



# EVIDENCE BASED HEALTH RISK MANAGEMENT

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Inspector of Mines  
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DNRM

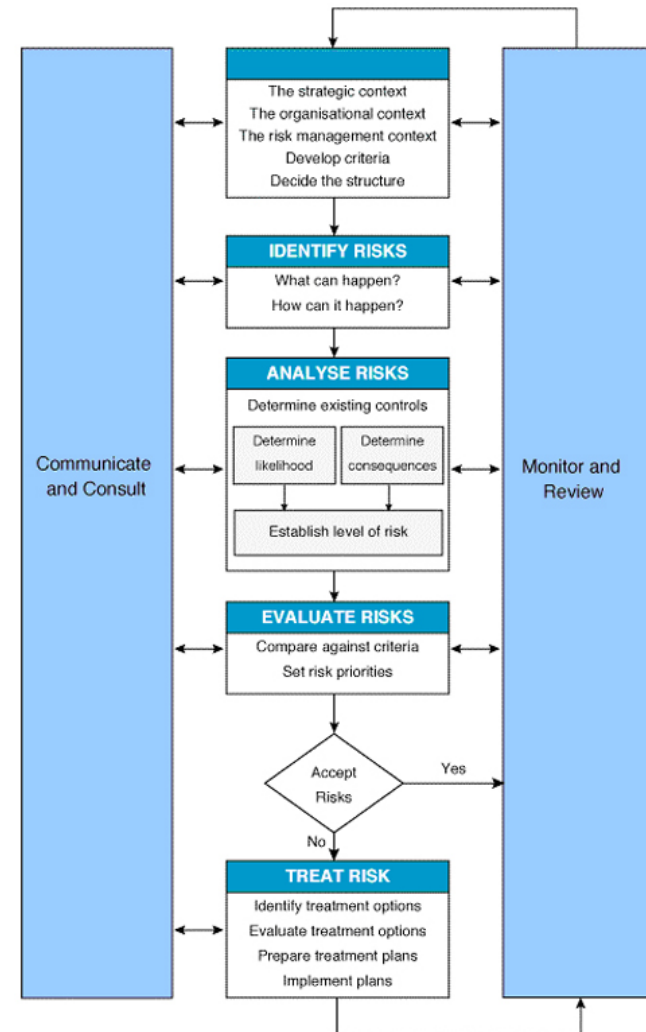
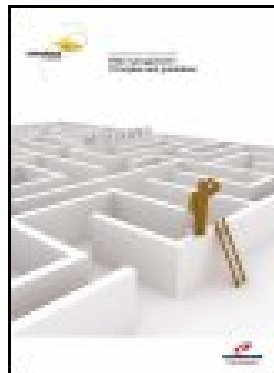
# OVERVIEW

- Current approach to risk management in Australia
- Context- perspective, data, numbers
- Occupational health/ environmental health approach to health risk management
- Why do we have a problem with evidence based health risk assessment?
- What can we do better?

# CURRENT APPROACH



## Risk management— Principles and guidelines



# AS/NZ ISO Standard 31000 (2009)

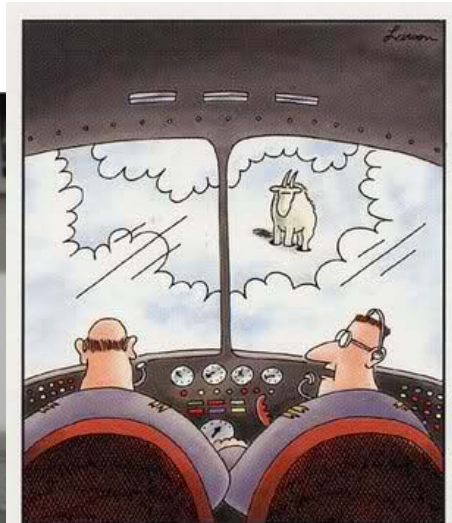
“An **essential** preliminary step to assessing the risk is establishing the context. This articulates the organization’s objectives and the internal and external factors that give rise to risk and can affect how risks are treated. It also aids the development of criteria against which risks will be evaluated. For any particular risk assessment, establishing the context also—

- clarifies the exact scope and purpose of the risk assessment activity;
- identifies the relevant stakeholders; and
- provides a structure for subsequent risk assessment”

# CONTEXT – according to the Oxford Dictionary

Is the **circumstances** that form the **setting** for an event, statement, or idea, and in terms of which it can be fully understood

Synonyms include: **background**, **perspective**, **environment**, framework

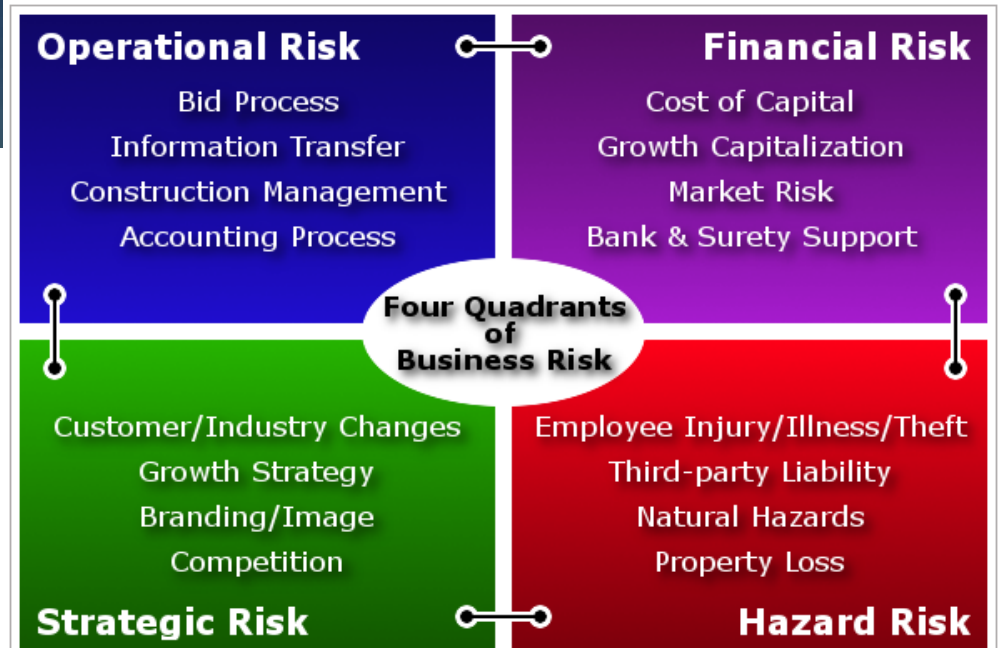
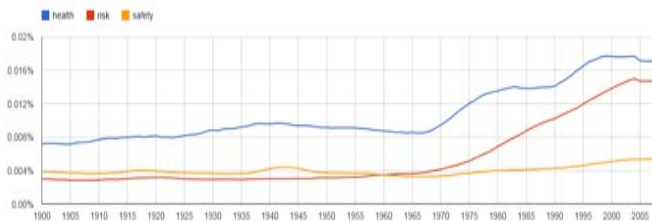
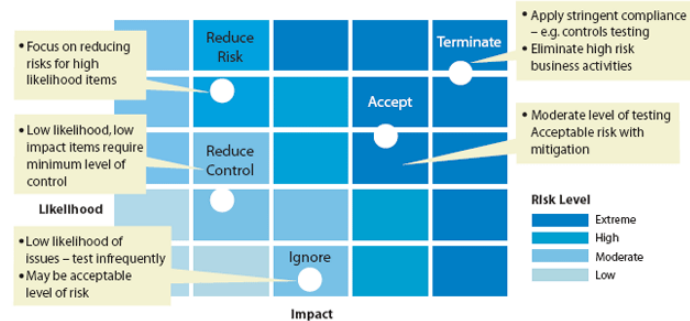


"Say ... what's a mountain goat doing way up here in a cloud bank?"





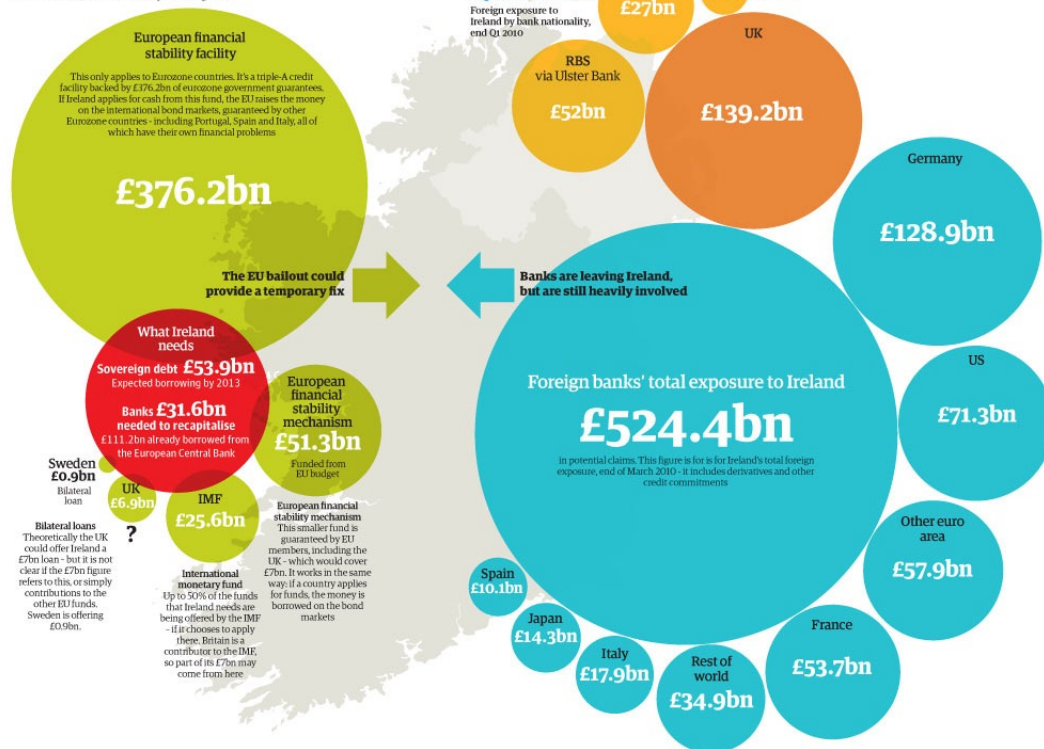
# WHAT DO WE MEAN BY RISK?



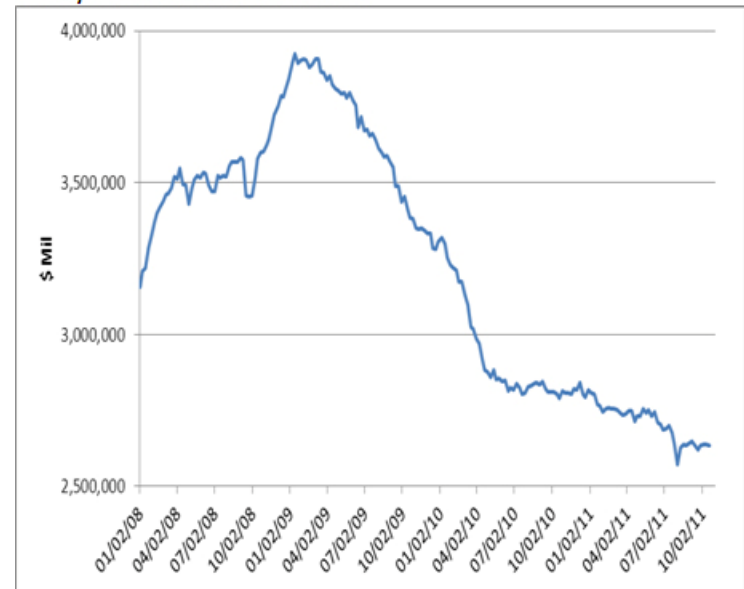
# Is there a 'reward' for getting financial risk assessment wrong?

## How will Ireland get its bailout?

The EU bail-out, where the money is coming from



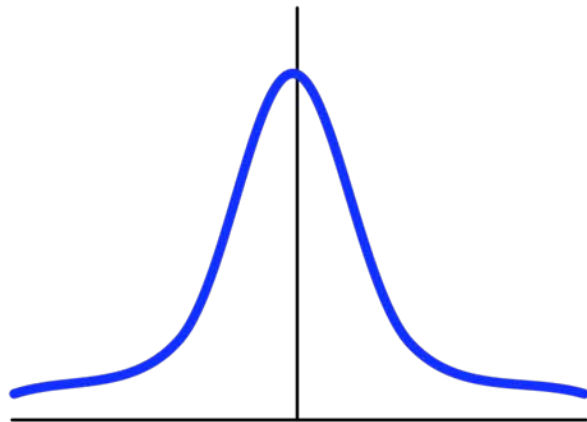
## Money Market Mutual Fund Assets



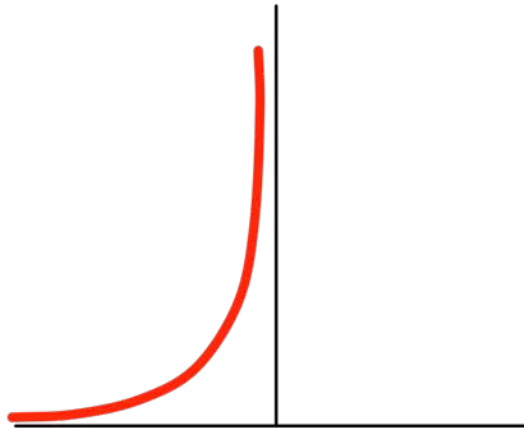
Source: Investment Company Institute.



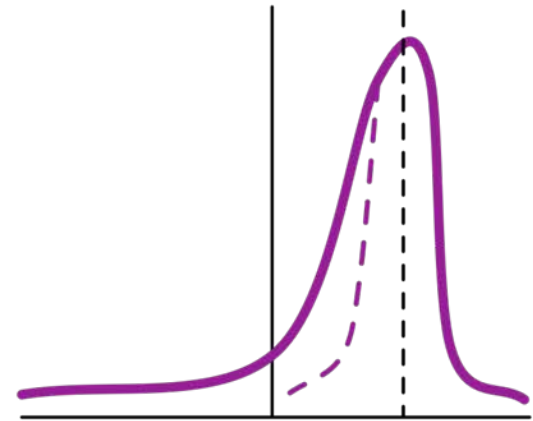
# Is there a 'reward' for getting safety risk assessment wrong?



Market Risk

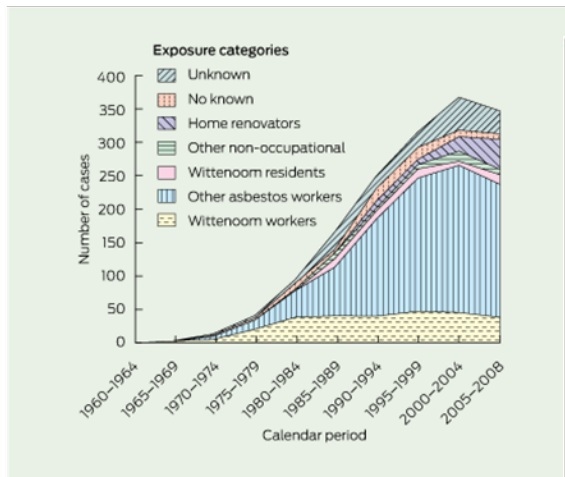


Safety Risk



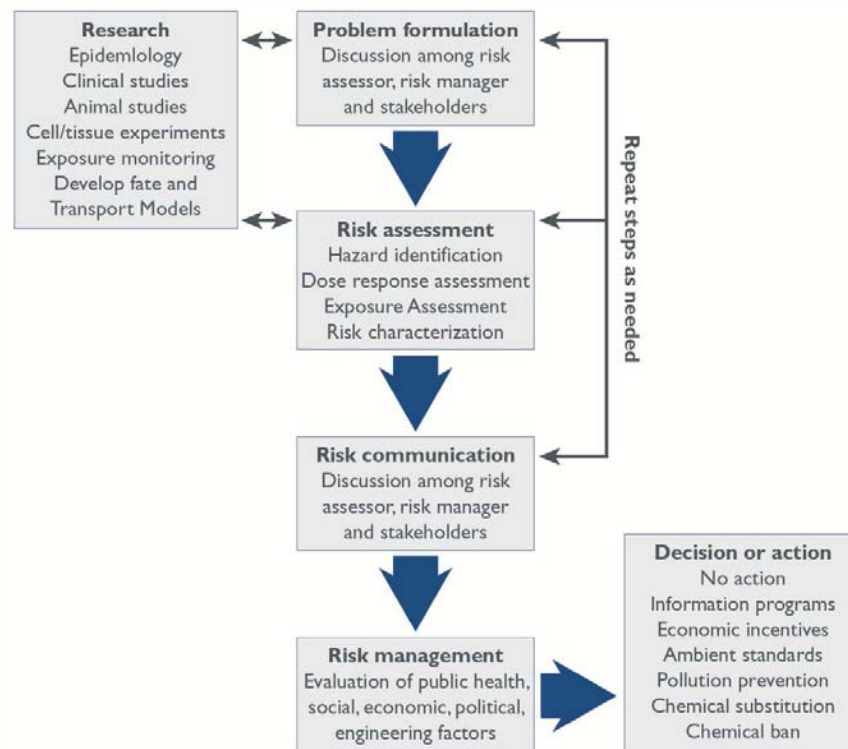
Project Risk

# Are we all looking at risk in the same way?



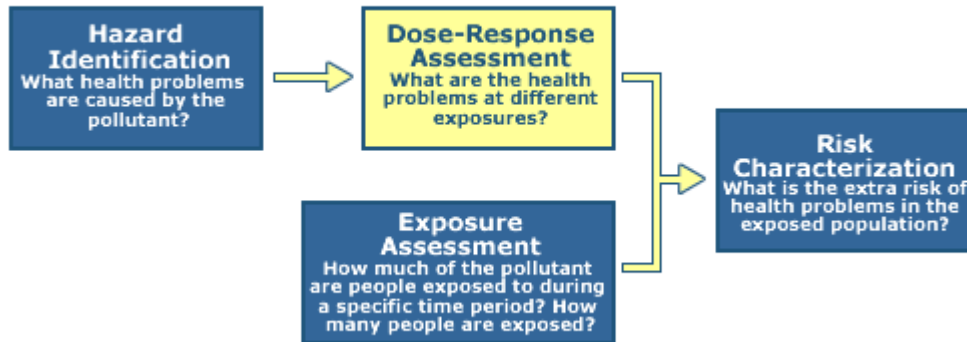
Asbestos exposure and number of cases

Med J Aust 2011; 195 (5): 271-274

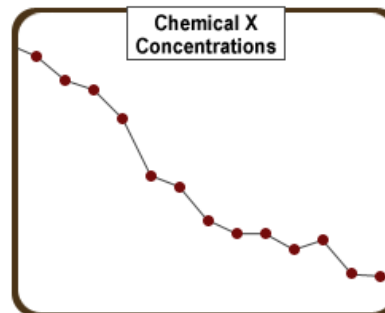
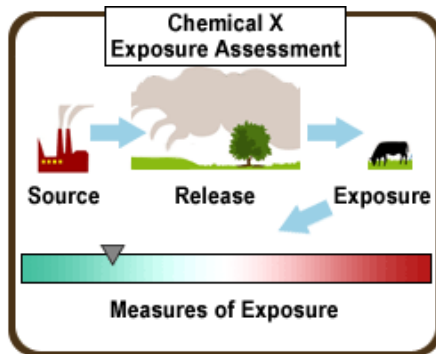


# Are we all looking at risk in the same way?

## The 4 Step Risk Assessment Process



$$\text{RISK} = \text{EXPOSURE} \times \text{TOXICITY}$$



<http://www.in.gov/idem/4144.htm> and [http://www.epa.gov/risk\\_assessment/health-risk.htm](http://www.epa.gov/risk_assessment/health-risk.htm)

# Are we *all* looking at risk in the same way?

An HRA is generally a cyclical and iterative process rather than a simple linear one.  
An HRA is generally made up of the following steps:

1	Identify the health hazards and their harmful health effects
2	Identify the exposed individuals and groups (i.e. Similar Exposure Groups) <sup>6</sup>
3	Identify the processes, tasks and areas where hazardous exposures could occur
4	Assess, measure or verify the exposures
5	Analyze the effectiveness of existing control measures
6	Analyze the potential health risks of the hazardous exposures (e.g. compare against occupational exposure limits)
7	Prioritize the health risks (high, medium and low)
8	Anticipate potential new and emerging health risks
9	Establish a risk register
10	Set priorities for action
11	Develop, implement and monitor a risk control action plan or review existing risk control action plan
12	Maintain accurate and systematic records of the HRA or amend existing Risk Control Action Plan and use alternative and/or additional control measures
13	Review and amend at regular intervals or earlier if changes to processes or new developments are proposed

<sup>5</sup> International Council of Metals and the Environment. (2001). Risk assessment and risk management of non-ferrous metals: realizing the benefits and controlling the risks.

Good Practice Guidance on  
Occupational Health Risk  
Assessment

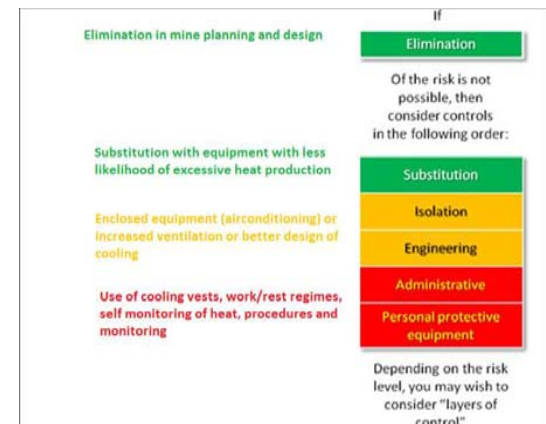
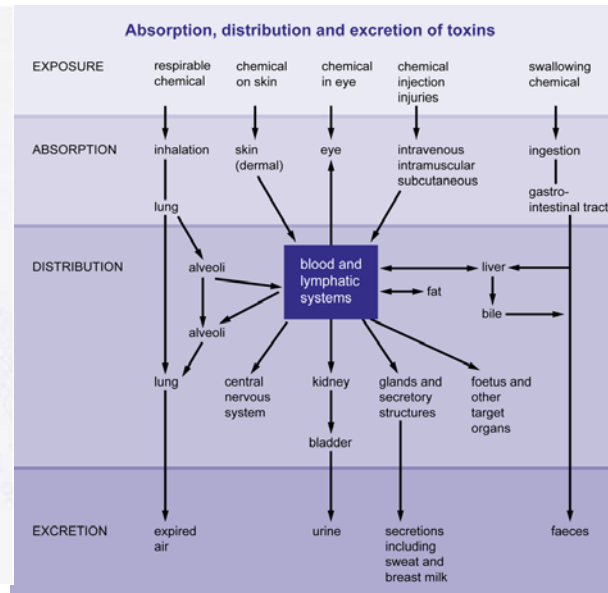
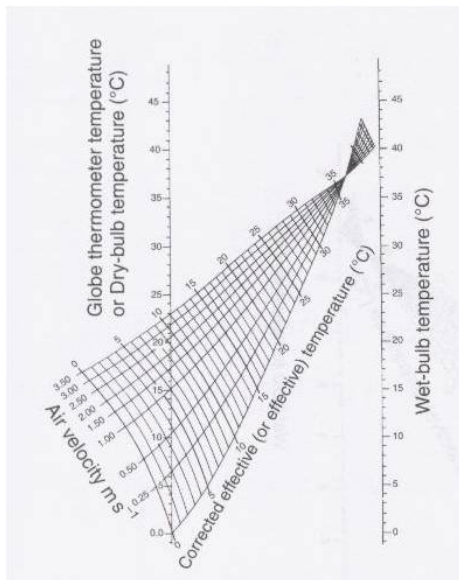


Are we **all** looking at risk in the same way?





# EXAMPLES OF AN OCCUPATIONAL HEALTH APPROACH TO MINING HEALTH ASSESSMENT



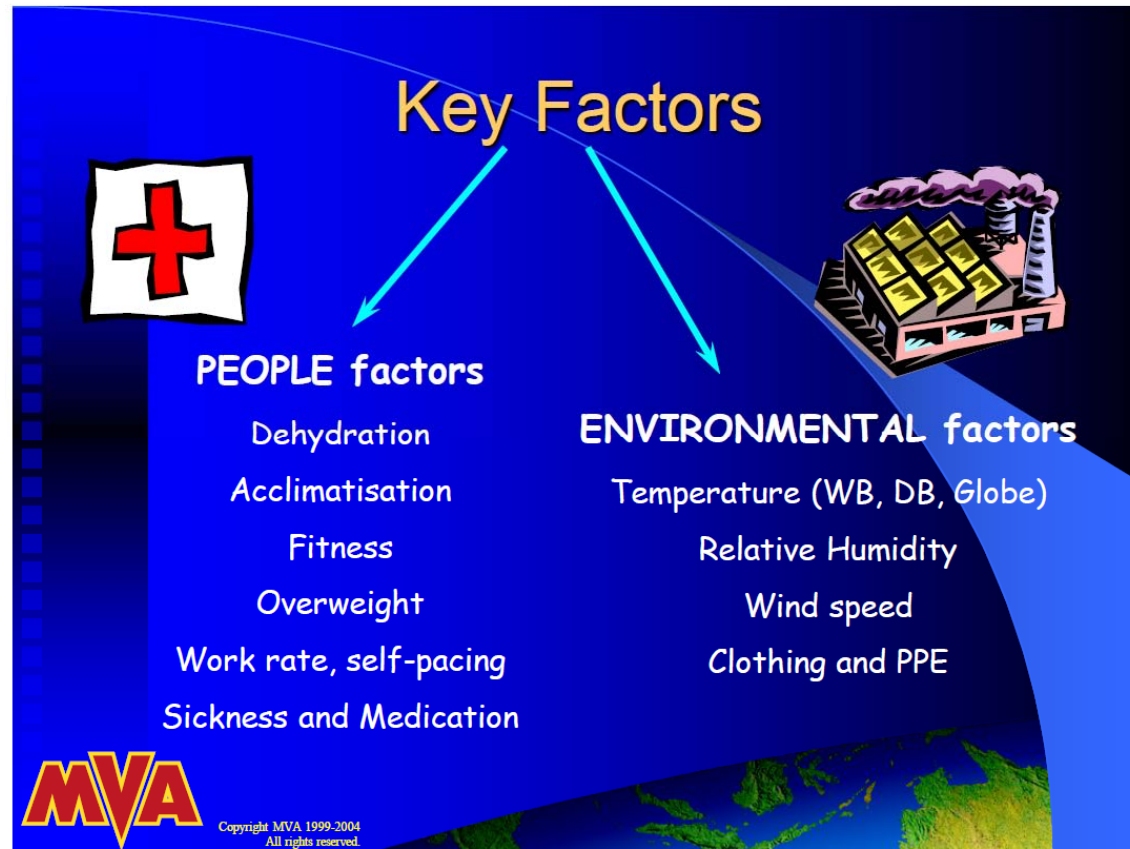
# **Standards and other accepted approaches to health risk management: Heat**

**ISO 7243:1989: Hot environments -- Estimation of the heat stress on working man, based on the WBGT-index (wet bulb globe temperature)**

**ISO 7933:2004 Ergonomics of the thermal environment -- Analytical determination and interpretation of heat stress using calculation of the predicted heat strain**

**AIOH (2003): Heat Stress Standard & Documentation Developed for Use in the Australian Environment**

# Risk factors? PEOPLE FACTORS?



From presentation by Dr Rick Brake, November 2011

# Heat/thermal risk assessment

RioTinto

Basic Thermal Risk Assessment						
(Reproduced from AI/OH Heat Stress Standard & Documentation For Use In Australian Environment March 2003)						
Hazard Type	Assessment Point Value					
	Value = 1	"1"	Value = 2	"1"	Value = 3	"1"
Hot Surfaces	Contact Neutral	1	Hot On Contact	0	Burn on Contact	0
Exposure Period	< 30 min	0	30 min - 2 hours	1	> 2 hours	0
Confined Space	No	0		0	Yes	1
Task Complexity	Simple	1	Moderate	0	Complex	0
Climbing, Ascending, Descending	None	0	Moderate	1	Significant	0
Distance from cool rest area	< 50 metres	0	50 - 100 metres	0	> 100 metres	1
Distance from drinking water	< 30 metres	1	30 - 50 metres	0	> 50 metres	0
Clothing (permeable)	Single Layer (light)	1	Single Layer (mod)	0	Multiple Layer	0
Understanding of Heat Strain Risk	Training Given	1		0	No Training Given	0
Air Movement	Windy	0	Some wind	1	No Wind	0
Respiratory Protection (neg. press)	None	1	Half Face	0	Full face	0
Acclimatisation	Acclimatised	0		0	Unacclimatised	1
		6		6		9
SUB-TOTAL "A"		21				
Metabolic Work Rate	Assessment Point Value (Select one only)					
	Value = 2	"1"	Value = 4	"1"	Value = 6	"1"
Left click on yellow cell for Examples	Light	0	Moderate	1	Heavy	0
		0		4		0
SUB-TOTAL "B"		4				
WBGT	Assessment Point Value (Select one only)					
	Value = 1	"1"	Value = 2	"1"	Value = 3	"1"
Wet Bulb Globe Temperature (Deg Celsius)	< 24	0	> 24 and <= 27	1	> 27 and <= 30	0
		0		2	> 30	0
SUB-TOTAL "C"		2				
TOTAL Assessment Value (A+B)xC		50				
<p>If the total is less than 25 then the risk due to thermal conditions are low to moderate.</p> <p>If the total is 25 to 55 there is a potential of heat induced illnesses occurring if the conditions are not addressed.</p> <p>If the total exceeds 55 then the onset of a heat induced illness is very likely and action should be taken as soon as possible.</p> <p>It is important to note that this assessment is to be used as a guide only.</p> <p>A number of factors are not included in this assessment such as employee health condition and the use of high levels of PPE (particularly impermeable suits). In these circumstances experienced personnel should carry out a more extensive assessment.</p>						

From presentation by Ross Di Corletto, November 2011



# WHY DO WE HAVE PROBLEMS WITH EFFECTIVE HEALTH RISK MANAGEMENT



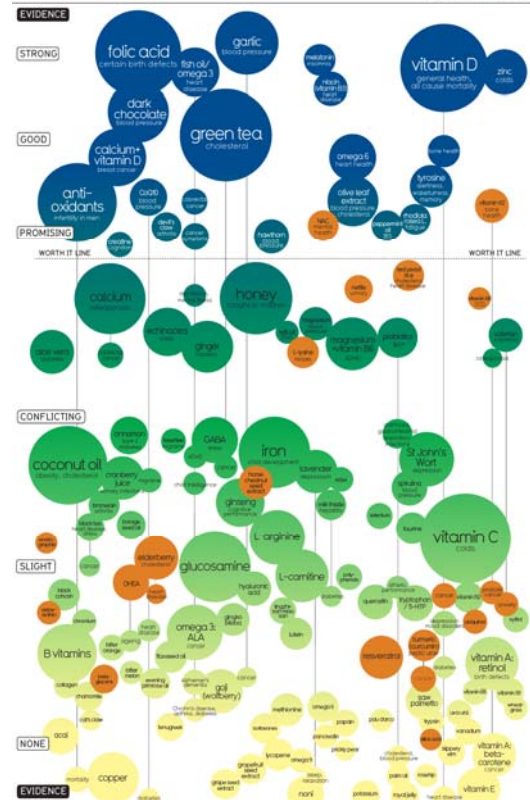
## Chapters

Chapters	Pages
1. Introduction	1-10
2. The OHS Body of Knowledge	11-15
3. The OHS Body of Knowledge: A Framework	16-20
4. The OHS Body of Knowledge: A Framework	21-25
5. The OHS Body of Knowledge: A Framework	26-30
6. The OHS Body of Knowledge: A Framework	31-35
7. The OHS Body of Knowledge: A Framework	36-40
8. The OHS Body of Knowledge: A Framework	41-45
9. The OHS Body of Knowledge: A Framework	46-50
10. The OHS Body of Knowledge: A Framework	51-55
11. The OHS Body of Knowledge: A Framework	56-60
12. The OHS Body of Knowledge: A Framework	61-65
13. The OHS Body of Knowledge: A Framework	66-70
14. The OHS Body of Knowledge: A Framework	71-75
15. The OHS Body of Knowledge: A Framework	76-80
16. The OHS Body of Knowledge: A Framework	81-85
17. The OHS Body of Knowledge: A Framework	86-90
18. The OHS Body of Knowledge: A Framework	91-95
19. The OHS Body of Knowledge: A Framework	96-100
20. The OHS Body of Knowledge: A Framework	101-105
21. The OHS Body of Knowledge: A Framework	106-110
22. The OHS Body of Knowledge: A Framework	111-115
23. The OHS Body of Knowledge: A Framework	116-120
24. The OHS Body of Knowledge: A Framework	121-125
25. The OHS Body of Knowledge: A Framework	126-130
26. The OHS Body of Knowledge: A Framework	131-135
27. The OHS Body of Knowledge: A Framework	136-140
28. The OHS Body of Knowledge: A Framework	141-145
29. The OHS Body of Knowledge: A Framework	146-150
30. The OHS Body of Knowledge: A Framework	151-155
31. The OHS Body of Knowledge: A Framework	156-160
32. The OHS Body of Knowledge: A Framework	161-165
33. The OHS Body of Knowledge: A Framework	166-170
34. The OHS Body of Knowledge: A Framework	171-175
35. The OHS Body of Knowledge: A Framework	176-180
36. The OHS Body of Knowledge: A Framework	181-185
37. The OHS Body of Knowledge: A Framework	186-190
38. The OHS Body of Knowledge: A Framework	191-195
39. The OHS Body of Knowledge: A Framework	196-200
40. The OHS Body of Knowledge: A Framework	201-205
41. The OHS Body of Knowledge: A Framework	206-210
42. The OHS Body of Knowledge: A Framework	211-215
43. The OHS Body of Knowledge: A Framework	216-220
44. The OHS Body of Knowledge: A Framework	221-225
45. The OHS Body of Knowledge: A Framework	226-230
46. The OHS Body of Knowledge: A Framework	231-235
47. The OHS Body of Knowledge: A Framework	236-240
48. The OHS Body of Knowledge: A Framework	241-245
49. The OHS Body of Knowledge: A Framework	246-250
50. The OHS Body of Knowledge: A Framework	251-255

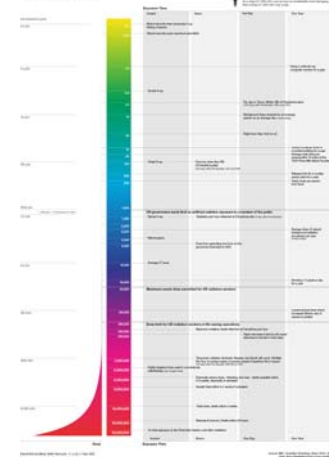
NOT FOOLED BY THE MEDIA

## Snake Oil?

Scientific evidence for popular health supplements  
Showing tangible human health benefits when taken orally by an adult with a healthy diet

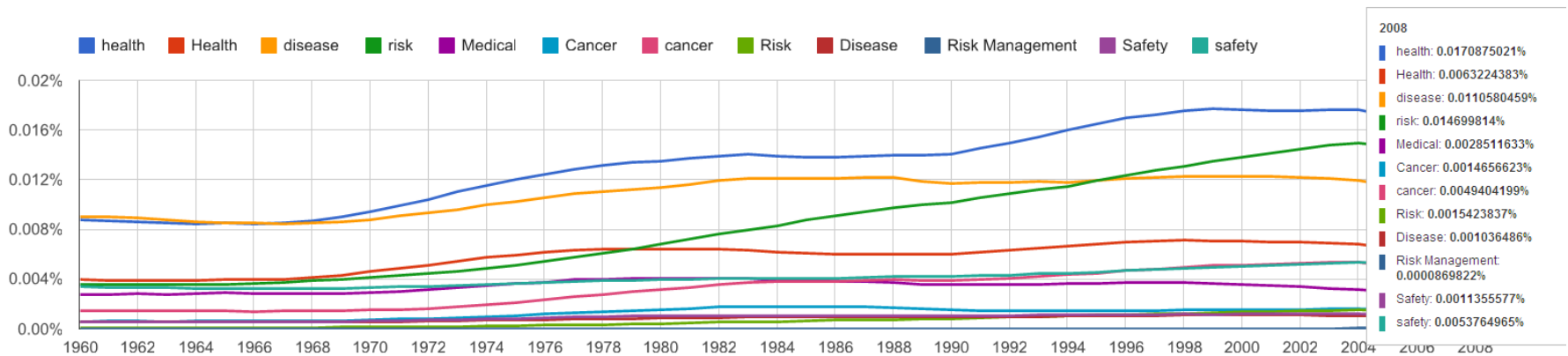


Radiation Dosage Chart





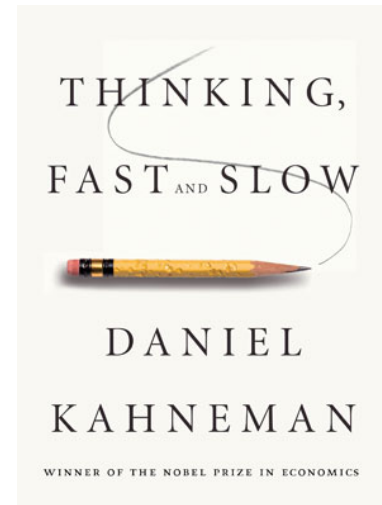
# Availability bias, hindsight bias, uncertainty: would you trust a Nobel prize\* winner?



Good practice and pitfalls in risk assessment

Prepared by the Health & Safety Laboratory  
for the Health and Safety Executive 2003

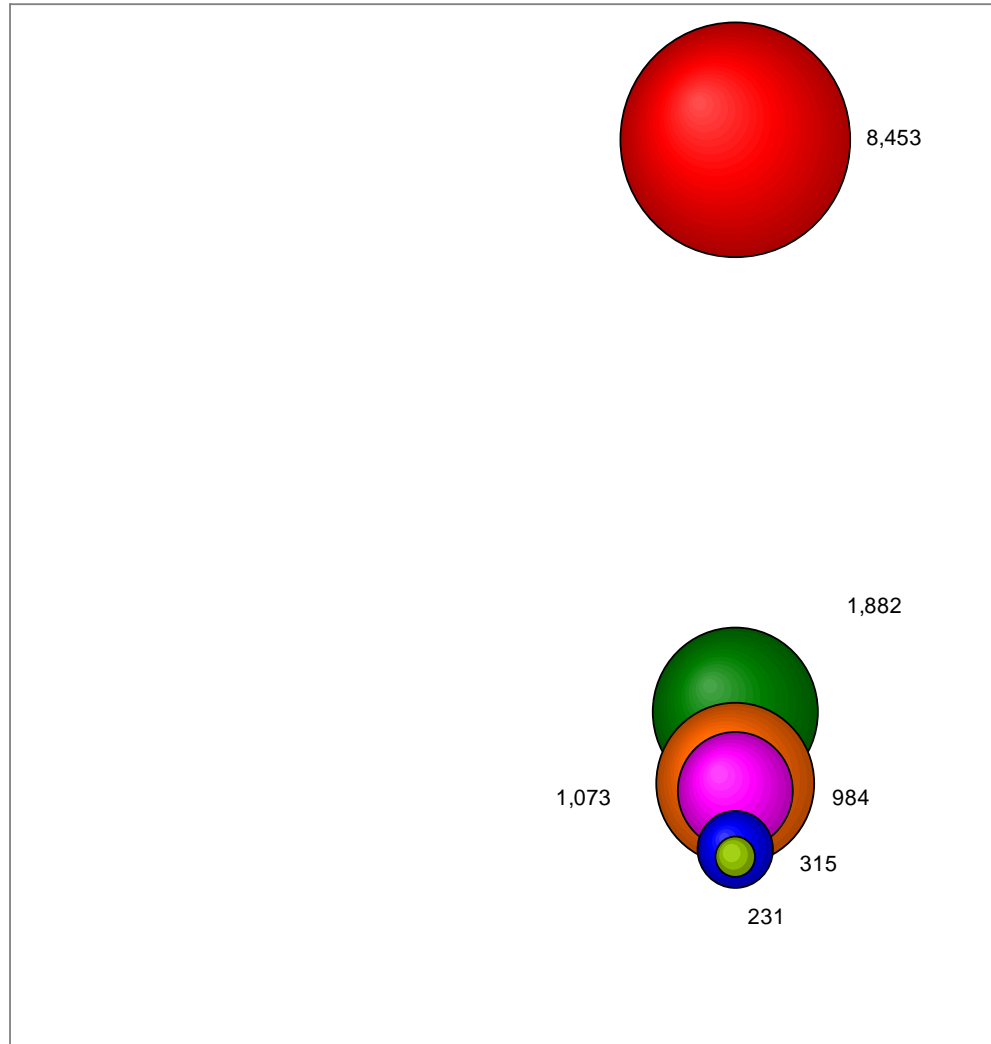
RESEARCH REPORT 151



\* Daniel Kahneman, 2002

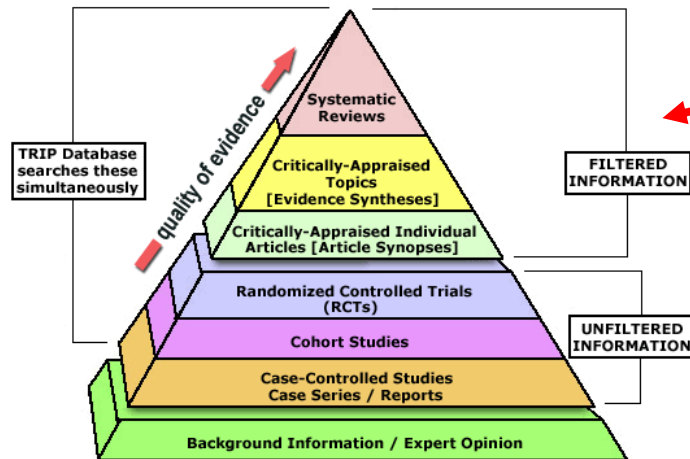


# Death from all causes- Queensland



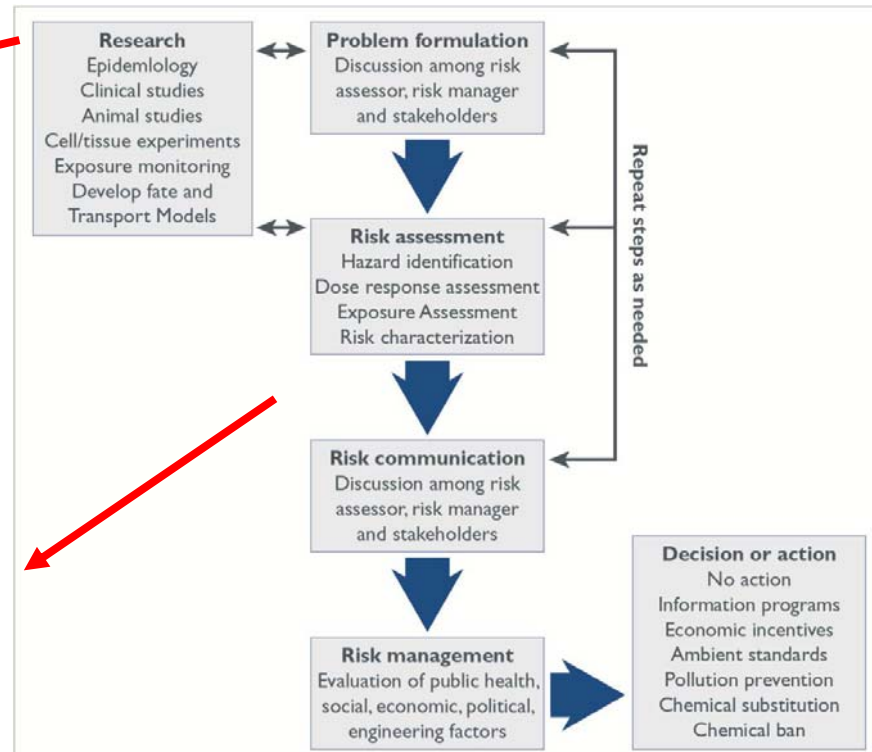
- All Cancer
- External causes- trauma, road deaths, suicide, falls and workplace combined
- Diabetes and other endocrine disorders
- Digestive system
- Infections/parasites
- Other diseases picked up on lab tests
- Skin and subcutaneous tissue

# Where is research, exposure data, or dose-response considered?

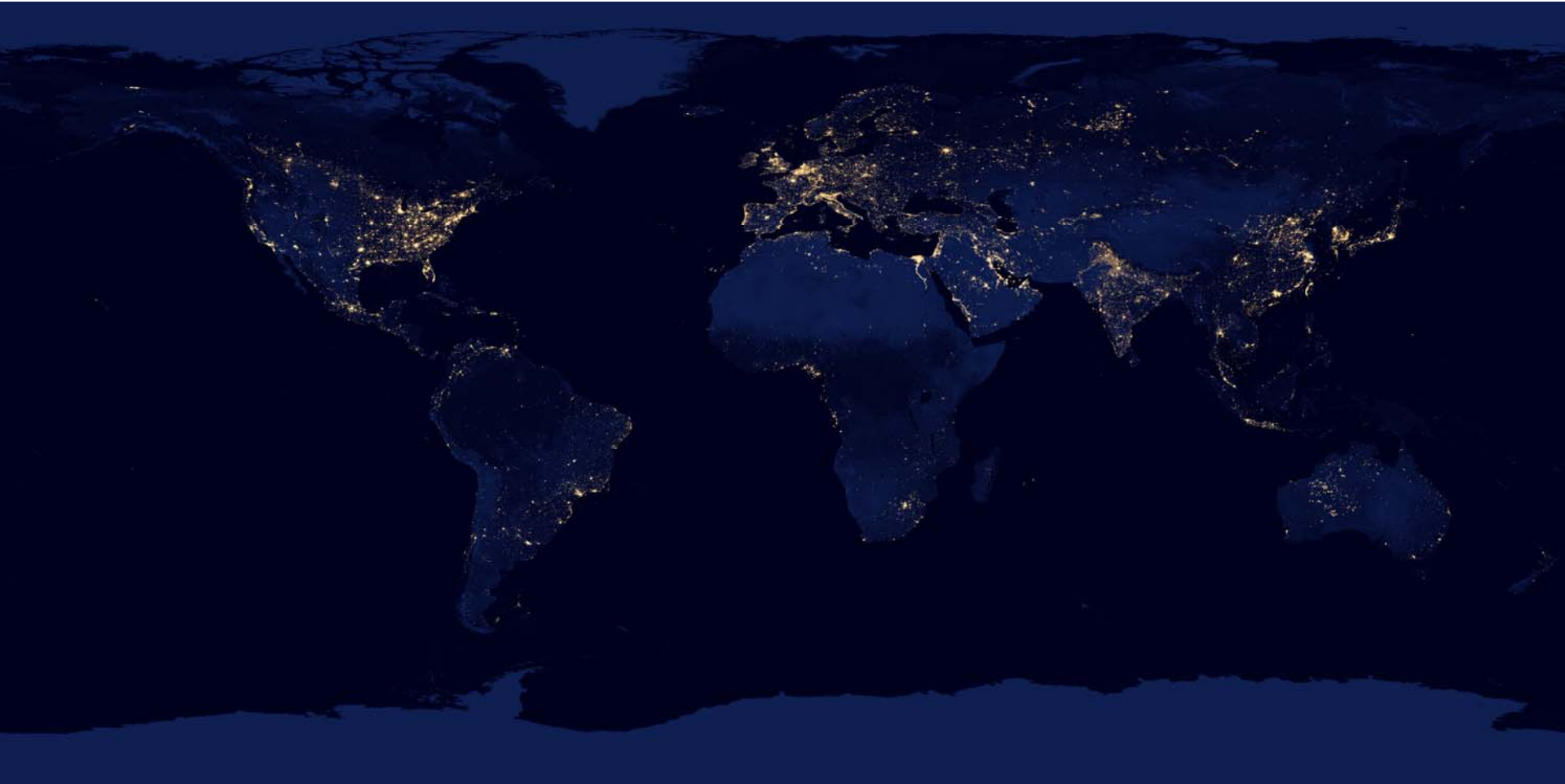


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Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Severe
Almost certain	M	H	H	E	E
Likely	M	M	H	H	E
Possible	L	M	M	H	E
Unlikely	L	M	M	M	H
Rare	L	L	M	M	H



# What can we do better?





# Three basic concepts for better health risk management in mining

1. Use evidence based and accepted sources for all health information
2. Understand that not everyone providing answers has the same health knowledge and skills
3. Find better ways to identify health issues or hazards before you are in the reactive phase

## Final words:

“A good decision is based on knowledge and not on numbers.”- Plato



## QUESTIONS?