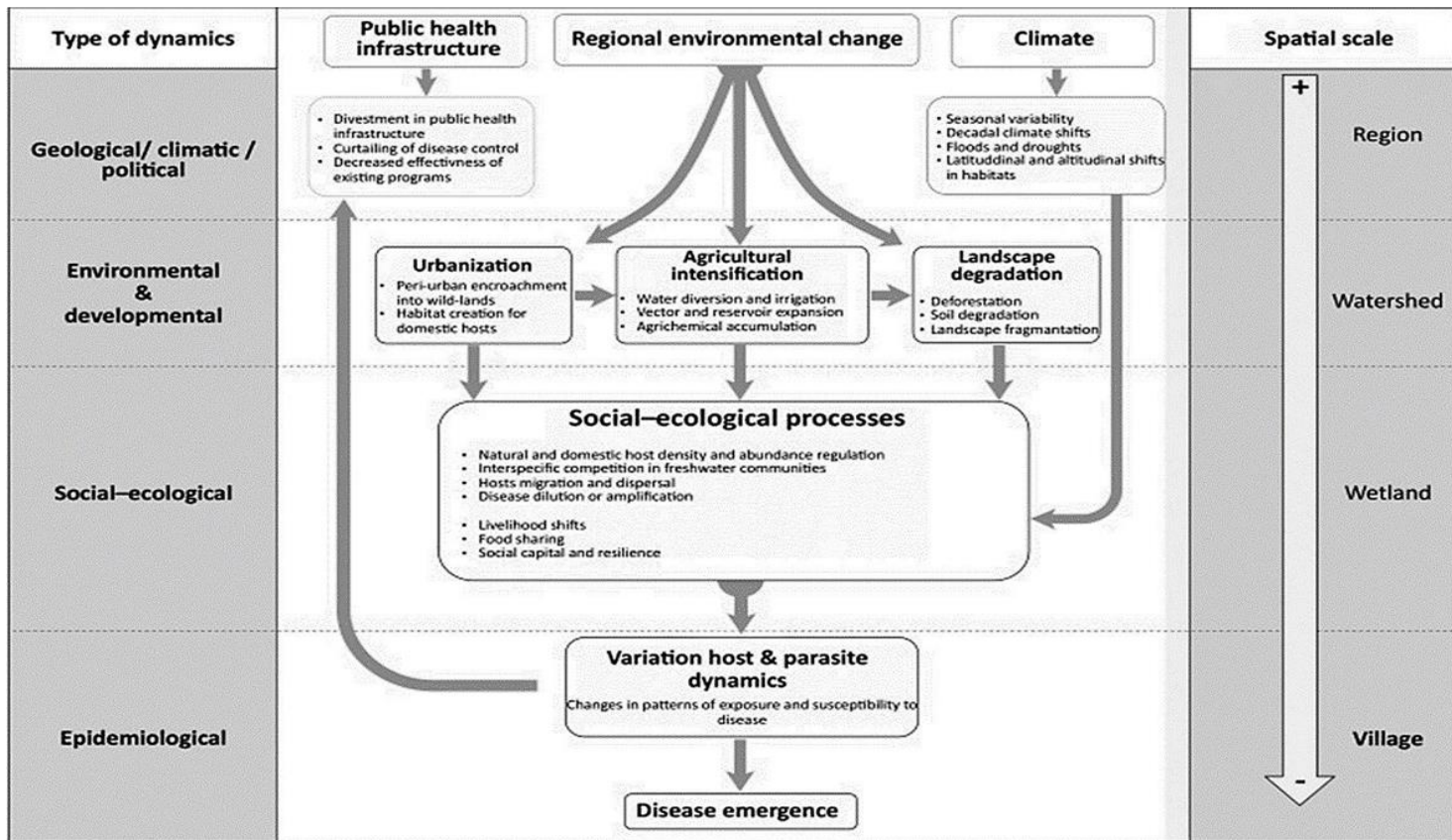
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# An International Snap-shot of national-level practice

<b>Economy (Institution)</b>	<b>Standardised Threat /Incident Taxonomies</b>	<b>Horizon-scanning (Foresight) Techniques</b>	<b>Impact Frames (Trans-National National &amp; Regional)</b>	<b>All Hazards (Threat Sources) Approach</b>
<b>Singapore</b>		****	<i>Mega-city Scale</i>	
<b>United Kingdom</b>	**	** In Cabinet Office & Office of Chief Scientist		**
<b>Germany</b>		Focus on Impact Analysis	<i>GIS (Reliant on State data)</i>	
<b>Canada</b>	****	** Risk Analysis & Capability Development		**
<b>Netherland</b>				
<b>Switzerland</b>		** In Chancellor's Office		
<b>OECD *</b>		**	<i>Global</i>	
<b>International Risk Governance Council *</b>			<i>Global</i>	
<b>World Economic Forum *</b>		** Networked Experts	<i>Global</i>	

Barnes, P. & Ungerer, C. (2009) *A comparative assessment of risk-based methods used in national security planning*. Commissioned Report, Australian Strategic Policy Institute.

# We need to synthesise thinking



Sripa, Banchob et al. (2017) "Prospects and Challenges towards Sustainable Liver Fluke Control," in Trends in Parasitology , Volume 33 , Issue 10 , 799 - 812

Trends in Parasitology

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## (National) Risk Management Practice

An overall goal of effective and enhanced risk assessment - as part of a National approach - is arguably to strengthen capability to make timely and appropriate decisions under variable degrees of uncertainty.

Additional value:

- To contextualise futures thinking and coordinated choices at whole-of-economy level
- To inform decisions on where we invest in preparation, planning and mitigation against future disruptions
- To create contestable policy options across threat landscapes (agricultural security, border security, counter-terrorism, food security, energy, climate change etc.

We need to change our thinking to appreciate:  
**complexity, ambiguity & the potential for sudden change**

<b>From</b>	<b>To</b>
Threat-specific	Multi-Hazard Scenarios: linked to <b><i>(Tasks &amp; Capabilities)</i></b>
Limited Scale	Multi-scale (Town-City-Region-State-Nation) <b><i>(Joined up thinking)</i></b>
Adhoc Assessment	Systematic Impact Assessment <b><i>(Vulnerabilities)</i></b>
Responsibilities	Functional Requirements <b><i>(Continuity &amp; Recovery)</i></b>
Re-action	Pro-action <b><i>(Anticipation of near &amp; future impacts &amp; collaboration)</i></b>
Fit-for-Purpose	Flexibility <b><i>(Thought &amp; action)</i></b>

# Thanks