



# Risk and Societal Concern

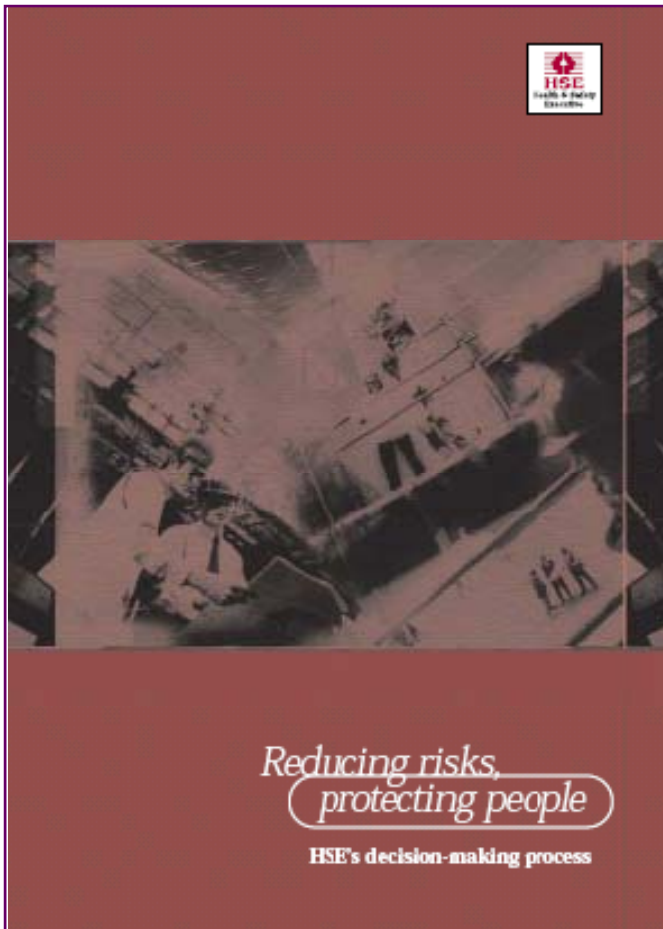
## **IRM North West Regional Group Public Perceptions of Risk Sheffield, 20 March 2009**

**Presented by Mike Robertson  
Managing Director, Risk Solutions**

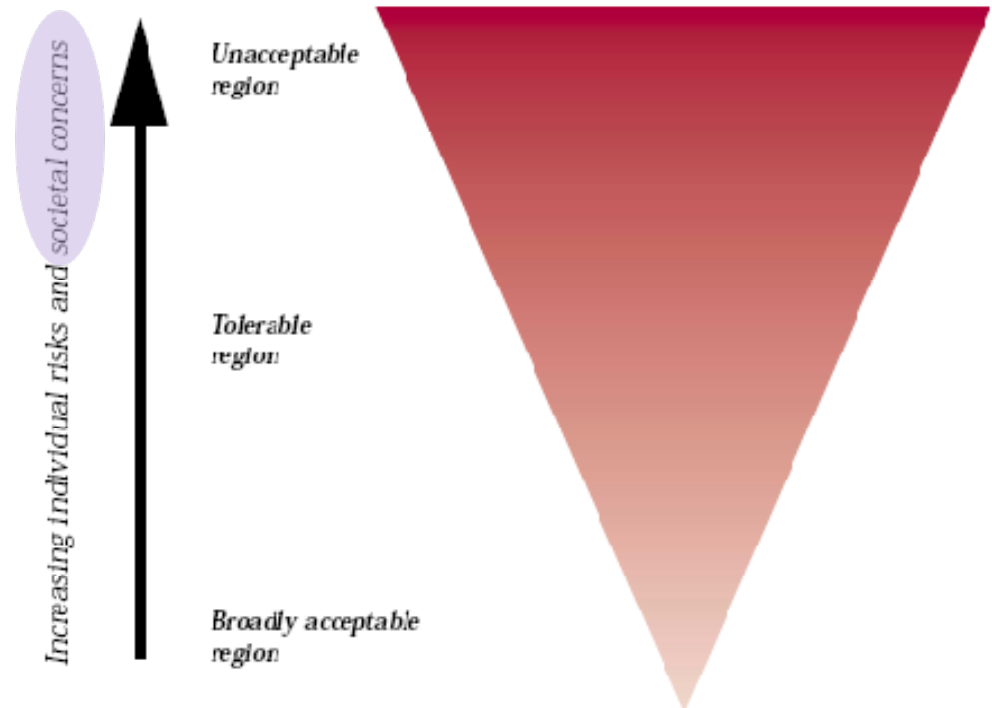
# Presentation outline

1. Background – motivation for the work
2. Literature review - research
3. Model development
4. Model testing and application

# Background



*HSE's framework for the tolerability of risk*



# Societal concern?

- What is it?
- Can you measure it?
- If you can measure it, what do you do with it?
- How do you take it into account in safety decision making?

# Literature Review

- Extensive literature review on the psychology and sociology of risk perceptions and concerns.
- Model based on Slovic's 'psychometric paradigm'

# Concern Factors

risk to future generations

catastrophe

UNKNOWN EFFECTS

How do these interrelate / combine?

inequity

involuntary exposure

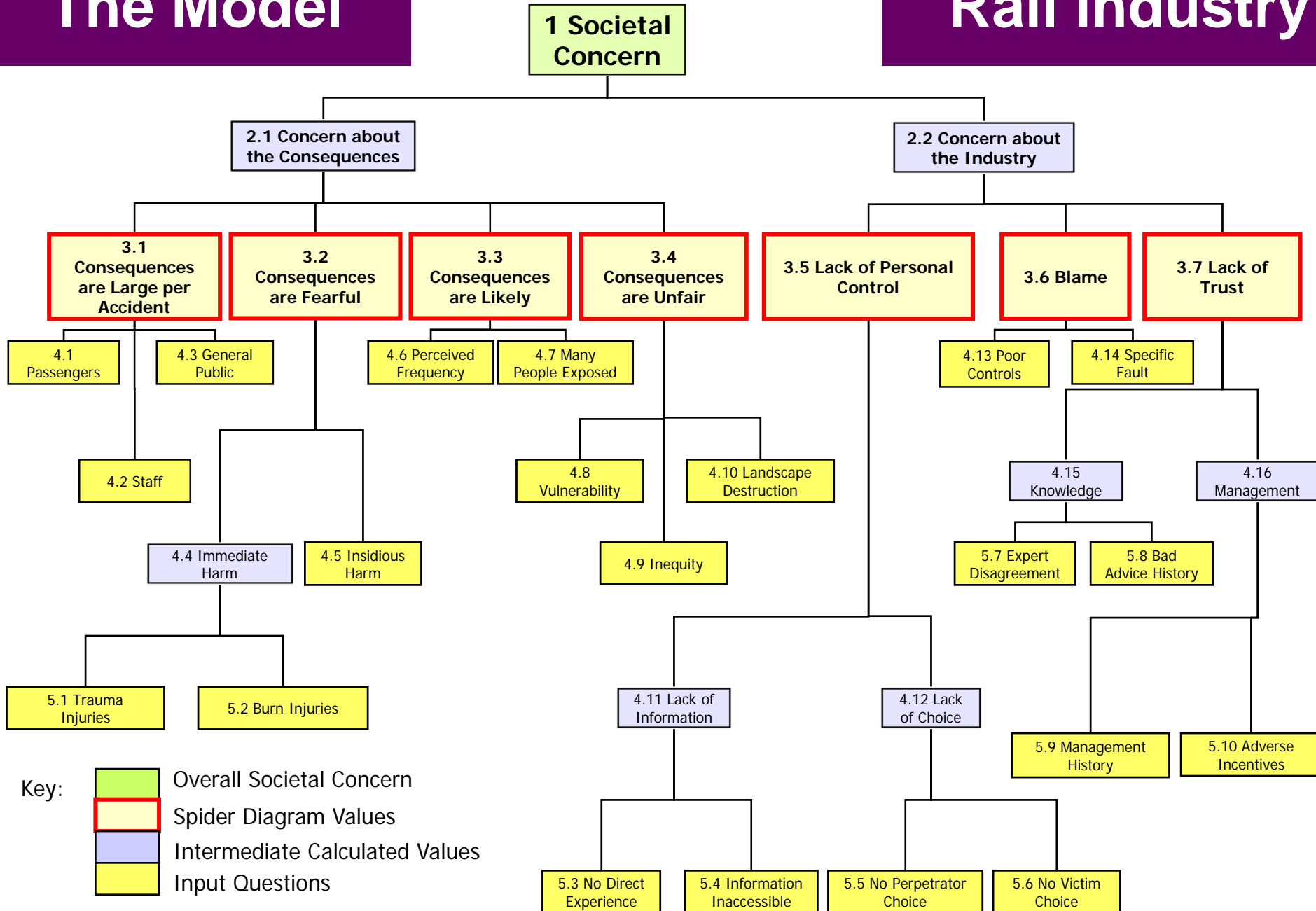


# Rail industry - societal concern factors

- Risk characteristics:
  - Large consequences
  - Likely to be realised
  - Dreadful consequences ('dread' factor)
  - Inequitable impact
  
- Control characteristics:
  - Personal control can be exerted
  - 'Trust' in those (industry) who can control the risk
  - Accountability of industry ('blame')

# The Model

# Rail industry



# Scoring the factors

- Each risk scenario (or issue) is characterised by a 'score' against a range of concern factors.
- Scores are elicited in focus groups by asking for responses to specific questions, e.g.
  - *How many passengers might be harmed in an incident such as this?*
  - *How much choice did the people affected have about whether they were exposed to this risk? (victim's choice)*
  - *How sceptical are you about the information provided to the public by the railway industry about this kind of incident?*

# Scenario examples

## Passenger Assault

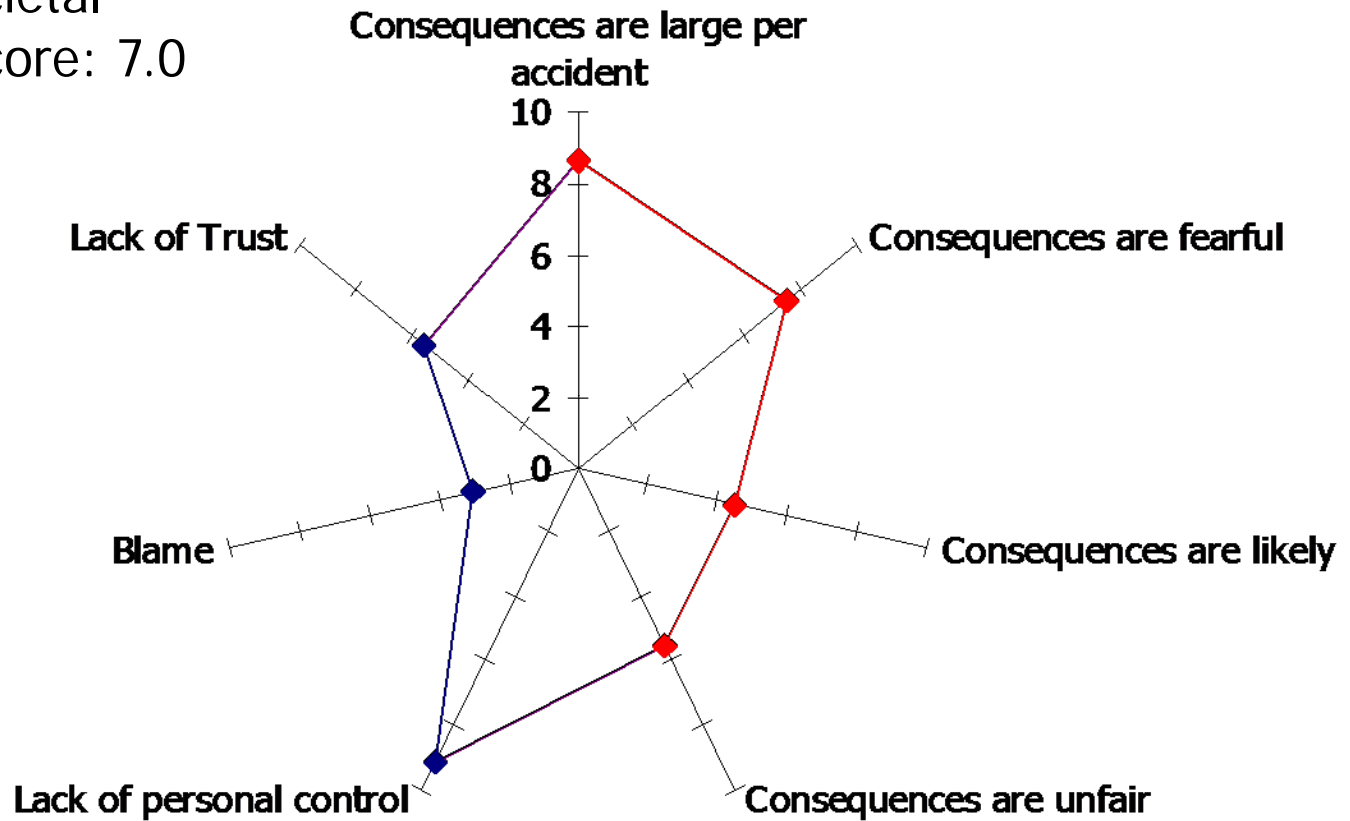
Imagine a small, unstaffed station late at night. A train arrives and a woman gets out. As she walks across the station car park, which is poorly lit, a man attacks her and sexually assaults her, then runs off.

## Passenger Train Collision with Road Vehicle on Level Crossing

Imagine a train travelling at speed approaching a level crossing. For some reason the barrier fails to lower. A car approaches the level crossing without realising there is a problem. As the car traverses the crossing the train hits it, causing part of the train to derail and considerable damage to the train and the car.

# Example model output

Overall Societal  
Concern Score: 7.0



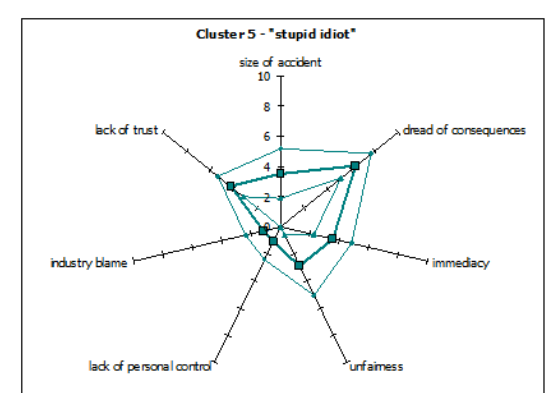
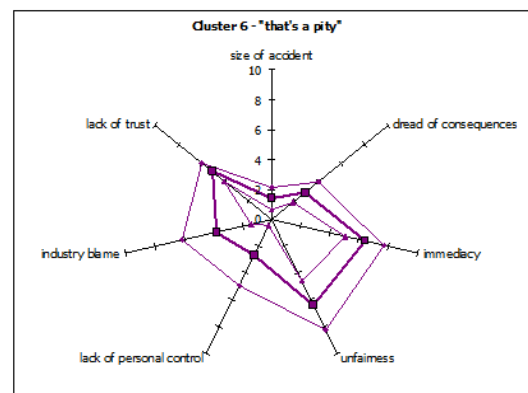
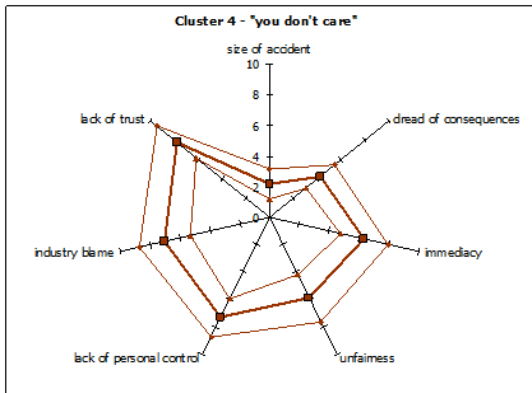
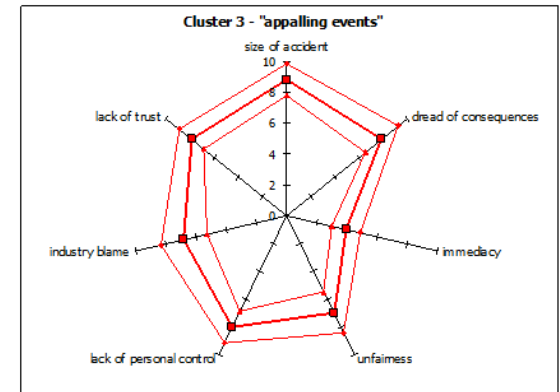
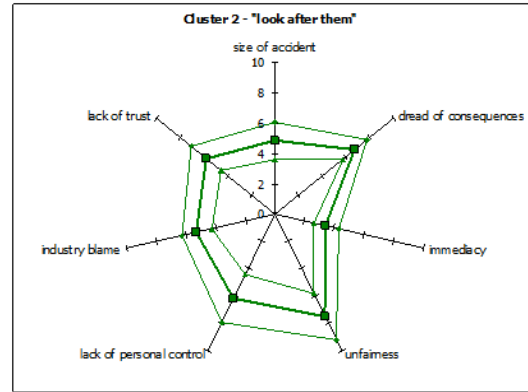
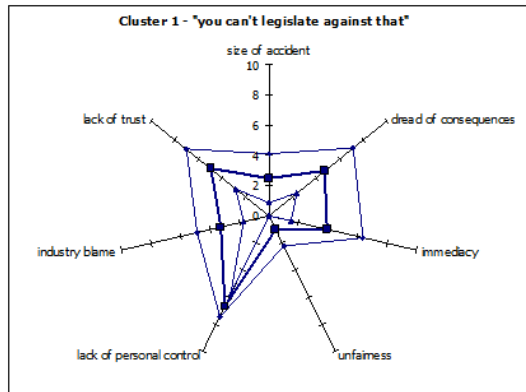
# Ranking Exercise

- Before using the model, focus group participants were asked to rank the scenarios in order of concern.
- The ranks were compared across groups (Spearman rank correlations) – good agreement was found.
- Ranks based on model top-level scores were compared with the results of the ranking exercise – generally good agreement.
- Differences could be explained in terms of how the model put a new perspective on the scenarios.

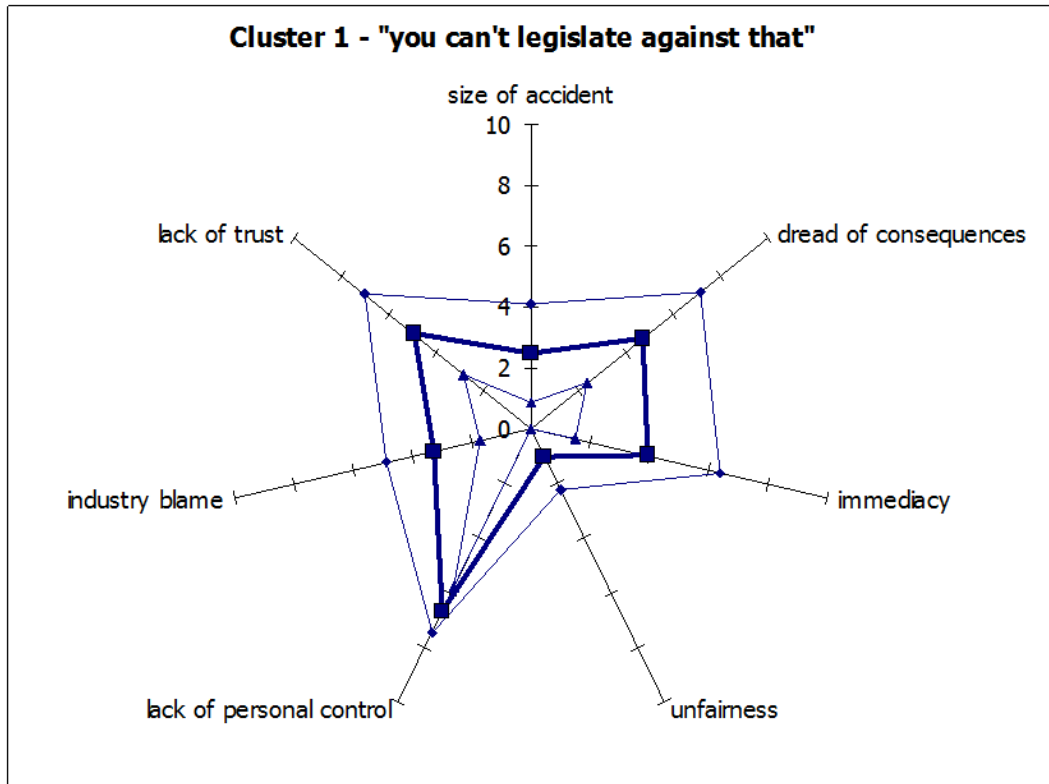
# 'Anatomy' Scores and Clusters

- For each focus group and for each scenario covered by them, the model produces a set of 'anatomy level' scores.
- We used cluster analysis to look for consistent pattern types within this set of scores.
- We found six clusters, which we identified with distinct patterns of concern.
- The model now tests each new result for possible cluster membership.

# Different 'anatomies' of societal concern



# “You can’t legislate against that”

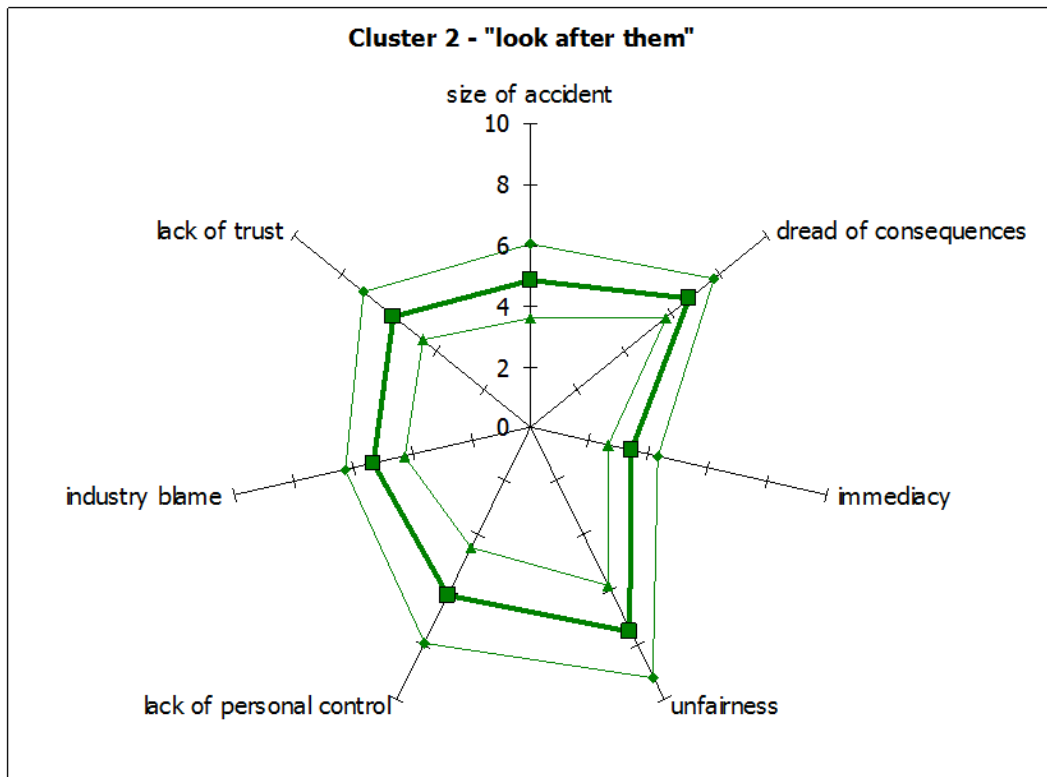


There's little industry can do to prevent such incidents.

Expect industry to comply with legal requirements and no more.

e.g. worker assault by fare dodger

# “Look after them”

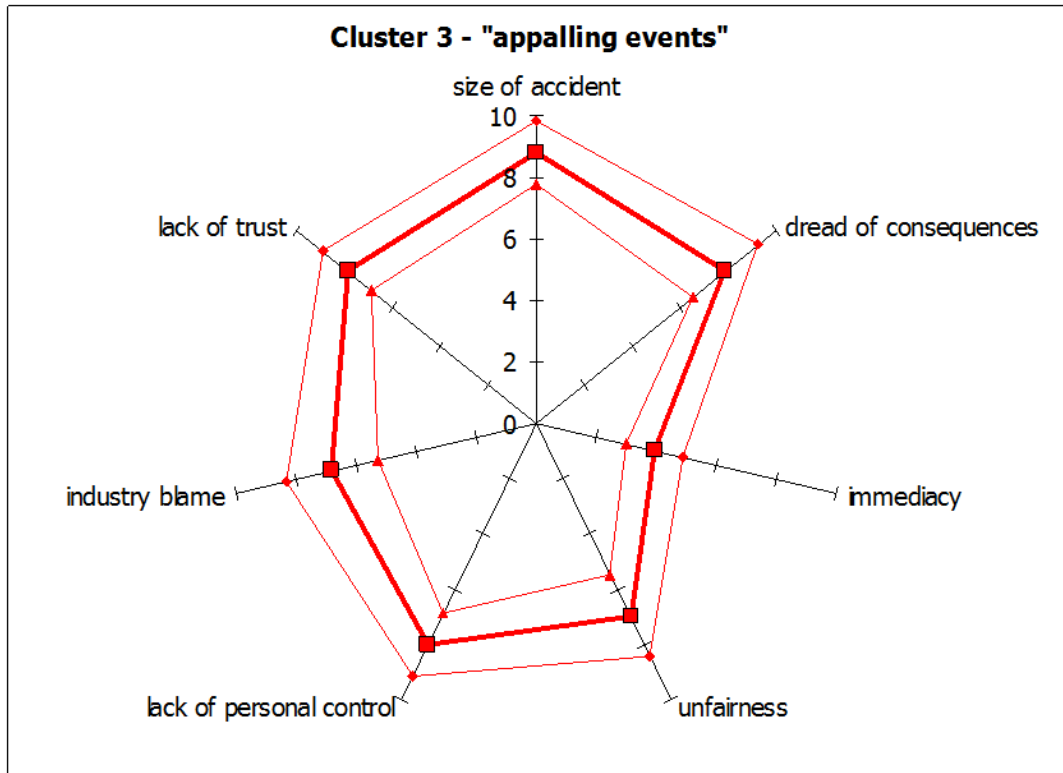


These incidents affect the vulnerable to whom we all owe a greater duty of care.

Industry should pay particular attention to looking after the vulnerable, especially children.

e.g. children electrocuted on track

# “Appalling events”

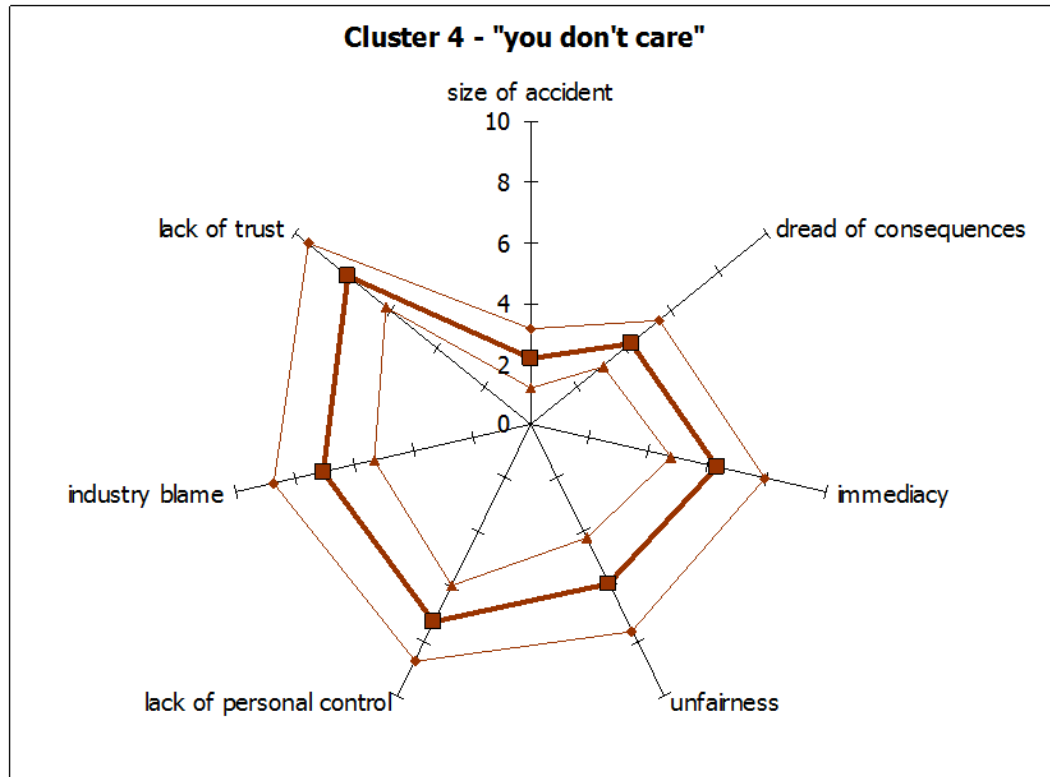


These things should never happen.

Industry to pay particular attention to the hazards that could lead to such events, even if the risks are very low. No room for complacency. Communicate the good work that is done here.

e.g. passenger train collision

# “You don’t care”

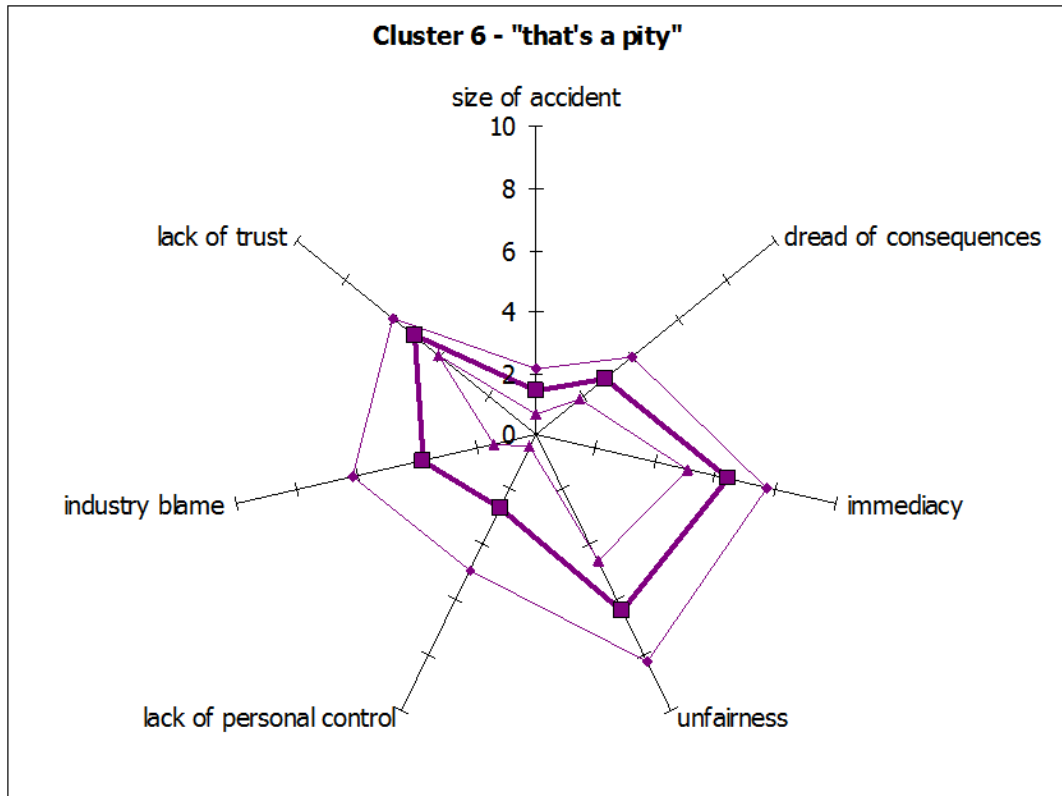


The industry puts financial interests above trying to control these risks.

Industry should pay more attention to these issues to improve reputation and trust.

e.g. assault in car park

# “That’s a pity”

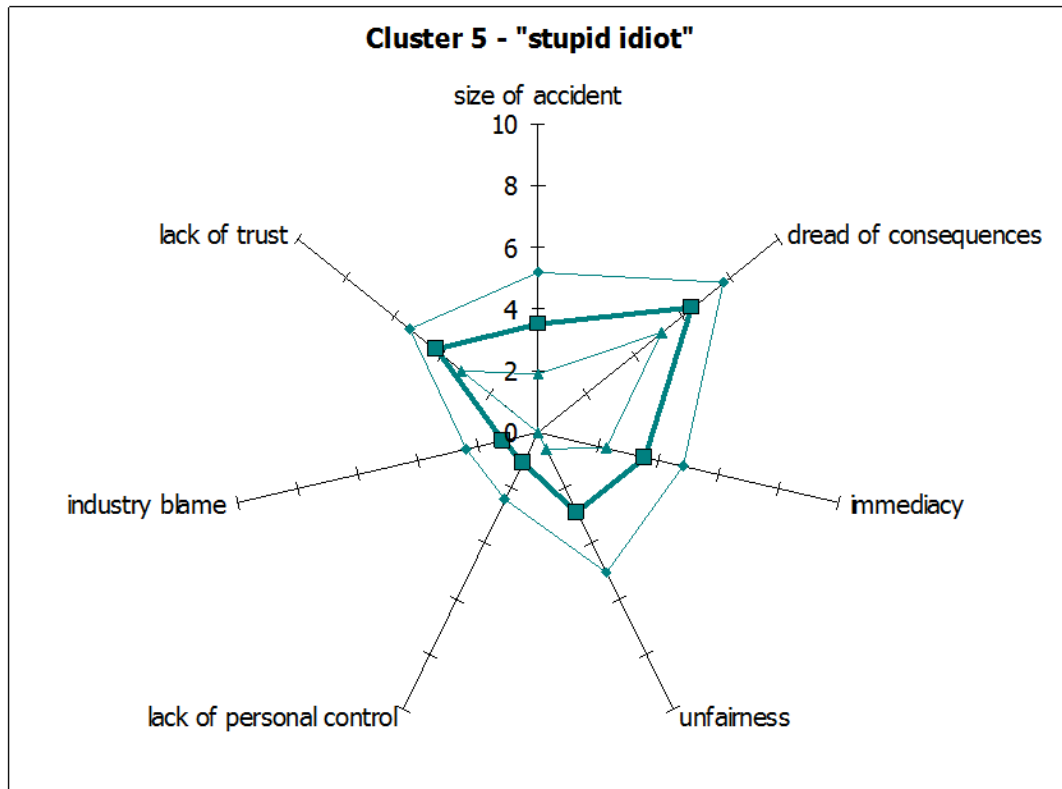


These are minor incidents but affect the vulnerable.

Industry should comply with legal requirements and ensure staff pay particular attention to vulnerable people travelling on the railway.

e.g. drunk falls onto track, commuter trips on stairs

# “Stupid idiot”



The people involved were responsible for their own fate.

Industry should comply with legal requirements and no more.

e.g. shortcut home across track

# Scenario clusters

Cluster 1:	Cluster 2:	Cluster 3:	Cluster 4:	Cluster 5:	Cluster 6:
"you can't legislate against that"	"look after them"	"appalling events"	"you don't care"	"stupid idiot"	"that's a pity"
lookout killed	lookout killed	train collision	car park assault	shoplifter killed	stones at train
stones at train	lookout killed	train collision	car park assault	walks into pillar	falls onto track
worker assault	child falls	train collision	car park assault	head out of train	falls onto track
worker assault	killed on crossing	train collision	car park assault	head out of train	falls getting on train
shoplifter killed	killed on crossing	train collision	car park assault	rambler falls	walks into pillar
train fire	train fire	train collision	car park assault	rambler falls	child traps fingers
track worker struck	children electrocuted	train collision	car park assault	shortcut on tracks	commuter falls
	children electrocuted	train collision	car park assault	shortcut on tracks	
	children electrocuted	derailment	lookout killed	shortcut on tracks	
	children electrocuted	train fire	train jerks	track worker struck	
	children electrocuted	train fire	train jerks	killed getting hat	
	chemical spill	train fire	child falls	killed getting hat	
	killed getting hat	level crossing	mugged on train		
		level crossing	mugged on train		
		level crossing	falls getting on train		
		chemical spill	knocked over		
			knocked over		
			coat trapped		
			coat trapped		
			child traps fingers		
			collapses on train		
			collapses on train		



# Societal concern? *(revisited)*

- What is it?     ***Academic literature***
- Can you measure it?     **Yes**
- How do you take it into account in safety decision making?  
***‘Anatomy’ of concern can inform an appropriate response***

# Applications of model

- Supporting safety decision making:
  - Do alternative controls attract more public confidence?
  - Are public concerns so strong that normal cost-benefit criteria may not be appropriate?
- Aiding design of communication plans
- Research and monitoring of public attitudes or concerns (*e.g. time-line or trends analysis*)

# Our Philosophy

If you want to know what  
people think about an issue

..... *ask them !*

# Conclusions

- Societal concern is a tangible thing that *can* be measured
- Our model provides a structured approach for engaging with ordinary members of the public and *gauging* their concern
- It has been tested and *validated* extensively with the public



# Risk and Societal Concern

**Any further questions?**

**[mike.robertson@risksol.co.uk](mailto:mike.robertson@risksol.co.uk)**

**Tel: 0870 850 4889**

**[www.risksol.co.uk](http://www.risksol.co.uk)**